THE MERCOSUR RICE ECONOMY

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INTRODUCTION

There has been growing interest among nations in the western hemisphere in preferential trading arrangements (Taylor et al., 1995; Schuh and Junguita, 1993). Since 1990, 33 regional agreements have been registered with the World Trade Organization — the supranational organization that sets the rules for international trade (Blandford, 1995). One of the most important of these trading arrangements is the *Mercado Comun del Sur* (Common Market of the South), commonly referred to by its acronym, the MERCOSUR. (See Table 1 for a definition of acronyms and technical terms.) The MERCOSUR is a customs union whose member nations are Argentina, Brazil, Paraguay and Uruguay and whose economies account for over half of Latin America's gross domestic product (GDP)[1]. Chile joined as an associate member on October 1, 1996, and Bolivia is expected to become an associate member in 1997[2].

Since 1991 regional integration and bilateral economic reforms have had major impacts on MERCOSUR rice markets. Brazil, the largest rice consuming nation

[1]Forms of economic integration include free-trade areas, customs unions, common markets and economic unions. Free-trade members lower or eliminate tariffs and perhaps other trade barriers among themselves, but each maintains its own trade policy toward non-members. A customs union is a trading arrangement in which internal tariffs are lowered or removed and a common trade policy is maintained toward non-members. A common market is a customs union in which factor markets such as labor, capital and enterprise are also integrated. An economic union pushes integration substantially beyond that of a common market. Factor markets and product markets are closely integrated as well as fiscal, monetary, taxation and social policies. As nations move from free-trade areas to economic unions, national demarcations among members become increasingly blurred.

[2]The most important impediments to Chile becoming a full MERCOSUR member were tariffs that were typically lower than those of the MERCOSUR and its preferential trading arrangements with other nations. Under its agreement with the MERCOSUR, Chile will retain its external tariff of 11% on imports from non-members and will immediately place zero tariffs on 700 import categories from members. Gradual elimination of other tariffs will take place over an 18-year period. An important aspect of the agreement is the physical integration protocol, which will give the other MERCOSUR nations access to Chilean Pacific ports.

Table 1. Definitions.

Name	Definition
Asociación Cultivadores de Arroz	Uruguayan Rice Growers Association. Represents the interests of rice producers.
Amazon Basin	Large upland production area in Brazil located west of the Cerrado.
Banco de la Republica	Uruguayan gov't bank that lends to the private sector at market interest rates.
Blue Belle	A U.S. high-quality long-grain indica rice variety. This and similar varieties planted in Argentina and Uruguay.
Cerrado	Large upland rice production area in Brazil that runs north to south between the Amazon basin and the Atlantic ocean.
CFP	Brazil's Commission of Production Finance. In charge of gov't credit to agriculture from 1943 to 1990.
Chui	City in eastern Uruguay on Brazilian border. Major crossing point for Uruguayan rice.
CIAT	Center for International Tropical Agriculture located in Cali, Columbia. Channels new rice varieties from IRRI to national rice research programs in the MERCOSUR.
Comision Sectorial de Arroz	Uruguayan Sectorial Rice Commission. Group composed of growers, millers and gov't that sets the national seasonal average producer price.
CONAB	The National Supply Company of Brazil. Manages the price support program for rice, which includes substantial storage.
Corrientes	Several largest Argentinean rice-producing provinces between the Paraná and Uruguayan rivers. Second largest rice producer.
Double Carolina	A double-width indica rice variety primarily grown and consumed in Argentina. Has low yields and is slow to mature.
EMBRAPA	The Brazilian Institute for Agriculture Research. Federal agency in charge of basic agricultural research.
Entre Rios	Largest Argentinean rice-producing province between the Paraná and Uruguay rivers.
Gremial de Molinos Arroceros	Uruguay Rice Millers Association. Represents the interest of millers.
Hidrovia	The Paraná-Uruguay river system. Seen as backbone of MERCOSUR transportation system.
INTA	National Institute of Agricultural Technology. Primary agricultural research arm of Argentinean government.
IRGA	The Rio Grande do Sul Rice Institute. State institution that is largest research institution for irrigated rice in Brazil.
IRRI	The International Rice Research Institute. Located in the Phillipines, it is responsible for developing new rice cultivars.
Junta de Granos	The National Grain Board of Argentina. Prior to 1990s regulated internal rice prices and exports.
MERCOSUR	Customs union consisting of Argentina, Brazil, Chile, Paraguay and Uruguay.
NAFTA	A free trade area consisting of Canada, Mexico and the United States.

continued

Table 1. continued.

Name	Definition
PLE	A 60-month running average wholesale trigger price for Brazilian rice. If exceeded, stocks released.
Proarroz	Commission for the Improvement of Rice Cultivation. A non-profit mixed commission representing the Argentinean rice industry.
Real Plan	1995 Brazilian economic plan that introduced a new currency and reduced government expenditure.
Rio de la Plata	An estuary on the Atlantic ocean between Argentina and Uruguay formed by the Paraná and Uruguay rivers.
Rio Grande do Sul	Southernmost state in Brazil that is the largest producer of irrigated rice.
Saõ Paulo	Largest city and deficit market for rice in Brazil.
Tipo 1	Brazilian grade of milled rice with 10% or less brokens. Used as standard throughout MERCOSUR.
Tropical indica varieties	High-yielding rice varieties planted throughout MERCOSUR and primarily consumed in Brazil. Originated with IRRI.
Uruguayana	City in southeastern Corrientes, Argentina, on Brazilian border. Point through which bulk of rice crosses into Brazil.

outside of Asia, was self-sufficient in rice until the early 1990s. In the 1990s, Brazil has imported about 1 million metric tons (MT) annually[3]. In response to Brazilian import demand, Argentina and Uruguay have doubled their production since 1990, and they have the potential to produce substantially more.

Although intra-MERCOSUR trade has increased to 600,000 MT (about 4% of world trade), little attention has been given to the emergence of MERCOSUR rice markets because no import substitution has taken place. MERCOSUR exports out of the region remain relatively unimportant when compared to the total world quantity traded, and until the 1990s the region did not import substantial quantities of rice on a regular basis. There are indications, however, that events in MERCOSUR rice markets will have repercussions on international markets in 1996 and beyond. Because of drought and a reduction in area planted, Brazil imported 2 million MT in 1996. Estimates at planting indicate that Brazilian production will fall 8% in 1997 and imports will be greater than those of 1996. Currently, Argentina and Uruguay are able to supply less than half of Brazil's import needs. This has opened up substantial export opportunities to other suppliers that are likely to extend to at least 1998. In addition, Argentina and Uruguay are desirous of diversifying their export markets away from Brazil, and there are a number of factors that indicate that they will have some degree of success in accomplishing this goal in the future.[4]

[3]Except where noted, imports and exports are on a milled basis. Production and yields are on a rough or unmilled basis.

[4]See Bierlen et al. (1996b) for an extended discussion of this topic.

In order for the United States and other exporters to successfully compete in the Brazilian rice import market, and in non-MERCOSUR markets contested by Argentina and Uruguay, they need a thorough understanding of the MERCOSUR rice economy. Changes in the MERCOSUR rice economy are particularly relevant to U.S. rice firms that export substantial quantities to Latin American markets, markets in which Argentina and Uruguay are expected to increase their market shares. Current information on the MERCOSUR rice economy is limited and typically not written in English. This bulletin combines secondary data with information gathered from available Spanish and Portuguese language publications and personal interviews by the authors in the region in May and June 1995 to create a unique, comprehensive information source.

The purpose of the bulletin is to describe and analyze the current production, marketing and policy structure of the MERCOSUR rice economy. Emphasis is placed on the dynamics created by regional integration and unilateral national economic reforms. The study begins with a brief background of national economic reforms and regional integration. The following sections discuss MERCOSUR rice production, marketing, trade, policy and research.

REGIONAL INTEGRATION AND NATIONAL ECONOMIC REFORMS

Regional Integration

The MERCOSUR is the largest trade block in the western hemisphere after NAFTA. Its development is viewed as a key step in the economic integration of the western hemisphere, which is expected to be fully implemented early next century. The MERCOSUR was created by the Treaty of Asunción in March 1991 with the objective of establishing a customs union by January 1, 1995. Internal tariffs were reduced to zero in a series of seven steps from December 31, 1991, to December 31, 1994. Common external tariffs were put into place on January 1, 1995. Currently, the average common external tariff is about 20% with zero tariffs on most imports from MERCOSUR members. Zero tariffs will be phased in on about 1600 protected items, which account for 15% of intra-MERCOSUR trade.

Regional integration has three rationales: 1) development of a national strategy to improve economies of scale and to make national industries more competitive in the international market place, 2) increased regional security and consolidated democracy and 3) increased bargaining power of individual nations in broader trade liberalization negotiations (Manzetti, 1993; Taylor et al., 1995). More immediate rationales for joining the MERCOSUR include: 1) Brazil's expected ability to increase exports of capital and consumer goods, 2) the expected ability of the other four nations to immediately increase exports of agricultural products to Brazil and 3) the hope of the non-Brazilian nations to strengthen their industrial sectors in order to compete with

Brazilian goods in the future. Uruguay, in a key geographical position with good natural harbors on the Rio de la Plata, hopes to develop itself as the regional transportation and service center. Since Paraguay is the poorest MERCOSUR nation, leaders feel that membership can only improve current economic conditions. Chile, with the only Pacific Ocean ports in the region, is a key link in the MERCOSUR transportation system. The success of MERCOSUR hinges on real economic growth in Brazil. Also, because neither Argentina not Brazil has a strong currency, considerable exporting will have to be done outside of the region in order to obtain hard currency.

The MERCOSUR (not including Chile) has a land area of 4.5 million square miles (about 123% of that of the United States) and a population of 203 million (about 77% of that of the United States) (Table 2). Argentina accounts for 23% of the area and 17% of the population while Brazil accounts for 72% of the area and 80% of the population. The other two nations account for 5% of the area and 3% of the population. Over three-quarters of MERCOSUR citizens are urban dwellers, and

Table 2. Summary of MERCOSUR population and economic statistics.

Characteristic	Argentina	Brazil	Paraguay	Uruguay	MERCOSUR[a]	Chile
Land Area[b]	1056.6	3265.1	153.4	67.5	4542.7	289.1
Population[c]	34.7	160.5	5.0	3.2	203.4	14.5
Density[d]	33	49	32	47	42	50
Population Growth[e]	1.2	1.7	2.8	0.8	1.6[g]	1.6
Urban Population[e]	87	76	50	90	78[g]	85
Life expectancy[f]	72	66	69	73	68[g]	72
GDP[h]	279.5	540.9	8.8	11.0	840.3	65.6
GDP/Capita[i]	8054	3370	1753	3450	4131	4525
Exports[j]	21.0	46.5	0.8	1.9	70.2	16.0
Imports,cif[j]	20.1	53.8	2.4	2.6	78.9	15.9
Exchange Rate[k]	1.000	1.013	2082.8	7.940	-	410.7
Annual Inflation[l]	-2.0	162	10.2	26.3	10.1[m]	8.0

[a]Includes Argentina, Brazil, Paraguay and Uruguay.
[b]Thousands of square miles
[c]Millions (1996)
[d]Persons per square mile (1996)
[e]Percentage (1996)
[f]Years at birth (1996)
[g]Calculated by using the population of each country to total MERCOSUR population as weights (1996)
[h]GDP = Gross Domestic Product (a measure of national output) = Billions of U.S.$ (1995)
[i]U.S.$ (1995)
[j]Billions of U.S.$ (1995)
[k]Local currency per U.S.$ (August 1996)
[l]Percentage (second quarter 1996)
[m]Calculated by using the GNP of each country to total MERCOSUR GNP as weights (1995)

Source: Population Reference Bureau and International Monetary Fund.

population growth rate in the region averages 1.9% annually. Gross Domestic Product (GDP) in the region was $840.3 billion in 1995, about 12% of that of the United States. Brazil accounts for 64% and Argentina 33% of the region's GDP, while Paraguay and Uruguay each account for around 1%. In 1995, per capita income was highest in Argentina ($8,054), followed by Uruguay ($3,450), Brazil ($3,370) and Paraguay ($1,753). In 1995, exports were valued at $70.2 billion and imports at $78.9 billion. Only Argentina ran a small trade surplus, while Brazil, Paraguay and Uruguay ran deficits. Over the past five years, intra-MERCOSUR trade has tripled and in 1995 was $25 billion (imports and exports). Second-quarter 1996 inflation ran at an annual rate of 10.1% in the region. Inflation ranged from -2% in Argentina to 26.3% in Uruguay.

National Economic Reforms

Unilateral national economic reforms, most prominently by Argentina and Brazil, have paralleled regional integration. Due to a policy of economic reforms, begun by the Menem administration in 1991, the business environment in Argentina is optimistic for the first time in more than a generation. Specific reform measures include fiscal responsibility, tariff reduction, privatization and deregulation. The Law of Convertibility has closely tied the peso to the dollar, thus limiting the growth in the money supply and making budget deficits virtually impossible. Currently, inflation is down to a single digit, and privatization is largely complete at the federal level and has begun at the provincial level. Although having run a trade deficit in recent years, Argentina had a merchandise trade surplus of $844 million in 1995 fueled by strong agricultural export sales.

Although lagging Argentina's reforms, Brazil's economic reforms have recently overshadowed those of Argentina due to its large economy (the largest in Latin America and the tenth largest in the world). Brazil's reforms date from July 1, 1994, when the then-finance-minister and current president, Fernando Henrique Cardoso, implemented the *Real* Plan. Important features of the *Real* Plan were a sharp reduction in government expenditures and the introduction of a new currency, the *real*, which was closely tied to the dollar. A new currency was necessary due to the triple-digit inflation of the early 1990s. An immediate effect of the *Real* Plan was a sharp reduction in inflation, which was running at 40% a month in the first two quarters of 1994 and dropped to 0.91% a month in the fourth quarter of 1995. Other effects of the *Real* Plan were increased income or economic growth to 5%, a more than doubling of foreign investment from $1.5 billion in 1994 to $3.5 billion in 1995 and real wage increases. Strong economic growth and an overvalued *real*, however, resulted in a trade deficit of $7.3 billion in 1995. In order to cool down an overheated economy, the central bank increased reserve requirements early in 1995. In spite of fears that Brazil was headed for a recession similar to that of Mexico and Argentina in 1995, optimism is strong that rapid growth will continue into the next century and that Brazil will fulfill its role as the MERCOSUR's engine of growth.

Uruguay has generally avoided the economic crises and the resulting austere economic plans of Argentina and Brazil. Over the past decade, it has gradually privatized and reduced inflation, tariffs and budget deficit levels. Inflation has steadily declined from 112% in 1990 to a 23.5% annual rate in the first half of 1996. Although there has been some success in reducing the budget deficit, trade balances have been negative since 1990. In 1993 the trade deficit was $680 million and grew to $873 million in 1994. This fell slightly to $750 million in 1995. In 1994 about 8% and in 1995 about 10.5% of the government budget was debt-financed. Budget deficits are related to a liberal social security system that accounts for 37% of government expenditures. In 1995, however, the Uruguayan Congress passed legislation to reduce social security transfer payments to future beneficiaries. Although recent administrations have tried to reduce the government's role in the economy, a December 1992 referendum rejected large-scale privatization. In spite of the outcome of the referendum, economic liberalization continues to be a long-term government goal.

RICE PRODUCTION SECTOR

Brazil is the ninth largest rice producer in the world and the second largest importer after Japan. Argentina is the 25th largest producer and the ninth largest exporter. Uruguay is the 26th largest producer and the eighth largest exporter. The MERCOSUR produces substantial quantities of both irrigated and upland rice.[5] Irrigated production is located in a contiguous area between 30 and 35 degrees south, which includes the southernmost states of Rio Grande do Sul and Santa Catarina in Brazil, an area north and northwest of Buenos Aires in Argentina, primarily in the provinces of Entre Rios and Corrientes, and the eastern and northern departments (akin to states) of Uruguay (see Fig. 1). Upland rice (non-irrigated) is grown in most states of Brazil except for Rio Grande do Sul, the northeast and parts of the Amazon basin. There is no upland rice production in either Argentina or Uruguay. Brazilian upland production is located in two major regions: the deficient rainfall region (Cerrado) and the adequate rainfall region (Amazon basin). The Cerrado is an extensive area that runs north to south between the Amazon Basin and the Atlantic coastal plain and includes all or parts of the states of Bahia, Tocantis, Piaui, Maranhão, Minas Gerais, Saõ Paulo, Goias, Mato Grosso and Mato Grosso do Sul. The Amazon basin is located west of the Cerrado and includes all or parts of the states of Mato Grosso, Rondonia, Maranhão, Para, Amapa, Rondonia, Amazonas and Acre.

[5]Paraguay and Chile are not included in the discussion. Paraguay and Chile are small producers relative to the other three nations (100,000 MT), and their international trade in rice is relatively unimportant.

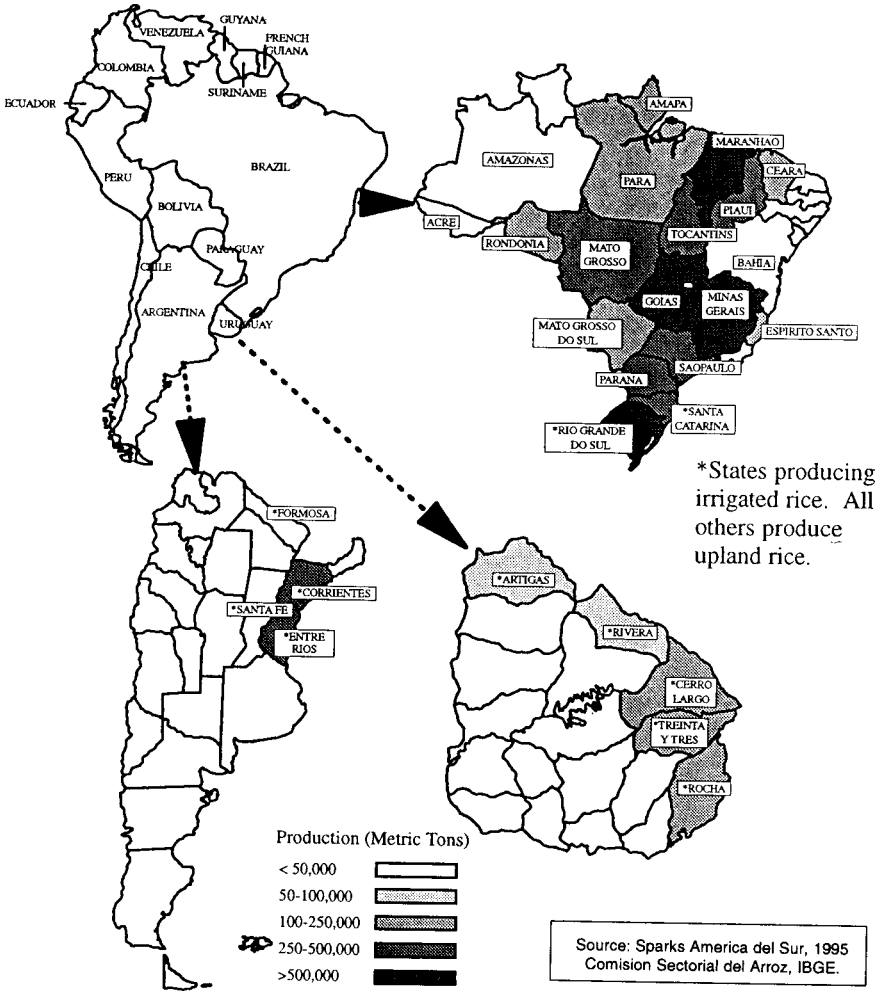

Fig. 1. 1994/95 MERCOSUR rice production by country and state (in metric tons). (Source: Sparks American del Sur, Comision Sectorial del Arroz, IBGE, 1995)

Irrigated Production Sector

Irrigated rice production uses modern inputs and cultural methods. Average yields are in excess of 5 MT/ha. Farm size varies, but the majority of rice is produced on farms with more than 200 ha of rice. Large operations tend to be vertically integrated with milling. There are over 12,000 irrigated rice producers in Brazil, over 800 in Argentina and 730 in Uruguay. Land is well suited to rice production because it is flat and relatively impermeable and has a good supply of surface water. Livestock

grazing is generally the only competing enterprise. Rice is typically produced for two years followed by four years of livestock grazing. Recently, however, producers have attempted to intensify the production of rice within this rotation. Santa Catarina and northern Rio Grande do Sul are the only areas where two crops of rice can be produced per crop year.

The first step in preparing for planting is construction of an internal drainage system in the late fall and winter months (May through September).[6] This is followed by discing and leveling. Plowing is performed as needed in order to break up the hardpan created by continual flooding. Seedbeds are prepared just prior to planting, which is performed on the ground by broadcasting or by planting in rows in October, November and early December. Currently, pre-germinated seed is the newest technological innovation being adopted. Shortly after planting, in preparation for flooding, the internal levee system is constructed. Herbicide is applied (generally just once) 20 to 25 days after seeding and urea 40 days after seeding (during tillering) by air. The field is flushed once or twice after the urea application in order to aid the young plant in recovering from the herbicide application and to break the soil crust. The field is flooded to a depth of 10 to 15 cm 45 days after emergence; about 10 million liters of water/ha are needed. Urea is applied a second time to fields with low fertility levels 60 to 70 days after seeding. Fields are drained about 20 to 30 days before harvest. Harvest begins in the northern interior zones of Brazil and Argentina in late January or early February and finishes in eastern Uruguay and southern Argentina in May.

Typically, there are 100 days of the year with measurable precipitation, with those days concentrated in the fall and spring. Excessive rain in the spring can delay planting and cause flowering to occur in periods of cooler temperatures, resulting in lower yields and higher incidences of blanking. Cool flowering days are particularly a problem in eastern Uruguay, southern Entre Rios and southeastern Rio Grande do Sul. In order to speed up planting and avoid cooler temperatures, no-till planting has been increasingly adopted. Another advantage of the no-till method is that levees do not have to be rebuilt each year.

Seed variety selection is another method of reducing problems related to cool flowering temperatures. Blue Belle and similar varieties, which previously accounted for the bulk of production and are still important in Argentina and Uruguay, perform well in cool flowering temperatures. As a result, Blue Belle production dominates in southern Entre Rios and eastern Uruguay. Currently, Blue Belle comprises 42% of acres planted in Uruguay and 30% in Argentina. Blue Belle production is unimportant in Brazil. Although Blue Belle is better tasting and has higher milling yields, producers

[6]The reader should keep in mind that the four seasons in the southern hemisphere are just the opposite of those in the northern hemisphere.

prefer domestically bred tropical varieties because they are higher yielding and Blue Belle price premiums typically do not compensate for their lower yields. Because tropical indica varieties grow numerous tillers, yields tend to be high, even when plant populations are relatively sparse. Because of the tradeoff between production yields on the one hand and quality and milling yield on the other, current varietal improvement research in Argentina and Uruguay is focused on increasing the yields of varieties similar to Blue Belle.

Except for small quantities of medium- and short-grain rice produced for the Brazilian-Asian community, long-grain rice dominates irrigated production. About one-fifth of Argentinean production is double-long-grain rice (double Carolina or Risotto), which is referred to locally as Fortuna or Yeruá, and is preferred by high-income domestic consumers. Previous to their integration into the European Union (EU), Argentina exported double-long-grain rice to Spain, Portugal and Italy. In 1994/95, about 2% of Uruguayan area was planted to a double-long-grain known as EEA-404, which is largely marketed in Sao Paulõ. Double-long-grain plants are taller than fine long-grain plants, are more blast susceptible, have yields 1 to 2 MT/ha lower than fine long-grain and need 30 additional growing days.

The irrigated zone has abundant supplies of surface water. Major sources of surface water include the Paraná and Uruguay rivers in Argentina; the Uruguay, Rio Negro and Cuareim rivers and Laguna Marin in Uruguay; and the Uruguay river and Laguna de Los Patos in Brazil. Except for deep-well pumping in the southern two-thirds of Entre Rios, irrigation water is predominantly taken from surface sources and is sustainable in the long run. Uruguay is the only nation with large irrigation systems, usually owned by one or more mills, that provide water to multiple production units. Uruguayan mills control about 60% of the surface water rights in rice production areas. In order to purchase water from these mill-controlled irrigation systems, producers must agree to market their rice to them. Although somewhat inefficient due to overlapping systems in some areas, milled-controlled irrigation is the dominant system in the eastern region of the country. There are several examples in which Uruguayan mills jointly own and operate irrigation systems under a separate corporate entity. In Brazil, Argentina and northern Uruguay, irrigation systems are decentralized and farm specific.

In Entre Rios, a typical deep well irrigates 60 ha and the pumping rate is 60 to 80 liters/second. The diesel fuel (550 liters/ha) consumed by pump engines is a significant production cost. Due to increased pumping, the water table is estimated to have dropped 9 m in recent years. In the long run, surface water, the availability of which is ample, will likely replace subsurface water in southern Entre Rios. In Rio Grande do Sul, about 32% of the land is irrigated with the use of diesel-powered pumps, 25% with electric-powered pumps and 43% by gravity flow. About 60% of

Uruguayan irrigation water is taken from rivers and lakes and 40% from reservoirs. About 45% of the water is extracted by gravity, and 55% is extracted with the aid of pumps.

Currently, rice production in Corrientes and northern Entre Rios, where rice area is expanding, is located where surface water can be readily accessed, i.e., near the Uruguay and Paraná rivers. Large farms tend to be concentrated along the Paraná and Uruguay rivers, from which they obtain their irrigation water, while smaller farms use lagoons and streams as their source of irrigation water. Additional investment in irrigation infrastructure is needed before planted area can be significantly increased in these areas.

Land leasing and/or purchasing water is pervasive. Payment is typically in the form of rough rice. In Rio Grande do Sul 65% of operators lease land. In 1993, land rent averaged about 16.5 bags (50 kg each) of rough rice (15.3% of production)/ha. Per-hectare water costs were similar to those for land. When both land and water were provided, costs were 26.5 bags (25.5% of production)/ha. In Corrientes, about 80% of producers lease land, paying from 12 to 16% of their production. Leases in Corrientes tend to be three-year verbal agreements. About 70% of producers lease land in Entre Rios where typical rent is 16 bags/ha. In Uruguay, where 70% of operators lease, land rent is 8 to 10 bags/ha. The water necessary to irrigate 1 ha sells for 12 to 20 bags, with prices varying according to field accessibility.

Farm size varies. In Rio Grande do Sul, 80% of farms operate less than 100 ha, and only 3% operate in excess of 400 ha, with the average farm operating 145 ha. However, the 20% of farms operating more than 100 ha account for 70% of production, and the 3% of farms operating in excess of 400 ha account for 27% of production. Rio Grande do Sul tenants tend to have larger operations than owner-operators. Tenant operations account for only 44% of farms with less than 100 ha but 64% of those with more than 100 ha. Leasing in the state is becoming increasingly dominant.

In Entre Rios 58% of production is from farms operating less than 100 ha, 34% from farms operating between 100 and 200 ha and 8% from farms operating more than 200 ha. Farm size tends to be larger in northern Entre Rios and Corrientes. In Corrientes, approximately 40% of farms operate less than 200 ha, 32% between 200 and 400 ha and 28% over 400 ha. Farm size and tenancy are related; 50% of tenants operate less than 200 ha and 85% less than 400 ha, while 80% of owner-operators operate more than 400 ha. The average farm size in Uruguay is 166 ha with size varying by department. Farms in the eastern departments of Treinta y Tres and Cerro Largo have average farm sizes of 316 ha, while those in the other departments average between 91 and 144 ha.

Brazilian Upland Production

Upland rice is totally rainfall dependent and is produced by farmers who typically operate fewer hectares, use more traditional inputs and cultivation methods and are more diversified than their irrigated counterparts. Important crops that compete with upland rice include wheat, soybeans, corn and sorghum.

Prior to the mid-1980s, upland rice grew in importance due to its use as a good initial crop on the agricultural frontier and government incentives to increase planted area. Because yields decline in the frontier areas after one to three years of production, rice is typically followed by the production of livestock or other crops. The development of a soybean variety that has been successful as an initial crop and recent government programs that have emphasized efficiency and markets over planted area have reduced the importance of rice in the agricultural frontier regions.

Upland rice varieties are generally taller than irrigated varieties and, therefore, are more susceptible to lodging. If there is insufficient moisture at emergence, the plant will weaken and lodge. Upland rice is also highly susceptible to blast due to high humidity levels. In the Amazon basin the probability of adequate rainfall is greater than 70% while in the Cerrado it is less than 70%. The probability of receiving adequate rainfall generally increases from east to west. Because of these problems, average yields, at just above 1.5 MT/ha, are less than one-third of irrigated yields and are highly variable from year to year. Production could be doubled or tripled with adequate and timely rainfall and the proper use of fertilizer, pesticides, plant spacing and improved seeds. With pivot irrigation, upland rice has had yields as high as 5 MT/ha.

The Cerrado production area is flat to smoothly undulating, ideal for mechanized agriculture. Soils range from sand to heavy clay with medium to heavy clay soils predominating. Soils are normally well-drained with naturally low fertility. The climate is tropical, with a temperature range between 0 and 40^{o} C and an average temperature of 22^{o} C. Rainfall averages 1200 mm annually with a dry season between April and September. Summer droughts, which are frequent, are intensified due to the low absorption qualities of soils. As in the Amazon basin, rice plays the role of a good initial crop in the agricultural frontier zones. The Cerrado has a number of advantages over the Amazon Basin: 1) a number of population centers in Brasilia, Goiania and Campo Grande, 2) closer proximity to major consumption points in the Southeast and 3) a better transportation system.

In the Cerrado, rice is typically produced for three years before rotating to other crops or grazing cattle. In Mato Grosso rice has begun to be rotated with corn and soybeans, and in Goias rice is intercropped with pasture. Rainfall variability, particularly its distribution in critical growth periods, is the principal production risk. Inadequate moisture, however, can be minimized with the application of technologies that seek to increase the availability of water, e.g., reducing unnecessary compaction and

avoiding the overlapping of critical growth periods and low rainfall. Generally, mechanization levels are high, but producers have poor managerial skills and technical knowledge. Drying is typically performed in the field on small farms and mechanically on large farms. The use of fertilizer, weed control and phytosanitary measures are generally deficient. Access to credit, however, is generally adequate. The highest technological levels are found in Mato Grosso and Maranhão. Farms that operate more than 100 ha are common, and farms that operate more than 1000 ha predominate in Mato Grosso and Mato Grosso do Sul. Leasing is pervasive throughout the region.

The Amazon basin production region has a tropical climate with a one- to three-month dry period. The land ranges from flat to gently rolling hills with diversified soil types. Current yields are low, but when input levels are increased, yields do respond. There are three production systems in the Amazon basin: intercropping, mechanized and manual. Under the first system, which is largely practiced on 600,000 ha in the northern state of Maranhão, rice is intercropped with corn and manioc on small subsistence plots of around 2 ha. Rice is produced for a couple of years and then abandoned for five to six years before being replanted. Rice is manually harvested and field dried.

The mechanized upland production system is located in the states of Rondonia, Maranhão and northern Mato Grosso where farmers typically operate more than 20 ha, have access to production loans and have good management skills and mechanization levels. Plowing is the initial step in land preparation, and soil conservation methods are generally ignored. Planting is performed at the beginning of the rainy season. The use of purchased seed is low, but the use of recommended seed is high. Fertilization is performed at less than optimal levels, weeds are controlled by herbicides, and the treatment of seeds with insecticide is common. Harvesting and drying are mechanically performed.

A shifting rice production system is practiced in the states of Rondonia, Acre and Mato Grosso (along the border with Peru and Bolivia). Although farms typically operate less than 4 ha, they are market oriented. Planting, hoeing and harvesting are manually performed. There is no use of fertilizer or phytosanitary measures. Harvesting includes cutting, shocking, thrashing, cooling and bagging.

Area Trends

It is estimated that 4.2 million ha of rice will be planted in the 1996/97 crop year in the MERCOSUR: 1.1 million irrigated and 3.1 million upland (MERCOARROZ, October 17 and November 4, 1996).[7] In 1993/94, Brazilian irrigated area peaked at 1.1 million ha, up from less than 400,000 ha in 1960/61 (see Fig. 2). Brazilian

[7]For area, yield and production by state and department, see Table 3. This is the most recent year for which the data is available.

Table 3. MERCOSUR rice area, yield and production, 1994/95.

Country/State	Harvested area (000's ha)	Yield (kg/ha)	Production (000's MT)
Brazil	4300(-520)[a]	2235(416)	9612(847)
North Region	519(229)	1598(226)	829(432)
Rondonia	12(2)	2020(406)	24(8)
Amazonas	4(1)	1160(160)	5(2)
Amapa	1(0)	900(-213)	1(0)
Para	114(16)	1250(-71)	143(13)
Acre	26(3)	1500(301)	39(12)
Rondonia	112(-43)	1680(257)	188(-32)
Tocantis	250(N.A.)[b]	1720(N.A.)	430(N.A.)
Northeast Region	1275(311)	1439(307)	1835(729)
Maranhão	825(183)	1330(388)	1097(492)
Piaui	232(24)	1520(275)	353(94)
Ceara	61(36)	2250(-65)	137(51)
Rio Grande del Norte	8(0)	1410(275)	11(2)
Paraiba	14(5)	1630(41)	23(8)
Pernambuco	10(4)	3680(225)	37(17)
Alagoas	10(4)	3320(492)	33(15)
Sergipe	10(0)	3380(630)	34(6)
Bahia	105(55)	1050(270)	110(44)
Southeast Region	636(-301)	1853(-241)	1179(-332)
Minas Gerais	395(-169)	1700(250)	672(-146)
Espiritu Santo	35(0)	3080(377)	108(13)
Rio de Janeiro	11(-21)	3500(301)	39(-64)
Saõ Paulo	195(-111)	1850(232)	361(-134)
West Central Region	840(-707)	1526(288)	1282(-632)
Mato Grosso	340(-97)	1450(290)	493(-14)
Mato Grosso do Sul	120(-122)	1800(498)	216(-99)
Goias	375(-486)	1510(251)	(-518)
Federal District	5(-2)	1330(118)	7(-1)
Southern Region	1030(-39)	4356(767)	4486(649)
Paraná	155(-45)	1725(285)	267(-21)
Santa Catarina	130(-14)	3800(786)	494(60)
Rio Grande do Sul	745(20)	5200(703)	3874(610)
Argentina	181(72)	5113(1573)	942(493)
Corrientes	61(7)	4900(1719)	297(130)
Entre Rios	99(58)	5473(911)	541(356)
Formosa	9(6)	5200(2277)	46(38)
Santa Fe	10(1)	4354(1254)	42(14)
Uruguay	146(61)	5500(434)	804(374)
Artigas	12	5809	67
Cerro Largo	24	5460	130
Lavalleja	4	5247	21
Rivera	6	5219	29
Rocha	20	4675	93
Tacuarembo	6	6372	36
Treinta y Tres	38	5869	222

[a]Number in parentheses is the change in production from 1984/85

[b]N.A. Data for the state of Tocantis was not available until 1987/88 production year

Source: Sparks America del Sur (May 1995), MERCOARROZ (August 28,1995) and Comision Sectorial de Arroz, 1995.

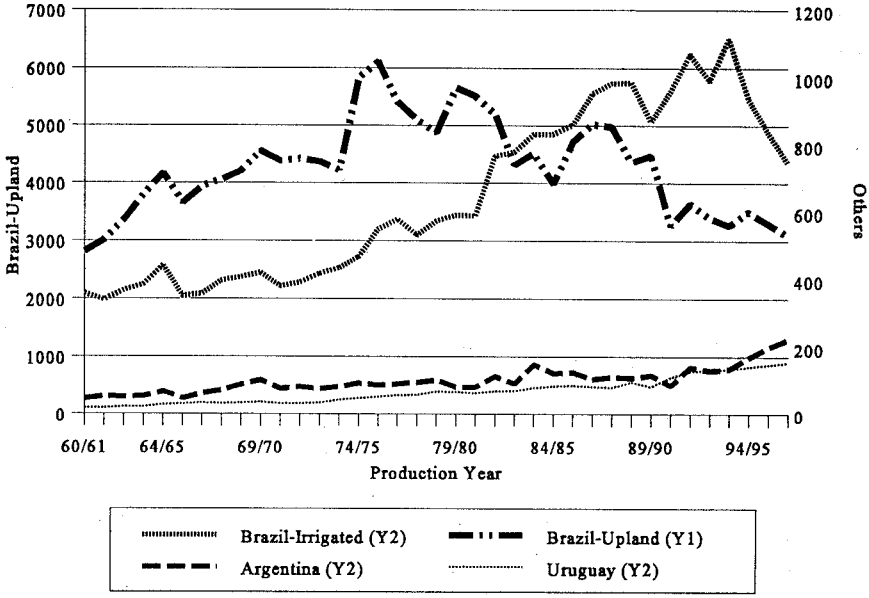

Fig. 2. MERCOSUR planted rice area (000's ha, 1960/61-1996/97). Source: See Fig. 3.

irrigated area has steadily fallen from the 1.1 million ha peak to an estimated 760,000 ha in 1996/97. Changes in Brazilian irrigated area have been fueled by changes in production cost, population growth, consumer tastes, credit availability and price support levels. Rio Grande do Sul has about 53,000 km^2 of potential rice area, only about 15% or 750,000 ha of which is currently planted in rice. The limiting factor to increasing rice area is water and credit availability, low market prices (high costs relative to Argentina and Uruguay), disease problems and diseconomies of scale. Another limiting factor, and one that is common to Argentina and Uruguay as well, is a rotation practice in which rice is produced in only one out of three years. Currently, this is felt to be necessary due to the disease and pests associated with continuous rice production.

Argentinean planted area has gone from less than 50,000 ha in 1960/61 to an estimated 224,000 ha in 1996/97. Historically, area expansion has been dependent on a slowly growing domestic population. Recently, however, Argentinean area has grown significantly due to preferential access to the large Brazilian import market and the discontinuance of export taxes. Factors limiting Argentinean production are flooding problems in Corrientes and inadequate irrigation infrastructure. A major impediment to investment in irrigation is an inadequate supply of credit. If these problems are corrected, Argentina could plant more than 500,000 ha. Uruguayan area has grown from less than 50,000 ha in 1960/61 to an estimated 155,000 in 1996/97.

Like Argentina, the past two years have seen a record number of hectares planted. The limiting factor to increasing area is inadequate supplies of irrigation water. With sufficient irrigation water, Uruguay could increase production another 50,000 to 200,000 ha. Additional water could be taken from the Laguna Marin if the necessary infrastructure were available.

Brazilian upland area began at just under 3 million ha in 1960/61. It peaked at just over 6 million ha in the mid-1980s and in 1996/97 is expected to fall to 3.1 million ha. Most of the decline in area has occurred in the West Central states (Cerrado) of Goias, Mato Grosso and Mato Grosso do Sul due to 1) lower government (the main buyer in the area) support levels, 2) a shift in policy, which has emphasized higher-yielding (over area-intensive) production systems, 3) declining acceptance of upland rice (low quality) in urban areas, 4) a disappearing agricultural frontier and 5) increasing competition from corn, wheat and soybeans. While upland rice production has declined, corn production has grown 75% and soybean production 88% over the past ten years.

Trends in Yield

Irrigated and upland yields have had distinct histories. Not surprisingly, irrigated yields in the three countries have followed one another closely over the past 35 years (see Fig. 3). With technology adoption, irrigated yields have steadily increased from about 3 MT/ha in 1960/61 to over 5 MT/ha in 1995/96. The latter is just below current U.S. long-grain yields of about 6 MT/ha. While Brazil had an annual compound yield growth rate over the period of 1.90%, rates for Argentina and Uruguay were lower at 1.04% and 1.15%, respectively. Some production units in Argentina claimed yields of up to 8 MT/ha in 1994/95 and of up to 10 MT/ha in Uruguay in 1995/96. Upland yields, with an annual compound yield growth rate of only 0.33%, have increased only marginally since 1960/61 (being just about 1.7 MT /ha in 1995/96) due to 1) lack of appropriate technology, 2) inadequate financing, 3) a weak producer co-operative movement, 4) diseconomies of scale and 5) inability to solve lodging problems.

The 1995/96 production year began with low levels of available irrigation water in Entre Rios and southern Corrientes. However, favorable rainfall in the last weeks of October, rising prices and producer knowledge of low planting levels in Rio Grande do Sul boosted planting levels. By December the water situation became grave again, and many producers were unable to flood their previously planted fields. By the end of December, there was a 300-mm precipitation deficit, and dams held only 50 to 70% of their normal levels. December and January rains helped to save the situation to some extent. Due to the drought, 26,870 ha, or about 13% of planted area, was not harvested (MERCOARROZ, May 30, 1996). While yields on harvested area were 5.1 MT/ha, they were 4.6 MT/planted ha. Lack of precipitation in November and December in Rio Grande do Sul reduced potential production levels 18%. In Rio Grande do Sul, precipitation levels were only 40% of normal in April to November

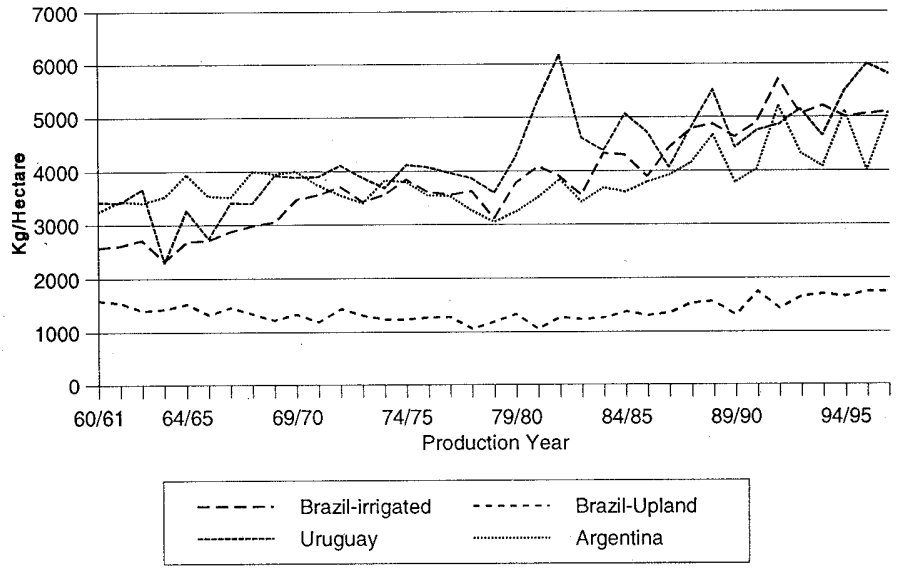

Fig. 3. MERCOSUR rough rice yields (kg/ha), 1960/61-1996/97.
(Source: Comision Sectorial del Arroz, Bolsa de Cereales, SAPyA, IBGE, 1995)

and only 25% in December. January rainfalls helped to alleviate the situation, however. Rio do Grande do Sul 1996 yields were expected to be down only 150 kg/ha over 1995.

In Uruguay the drought affected only a few producers in Artigas who had low initial water levels in their dams. The January rains saved most producers with initial low water levels. Generally, it was an excellent crop year in Uruguay with lots of sunlight and few low-temperature days. Average yields were close to 6.0 MT, a 500-kg/ha increase over 1994/95.

Higher-than-normal precipitation levels have been forecast for October to December 1996 in Rio Grande do Sul. While this will aid in filling reservoirs, it will also delay and possibly prevent planting in some areas (MERCOARROZ, October 17, 1996). In Argentina, normal precipitation and above-normal temperatures have been forecast during planting. In October needed rain fell in Corrientes, but another 100 mm are needed in Entre Rios. Due to lack of rain and high temperatures in Entre Rios, many producers began irrigating early. On October 25, 53% of Argentinean area was planted, with 34% in Corrientes and 68% in Entre Rios. As of early November 1996, reservoir levels in Uruguay were adequate to irrigate the 155,000 ha that are expected to be planted.

Production Trends

Irrigated and upland rice production trends are derived from the joint area and yield trends (see Fig. 4). Since 1960/61 irrigated rice production has increased by a factor of about four, currently being around 4 million MT in Brazil, 900,000 MT in Uruguay and over 1 million MT in Argentina (assuming normal yields). This growth has been relatively smooth. However, due to a decline in area, Brazilian irrigated production has fallen in each of the past two crop years (94/95 and 95/96) and is expected to fall again in 1996/97. Upland production levels have fallen sharply in the 1990s to less than 6 million MT. Upland production peaked in the late 1970s at about 7.8 million MT. The rate of growth in upland production is expected to continue to be negative due to declining area.

In 1995/96 both Argentina and Uruguay planted record high areas, expecting record production levels. Due to almost ideal growing conditions, Uruguay achieved this goal with an increase of about 158,000 MT over the 1994/95 production record of 808,000 MT. With a planted area of 208,000 ha, Argentina was expected to break the 1 million MT barrier. Lack of rainfall, particularly in Corrientes, reduced yields and caused some fields to be abandoned altogether. In spite of average yields of 4.6 MT/ha, Argentinean production exceeded the 1994/95 record by 99,000 MT. Due to a combination of both lower planted area and inadequate rainfall, Rio Grande do Sul irrigated production fell over 900 thousand MT to about 4.1 million MT in 1995/96.

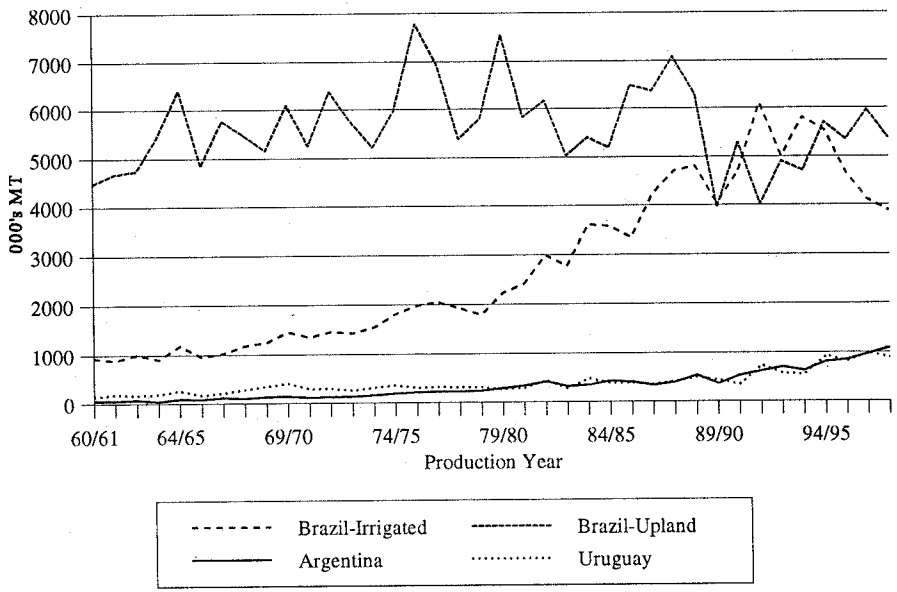

Fig. 4. MERCOSUR rough rice production (000's MT, 1960/61-1996/97). Source: See Fig. 3

Sparks America Del Sur expects Argentina to produce another record rice crop in 1997, which they estimate at 1.08 million MT (MERCOARROZ, November 4, 1996). This is based on an additional 11,000 ha planted and more normal precipitation. Although planted area in Uruguay will hold steady or slightly increase, it is unlikely that the almost ideal growing conditions in 1995/96 will be repeated in 1996/97. Thus production is expected to fall from 966,000 MT to 891,000 MT. Production in Brazil is expected to fall 8% over 1995/96 to 9.3 million MT due to a similar decline in area.

Producer Prices and Costs

Over the past 35 years, MERCOSUR nominal rough rice prices have had four phases:

- From 1960/61 to 1971/72 when prices varied between $5 and $10 (100 kg),
- From 1972/73 to 1982/83 when prices were over $15 and frequently exceeded $20,
- Mid-1980's when prices fell to between $10 and $15 and
- After 1987, a rebound to around $20 (see Fig. 5).

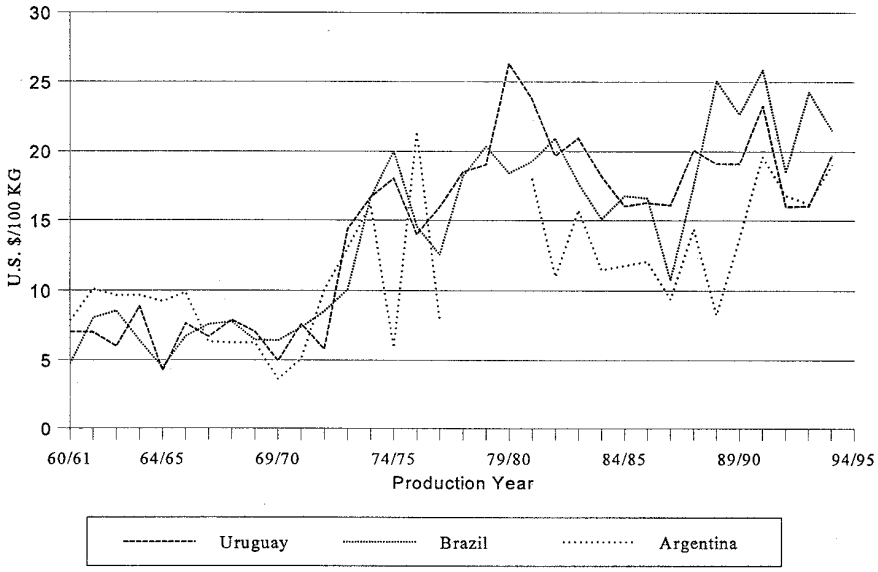

Fig. 5. MERCOSUR irrigated rough rice prices (current annual average), 1960/61-1994/95. (Source: Comision Sectorial de Arroz, Bolsa de Cereales, Sparks America del Sur, 1995; IRGA, 1995)

As of November 1996, prices for rough rice (10% or less brokens) was in the $21 to $23 range. In Argentina, Double Carolina rice commands a 20-30% premium, while in Brazil, upland rice receives a 30% discount. These premiums/discounts are largely due to perceived quality differences among consumers. When rough rice prices are converted into constant 1995 U.S. dollars, the scenario given by that of Fig. 5 changes substantially. Real rice prices were the highest in the 1970s ($30 to $45/100 kg). Prices since 1981/82 have been their lowest in real terms since the late 1960s, around $15 to $25.

The law of one price (LOP) was tested for MERCOSUR irrigated rough rice markets (Argentina and Rio Grande do Sul) and between the MERCOSUR and the United States using monthly 1981 to 1995 price data (Bierlen et al., 1996a). The LOP is the notion that efficient trade and arbitrage activities will ensure that prices in spatially separated markets, adjusted for exchange rates and transportation costs, will be equalized. In its extreme form, the LOP implies that there is a single representative price that is common to all markets. Using Johansen's multivariate cointegration method, weak support was found for the LOP for MERCOSUR rice markets for the full sample 1981 to 1995 period, no support for the LOP for the 1981 to 1990 pre-MERCOSUR period and strong support in the 1991 to 1995 MERCOSUR period both within the MERCOSUR and between the MERCOSUR and the United States. Support for the LOP during the MERCOSUR trade regime is expected because of the flow of rough rice from Argentina and Uruguay to Rio Grande do Sul and the close proximity of the three production areas, insuring that arbitrage can readily be performed. The results support the notion that lower trade barriers, greater reliance on market forces and a greater volume of trade led to the existence of a single reference price.

While irrigated production technology is similar, costs vary among the three nations. Recently, production costs have decreased in Argentina and increased in Brazil due to economic liberalization, currency revaluations that have accompanied economic stabilization programs, tax reforms, privatization and regional integration. Costs in Uruguay have remained stable, however. Assuming 5-MT yields, current estimated costs are lowest in Corrientes at $716.13/ha ($6.51/50 kg), followed by Entre Rios at $918.26/ha ($8.35/50 kg), Uruguay at $1042.22/ha ($9.47/50 kg) and Rio Grande do Sul at $1208.79/ha ($11.35/50 kg) (Table 4). Although varying by region, per-kilogram MERCOSUR costs are competitive with production costs in the United States (Bierlen et al., 1996b). Cost differences are primarily due to differences in taxation levels, the price of land and soil fertility. Soil quality is generally considered to be better in Uruguay and Argentina (where land prices are lower) than in Rio Grande do Sul. As a result, Rio Grande do Sul tends to need higher input levels in order to produce yields comparable to the other two nations. Soil quality is highest in Corrientes (where prices are lowest) where expansion potential is also the highest. Recent increases in fertilizer costs have hit producers with low-fertility land the hard-

Table 4. MERCOSUR irrigated rough rice production costs in US$/ha, 1994/95.

Item	Brazil	Uruguay	Argentina	
	Rio G do Sul		Entre Rios	Corrientes
Land rent	173.19	157.84	105.00	83.33
Pre-planting prep.	210.37	97.69	97.20	-
Irrigation	219.88	107.06	238.19	-
Labor	-[b]	138.42	-	113.97
Machinery repair	-	75.68	-	45.70
Fuel	-	-	-	109.30
Seed, fert & pest	223.56	178.44	169.57	140.01
Harvest	74.42	66.27	87.50	-
Transportation	76.35	71.48	22.50	25.25
Drying	77.06	54.83	54.83	66.66
Management	39.39	42.04	32.00	32.43
Finance charge	49.96	13.23	53.33	-
Other	104.84	39.24	58.14	99.48
Total Cost[a]	1248.99	1042.22	918.26	716.13
Cost per 50 kg	12.49	10.42	9.18	7.16

[a]Assumes yields of 5,000 kg of rough rice/ha.
[b] - Subsumed under other costs.

Source: Sparks America del Sur, 1995.

est. Average upland costs are estimated at $237.87/ha (Table 5). With an assumed yield of 1.5 MT/ha, per-bag costs are $8.30.

MARKETING

The marketing system moves rice from the farm gate to the consumer. Typical rice marketing functions include drying, storage, milling, byproduct disposal, packaging, transportation and retailing. Major problems are the high costs of milling, transportation and financing storage. A problem unique to Brazil is the loss of large quantities of rice (primarily upland) due to high humidity and temperatures, insects and substandard storage units.

Drying and Storage

Rough rice is dried following harvest. Humidity must be reduced to 14% before rice can be properly stored and milled. Because undried rice is highly perishable in the Amazon basin (humid tropics), timely drying is especially critical in this region. It has been estimated that 20% of the Brazilian rice harvest (predominantly upland) is lost each year (IRGA, 1993). Drying and storage technologies are generally more advanced in the irrigated than in the upland regions. Upland rice is typically field-dried and stored in small, rudimentary facilities while irrigated producers use driers and large, modern storage facilities. Large upland producers, however, tend to use driers and store in more modern storage facilities. Large producers and mills are responsible for the bulk of drying and storage.

Table 5. Brazilian upland rough rice production costs in U.S.$/ha, 1994/95.

Item	Unit	Quantity	Price/Unit	% of Cost	Total Cost
Inputs				54.69	149.77
Seed	kg	55.0	0.97		53.23
Furadan	lt	0.8	17.76		14.22
Fertilizer(04-30-10)	kg	200.0	0.23		45.16
Zinc Sulfate	kg	20.0	0.71		14.19
Mirex	kg	0.2	4.82		0.97
Casumin	lt	1.0	12.33		12.23
50 kilo bags	bag	30.0	0.32		9.67
Machinery				38.28	104.84
Pre-incorporation(18 discs)	machinery hr	1.2	16.13		19.35
Plowing (3 bottoms)	machinery hr	2.7	16.13		43.55
Leveling(36 discs)	machinery hr	0.5	16.13		8.07
Planting/Fertilizing(10 row)	machinery hr	0.6	16.13		9.68
Pulverizing	machinery hr	0.5	16.13		8.07
Harvester	machinery hr	1.0	16.13		16.13
Services				4.12	11.29
Seed treatment	dh	0.1	7.53		0.75
Planting	dh	0.3	7.53		2.26
Formicide application	dh	0.1	7.53		1.53
Harvest	dh	1.0	7.53		7.73
Administrative Charge(3%)				2.91	7.97
Total Cost					273.87
Cost per 50 kg[a]					9.13

[a]Assumes a yield per hectare of 1,500 kg.

Source: Central Nacional de Pesquisa de Arroz e Feijao, 1995.

In Rio Grande do Sul there are about 1600 driers with a daily drying capacity of 132,000 MT, and 2.1 million MT of conventional and 3.7 million MT of modern silo storage capacity (see Table 6). The bulk of storage is located on the western border (with Argentina) with 1.2 million MT of capacity and the north Atlantic coast with 2.3 million MT of capacity. Storage is adequate to handle state production as well as Argentinean and Uruguayan imports. Large farms tend to perform their own drying and storage while small farms hire the services of co-operatives.

There is excess storage capacity in Argentina due to the presence of numerous mills that operate at suboptimal levels. Total storage capacity consists of 750,000 MT of farm-level storage, 1.3 million MT of mill-level storage and 38,000 MT of port-level storage. Large producers are more likely to own storage and drying facilities than small producers. Most producers, however, are unable to store more than 100 MT. There is a higher percentage of on-farm drying and storage in Corrientes, where large producers dominate, than in Entre Rios. In Uruguay, mills dry and store 80 to 85% of rough rice. The remainder of drying and storage is performed by large producers.

Table 6. Number, milling and storage capacity of rice mills in Rio Grande do Sul.

Region	Number of Mills	Milling Capacity	Non-Modern Storage Capacity	Silo Storage Capacity
		MT/hour	MT	MT
Campanha (Plains)	103	178	303,225	352,830
Western border	153	426	463,870	772,384
South coast	106	354	590,301	352,781
North coast	194	275	345,216	1,911,137
Central Depression	169	223	407,578	313,443
Total	725	1456	2,110,190	3,702,575

Source: IRGA, 1993.

In Argentina and Uruguay, on-farm drying and storage facilities give producers greater marketing flexibility, in particular, the ability to sell rough rice directly to Rio Grande do Sul mills. This practice is most common in the northern production areas of Uruguay and in Corrientes. This is facilitated by the high concentration of Brazilian producers (who have operations in Argentina and Uruguay) in these areas and weaker ties between mills and producers in northern Uruguay than in eastern Uruguay.

Milling and Byproducts

Milling firms range from small, single-mill, family-run firms to large, multi-mill corporations. Private mills dominate, but co-operatives are important in Argentina and Rio Grande do Sul. Large mills typically operate at full capacity, have high technical levels and hire specialized labor. Small- and medium-sized mills operate about 8 and 16 hours a day (often on a seasonal basis), respectively. Compared to the larger mills, small- and medium-sized mills have less modern milling equipment and hire non-specialized labor. Equipment (including parboiling equipment) is predominantly Brazilian, but some mills are outfitted with Japanese, German and U.S. equipment.

The Brazilian milling sector is characterized by excess capacity, a profusion of retail labels, a disregard for economies of scale and, with the liberalization of the Brazilian rice market, declining profit margins. Idle capacity is worse in the upland zones due to a significant contraction in production. Declining profit margins have placed pressure on mills to increase volume or capacity utilization, which has resulted in significant downsizing, a trend that began in the 1980's and has accelerated in the 1990's.

There are approximately 745 mills operating in Rio Grande do Sul, the bulk of which are located in the five principal production areas (Table 6). Currently, about 180 mills process at least 250 MT/month (commercial size). Commercial mills operate closer to full capacity, while non-commercial mills are closing or have no growth. Many non-commercial mills continue to operate by performing contract milling. About 50% of Rio Grande do Sul rice is milled by private firms, 35% is milled by co-ops, and 15% is used for seed or milled in other states. The three largest firms account for 30%

of total milling, the 11 largest 47%, the 50 largest 71%, and commercial mills 95% (see Table 7 for the 25 largest mills and Table 8 for percentage of total milling capacity by municipio [county]). The five largest mills are vertically integrated in production, milling and marketing. Several large mills are located close to production areas in Argentina and Uruguay, which gives them greater flexibility in rough rice procurement. There is no reliable information on the number, size, technology, etc., of Brazilian mills outside of Rio Grande do Sul. However, mills in upland regions tend to be smaller, less technically advanced and more numerous than in irrigated areas.

There are 41 rice co-ops in Rio Grande do Sul with 58 active mills, 30 of which operate on a commercial level. About 10,000 of the state's 12,000 producers are co-operative members. Co-ops include four of the five and seven of the 25 largest milling firms (see Table 7). The four largest co-ops each mill more than 5000 MT/month. The three largest co-ops mill 21% of the rice in the state, the five largest 24%, and the 16 largest 30%. Shares of total co-op rice milled in the state for these co-ops are 61%, 70% and 87%, respectively. Recent co-op growth has been slow or negative among large and small co-ops, while medium-sized co-ops have grown significantly.

Most Argentinean mills are small, family-owned, vertically integrated, into production and have relatively low technical levels. The largest technical problem is a lack of physical integration from storage to the loading dock, resulting in the excess use of unskilled labor. Like drying and storage facilities, mills are often purchased by producers during highly profitable years with the idea that "*procesando duplicamos la cosecha*" (by milling we double the harvest) but frequently without regard to cost and marketing considerations. Brazilian-made mills can be purchased for as little as $80,000. Small mills operate only three or four months out of the year, milling as little as 1500 MT annually. They pay higher prices for their rough rice and are unable to secure rough rice by guaranteeing production loans. Few mills are well situated with respect to ports on the Paraná and Uruguay rivers and railheads. With continued downsizing this is likely to change because more mills will have the necessary volume to utilize rail and water transport.

The Argentinean milling industry is also downsizing with the exit of primarily smaller mills. In 1995, 104 mills were operating, down from 150 in 1990. Factors that indicate that small mills will continue to exit the industry are 1) the demise of small Brazilian mills that are the principal buyers of their milled rice, 2) the inability to produce large minimum quantities needed to receive transportation discounts and to enter export markets and 3) the increasing need to be cost competitive. Only 12 mills have a milling capacity in excess of 4 MT/hour. About 16 firms do 70% of the milling. On the national level, 51% of milling capacity is located in Entre Rios, 33% in Corrientes and 16% in other provinces.

Table 7. Location and production of 25 largest rice mills in Rio Grande do Sul, 1994.

	Company Name	Location	Monthly Prod	Annual Prod
			------000's MT-------	
1	SUPRARROZ	Pelotas	40.9	490.8
2	Co-op. AGRICOLA ITAQUIENSE	Itaqui	35.9	431.7
3	Co-op. ARROZEIRA EXTREMO SUL	Pelotas	25.0	300.0
4	Co-op. AGROINDUSTRIAL ALEGRETE	Alegrete	9.2	98.8
5	Co-op. TRITICOLA SEPEENSE	Sao Sepe	8.0	95.7
6	IND. E COM. SANTA LUCIA	Camaqua	6.5	78.0
7	URBANO AGROINDUSTRIAL	Sao Gabriel	5.9	70.4
8	HELMUTH TESSMANN & CIA	Camaqua	5.8	69.8
9	Co-op. AGRICOLA IMEMBUY	Sao Borja	5.4	65.0
10	CEREALISTA PIRAHY	Sao Borja	5.3	63.0
11	ENG. DE ARROZ CORADINI	Dom Pedrito	5.0	60.2
13	NELSON WENDT	Pelotas	4.5	54.3
14	PILLECO	Alegrete	4.2	50.5
15	ICR CEREAIS	Sao Borja	3.6	43.6
16	Co-op. REG. TRIT. SERRANA	Dom Pedrito	3.5	42.2
17	KARROZ-COM. E EEPRES.	Osorio	3.2	38.4
18	DOMINGOS CASARIN & CIA.	Pelotas	2.8	34.0
19	ARROZEIRA ZACHER	Camaqua	2.8	33.3
20	CEREALISTA ALBARUSKA	Sao Borja	2.8	33.3
21	Co-op. AGRICOLA URUGUAINA	Uruguaina	2.7	32.2
22	PROD. ALIM. ORLANDIA	Pelotas	2.6	30.7
23	ENGENHO A.M. LTDA.	Eldorado D	2.5	30.1
24	CEREALISTA TOMAZONI	Uruguaina	2.5	29.9
25	ARROZ AGROIND. DO SUL	Itaqui	2.5	29.5

Source: FEDARROZ.

Table 8. Location of Rio Grande do Sul milling capacity by municipio.

Municipio	% of Milling Capacity
Pelotas	19
Itaqui	10
Saõ Borja	8
Uruguaiana	7
Alegrete	6
Camaqua	4
Dom Pedrito	3
Cachoeira do Sul	3
Santa Vitora do Palmar	3
Bage	2
Others	35

Source: IRGA, 1993.

Argentinean mills compete for rough rice deliveries based on price, location and producer services such as the financing of production inputs. Mills forward contract with producers to purchase rough rice. Payment is in the form of production inputs or cash (usually paid in installments). One mill found bartering rough rice for diesel fuel (sold 9 million liters in a recent year) to be an important and profitable component of its operations. In order to ease producer harvest costs, mills purchase rough rice in the fields and transport it to their mills at their own expense. About one-half of the Argentinean rice crop is sold during the harvest season (Personal communication - Eric Ingouville).

While Argentinean private mills dominate the industry, co-ops continue to be important. There are nine rice co-ops in Entre Rios and two in Corrientes. Although many producers are members, co-ops typically purchase the bulk of their rough rice from a small number of members. Profits are distributed to members based on shares and rough rice deliveries. Co-ops also sell production inputs to members, often bartering them for rough rice.

Argentinean mills tend to specialize in either domestic or export markets. Small mills tend to export to Brazil exclusively and/or participate in regional domestic markets. Rio de la Plata, Sagemüller, Molinos ALA, Suca S.A., Mocovi and La Arrocera Argentina, S.A. (Gallo) have national consumer brands. Glencore Cereales S.A. and Molinos ALA dominate the export side. Few mills can handle large export orders due to lack of quality uniformity.

Glencore, which exports about two-thirds of Argentinean rice, has a unique operation. Glencore procures rough rice through forward contracts with producers and then contracts with other firms to mill the rice. Because of the large quantities it exports, Glencore is able to utilize low-cost rail and barge transportation. Like smaller mills, however, Glencore is still unable to ship large quantities of uniform quality rice. Marc Rich, the founder of Glencore, has recently sold his interests in Glencore and is starting a new firm based on the Glencore model. This should increase the competitive conditions among Argentinean export mills, now dominated by Glencore. Increased growth in the Argentinean rice sector could see the entry of other Buenos Aires grain trading houses (Glencore is currently the only one) into the rice export business.

In contrast to Brazil and Argentina, there are relatively few milling firms in Uruguay, 20 firms with 29 mills (see Table 9 for names, locations and capacity). Firms with multiple mills are SAMAN with seven, Casarone with three and COOPAR with two. Ten mills are located in the northern production zone: six in Artigas, two in Tacuarembo and one in Rivera. Eighteen mills are located in the eastern production zone: six in Cerro Largo, six in Treinta y Tres, four in Rocha and one in Lavalleja. One mill is located in the port of Montevideo. All mills are privately owned and have relatively good technical levels. The most important mills are equipped with Japanese and U.S. technology (Satake and Carter). Industry milling capacity is 167 MT/hour, or more than 1 million MT annually. The five largest firms, which account for 68.6%

Table 9. Location and capacity of Uruguayan rice mills, 1996.

Name	Capacity	Location
	MT/hour	
ACAMAY S.A.	3.0	Montevideo
ARROZAL 33 S.A.	10.0	Montevideo
ARROZUR S.A.	12.0	Treinta y Tres
CARLIN	3.0	Chuy
CASARONE AGROINDUSTRIAL S.A.	17.3	Montevideo
COLIS S.A.	2.0	Bella Union
COOPAR S.A.	14.0	Montevideo
COPAINOR R.S.	7.0	Montevideo
DAMBORIARENA ESCOSTEGUY SRL	3.7	Rivera
DEMELFOR S.A.	3.8	Artigas
KHI ARROZ LTDA.	2.6	Chuy
MOLINO ARROCERO BELLA UNION	1.4	Montevideo
MOL. ARROC. CERRO LARGO SRL	5.0	Melo
MOLINO ARROZ BENKE SRL	2.0	——[a]
OLINA S.A.	5.2	Montevideo
OVER Y CIA. SRL	4.0	——[a]
PIVETTA HERMANOS SRL	1.2	Artigas
PROCIPA S.A.	5.5	Montevideo
S.A. MOLINOS ARROCEROS NACIONAL (SAMAN)	61.0	Montevideo
TOPSIL S.A.	3.0	Montevideo
Total	166.7	

[a] --- Unknown location.

Source: Comision Sectorial del Arroz.

of installed capacity, are SAMAN, Casarone, COOPAR, Arrozal 33 and Arrozur. SAMAN alone accounts for nearly 37% of installed capacity but is thought to mill a higher percentage of the total because it runs closer to capacity than other firms. Arrozal 33 is owned and operated by the largest Rio Grande do Sul producer, who operates 43,000 ha in Rio Grande do Sul and 6500 ha in Uruguay.

Uruguayan mills compete for rough rice deliveries based on location, the terms of production loans and the rental price of land and water. Because 90 to 95% of Uruguayan rough rice is sold under an average marketing year pricing scheme (see page 51), price is typically not a point of competition. Producers may be limited to marketing their rough rice to a single mill when that mill is their landlord or is the only supplier of water to their land.

There are about 53 plants with parboiling facilities in the region. The bulk of these—38—are in Rio Grande Do Sul (see Table 10). There are two parboiling facilities in Argentina, one operated by Molinos Rio de la Plata (Bunge and Borge) and the other by La Arrocera Argentina (Gallo). Molinos ALA swaps white milled rice (which carries a premium in Brazil) for parboiled rice (which carries a premium in Argentina) with Suprarroz, a large Rio Grande do Sul mill. In Uruguay, the nation's only parboiling facility, Arrozur, is jointly operated by the five largest mills. SAMAN retains a 46% interest in Arrozur, COOPAR 27%, Casarone 12.5% and Procipa and

Table 10. Name and location of parboiling plants in Rio Grande do Sul, Argentina and Uruguay, 1995.

Name	Location	Name	Location
	Rio Grande do Sul		
Alfred A. Treichel e Cia	Cachoeira do Sul	Reinaldo Roech S.A.	Cachoeira do Sul
UNICOP - Uniao Co-op Sul	Canoas	Jose Berta S.A. Exp. Imp.	Camaqua
Effem - Prod. Aliment. Inc.	Eldorado do Sul	Arrozeira Santa Lucia	Tapes
Arrozeira Centro-Sul	Arroio dos Ratos	Arrozeira Camaquense	Camaqua
Irmaos Dalbem	Arroio dos Ratos	Brazarroz Ind. Com. Agrop	Uruguaiana
INDUBER Ind. Alim. Berleze	Santa Maria	Comercial de Cereais Schrank	Tapes
Agricape S.A. Prod Alimentares	Camaqua	Engenho de Arroz Ipiranga S.A.	Cacequi
Nelson Wendt & Cia.	Pelotas	Dist. Cereais Tapense	Tapes
Emilio Romani S.A.	Pelotas	Da Cas e Irmaso	Santa Maria
Suprarroz S.A. Ind. Com.	Pelotas	Engenho Sao Gabriel	Sao Gabriel
Orla Cereais Ind. Com.	Tapes	Agrisa - Ind. Com. Exp. Prod. Agric.	Camaqua
Bonato S.A. Com E Ind.	Uruguaiana	Comercial de Cereais DALBEM	Tapes
Talisma Ind. Com. Cereais	Eldorado do Sul	Damil-Mercantil Ind. Com.	Camaqua
Hiroshi Mashima e Cia.	Santo Antonio da Patrulha	Helmut Tessmann	Camaqua
Co-op. Arrozeira Extremo Sul	Camaqua		
Guaibarroz S.A.	Camaqua		**Argentina**
Arrozeira Veneato	Tapes	La Arrocera Argentina	C. del Uruguay
Arrozeira Luzipe	Tapes	Rio de la Plata	——-[a]
Comercial de Cereais Barros	Candelaria		
H. Porto	Candelaria		**Uruguay**
Ledo Ritzel	Candelaria	Arrozur	Villa Sara
Co-op. Agricola Rio Pardo	Santa Cruz do Sul		
Eugenio Iserhard e Cia.	Santa Cruz do Sul		
Ivo J. Marchiori e Irmaos	Jaguari		

[a] -- Unknown location.

Source: FEDARROZ.

Table 11. 1995 milling costs.

Item	Rio Grande do Sul	Argentina
	----------$/MT of Milled Rice----------	
1.62 MT of Rough Rice	283.19	227.27
Taxes	10.26	
Transportation Field/Mill	1.33	(7.07)[a]
Total Cost of Rough Rice	294.78	220.20
Milling and Packaging	97.78	59.13
Milling Margin	23.58	23.58
Taxes	66.45	
Selling, Grading, and Others	15.47	36.09
Total Milling Costs	203.28	118.80
Byproducts	(44.44)[a]	(38.36)[a]
FOB Mill Cost	453.62	300.64

[a]Income
Source: Sparks America del Sur, 1995.

Arrozal 33 the remaining 14.5%. The annual 70,000-MT capacity of the U.S. technology plant is divided among the partners according to their number of shares. The parboiling service is performed at cost to each partner. The parboiled rice is marketed under each partner's individual brand name. Although there was a substantial premium for parboiled rice at the time of construction (early 1980's), the facility currently has a low profitability level due to weakened demand for parboiled rice. Like Argentina, however, the plant gives the Uruguayan rice industry the ability to enter parboiled export markets. Tropical varieties, not Blue Belle or similar varieties, are typically used for parboiling.

Brazilian and Argentinean milling costs are presented in Table 11. Uruguayan milling costs are thought to be similar to those in Argentina. Estimated FOB costs for milled rice are $454/MT in Brazil and $301 in Argentina. Milling costs account for $203 and $119 of total costs, respectively. These estimates indicate that FOB mill prices in Brazil are about 50% higher than in Argentina. About half of the cost difference is accounted for by higher Brazilian tax levels.[8] The other half of the price difference is due to higher Brazilian production and milling costs.

Weekly MERCOSUR FOB mill prices per MT of milled Tipo 1 rice (10% or less brokens) are graphed in Fig. 6 from October 1993 to January 1996 for the cities of Uruguayana, Chui and Saõ Paulo. Uruguayana is a crossing point on the Brazilian border in Argentina, and Chui is a crossing point in Uruguay. The three prices move together closely. This is not surprising since the bulk of Brazilian imports of Argentinean

[8]See page 49 for further discussion on Brazilian taxes.

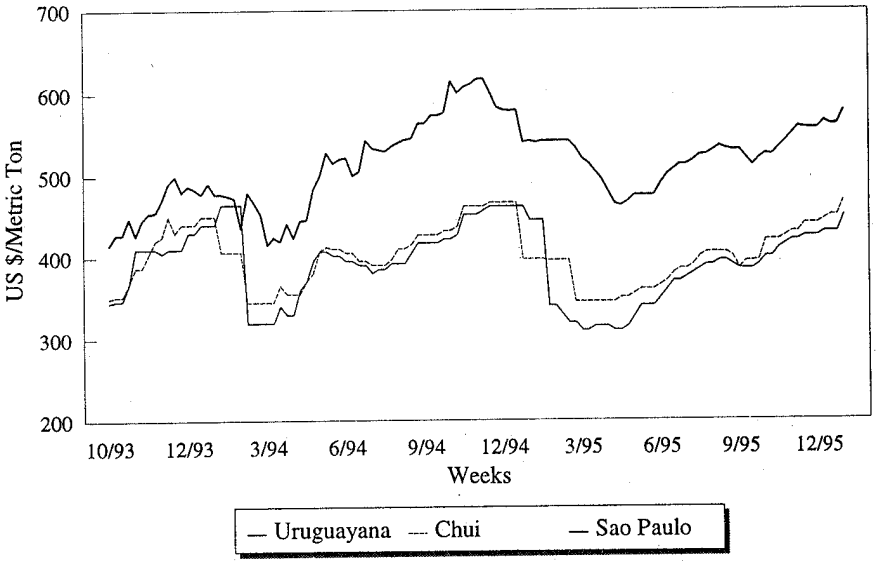

Fig. 6. MERCOSUR Tippo 1 prices. Source: MERCOARROZ, various issues.

and Uruguayan rice crosses the border at Uruguayana and Chui, respectively, and Saõ Paulo is the largest deficit market in Brazil, located less than 1000 miles away. As expected, Saõ Paulo carries a constant premium over the price of its exporting neighbors, and Uruguayan rice carries a slight premium over Argentinean rice, which is consistent with quality perceptions.

The milling process typically produces 65 to 75% polished rice (head rice and brokens), 19 to 23% husks, 8 to 12% bran and 3 to 5% impurities. Income from byproducts (broken rice, husks and bran) has a major impact on a mill's profitability. Large mills are generally able to dispose of byproducts in a more profitable manner than small mills. Byproducts have diverse uses. In Rio Grande do Sul, the husks are used as fuel for drying and parboiling and as litter in the large domestic poultry industry. Bran is used as an animal feed and further processed into edible rice oil using domestic technology. Two Rio Grande do Sul firms produce rice oil. Suprarroz, the largest milling firm, markets a rice oil under its brand name, Tio João. The beer and animal feed industries purchase most of the broken rice.

The recent upswing in production has created a byproduct disposal problem in Argentina and Uruguay, which may intensify with time unless new uses are found. In Argentina, husks are utilized as livestock feed, fuel for drying rough rice and litter for the southern Entre Rios poultry industry. The use of husks for electrical generation has been discussed among San Salvador (Entre Rios) millers. Bran is sold as a livestock feed, but currently no bran oil extraction or refining is performed in the country.

Major byproduct uses in Uruguay are husks and bran for animal feed, husks for litter and fuel to parboil and dry rough rice. In addition to parboiling, Arrozur also extracts and refines bran oil. The five mills who own Arrozur sell stabilized bran to the firm. The spent bran is returned to the five mills where it is sold as animal feed. The refined oil is sold under the Arrozur name in Brazil. Arrozur also exports crude oil and bran to Brazil.

Grading

There are currently no uniform MERCOSUR quality and inspection standards. There is, however, a desire by the industry to have uniform milled rice grading standards, and the five countries are currently working together toward that end. It is thought that uniform MERCOSUR milled rice grades will closely follow the current Brazilian grading system as it is the dominant consumer. The percentage of brokens appears to be the most important milled rice grading characteristic in the region.

Brazilian mills tend to set their own internal rough rice grades, but there are industry-wide milled rice grades known as Tipo 1, Tipo 2 ..... and Tipo 5. Tipo 1 rice has 10% or less brokens and Tipo 2 has 20% or less brokens. Irrigated rice falls into grades Tipo 1 and Tipo 2, with the bulk in the Tipo 2 classification. Upland rice falls into Tipo 2 and lower quality grades. Brazilian imports from Argentina and Uruguay are 25% or less brokens; most would be classified as Tipo 2.

Argentina has three domestic milled rice grades, which are also used at the retail level: quintuple zero (00000) with 15% or less brokens, quadruple zero (0000) with 25% or less brokens and second grades with 38% or less brokens. Second grade is sold to low-income households or as pet food. Argentinean and Uruguayan exports to Brazil are classified under the Brazilian grading system. Rough rice grades are set at the state level in Argentina. Discounts and premiums on rough rice are a percentage of the market price (see Table 12 for an example). In accordance with Argentinean law, sample testing by mills is carefully performed in order to readily resolve producer-miller quality disputes. Uruguay does not have official grades for either rough or milled rice. However, discounts and premiums are given for deviations from industry norms for rough rice. In Uruguay, both mills and the *Asociacion de Cultivadores de Arroz* (Rice Producers Association) take test samples. The two groups work together to resolve quality disputes.

Transportation

MERCOSUR transportation is inadequate and costly by world standards. This has been exacerbated by the recent increase in economic activity due to domestic reforms and regional integration. Due to security reasons and government policies, which promoted self-sufficiency, transportation links among the five nations have traditionally been poor. Even though expensive and insufficient in number, the bulk of MERCOSUR rice is transported by truck. The region's rail system is inadequate and lacks integration and gauge uniformity.

Table 12. Grading system for Argentinean rough rice.

Type	Base %	Min. %	Premium	Discount up to 45%	Discount below 45%
			Minimum Whole-Grain Percentage		
Double long	54	42	1% price increase for each percentage increase above the base	1% price decrease for each percentage below the base	1.5% price decrease for each percentage below 45%
Fine long	56	42	1% price increase for each percentage increase above the base	1% price decrease for each percentage below the base	1.5% price decrease for each percentage below 45%
Medium	54	42	1% price increase for each percentage increase above the base	1% price decrease for each percentage below the base	1.5% price decrease for each percentage below 45%
Short	59	45	1% price increase for each percentage increase above the base	1% price decrease for each percentage below the base	1.5% price decrease for each percentage below 48*

Type	Base	Max. %	Discount
		Other Characteristics	
Foreign matter	-	3.0	Up to 3% will lower price by 1% of each percentage. Will lower price by 1.5% for each percentage over 3%.
Panza blanca	1.00	5.00	For values between 1 and 5% decrease price by 1%.
Foreign matter	-	3.0	Up to 3% will lower price by 1% of each percentage. Will lower price by 1.5% for each percentage over 3%.
Panza blanca	1.00	5.00	For values between 1 and 5% decrease price by 1%.
Spotted and/or red grains	0.25	0.50	For values between 0.25 and 0.50% decrease price by 1%.
Chalky or dead grains	0.25	1.00	For values between 0.25 and 1.00% decrease price by 1%. For values between 1.00 and 2.00% lower price by 1.5%.
Red grain and/or grain with red streaks	-	2.50	Up until 2.5% will decrease price by 2%
Moisture		14	When humidity exceeds 14% costs due to drying and product loss will be discounted according to the established tables of the National Grain Council
Liana and porotillo seeds		1 seed	Decrease by 0.50% for each seed that exceeds the maximum level
		No Live Insects Permitted	

Source: Comision Arbitral de Entre Rios.

Although currently underutilized, the Paraná-Uruguay river transportation system holds the most promise for reducing transportation costs for bulk commodities such as rice. Currently, however, most mills lack the volume to use this transportation mode. Because the two rivers straddle the Argentinean production area (Corrientes and Entre Rios), Argentina should be in the best position to take advantage of an improved river system in shipping to Brazil. The Uruguay river, however, has a dam without a lock; the river, in effect, is navigable only from just north of Condordia (northern Entre Rios) to Buenos Aires, and shipping is limited to 5000 MT. Any serious improvement of the system will have to rectify this. Currently the river system, known as the *hidrovia* in Brazil, is being expanded and improved. The *hidrovia* will harness the Paraná and the Paraguay rivers, which drain the continent's largest river basin (after the Amazon) to the needs of modern trade. From Caceres in Brazil, it will stretch 3,450 km to Buenos Aires. Developers see this as the Mississippi River of South America, carrying goods on barges up and down the river. Some have proclaimed it the backbone of the MERCOSUR. Increased use of the *hidrovia* should reduce rice transportation costs dramatically. Minor improvements estimated at $100 million should cut the time it takes to travel from Caceres to Buenos Aires in half and increase barge sizes to 2000 MT on the lower river and to 500 MT on the upper reaches. There is currently a rail link from the Paraná to the city of Saõ Paulo. This will be supplemented with a barge canal, which is being financed by the state of Saõ Paulo.

The Brazilian road system, the backbone of the nation's transportation system and by which the bulk of rice is transported, is in a general state of disrepair due to a lack of maintenance and damage from overloaded trucks. Historically, little importance has been placed on rail and river transportation networks. Railroads are unreliable and frequently delayed. Only 8% of Rio Grande do Sul's rough rice and 0.5% of milled rice are shipped by rail. South to north shipments frequently use intracoastal shipping. Traditionally, intra-coastal shipping has been closed to non-Brazilian shipping. Recently, however, the Brazilian government has allowed non-Brazilian ships to compete in that trade. One of the biggest problems in importing rice into Brazil by ocean transport, and actually considered by many to be a significant non-tariff barrier, is ocean port costs. Due to a strong longshoreman's union, which uses 50-year-old labor efficiency standards to determine wage rates, unloading costs run $17 to $18/MT. Due to this, the government has allowed three or four private firms to develop port facilities with non-union longshoremen. High port costs are an advantage to Argentina and Uruguay, who ship the bulk of their rice into Brazil by truck and rail.

The Rio Grande do Sul government has made recent efforts to improve the state's transportation infrastructure. This has included rebuilding and improved maintenance of the current road system, adding more paved roads and improving connections with the highway systems of Argentina and Uruguay. There is also an interest in

extending the current rail and river transportation systems and better integrating them with other modes of transportation.

The predominant transportation problem in Argentina for the rice industry is the logistics of shipping rice to Brazil. Most rice moves into Brazil at a single crossing point at Uruguayana by truck and, to a lesser degree, by rail. Due to inadequate infrastructure, three-week delays are not unknown. Argentina's fleet of trucks is old and inadequate. There is a large back order for new trucks. Although less costly, the rail system has limited capacity, and small mills lack the volume to utilize it. Rice must compete with wheat, corn and soybeans, which have much larger volumes, for limited rail capacity. Railroad rates in Argentina are about 12% higher than those in the United States and 11% higher than in Europe.

Due to the large volumes it markets, Glencore has been the most innovative rice exporter in utilizing available transportation. It has shipped rice across Uruguay to Brazil using Uruguayan rail. Second, it has shipped rice up the Paraná river from Corrientes to Corumba, Mato Grosso do Sul, where it is shipped by train to Saõ Paulo. Finally, Glencore has contracted with the Ferrocarril de Mesopotamia (the local railroad) to ship 150,000 MT of rice to Brazil via Uruguayana. This has been possible due to the large volumes that Glencore ships.

Uruguay is considered to have the best surface transportation system in the region because of substantial investment (responsible for much of its external debt) by the former military government. Transportation costs, however, are high, because fuel taxes are among the highest in Latin America. To its advantage, production zones are located within a short drive to one of six border crossing points with Rio Grande do Sul (four have rail connections) and to Montevideo, the nation's major port.

Retailing and Retail Prices

The structure of the MERCOSUR retail food sector is mixed. Large supermarkets and hypermarts predominate in large urban centers such as Sao Paulõ, Rio de Janeiro and Belo Horizonte in Brazil; Buenos Aires in Argentina; and Montevideo and Punta del Este in Uruguay. Small supermarkets and mom-and-pop stores dominate in small cities and rural areas. In large urban centers, food selection is good and international in scope, and speciality departments such as delis, prepared food and bakeries are present in supermarkets. However, MERCOSUR supermarkets generally lack the variety of selection within each food group, including rice, that would be present in U.S. supermarkets.

Millers' brand name white and parboiled rice are the most important rice products. Processed, brown and mixes are present but are less important. In urban areas of Brazil, private label rice has an important presence. Private label rice is unimportant in Argentina, and Uruguay and is not a widely used marketing concept.

In May and June of 1995 the authors collected prices for 1-kg bags of rice in Montevideo, Buenos Aires, Porto Alegre (Rio Grande do Sul) and Saõ Paulo supermarkets. The prices, in U.S. dollars, are in Tables 13 to 15. Prices tended to be highest in Argentina, followed by Uruguay and Brazil. This is consistent with the perceptions of Buenos Aires as a high-quality market and Brazil as a low-quality market. El Dorado and Carrefour are hypermarts in Saõ Paulo, and S.M. is a small neighborhood grocery store in central Porto Alegre. The highest Brazilian prices are for Uncle Ben's precooked rice and a specialized brown rice product found in El Dorado. Tipo 1 white milled prices ranged from $0.48 to $0.75. Tipo 2 white milled prices ranged from $0.51 to $0.56. The only Tipo 3 rice encountered was priced at $0.42 in Porto Alegre. Parboiled rice did appear to carry a slight premium over white milled rice. The price of Tipo 1 parboiled rice ranged from $0.55 to $0.96 and Tipo 2 from $0.63 to $0.69.

Table 13. Brazilian retail rice prices ($/kg), June 1995.[a]

Description[b]	El Dorado Saõ Paulo	Carrefour Saõ Paulo	S.M. Porto Alegre
Tipo 1			
Uncle Ben's Roris Brown Rice - Precooked	2.52		
Uncle Ben's Regular Brown Rice - Precooked	1.40		
Uncle Ben's Converted - Parboiled	0.96	0.80	
Provita Arrocita - Polished	0.57		
Tio João - Polished	0.69	0.74	0.75
Camil - Polished	0.59		
Dorado (private label)	0.64		
Tio Belo - Polished	0.63		
Tio Patinho - Polished	0.56		
Brejeiro - Polished "Irrigated Rice"	0.70		
Novo Rozcato - Parboiled	0.55		
Arroz Nacional			0.58
Tres Patinhas			0.51
Arroz Compe Bem			0.48
Rissul			0.58
Blue Ville - Parboiled			0.55
Requinte - Polished		0.65	
Tipo 2			
Natu's - Brown Rice "Natural Product"	2.99		
Camil	0.56		
Tio Mingote - Parboiled	0.69	0.65	0.63
Arroz Patinho	0.52		
Rei do Sul - Polished	0.51		
Arroz Canoas			0.45
Arroz Butui - Polished		0.50	
Tipo 3			
Arroz Falador			0.42

[a]Price at time price was collected
[b]Long grain white milled except where noted

Source: the authors.

Table 14. Argentinean retail rice prices ($/kg), June 1995.[a]

Description[b]	Carrefour Buenos Aires	Tia Express Buenos Aires
00000		
Arroz Barbara - Parboiled (Sagemuller)	1.39	1.65
Arroz Barbara (Sagemuller)	1.17	1.05
Arroz Barbara - Double Carolina (Sagemuller)	1.15	1.59
Arroz Barbara - Brown Rice (Sagemuller)	1.37	
ALA Dorado - Parboiled		1.39
Blue Bell (ALA)		1.18
ALA Doble - Double Carolina		1.57
Arroz Maxima - Parboiled (Molinos Rio de la Plata)	1.55	1.85
Arroz Maxima - Brown Parboiled (Molinos Rio de la Plata)		2.77
Arroz Maxima Doble Blanco - Double Carolina (Molinos Rio de la Plata)	1.99	2.25
Condor Double - Double Carolina (Molinos Rio de la Plata		1.62
Arroz Condor (Molinos Rio de la Plata)		1.25
Arroz Gallo Oro - Parboiled (La Arrocera Argentina)	1.82	1.95
Gallo - Brown Rice (La Arrocera Argentina)	2.69	2.88
Arroz Doble Gallo - Double Carolina (La Arrocera Argentina)	2.49	2.10
Arroz Gallo (LaArrocera Argentina)	1.99	1.39
Gallo - Boiling-Bags		2.49
Dos Hermanos “Blue Bonnet”		1.69
0000		
Arroz 53 ‘Blue Bonnet’		0.81
Nutri Max	0.72	

[a]Price at time price was collected
[b]Long grain white milled except where noted

Source: the authors.

In Buenos Aires, prices were collected in Carrefour, a hypermart like its sister store in Sao Paulõ, and Tia Express, a small center-city supermarket. Not surprisingly, prices in Tia Express were generally found to be higher than those in Carrefour. Most prices were over $1 and ranged up to $2.88 for Gallo brown rice in Tia Express. The majority of brands fall under 00000, the highest retail grade. White milled 00000 ranged in price from $1.05 to $1.99. Arroz Gallo, the nation's largest seller, sold for $1.39 in Tia Express and $1.99 in Carrefour. Double Carolina carried a premium over white milled with prices ranging from $1.15 to $2.49. Lower grade 0000 white milled sold for $0.75. Brown rice was the most expensive, up to $2.88 in Tia Express.

In Montevideo prices were collected from Disco, the largest chain of supermarkets in Uruguay, and Tienda Inglesa, an upscale chain store. Uruguayan rice is equal to or superior to Argentinean rice in quality but lacks the sophisticated packaging and high prices. There is less brand name selection than in Argentina and Brazil. Various rices from SAMAN and COOPAR accounted for virtually all of the shelf space. White milled rice prices ranged from $0.82 to $0.95. The largest seller, COOPAR's Blue

Table 15. Uruguayan retail rice prices ($/kg), May 1995.[a]

Description[b]	Disco Montevideo	Tienda Inglesa Montevideo
SAMAN		
Brown Rice	0.73	0.77
Parboiled	0.92	0.93
Aromatic	0.99	
Patna	0.83	0.85
Brokens		0.43
COOPAR		
Parboiled Blue Patna	0.88	0.95
Blue Patna 'Blue Belle'	0.93	0.93
Blue Patna Parboiled Boiled-in-Bag	1.89	
Blue Patna Boiled-in-Bag	1.93	1.94
OTHER		
Arroz Patna - La Olmorena	0.82	

[a]Price at time price was collected
[b]Milled long grain white except where noted

Source: the authors.

Patna (Blue Belle or similar variety) sold for $0.93 in both locations. Its major competitor, SAMAN's Patna, sold for $0.83 in Disco and $0.85 in Tienda Inglesa. The price for parboiled rice does not appear to be significantly different from the price of white milled rice. SAMAN's brown rice was priced $0.08 and $0.10 under the price of its white milled rice.

MERCOSUR RICE TRADE

MERCOSUR rice trade is complex, taking place on three levels. First, there are internal flows of rice from surplus to deficit areas within each of the three countries. Internal flows are the most complex in Brazil. Second, there are flows of rice among the three nations, primarily from Argentina and Uruguay to Brazil. Third, Argentina and Uruguay export rice to non-MERCOSUR nations, and Brazil imports rice from non-MERCOSUR nations. Although Argentinean rice exports have increased, they are substantially less important than wheat, corn, soybean and beef exports. Uruguayan rice exports, estimated at $165 million for the 1995/96 marketing year, have the third highest export sales after meat and wool. In addition to being complex, the MERCOSUR rice trade is also dynamic. In the 1990's, Brazilian imports and Argentinean and Uruguayan exports have increased dramatically.

Internal Flows

In Brazil, the southern region accounts for nearly half of total domestic production. The other four regions have similar production levels but are lower than that of the southern region. About 71% of the population, but only 29% of the national area,

is located in the northeastern and southeastern regions along the Atlantic coast. The three largest urban centers, Saõ Paulo, Rio de Janeiro and Belo Horizonte, are located in the southeast. Together, these two regions have an estimated rough rice deficit of about 5.4 million MT. The southeast alone accounts for about 70% of this deficit. The northern region is roughly self-sufficient in rice, the west-central region has a surplus of 0.5 million MT of upland rice, and the southern region a surplus of 2.7 million MT of largely irrigated rice. Current west-central surpluses are down from 1.2 to 1.5 million MT in the 1980's due to lower production levels in the states of Goias and Mato Grosso. Increases in irrigated production in Rio Grande do Sul have only partially offset the decline in upland production.

Most of the west-central region's 0.5 million-MT surplus is shipped to the northeast due to its low income levels and traditional consumption of upland rice. The northeastern region is the largest market for low-quality rice, i.e, upland rice and irrigated rice with a high percentage of brokens. The primary market for the south's irrigated surplus is the urban centers of the southeast.

With lower per-capita rice consumption, smaller, more concentrated populations and production concentrated in a single contiguous area, Argentina and Uruguay have relatively simple internal rice flows. Argentina consumes nearly 400,000 MT of rough rice annually. About 70% of consumption is concentrated along the Rio de la Plata and Paraná rivers (the Littoral) in the states of Buenos Aires, Santa Fe, Cordoba, Entre Rios and Corrientes. The bulk of domestically consumed rice (Blue Belle varieties and Double Carolina) is from Entre Rios and Santa Fe. The two states are within easy reach of consumption areas in the Littoral. Corrientes primarily produces long-grain tropical indica varieties for the Brazilian market.

Uruguay, with the smallest national area (about the size of North Dakota), relatively flat topography and 50% of its population in the capital city of Montevideo, has the simplest internal logistics. Uruguay consumes only about 75,000 MT of rough rice annually, and all points within Uruguay are no more than 4 to 5 hours by truck from rice production areas. Rice intended for the domestic market (Blue Belle and similar varieties) is largely produced in the eastern departments. The northern and north-central departments primarily produce long-grain tropical indica varieties for the Brazilian market.

Intra-MERCOSUR Trade

Intra-MERCOSUR rice trade is relatively simple. Of the six possible directions of trade among the three countries, only two are important: Argentinean and Uruguayan exports to Brazil[9]. Brazilian imports of Argentinean and Uruguayan rice has increased from about 230,000 MT of milled rice in 1989 to about 700,000 MT in 1994 (Table

[9]Argentina and Uruguay also export to Chile and Paraguay. However, in comparison to Brazil, these markets are relatively unimportant.

Table 16. Brazilian imports of milled rice by country.

Country	1989	1990	1991	1992	1993	1994
	----------000's MT----------					
Uruguay	193	357	384	343	511	452
Argentina	39	78	124	232	344	250
United States	2	101	330	12	6	203
Vietnam	-	-	224	20	69	200
Thailand	-	17	131	-	14	13
Indonesia	-	-	-	-	36	138
Pakistan	-	-	25	30	-	1
Taiwan	-	-	-	-	-	45
Total	233	553	1218	637	980	1303

Source: Sparks America del Sur.

16). In 1995, this number fell to 638,000 MT. In 1996, intra-MERCOSUR trade should expand as Uruguay ships a higher percentage of its total exports to Brazil.

Due to its small domestic needs, Uruguay has traditionally been the main MERCOSUR supplier to Brazil. However, Argentinean exports have increased markedly in the 1990's, and in 1995/96 Argentina became the number one foreign supplier to the Brazilian market. This was aided by Uruguay's success in diversifying its export markets. In the previous two marketing years, Uruguay shipped between 75 and 80% of total exports to Brazil. In 1995/96 this number was down to 52% because Uruguay made large sales to Iran, Peru and Senegal[10]. In 1989 Argentina exported only 39,000 MT to Brazil, but this grew to 345,000 MT in 1995. Argentina's and Uruguay's exports to Brazil should continue to grow as their area expands. Their large market share is aided by the tariff on non-MERCOSUR rice imports, which is currently 20% (up from 10% in the spring of 1995). In addition, except for northeastern markets, non-MERCOSUR Brazilian imports cannot be financed with extended credit. Argentina's and Uruguay's future role in the Brazilian market, however, is dependent on their ability to diversify their export markets — an important priority of both nations.

The bulk of intra-MERCOSUR rice trade is mill to mill. Middle men are usually unnecessary due to the close physical proximity of the production areas in the three countries and the small quantities involved in a typical transaction. The importing and exporting mill are typically the same size. Because most sales are on a cash-and-carry basis, financial institutions seldom become involved.

The lack of uniform MERCOSUR-wide customs procedures, in effect acting as a non-tariff barrier, is a major problem. This has resulted in delayed imports of rice into Brazil (up to 20 days), which have been the most severe at the Brazil-Argentina

[10]From January through August 1996, Uruguay had exported 358,168 MT of rice. About 73.5% or 263,123 had been shipped to Brazil.

border in Uruguayana. While the Argentinean rice industry claims that these delays are due to pressure from the Brazilian rice industry, the Brazilians attribute the delays to transportation problems. The Argentineans have conceded that this problem is slowly improving. Both sides agree that uniform customs procedures should substantially reduce this problem.

Traditionally, Argentinean and Uruguayan mills have not tried to distribute consumer-packaged rice under their own brand names in Brazil. Recently, however, more Argentinean and Uruguayan consumer-packaged brand-name rice has reached Brazilian consumers through joint ventures and exclusive distribution rights. SAMAN, an Uruguayan mill, sells rice under its brand name in Brazil and has set up a distribution system to facilitate this. This is aided by Uruguay's regional reputation for high-quality rice.

External MERCOSUR Trade

External MERCOSUR rice trade consists of Brazilian imports from, and Argentinean and Uruguayan exports to, non-MERCOSUR nations. Brazilian imports from non-MERCOSUR nations have been growing but are highly variable (Table 16). The United States and Vietnam are the principal non-MERCOSUR suppliers. The consistency of Argentinean and Uruguayan exports and the variability of non-MERCOSUR imports would appear to indicate that non-MERCOSUR exporters are Brazil's residual suppliers, supplying what Argentina and Uruguay are unable to supply.

Although Brazil is the primary export market, an important goal of both Argentina and Uruguay is market diversification. Based on data in Tables 17 and 18, non-Brazilian markets account for only about 20% of their exports. Uruguay has a longer history of exporting to non-Brazilian markets and in this area is more sophisticated than Argentina. As noted earlier, Uruguay was successful in reducing exports to Brazil from 80% of the total in 1994 to only 52% in 1995. However, it is expected that this number will increase in 1996. There is no indication that Argentina is diversifying away from the Brazilian market. Uniformity of quality still hinders the ability of Argentina to make large sales in high-quality non-Brazilian markets.

Several factors indicate that the 1996/97 and 1997/98 marketing years should see strong sales to Brazil from both MERCOSUR and non-MERCOSUR exporters. Due to reduced production (see page 16) Brazil is expected to have a 2 million-MT (milled basis) shortfall in the 1996/97 marketing year. In 1996, Argentina is expected to supply only slightly more than the 345,000 MT that it supplied in 1995. If Uruguay increases its shipments to Brazil as expected, then total MERCOSUR shipments to Brazil for 1996/97 should be about 730,000 MT — less than one-third of Brazil's import needs. This would indicate that non-MERCOSUR imports at about 1.35 million MT will account for the bulk of imports. Under normal growing conditions, Brazil's imports for 1997/98 should exceed 1996/97 imports. High Brazilian import needs may result in a reduction in the MERCOSUR tariff from 20 to 10% and

Table 17. Argentinean exports of rice by country.

Country	1992	1994	1995
	----------MT----------		
Angola	-	-	4166
Chad	-	-	7071
Bolivia	18327	6444	5079
Senegal	-	-	5729
Brazil	225734	168070	314581
Colombia	-	-	300
Costa Rica	73	2	70
Chile	19088	12871	28184
Ecuador	-	18	14
Jamaica	-	235	-
Haiti	-	-	12176
Mexico	-	17703	-
Netherlands	-	-	1400
Paraguay	5572	9662	10569
Peru	5038	-	18
Uruguay	24	76	77
Spain	90	-	194
Portugal	2549	-	-
Israel	964	-	-
South Africa	-	-	13490
Total	277459	215081	403118

Source: MERCOARROZ (April 16, 1996).

the lifting of the ban on extended financing in non-northeastern markets. Although the drought played a major role in reduced Brazilian production in 1995/96, reductions in planted areas are a likely long-term possibility; consumer tastes continue to shift away from upland rice, Brazil's irrigated rice production costs remain high in comparison to Argentina and Uruguay and lack of production credit remains a problem. It would appear that current high world prices and strong Brazilian demand will increase plantings in Argentina and Uruguay in 1996/97 and beyond. It is likely that the rice area in Argentina will continue to grow at a 5 to 10% rate for the remainder of the decade. Future export opportunities for non-MERCOSUR nations will depend on the size of production shortfalls in Brazil as well as exportable surpluses in Argentina and Uruguay.

Most non-MERCOSUR rice is imported by Brazilian distributors. Distributors buy, package and market milled rice, frequently contracting with supermarket chains to provide private label rice. They perform no milling functions. Most distributors import non-MERCOSUR rice through brokers, lacking the sophistication or size to import directly. Distributors have only been important since 1990 when Brazil lowered its tariff on non-MERCOSUR rice from 40 to 10% and on MERCOSUR rice to 0%.

Table 18. Uruguayan exports of milled rice by country by marketing year (MT).[a]

Country	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96
Angola	-	-	-	-	-	1127
Argentina	-	-	-	-	-	3120
Bahamas	-	-	86	280	322	-
Brazil	234540	253801	294339	360424	321116	343080
Chile	4007	5437	12648	11973	15266	10734
Cyprus	1017	948	1349	1116	1010	1247
Spain	-	378	634	236	237	1696
Haiti	-	-	-	5157	10370	-
Netherlands	6223	-	4074	-	-	-
Iran	-	-	24945	-	-	39562
Canary Is.	473	1044	1727	1569	1586	228
Kuwait	300	200	300	213	380	40
Malta	-	-	108	112	22	108
Mexico	520	-	9700	15265	24156	3350
Paraguay	-	-	-	8	-	36
Peru	-	-	40131	67997	10828	73228
Greece	-	-	-	-	-	194
Portugal	599	-	43	11736	323	258
South Africa						638
Senegal	-	-	-	-	12079	50898
Slovenia	-	-	-	-	-	215
Sweden	400	37	65	43	65	-
Japan						51
Others	1525	5842	1404	3881	5622	866
Total	249604	267687	391553	480010	403472	528944

[a]Marketing year is April 1 through March 31.

Source: Comision Sectorial del Arroz.

Distributors are primarily located in the large urban centers of the southeast. One of the strengths of distributors, and for which they have been criticized by millers, is their flexibility in procuring rice. Distributors may purchase milled rice from domestic mills or import from a number of sources. Imported rice is desirable because it avoids high Brazilian milling costs. Another option is to import rough rice and have it custom milled. Distributors have been criticized for blending any number of combinations of upland, domestic irrigated and imported rice. As a rule, an upland/irrigated blend can contain no more than 25% of upland rice before its taste becomes apparent. One problem with blending, of course, is that cooking times may vary among the component rices. Distributors and their allies, the supermarket chains, want to import rice freely in order to take advantage of subsidies and the favorable credit terms offered by non-MERCOSUR suppliers.

There are tradeoffs in the sourcing of Brazilian imports. MERCOSUR rice producers are the main beneficiaries when a high rice tariff prevails through the trade creation effect of a custom union. The MERCOSUR rice industry claims that they need a 35% external tariff to protect themselves from “subsidized” imports. A private

Buenos Aires commodity analysis firm estimates that a 25% tariff is needed. A high external tariff, however, may not be desirable for Brazil's low-income consumers and rice distributors. Distributors desire easy access to low-cost imports for use as a bargaining tool with large MERCOSUR mills from Rio Grande do Sul, Argentina and Uruguay.

POLICY

Government intervention in the rice economies of the region varies but has generally declined, consistent with recent domestic reforms (see Table 19 for a summary of policy instruments). Although Brazil has the largest number of policy instruments in place, their effect has declined due to budgetary restrictions. Argentina has revoked most of its traditional policy instruments and currently has a rice economy largely driven by market forces. In Uruguay, the major policy instrument is an annual average producer price (akin to the pooled price of the Canadian Wheat Board), which is determined by a consortium of producer, miller and government interest groups.

Brazil

The Brazilian government began to directly intervene in agriculture during World War I when it established a minimum producer price for beans and wheat and created the Executive Delegation of National Production to improve transportation and supply agricultural production inputs. The Production Finance Commission (CFP), under the Ministry of Finance, was later established in 1943 to supply producer credit. The CFP would be moved a number of times in a search to obtain the agency that could best fund it. The CFP was moved in 1962 to the National Superintendency of Supply

Table 19. Summary of MERCOSUR rice policy instruments, 1996.

Instrument	Brazil	Argentina	Uruguay
Production			
Price supports	X		
Credit	X		X
Negotiated seasonal price			X
Marketing			
Loans	X		
International trade			
Import tariffs	0% Mercosur 20% non-Mercosur	0% Mercosur 20% non-Mercosur	0% Mercosur 20% non-Mercosur
Tax rebate			$0.38/50kg
Significant non-tariff barriers	High port costs No long-term financing on imports except in Northeast		

Source: The authors.

(SUNAB), whose mission was to administer agricultural prices, because of an agricultural supply crisis. From 1967 to 1990, the CFP was under the direct control of the Ministry of Agriculture. In 1990, the CFP was placed under the direction of the CNA, or what a short time later would become CONAB (Companhia Nacional de Abasticimento or The National Supply Company), which administers the agricultural price support program. In 1991 CONAB was placed under the control of the Ministry of Agriculture.

The first producer price support program was established in July 1945 for rice, beans, peanuts and sunflower seeds. The program was financed by the Banco do Brasil and administered by the CFP. Minimum prices were to be based on "effective" costs plus a 30% markup and the expected tendency of the market. Although the purpose of the program was to support producer prices, until the 1980's the program was largely dedicated to estimating production costs, which were used as the main criteria in establishing credit levels. Under the CFP loan program, a producer could obtain financing of up to 80% of expected income based on the minimum price. The minimum price was fixed three months before planting, although this provision was frequently violated. CFP loans could be repaid in kind at the minimum price. Product accumulated under the program was placed in a strategic reserve. Accumulation in excess of the strategic reserve was exported. The minimum price was initially offered only to producers, especially small producers who traditionally relied on local moneylenders for production loans. However, after much lobbying, millers and other marketers obtained the right to receive the minimum price, provided that they could demonstrate that the producer of the rice had received the minimum price.

By 1979, the rural credit and subsidized input paradigm was exhausted and highly criticized by those outside of agriculture. In 1980 greater emphasis was placed on the price support program. Under the price support program, market prices were supported by purchasing rice when the Saõ Paulo wholesale price dipped below the minimum price for 10 consecutive days. When the Saõ Paulo wholesale price exceeded a 60-month running average trigger price (PLE), stocks were released. Later, a system based on regional wholesale prices was implemented. The PLE program also called for imports when domestic supplies were low, prices were accelerating or sales of government-held stocks could not dampen prices.

The goal of the price support program was to stabilize the market price. Government rationale for the program was 1) to maintain price parity between the agricultural and non-agricultural sectors, 2) to cover increasing production costs, 3) to set a stable long-run equilibrium price and 4) to provide a subsidy in order to increase production. Stocks accumulated under the price support program went to strategic reserves (which were designed to hold 1/12 of annual consumption) and to regulate the market. Due to Brazil's inflationary problems, the support and trigger prices and

interest on CFP loans were indexed. The support price, however, was not indexed. Only after several poor harvests was the support price indexed.

In reality, support price levels were usually set well below market prices due to budgetary constraints, so that in effect, the program had little influence on market prices. Support levels did not cover total costs and seldom gave the producer a 30% markup over cash costs.

CFP credit, about 25% of which went to rice producers, declined throughout the 1980s. By the early 1990s, CFP's budget for loans had fallen to 25% of its 1979 high of nearly $28 billion (see Fig. 7). Similar to credit, real support levels for irrigated rice declined sharply from 1987 to 1994 (Fig. 8). Average support prices (in constant 1994 *reals*) were 16.11 *reals* (one *real* is equal to one dollar) per 50-kg bag of rough rice from 1975 to 1986, but fell sharply to 8.04 *reals* (in 1994 constant *reals*) from 1987 to 1994. Similarly, Fig. 9 shows sharp drops in the per-hectare estimated production costs upon which the minimum price is based. In spite of falling support levels, government purchases became significant in the second half of the 1980s even in consumption-deficit states such as Saõ Paulo (see Table 20). It has been estimated that price supports increased rice prices 12% above the free market price in this period (Auxiliadora). The program was most effective in the central-west agricultural frontier where the government was typically the only buyer.

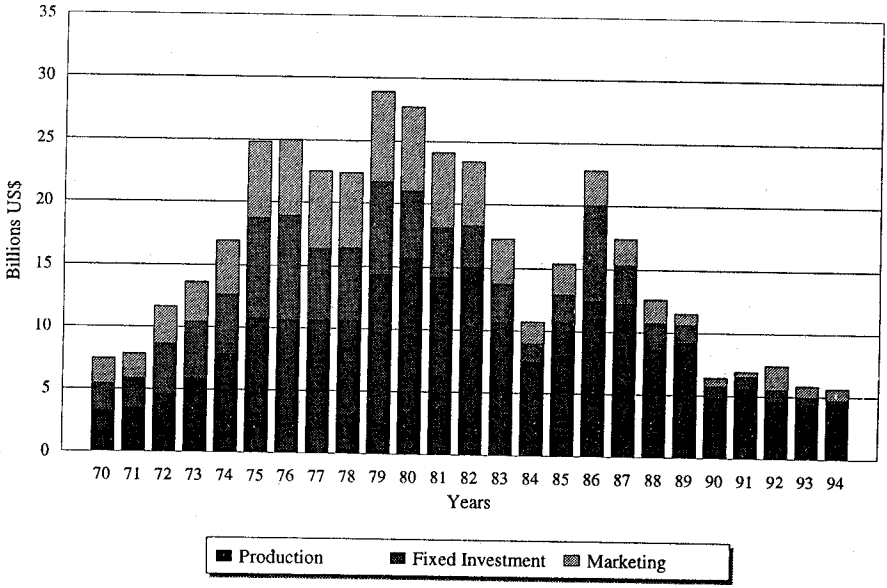

Fig. 7. Brazilian government credit to agriculture. Source: FEDARROZ.

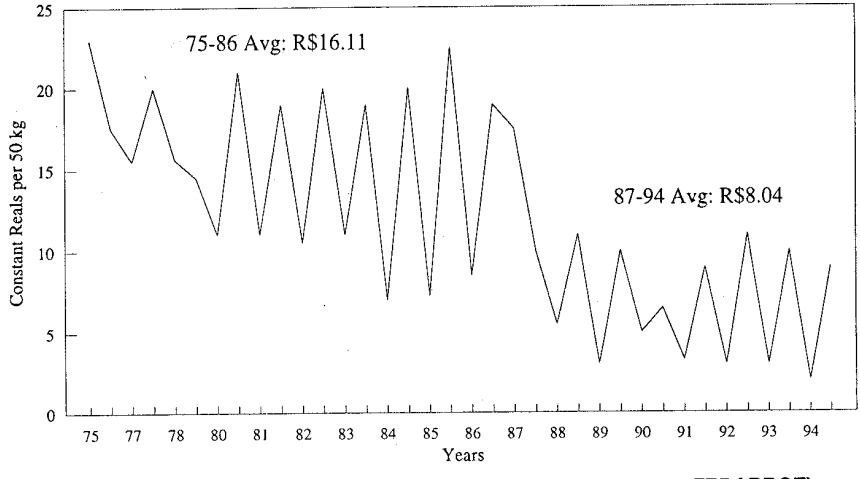

Fig. 8. Support prices for Brazilian irrigated rought rice. (Source: FEDARROZ)

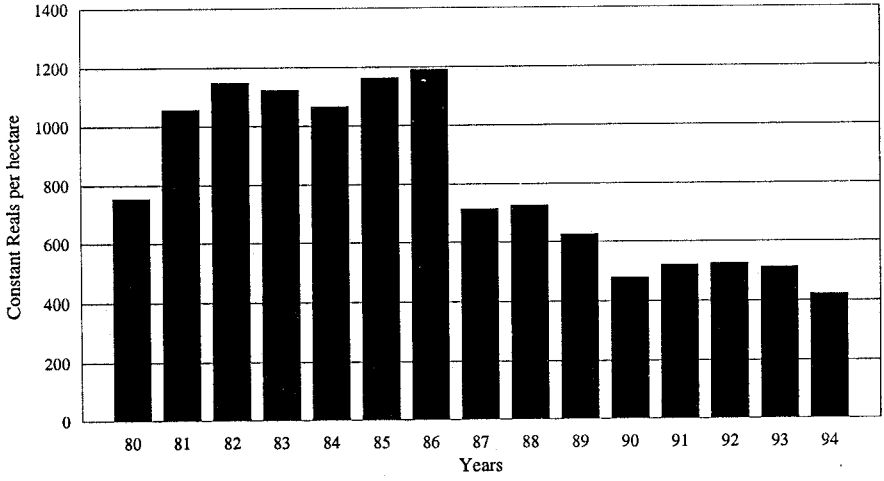

Fig. 9. Estimated government production costs on which loans are based (assumes 4.2 to 5.0 MT/ha yields). (Source: FEDARROZ)

Table 20. Brazilian production and government acquisitions of rice, by year, 1969-91.

Year	Production (MT)	Acquisitions (MT)	% of Production
1969	6394285	9175	0.1
1970	7553083	517800	6.9
1971	6593179	14122	0.2
1972	7824231	0	0.0
1973	7160127	12162	0.2
1974	6764038	6548	0.1
1975	7781538	3115	0.0
1976	9757079	649302	6.7
1977	8893696	1195241	13.4
1978	7296142	156076	2.1
1979	7595214	110871	1.5
1980	9775720	221868	2.3
1981	8228326	800040	9.7
1982	9734553	733343	7.5
1983	7741753	501142	6.5
1984	9027363	664534	7.4
1985	9024555	1499190	16.6
1986	10374030	1729640	16.7
1987	10578000	2837277	26.8
1988	11672200	2266130	19.3
1989	11092000	890073	8.0
1990	7967600	92042	1.2
1991	9996800	817	0.0

Source: Auxiliadora de Carvalho, 1994.

The price support and credit programs have had conflicting purposes. The official purpose of the programs was the long-term expansion and development of agriculture; in practice, however, they were used as short-term policies to manage immediate problems caused by unexpected shifts in supply and demand, i.e., crisis management. Macroeconomic and cheap food policies, in effect, controlled price support levels. As a macroeconomic crisis management tool, agricultural policy came to be used to insure adequate supplies of commodities at low prices rather than a policy to encourage production.

Because of its use as a short-term "crisis-solver," the price support program had several adverse effects. A major effect was the withdrawal of the private sector from many marketing functions, leaving only the public sector and speculators in the market, due to "institutional risk" (sharp changes in program provisions from year to year). For example, the storage function of the program largely drove out private storage firms, leaving the main storage responsibility to the government.

In the 1990's rice policy has become more market oriented. Liberalization of grain imports in 1990 shifted many of the government's former responsibilities to co-operatives, private millers, the financial community and brokers. The government has also reduced its ownership of storage facilities and has moved toward contracting with private firms for storage.

Currently, Brazil has minimum guaranteed producer prices (MGP) for rice and six other commodities that are based on the cost of production. Agricultural programs are announced in August for the summer crops and in March for the winter crops (seasons inverted in southern hemisphere). The government has mostly switched from direct purchase to marketing loans, so it now uses the MGP more as a loan rate and less as a purchase price. There are two types of marketing loan contracts: 1) contracts in which the government agrees to purchase the product at the minimum support price (EGF/SOV) and 2), due to budget constraints, contracts in which the government has the option to purchase the commodity at the minimum support price or to sell the product at the market price (EGF/COV). The majority of marketing loans are of the EGF/COV type. Before July 1, 1994, the support price was adjusted every 15 days beginning at harvest. Since July 1, 1994, however, the support price for irrigated rice has been frozen at $11.93/50 kg. The current support price for upland rice is $10.54/60 kg in the south, southeast, central-south and central-west; $10.17 in Tocantins and Mato Grosso; and $9.60 in the north.

Certain components of the credit programs vary from year to year, but loan terms are generally differentiated by farm size, crop, yield and region. In 1994/95, production and marketing loans for the winter crops (wheat, barley, canola and oats) and the summer crops (rice, corn, cotton, soybeans, etc.) totaled $6.5 billion, a 12% increase from the previous year but well below the record of $28 billion of 1979/80. Direct government production loans to producers are declining, as are the loan limits per farm. In the past, interest rates were indexed to the rate of inflation. During the 1995/96 crop year, the interest rate is a fixed 16%.

Because of the farm crisis of 1995/96, the government and the producers renegotiated some $7 billion of farm debt that will have to be repaid in the next 7-10 years with a one or two-year grace period at a 3% annual interest rate.

Farmers can also obtain private sector loans through the use of commodity certificates (CM-G) and bonds (CPR). There are two kinds of CM-G. The CMDG is used when the product is delivered and paid for in cash (a cash or spot transaction). The CMFG is used for a futures contract. Both are guaranteed by a bank. The CM-G's are freely negotiable in the market based on the quantity, quality, place and date of delivery. The certificates are issued by the producer, the lender, or a co-operative and are administered by the Center of Registrations S.A. The CPR's (bonds) are issued by the farms and co-operatives when the farms sell their agricultural products in advance to finance production. The CPR's are administered by a network of offices authorized by the Banco do Brasil.

Due to ongoing programs, the government is still the largest holder of rice stocks. In May 1996 CONAB estimated that 2 million MT of rice were in government contract storage facilities (MERCOARROZ, May 30, 1996). Maintaining the quality of rice in government storage is a major problem. In 1993 and 1994, rice worth several million dollars was ruined due to inadequate storage facilities. As a result of this, the

government instituted mandatory measures to monitor government stocks stored in private facilities.

Tax policies have perhaps had the largest impact on the Brazilian rice economy. Brazilian taxes are high and regressive and lack uniformity across states and economic sectors. There are over 60 separate taxes. A major goal of the Cardoso administration is to simplify the current tax code. Agriculture pays a disproportionately higher level of taxes than manufacturing. About one-third of the value of the market basket of basic foods is composed of taxes. Fochezatto and Mattuella (1995) have estimated that 42% of the retail price of rice is composed of taxes (see Tables 21 and 22). As a result, many business decisions are based on their tax consequences, e.g., millers ship rough rice out of Rio Grande do Sul to mill in other states in order to avoid high state milling taxes.

Brazil has several policies that primarily affect non-MERCOSUR rice imports. After February 28, 1995, all rice imports to Brazil were payable in cash only. Imports to the northeast were excluded from this policy. This measure was intended to exclude imported rice, which is viewed as having an unfair advantage by the MERCOSUR rice industry, which cannot offer liberal payment terms. Another policy that restricts non-MERCOSUR imports is the application of a 25% Merchant Marine tax on the freight rates of all imports outside the MERCOSUR. Brazil also has anti-subsidy policies that can be used to counter the effects of subsidized imports.

Argentina

From the end of World War II until the early 1990's, Argentina followed a systematic anti-rural policy in which rural infrastructure was neglected and agricultural exports were taxed in order to support macroeconomic and industrial import-substitution policies. Export taxes on agricultural commodities were as high as 25% of the world price and accounted for as much as 20% of government revenues. The agricultural sector was further taxed through a perpetually overvalued peso. The government regulated internal rice prices and exports through the Junta de Granos (National Grain Board). This forced the agricultural sector, which is highly export dependent, to become highly competitive by keeping capital investment and variable costs to a minimum.

Since the early 1990's, the Junta de Granos has been privatized, export taxes have been rescinded, the peso has been closely tied to the dollar, and both federal and provincial concessionary credit is no longer available. Tax levels, although much lower than in Brazil, are still relatively high and include fuel taxes, public utility service taxes and value added taxes, as well as taxes on other forms of consumption. In 1992 the government began a tax rebate program on exported rice, which is the only government program that is a direct subsidy to the rice industry. This amounted to about 2.5% of FOB value. On March 1, 1995, however, this program was discontinued.

Table 21. Brazilian rice costs and taxes per 30 kgs of milled rice, 1995

	Rio Grande do Sul[a]		Rio de Janeiro[b]	
Marketing Level	Total Cost	Tax	Total Cost	Tax
Production	7.73	1.94	7.74	1.95
Transport to Mill	0.47	0.20	0.47	0.20
Milling	5.91	2.59	6.16	2.84
Distribution	0.32	0.13	1.61[c]	0.67
Retailing	1.96	1.35	-	-
Total (U.S.$)	16.38	6.21	15.98	5.65

[a]Price includes 7% ICMS.
[b]Wholesale price with 12% ICMS.
[c]Transport from Rio Grande do Sul to Sao Paulo.

Source: Fochezatto and Mattuella, 1995.

Table 22. Breakdown of Rio Grande do Sul Consumer rice price with and without taxes, by marketing level, 1995.

Stages	with Taxes	% Taxes	Total Taxes	without Taxes
	$/MT		----------$/MT----------	
Production	257.94	25.17	64.92	193.02
Transport to mill	15.66	41.60	6.51	9.15
Mill rough rice price	128.20	21.78	27.92	100.28
Mill costs	23.54	42.00	9.89	13.65
Mill profits	23.54	42.00	9.89	13.65
ICMS 7%	32.96	100.00	32.96	0.00
COFINS 2%	9.41	100.00	9.41	0.00
PIS 0.65%	3.06	100.00	3.06	0.00
FOB mill price	470.77	32.85	154.67	316.10
Transport to retail	10.65	41.60	5.25	5.39
Delivered wholesale price	481.42	33.08	159.93	321.49
Retail costs	7.16	35.26	2.52	4.64
Fiscal credit	32.96	100.00	32.96	0.00
Retail profit	26.69	42.00	11.21	15.48
ICMS 7%	37.37	100.00	37.37	0.00
COFINS 2%	10.68	100.00	10.68	0.00
PIS 0.65%	3.47	100.00	3.47	0.00
Consumer price	533.83	36.17	192.22	341.61
Consumer price per kg	0.53	36.17	0.19	0.34

Source: Fochezatto and Mattuella, 1995.

Uruguay

Uruguay is unique in its institutional arrangements in that the millers, producers and government are represented in a commission that represents the interests of the rice industry. The Gremial de Molinos Arroceros (Rice Millers Association), founded in 1950, represents the interests of the rice millers. Initially, its executive committee was responsible for setting producer prices based on production costs. The Asociación Cultivadores de Arroz (Rice Growers Association), founded in 1947, represents the interests of rice producers. Beginning with 40 members, the Association currently represent about 95% of the 750 producers in the country. The Association is supported by a 0.27% tax levied on the sales of its members. Its functions are 1) to work with government and the milling industry to make policy decisions affecting the rice industry, 2) to develop and maintain a system of rice testing labs in order to crosscheck quality testing performed by mills and to promote quality improvement among producers, 3) to obtain the lowest cost production loans from the Banco de la Republica for its members, 4) to provide hail insurance and improved seed to producers who have no financing/marketing contracts and 5) to represent producer interests in the Sectorial Rice Commission. The Association does not provide specific extension or support service but occasionally sponsors "jornadas de campo" or field days. A future Association goal is to provide managerial support services to its members. The Association has very close relations with the Rice Millers Association with whom it works to resolve issues of common concern. In 1980 when the National Agricultural Research Institute (INIA) became quasi-privatized, the Association pledged $7 million for its support.

The Comision Sectorial de Arroz (Sectoral Rice Commission) initially started as the Comision Honoraria de Promoción Arrocera (Honorary Rice Promotion Commission), which was created by the president in 1962 when rice production and milling was declared to be in the national interest. In 1973 the name of the commission was changed to Comision Sectorial del Arroz, and the commission was made a dependent of the Secretary of Planning and Budget. The Commission is composed of representatives from the Rice Millers Association, the Producer Association, the Banco de la Republica and the Ministries of Agriculture, Commerce and Industry. The main purpose of the Commission is to act as a forum for the various rice industry interest groups and to establish the seasonal average national producer price. The seasonal average producer price is based on production costs and market prices. This price is applicable to producers who have signed marketing agreements with mills, about 90 to 95% of production. After the harvest is completed in May, a provisional price is announced in June based on expected market conditions. In February of the following year, a final price is announced based on actual sales. One result of the negotiated price is that mill competition for rough rice deliveries is based on non-price criteria such as location and the prices of rental land and water, if provided. This system is

most dominant in the eastern production zone. Producers in the north and north-central production areas (many of them Brazilian) are less likely to be a part of this system.

In addition to the average seasonal price, the marketing contract between millers and producers typically stipulates that the mill is to provide the producer with a 180-day production loan. Financing is provided by the Banco de la Republica but is guaranteed by the mill. The Banco de la Republica is a government bank that lends at market interest rates to the private sector. After harvest the account is closed, and the mill pays the loan and debits the producer's account.

Since 1980, Uruguay has had a tax rebate program on rice exports. In 1994 the rebate was set at $0.38/50 kg of milled rice. The rebate has been as high as $1.44. Rebate levels are set according to political and market conditions and budgetary considerations.

RESEARCH

Brazil, Argentina and Uruguay have sophisticated national rice research programs. In Brazil, the state of Rio Grande do Sul is responsible for much of the irrigated rice research. Currently, the research programs in Uruguay and Rio Grande do Sul are largely producer supported. Historically, the role of these programs was to increase yields and lower costs and to adapt seed and production practices to local soil types and climatic conditions. Seed stocks have come from the United States and CGIAR (Consultative Group on International Agricultural Research) Institutions.

Brazil

Brazilian rice research is primarily conducted by two public institutions, Empresa Brasileira de Pesquisa Agropecuaria (Brazilian Institute for Agricultural Research) or EMBRAPA and the Instituto Rio Grandense do Arroz (The Rio Grande do Sul Rice Institute) or IRGA. EMBRAPA, an arm of the Ministry of Agriculture, is responsible for coordinating the co-operative agricultural research system, which employs 2100 research scientists in 40 field units and administers an annual budget of approximately $200 million. EMBRAPA is wholly funded by the federal government. The main goal of EMBRAPA is to generate and promote scientifically and technologically based production with an emphasis on sustainability, the well-being of Brazilian society, the rational use of national resources and environmental protection (EMBRAPA, undated). EMBRAPA tests technology from other parts of the world for its appropriateness in Brazil and transfers generated technology to other developing nations, especially to Latin America and Africa.

EMBRAPA's upland rice research is conducted by the Centro Nacional de Pesquisa de Arroz e Feijao (National Center for Rice and Bean Research) in the west-central state of Goias, and its irrigated rice research is conducted by the Centro de Pesquisa

Agropecuaria de Clima Temperado (Temperate Climate Agricultural Research Center) in Pelotas, Rio Grande do Sul.

IRGA is the rice research arm of the state of Rio Grande do Sul and was the first institution to offer technical assistance to the industry. IRGA has 36 extension teams distributed throughout the rice production areas, covering 106 municipalities. Research is conducted in its five regional research centers. IRGA is supported by producers through a checkoff system in which 0.12% of producer receipts go to IRGA. The main goals of IRGA are to develop appropriate technologies for the state's irrigated rice industry, to provide technical assistance and extension, to generate rice situation and outlook reports and to store CONAB stocks. Specific research goals are to increase production efficiency, modernize production systems, train technical personnel, develop a production data base, conduct joint studies with the cooperative sector, produce 500 MT of improved rice seed, improve soil analysis capabilities and the technological levels of their research equipment and develop improved irrigation and drainage systems. Current research projects include developing cultivars that have a shorter growing period, are resistant to cold and disease, need less water, are shorter in stature and have better milling characteristics. Much of IRGA's research has been focused on releasing high-yielding tropical cultivars appropriate for the temperate climate of Rio Grande do Sul. Plant material for these varieties originated in the International Center for Tropical Agriculture (CIAT) via the International Rice Research Institute (IRRI).

Argentina

Rice research is primarily performed by the Instituto Nacional de Tecnologia Agropecuaria (National Institute of Agricultural Technology), or INTA, which was created in 1956, and a recently formed industry promotion group, the Comision Pro-Mejoramiento del Cultivo de Arroz (Commission for the Improvement of Rice Cultivation), or Proarroz. INTA is the autonomous experiment station system of the Secretary of Agriculture, Fisheries and Food (SAPyA). The INTA system consists of 42 experiment stations, 200 extension units and 13 research institutes. Research and extension are integrated at the experiment station level. The experiment stations are grouped into 15 regions. Experiment stations focus their research on agricultural activities that have a major economic impact in their region. Prior to 1993 INTA was supported by agricultural exports taxes. Currently, the system is supported by import taxes.

INTA's research and extension is intended: 1) to expand agricultural production so as to improve both internal and external market supplies without detriment to natural resources, 2) to diversify both domestic production and export markets geographically, 3) to place more emphasis on value-added products, 4) to promote sustainable production systems, 5) to assure that the benefits of technological change are accessible to all, particularly low-income sectors and 6) to improve the quality of rural life (INTA, 1994).

Rice research and extension in Argentina takes place at regional centers in Entre Rios and Corrientes but is primarily conducted at the experiment station in Concepción del Uruguay, Entre Rios. Research is directed toward seed improvement, improved management practices, pest and disease control and screening rice varieties sent from CIAT via IRRI for appropriateness in Argentinean production areas. INTA has recently developed a higher-yielding American-type cultivar known as H144 or Don Juan, which will be ready for commercial production for the 1995/96 crop year. The rationale for Don Juan is to make American-type varieties higher yielding and thus more competitive with tropical varieties. This should increase the supply of American-type rice available for high quality markets, which is part of industry strategy to diversify away from the Brazilian market.

Proarroz is a non-profit commission dedicated to serving the rice industry. The 38 members of Proarroz include representatives from private industry, co-operatives, producer associations and the provincial government of Entre Rios. The mission of Proarroz is 1) to conduct agronomic and economic research, 2) to disseminate information to the rice industry, 3) to lobby on behalf of the rice industry, 4) to solve rice industry problems and 5) to promote rice consumption (Proarroz, December, 1994). Proarroz participates in agronomic research primarily by channeling funds to INTA for specific projects of interest. Proarroz recently donated $50,000 to INTA to perform research oriented toward genetic improvement; weed, insect and disease control; crop rotation practices; and no-till planting.

Uruguay

The Instituto Nacional de Investigación Agropecuaria (INIA) is the primary agricultural research institution and is composed of five national research stations. Rice research began in the eastern research station, located in the eastern rice production region (department of Treinta y Tres) in 1970 and continues today to be the primary rice research institution. The eastern rice research station is staffed by 14 full-time professionals. In addition, rice research is conducted at one other research station and 15 experimental sites scattered throughout the east, north and north-central production regions. INIA's funding comes from a 0.4% tax levied on producer sales, a matching amount from the government and internal institutional revenues. INIA is directed by a board composed of two members appointed by the Ministry of Agriculture and two producer representatives. INIA research goals include 1) improving the efficient use of seeds and seeding density and the use of fertilizers and other inputs in the three distinct production zones, 2) evaluating new seeding methods — direct seeding or with reduced labor input and 3) estimating the costs of various production systems.

Rice research is conducted under the Programa Nacional de Investigación en Arroz (National Rice Research Program). The rice breeding program began in 1974.

In addition to its research, INIA disseminates information to producers through its *jornadas de campo*. A major goal of the program is to create new American-type cultivars that are pest resistant, surpass Blue Belle in yields and can be planted late without detriment to yields (short-cycle). INIA has recently bred two American-type cultivars, Yerbal and Tacuari, which are already in commercial production. In the 1995/96 crop year these were planted on 15% of area and in 1996/97 are expected to be planted on 30% of area. Yerbal and Tacuari are better tasting that IRGA varieties but have higher yields than traditional Blue Belle varieties. It is anticipated that these newer varieties will be planted in the eastern production areas, which are more susceptible to cold. Tacuari seed is distributed by a consortium of nine seed companies who control 90% of the market. Although these firms have exclusive rights to the seed, they must provide the seed to all producers who want it. Royalties received by INIA are plowed back into the rice program. Japonica cultivars that have good production potential and can be marketed in alternative markets are also being bred. Uruguay has been certified by the Japanese government to export to Japan.

Prior to field trials, all genetic improvement research is conducted in Treinta y Tres. Field trials are conducted in the eastern, northern and north-central production zones. INIA's genetic base is obtained from the United States and CIAT. The most promising genetic materials are planted in larger fields at the regional level by producers. The development of Yerbal and Tacuari has the same rationale as that for INTA's Don Juan: diversification of export markets.

SUMMARY

Due to recent reforms in domestic policies and regional integration, intra-regional and extra-regional MERCOSUR rice trade has expanded rapidly in the 1990's. Specifically, a decline in government support to the Brazilian rice sector has caused import demand to grow to 1.4 million MT in 1995, 2 million MT in 1996 and more than 2 million MT in 1997. The increase in Brazilian import demand, zero intra-MERCOSUR tariffs and more favorable domestic agricultural policies have caused production in Argentina and Uruguay to double since 1990. Argentina and Uruguay have also increased their exports to non-MERCOSUR Latin America, Africa and the Middle East. Argentina and Uruguay are expected to increasingly compete in high-quality long-grain import markets currently dominated by the United States.

The above scenario has significantly impacted production to the detriment of Brazil and to the benefit of Argentina and Uruguay. Changing consumer tastes, lower support prices and credit levels and increasing competition from alternative crops have caused Brazilian upland rice production to steadily decline since the mid-1980s. Increasing Brazilian irrigated rice production, primarily in the state of Rio Grande do Sul, made up for declines in the upland sector until recently. However, high producer

debt levels in the industry and high production costs relative to contiguous production areas in Argentina and Uruguay have caused a sharp decline in irrigated planted area in 1995 and 1996. Numerous Rio Grande do Sul producers have ceased production in Brazil and begun producing rice in lower cost areas of Argentina and Uruguay as a result. Argentina has a large supply of low-cost, high-quality rice land, primarily in the state of Corrientes. Industry members have estimated that Argentina could easily triple its current area of 224,000 ha with proper irrigation infrastructure. In comparison to Argentina, Uruguay's future increase in planted area will be more modest.

Currently, Argentina and Uruguay ship over 70% of their rice exports to Brazil, although export diversification is a major goal of both nations. Most exports are in the form of milled rice, although large farms, which are more likely to own drying facilities, are exporting rough rice in an effort to expand the potential number of buyers and increase revenues. Export sales are typically on a mill-to-mill basis, e.g., an Uruguayan mill exports generic milled rice to an importing mill in Rio Grande do Sul. The milling industry in both Argentina and Brazil has excess capacity and is undergoing a downsizing trend. This should result in a smaller number of larger mills, which should make Argentinean rice more competitive in non-MERCOSUR markets in the future. Uruguay has only about 30 mills (in comparison to 105 in Argentina), which typically operate at higher capacity levels than Argentinean and Brazilian mills.

Upland rice, which is produced only in Brazil, is locally consumed or else shipped to the low-income areas of northeast Brazil. Upland rice is increasingly viewed as inferior to irrigated rice by middle- and upper-income groups. High-yielding tropical long-grain indica rice is the most important irrigated variety produced in the region. Blue Belle and similar high-quality varieties are still produced in substantial quantities in Argentina and Uruguay. Blue Belle price premiums, however, have not generally compensated for their lower yields. There is also an important market for Double Carolina in Argentina among high-income consumers.

Brazil is a high-volume, generally low-quality market. Although there are many regional and local brands, large mills and distributors dominate urban markets. Distributors blend rice from both MERCOSUR and non-MERCOSUR suppliers, for resale to retailers. The smaller Argentinean and Uruguayan retail markets are dominated by a small number of domestic brands. Blue Belle and similar varieties dominate Uruguay and Argentina retail sales. Argentinean consumers, especially in Buenos Aires, are the most demanding with respect to quality. As a result, Argentinean retail rice carries the highest prices, is more heavily advertised and has the most sophisticated packaging.

A major marketing problem in the region is generally poor transportation. This is due to lack of investment and maintenance at the national level and historically poor integration between the transportation systems of the MERCOSUR nations. As a result of under-utilized inland water transportation systems and lack of gauge unifor-

mity and integration in the railroad system, most rice moves by truck. Improvement of the transportation system is an important regional goal. In improving the MERCOSUR transportation system, major emphasis will be placed on improving the Paraná-Uruguay inland barge system, which should be a key factor in lowering the cost of moving bulk commodities.

Brazil continues to support producers with minimum price and subsidized credit programs; however, these programs lack effectiveness due to substantially reduced budgets. Brazil also prohibits extended credit on rice imports on non-MERCOSUR imports to all regions except the northeast. This credit policy is seen as an aid to the MERCOSUR rice industry, which operates on a cash and carry basis due to high financial costs. Argentina has no specific rice programs. Uruguay has a partial tax rebate program, but the most important policy instrument is an average seasonal producer price that is similar to the pooled price of the Canadian Wheat Board. A commission composed of miller, producer and government representatives sets the price. Possibly the most important regional policy is the external tariff on rice imports, now set at 20%.

Existing rice research institutions are sophisticated and well-funded. Although national governments continue to privatize, which has strong political backing in the region, agricultural research continues to receive government funding. In Brazil and Uruguay money from producer checkoff systems is an important source of funds for rice research. An important component of Argentinean and Uruguayan rice research programs is the development of higher-yielding Blue Belle varieties, which can match tropical varieties in yield. Greater production of high-yielding Blue Belle varieties is seen as a key to diversifying away from the Brazilian export market.

Argentinean and Uruguayan rice production and exports should continue to expand rapidly over the next decade because of high international rice prices, production cost arbitrage (which causes Brazilian producers to cease production in Rio Grande do Sul and begin producing in Argentina and Uruguay) and declining milling and transportation costs in relation to its major competitor for import markets, the United States. Brazilian production, however, is likely to continue to contract in the short-run as producer debt remains a problem, competition from competing crops remain strong and Brazil continues to back away from producer support programs.

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