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THE PRESENT SITUATION OF THE AGRICULTURAL MACHINERY INDUSTRY IN LATIN AMERICA .

Sectoral Working Paper Series

No. 42

Susan Blackman

Sectoral Studies Branch
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SECTORAL WORKING PAPERS

In the course of the work on major sectoral studies carried out by the UNIDO Division for Industrial Studies, several working papers are produced by the secretariat and by outside experts. Selected papers that are believed to be of interest to a wider audience are presented in the Sectoral Working Papers series. These papers are more exploratory and tentative than the sectoral studies. They are therefore subject to revision and modification before being incorporated into the sectoral studies.

This paper was prepared by Ms. S. Blackman of David Dornbuch and Co. as UNIDO consultant. The views expressed do not necessarily reflect the views of the UNIDO secretariat.

Preface

As a part of the ongoing study work on the agricultural machinery sector the Sectoral Studies Branch of UNIDO's Division for Industrial Studies has commissioned a paper giving an overview of the present status of the Latin American agricultural machinery industry and the short-term market outlook. The main findings of this paper will be integrated into major studies of the agricultural machinery sector. However, because of its topical nature, the integral text of this consultancy paper is presented in advance. A similar paper has already been issued on the situation of the North American and Western European agricultural machinery (UNIDO/IS.503).

The consultant report was prepared by Ms. Susan Blackman of David M. Dornbusch & Co, San Francisco, California. The views expressed are those of the consultant and do not necessarily reflect the views of the UNIDO secretariat. Tables without explicit indication of source have been elaborated by the consultant.

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EXPLANATORY NOTES

References to dollars ($) are to United States dollars, unless otherwise stated.

A comma (,) is used to distinguish thousands and millions.

A full stop (.) is used to indicate decimals.

A slash between dates (e.g., 1980/81) indicates a crop year, financial year or academic year.

Use of a hyphen between dates (e.g., 1960-1965) indicates the full period involved, including the beginning and end years.

Metric tons have been used throughout.

The following forms have been used in tables:

Three dots (...) indicate that data are not available or are not separately reported.

A dash (-) indicates that the amount is nil or negligible.

A blank indicates that the item is not applicable.

Totals may not add up precisely because of rounding.

1. INTRODUCTION

Agricultural machinery production has fluctuated dramatically in Latin America during the past eight years. Sales reached an industry high in 1978-1979 and then dropped to an industry low in 1981-1982. Since then there has been a moderate recovery. Domestic manufacturers have consolidated their positions through investment in Brazil and Mexico, and through movement from manufacturing to assembly in Argentina. Two United States firms sold their entire agricultural machinery divisions: International Harvester to Tenneco and Allis Chalmers to Deutz. In addition, Massey-Ferguson's operations in Mexico were acquired by Ford.

Imports to Latin America, particularly from the United States, have dropped in response to the strong dollar, low commodity prices, competition from Japan and Europe, tight world credit policies and the associated lack of foreign exchange. Strict import policies have also reduced imports and strengthened the domestic producer's positions. In response especially to the strong dollar, a number of United States and Canadian firms have set up plants in Europe and have begun to ship farm machinery and components for assembly from those factories to Latin America.

The outlook for Latin America is mixed. Brazil is a growing market and, due to economies of scale, is making headway into the world farm machinery markets not just in Latin America and Africa, but in North America and Europe as well. The Argentinian agricultural machinery is weak and the production is not expected to grow considerably in the next few years. Though the Mexican economy appears to be recovering, recent policies adopted in response to IMF demands, such as reducing farm credit, may adversely affect the demand for agricultural machinery.

The above mentioned situation is analyzed in some detail in the present paper. After this introduction, chapter 2 presents an analysis of the current situation in the production and trade in Latin America as a whole and at the country level in Argentina, Brazil and Mexico. Chapter 3 describes the exogenous factors affecting the development of the agricultural machinery sector and the response of the manufacturers to overcome their present difficultires. Chapter 4 presents an outlook of probable future events under the present conditions which are especially important in the big countries of the region.

2. ANALYSIS OF THE CURRENT PRODUCTION AND TRADE SITUATION

Tractor production and sales constitute the lrgest income-generating component of the agricultural machinery industry. More data are available on tractors than on any other component.

Current data are not readily available. Information published by international agencies was old (up to 1982) and did not always agree with data collected from country-specific sources. As a result, much of this report relies on the interpretations of secondary sources. mainly industry officials.

2.1 Latin America

2.1.1 Structure of the industry

Argentina, Brazil, Mexico, Venezuela and Colombia are the largest producers of agricultural machinery in Latin America. The first three are practically self-sufficient and have been since the mid-1960s. All other Latin America countries must import some portion of their machinery.

In the farm machinery-producing countries, the industry is divided into two parts: a) tractors and combines and b) all other agricultural machinery. The tractor and combine markets are generally dominated by a few large firms while the implement markets include a larger number of small local manufacturers.

Since 1984, the number of tractor manufacturers has fallen with the sale of Allis Chalmers's agricultural machinery division to Deutz in mid 1985 and that of International Harvester to Tenneco at the end of 1984.

The Japanese dominate the export market for small tractors in those countries with open trade policies. However, they do not sell in Argentina, Brazil and Mexico, which restrict imports. There is little demand for small tractors in Argentina. Brazil has one Japanese manufacturer of a one axle walk-behind tractor used on small farms. In Mexico, Sidena manufactures a small tractor using Soviet technology.

As shown in table 1, the number of tractors and harvester-threshers in use region-wide has increased. Buyers of agricultural machinery include farmers, government and international agencies, and landless persons who contract out their services to farmers.

In general, employment in the agricultural machinery industry has increased over the last two years. However, most firms continue to operate below capacity. According to industry officials, labour has been fairly productive. There were few strikes over the last three to four years, especially in comparison to previous years.

2.1.2 Domestic sales

Table 2 shows that sales of agricultural tractors and combines in Latin America were high in 1977-1980, dropped in 1981-1983 during the height of most Latin American countries' debt crisis, and are now starting to pick up. Combine sales appear to have varied more by country, and reached their overall low in 1983. Though figures are not available on implement sales, most industry officials felt that implement sales follow tractor sales. According to one individual, on average world-wide, two to three implements are sold for every tractor sold.

Latin American farmers are demanding higher horsepower tractors. In today's market, most farmers buy 70 to 80 hp tractors, whereas 5 to 8 years ago the largest tractors manufactured in Latin America were 80 hp. The largest tractors built in the region today are 200 hp.

2.1.3 Foreign trade

a) Imports. Table 3 presents the quantity and value of tractor imports and exports to and from Latin America. Overall, the number of imports fell in 1981, but picked up in 1982, while the value in current U.S. dollars fell. According to industry officials, shortages of foreign exchange have reduced the import market in spite of local demand, particularly in Chile, Uruguay, Bolivia and Peru.

Table 1. Number of machines in use in Latin America

Country	Agricultural tractors				Harvester-threshers			
	1974-1976	1980	1981	1982	1974-1976	1980	1981	1982
Belize	1,100	1,320*	1,340*	1,350*	20	30*	32*	33*
Costa Rica	5,617	5,950*	6,000*	6,050*	900	1,020*	1,040*	1,050*
El Salvador	2,917	3,300*	3,320*	3,340*	260	310*	320*	330*
Guatemala	3,683	4,000*	4,020*	4,040*	2,333	2,600*	2,650*	2,700*
Honduras	2,829	3,250*	3,280*	3,300*				
Mexico	98,667	1,155,057	143,078	158,000*	12,500	15,000*	15,600*	16,000*
Nicaragua	1,047	2,200*	2,250*	2,300*				
Panama	3,667	4,000*	4,050*	4,100*	453	520*	540*	550*
Central America	119,527	1,179,077	167,338	182,480	16,466	19,480	20,182	20,663
Argentina	180,000	166,700	158,900	154,000*	40,000	44,000	44,500	45,000*
Bolivia	718	750*	740*	750*	199	225*	230*	240*
Brazil	253,333	330,000*	340,000*	345,000*	31,000	36,000*	37,000*	38,000*
Chile	34,302	34,600*	34,650*	34,700*	7,705	8,200*	8,250*	8,300*
Colombia	24,187	28,423	28,500*	28,600*	1,783	2,100*	2,150*	2,200*
Ecuador	5,084	6,198	6,844	7,200*	501	580*	700*	730*
Faulk Islands	113	117*	117*	117*				
French Guyana	40	95	106	110*	2	3*	3*	3*
Guyana	3,380	3,460*	3,480*	3,500*	404	415*	415*	416*
Paraguay	2,700	3,200*	3,300*	3,400*				
Peru	12,400	13,900*	14,300*	14,600*				
Suriname	1,177	1,400*	1,450*	1,500*	112	120*	122*	124*
Uruguay	29,777	32,878	33,470*	33,550*	4,923	4,641	4,590*	4,580*
Venezuela	27,756	38,000*	39,000*	40,000*	2,280	3,200*	3,500*	3,700*
South America	574,967	659,721	664,857	667,027	88,909	99,484	101,460	103,293

* Estimate.

Source: FAO, Production Yearbook, Volume 37, New York, United Nations, 1984.

Table 2 Agricultural tractor and combine sales in Latin America (units)

Countries	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985*
Latin America (except Mexico, Brazil and Argentina)	15,700	17,544	12,819	12,255	11,798	12,080	7,601	3,128	6,825	9,000
Mexico	10,026	11,831	14,681	21,009	18,004	21,156	14,949	9,470	12,487	12,000
Argentina	14,744	20,771	5,032	5,414	4,325	2,163	4,084	5,564	6,852	7,000
Brazil	...	...	...	58,828	60,973	35,221	31,322	26,419	43,716	...
Total	40,446	52,123	34,510	99,485	97,080	72,601	59,938	46,564	73,884	28,981
Combines (except Mexico, Brazil and Argentina)	946	688	737	761	721	816	400	271	577	600
Mexico				529	525	756	238	198	289	600
Argentina				112	273	60	99	112	64	150
Total	946	688	737	1,402	1,519	1,632	737	521	930	1,350

* Estimates.

Note: Argentina combines figures are not complete because many local producers do not declare sales.

Source: Associacao Brasileira da Industria de Maquinas e Equipamentos Sindicato Interstadual da Industria de Maquinas. Divisao de Economia e Estatistica. Producao Fisica Evendas 1981-1983. Industrie de Maquinas e Implementos Agropecuarios - Brazil, 1984. Camara Argentina de Fabricantes de Maquinaria Agricola. A guide to agricultural machinery export offers, 1983.

Table 3. Latin American tractor trade

Country	Imports quantity (units)			Imports value (1,000 US$)			Exports quantity (units)			Exports value (1,000 US$)		
	1980	1981	1982	1980	1981	1982	1980	1981	1982	1980	1981	1982
Belize	96	130*	90*	709	1,057	799	13	16*	17*	439	200	200
Costa Rica	515	210*	420*	9,013	3,822	8,000*						
El Salvador	100*	70*	110*	2,051	1,545	2,500	100*	16*	22*	2,115*	350*	500*
Guatemala	594	500*	540*	10,454	9,071	10,000						
Honduras	815*	550*	240*	14,676	10,077	4,563						
Mexico	7,900*	10,000*	11,300*	75,296	100,000	120,000	162	157*	157*	1,980	2,000*	2,100*
Nicaragua	929	870*	960*	8,086	10,322	11,925						
Panama	230*	310*	370*	4,574	6,570	7,000*	50*			1,193		
Central America	11,179	12,640	14,030	124,859	142,464	164,787	325	189	196	5,727	2,550	2,800
Argentina	4,750	1,170*	570*	62,725	30,048	15,000*	936	500*	1,200*	14,766	8,136	20,481
Bolivia	670*	1,270*	1,150*	7,993	15,879	15,000*						
Brazil	1,000*	670*	105*	34,927	23,569	19,027	10,829	11,800*	7,500*	161,328	188,422	125,485
Chile	1,312	1,511	101	15,000	15,600	3,500						
Colombia	3,970	4,200*	3,800*	42,562	51,009	48,526		7*			103	
Ecuador	1,750*	1,770*	5,415*	26,203	27,500*	30,682						
French Guiana	175*	65*	62*	1,863	723	726						
Guyana	272	408	465*	4,678	3,326	4,000*						
Paraguay	1,480*	1,280*	1,360*	12,000*	11,000*	12,500*						
Peru	2,600*	2,900*	2,550*	32,232	38,040	34,863						
Suriname	380*	385*	390*	5,000*	5,200*	5,500*						
Uruguay	2,850*	967	1,350*	28,438	10,084	1,500*		6	54		152	450
Venezuela	3,000*	4,950*	5,770*	52,440	88,796	106,780	280*	70*	88*	2,515	676	914
South America	24,209	21,546	23,088	326,061	320,774	297,604	12,045	12,383	8,842	178,609	197,489	147,330

* Estimates

Source: FAO, Trade Yearbook, Volume 37, New York, United Nations, 1984.

Within the last two years, the smaller, less industrialized Latin American countries, which do not have their own industries, have engaged in barter transactions, called "counter-trading", in which they trade agricultural commodities such as sugar, bananas and coconuts as well as oil and gas for trucks and tractors. It is estimated that such transactions account for about 400 to 500 imported units a year.

b) Exports. The number of tractor units exported from Latin America as a whole and their current U.S. dollar value rose in 1981 and fell in 1982, according to table 3. However, over the same period farm equipment exports from Brazil and Mexico to the United States have increased dramatically, as shown in table 4, largely as a result of government support for the agricultural machinery sector.

Table 4. Dollar value of farm equipment imports to United States (1,000 US$)

Country	1980	1981	1982	1983
Brazil	1,002	1,064	4,780	6,424
Mexico	9,080	9,699	11,349	18,563

Source: Implement and Tractor, August 2, 1981, p. 29.

2.2 Specific countries

2.2.1 Argentina

The tractor market is dominated by 5 large manufacturers: Zanello, Massey-Ferguson, John Deere Argentina, Deutz-Fhar Argentina and Fiat Argentina. The latter four had the market fairly evenly divided until 1981 when Zanello's market share began to increase. Zanello, a family-owned local firm begun in 1972, now dominates the industry (see table 5). Farmers buy Zanello products, trusting that the company will be around to service their equipment and provide parts.

Table 5. Domestic tractor sales by manufacturer, Argentina

Year	Deutz	Fiat	Deere	Massey	Zanello	Total
1971	3,256	5,283	3,698	1,512	100	13,849
1972	3,054	5,146	3,441	2,515	200	14,356
1973	3,804	6,451	4,248	4,279	300	19,082
1974	4,635	6,623	3,886	5,506	400	21,050
1975	3,139	5,096	2,867	4,108	300	15,510
1976	3,382	6,445	3,815	7,424	500	21,566
1977	4,317	6,689	3,736	7,190	600	22,532
1978	1,584	1,392	1,387	1,946	700	7,009
1979	2,198	2,095	1,698	2,160	600	8,751
1980	1,189	1,191	1,413	1,169	700	5,662
1981	853	777	780	644	1,000	4,054
1982	844	721	724	1,309	1,500	5,098
1983	1,515	1,483	529	1,855	2,763	8,145
1984	2,150	1,560	730	2,170	5,760	12,390
	Market shares by manufacturer (percentage)					
1971	24	38	27	11	1	100
1972	21	36	24	18	1	100
1973	20	34	22	22	2	100
1974	22	31	18	26	2	100
1975	20	33	18	26	2	100
1976	16	30	18	34	2	100
1977	19	30	17	32	3	100
1978	23	20	20	28	10	100
1979	25	24	19	25	7	100
1980	21	21	25	21	12	100
1981	21	19	19	16	25	100
1982	17	14	14	26	29	100
1983	19	18	6	23	34	100
1984	17	13	6	18	46	100

Source: Huici, Nestor. "La Industria de la Maquinaria Agrícola en la Argentina". Centro de Investigaciones Sociales. Sobre le Estado y la Administración, 1984. Nachrichten für Aussenhandel, 1 March 1985, p. 3.

Note: Data include imports.

Five locally-owned firms dominate the harvester industry, as shown in table 6.

All other agricultural implements are manufactured by many small locally-owned and operated businesses. In 1983, 210 factories produced tillage, seeding and cultivating machinery.

Argentina has been a roller-coaster market. Domestic tractor sales have gone from approximately 20,000 units during the mid-70s to 4,000 units in 1980 (see table 5). The world-wide recession was in part responsible for this decline in production as were depressed commodity prices and shortages of foreign exchange. Sales have subsequently increased, but are not expected to exceed 7,000 tractor units by the end of 1985.

Similar trends were observed in the domestic market for harvesters, ploughs and seeding machinery, as indicated in tables 6, 7 and 8. 1981 was the worst year in a decade for all agricultural machinery manufacturers. Sales have since increased.

Investment by major farm machinery manufacturers in Argentina has been low in the 1980s. John Deere built a factory to meet local content laws, and subsequently closed it. Most investment occurred in the 1970s, when the market was strong.

Table 9 focuses on the change in average CV (power) for tractors sold between 1952 and 1983. The average new tractor CV has increased from 34.1 (34.6 hp) in 1952 to 105.7 CV (107 hp) in 1983.

The entire agricultural machinery industry consisted of 400 establishments employing 12,000 individuals in 1980. 190 of these firms accounted for more than 80 per cent of the total sales. Of the 190 firms, 17 per cent had fewer than 11 employees, 45 per cent fewer than 26 and 72 per cent 50 or less (see table 10). Employee tenure appeared to be shorter at smaller firms (see table 11). Firms of 11-25 employees grew the most quickly (see table 12). Large enterprises of 51 or more employees were most likely to engage in exporting (see table 13).

Table 6. Domestic sales of harvesters by manufacturer, Argentina (units)

Year	Vassalli	Bernardin	Senor	Gema	9 other national manufactrs.	Total domestic sales	Imports	Total
1973	475	100	188	150	530	1,443		1,443
1974	398	231	234	200	570	1,633	3	1,636
1975	391	193	153	150	540	1,427		1,427
1976	761	296	253	200	640	2,150		2,150
1977	779	373	365	240	730	2,487	17	2,504
1978	832	418	158	170	620	2,198	66	2,264
1979	637	384	156	100	520	1,797	76	1,873
1980	223	100	40	40	230	633	246	879
1981	114	55	22	40	80	311	44	355
1982	600	180	150	150	180	1,260	108	1,368
1983	800	400	150	250	400	2,000	108	2,108

Note: 1982 and 1983 data are estimated.

Source: Huici, Nestor. "La Industria de la Maquinaria Agrícola en la Argentina". Centro de Investigaciones Sociales. Sobre el Estado y la Administración. Nachrichten für Aussenhandel, 1 March 1985, p. 3.

Table 7. Domestic trailed moldboard plough sales, Argentina (units)

Year	+6 plough bottoms	6 plough bottoms	5 plough bottoms	4 plough bottoms	-4 plough bottoms	Total
1970	90	454	732	610	43	1,929
1971	55	584	989	610	54	2,292
1972	45	558	1,283	1,017	357	3,260
1973	194	692	1,328	805	100	3,119
1974	218	1,110	2,568	929	127	4,952
1975	180	621	1,327	532	37	2,697
1976	414	976	1,784	664	18	3,856
1977	506	1,896	2,739	853	67	6,061
1978	376	1,083	1,444	410	41	3,354
1979	205	635	1,176	612	15	2,643
1980	154	401	757	195	2	1,509
1981	83	356	268	82	12	801
1982	305	597	986	128	22	2,038

Source: Huici, Nestor. "La Industria de la Maquinaria Agrícola en la Argentina". Centro de Investigaciones Sociales. Sobre el Estado y la Administración, 1984. Nachrichten für Aussenhandel, 1 March 1985, p. 3.

Table 8. Domestic sales of small grain seeders, Argentina

Year	Units
1970	1,575
1971	1,135
1972	2,364
1973	2,376
1974	2,183
1975	1,204
1976	1,663
1977	2,482
1978	1,170
1979	1,393
1980	1,282
1981	597
1982	1,522

Source: Huici, Nestor. "La Industria de la Maquinaria Agrícola en la Argentina". Centro de Investigaciones Sociales. Sobre el Estado y la Administración, 1984. Nachrichten für Aussenhandel, 1 March 1985, p. 3.

Table 9. Domestic tractor sales and power, Argentina

Year	Units	Power (CV)	Average power
1952	7,036	239,928	34.1
1953	9,670	329,747	34.1
1954	4,206	143,425	34.1
1955	5,737	195,532	34.1
1956	9,845	458,950	46.6
1957	10,578	495,230	46.8
1958	11,083	504,410	45.5
1959	12,518	544,400	43.5
1960	13,179	634,150	48.1
1961	16,784	806,690	48.1
1962	11,223	552,972	49.3
1963	12,134	626,528	51.6
1964	15,071	758,474	50.3
1965	13,737	661,017	48.1
1966	9,943	521,202	52.4
1967	10,554	529,226	50.1
1968	10,992	616,666	56.1
1969	9,439	545,517	57.8
1970	11,005	670,434	60.9
1971	13,849	885,009	63.9
1972	14,356	926,677	64.5
1973	19,082	1,229,632	64.4
1974	21,050	1,364,241	64.8
1975	15,510	1,064,921	68.7
1976	21,566	1,637,031	75.9
1977	22,531	1,731,430	76.8
1978	7,009	581,421	83.0
1979	8,751	714,575	81.7
1980	5,662	504,652	89.1
1981	4,054	398,482	98.3
1982	5,098	515,055	101.0
1983	8,145	860,527	105.7
1984	11,753		

Source: Huici, Nestor. "La Industria de la Maquinaria Agrícola en la Argentina". Centro de Investigaciones Sociales. Sobre el Estado y la Administración, 1984. Nachrichten für Aussenhandel, 1 March 1985, p. 3.

Note: Data include imports.
1984 includes 11 months.

Table 10. Size of workforce at 190 companies in 1980, Argentina

Workforce	Per cent of companies
Less than 5 people	7
6-10 people	10
11-25 people	28
26-50 people	27
51-100 people	14
101-200 people	9
More than 200 people	5
Total	100

Source: Cámara Argentina Fabricantes de Maquinaria Agrícola. A Guide to Agricultural Machinery Export Offers, 1983.

Table 11. Workforce seniority by workforce size, Argentina

Years of seniority	Number of persons in workforce						
	0 -5	6-10	11-25	26-50	51-100	101-200	200+
0-5	7	4	11	3	0	0	0
6-10	3	6	8	5	3	1	0
11-20	2	4	19	19	5	3	1
20+	1	6	15	24	18	14	8
Total	13	20	53	51	26	18	9

Source: Cámara Argentina Fabricantes de Maquinaria Agrícola. A Guide to Agricultural Machinery Export Offers, 1983.

Table 12. Change in firm size by workforce size, Argentina (number of firms)

Number of persons in workforce	Increase in area	Increase in machine park
0-5	7	6
6-10	10	9
11-25	24	29
26-50	20	21
51-100	16	14
101-200	10	11
More than 200	4	4
Total	91	94
Percentage of total sector	48	49

Source: Cámara Argentina Fabricantes de Maquinaria Agrícola. A Guide to Agricultural Machinery Export Offers, 1983.

Table 13. Exports by workforce size, Argentina

Number of persons in workforce	Number exporting companies	Total companies	Percentage
0-5	3	13	23
6-10	1	20	5
11-25	8	53	15
26-50	16	51	31
51-100	16	26	62
101-200	10	18	56
More than 200	9	9	100
Total	63	190	33

Source: Cámara Argentina Fabricantes de Maquinaria Agrícola. A Guide to Agricultural Machinery Export Offers, 1983.

Table 14 contains Argentine trade data. It indicates that the current dollar value for tractors and all other agricultural machinery imports rose between 1978 and 1980 before falling in 1981 and 1982.

Table 15 focuses on tractor imports by manufacturer. It reports that tractor imports rose between 1979 and 1981 before dropping about 50 per cent in 1982 and about 80 per cent more in 1983. Fiat of Italy appears to have been the largest importer.

Table 16 lists imports for 1982 and 1983 broken down by type of equipment and country of origin. The table shows that the United States was the only country supplying products in all of the categories listed, but that it was not the leading supplier of all products. Italy was the prime exporter of wheel tractors (as noted above) and planting equipment. The Federal Republic of Germany was in the forefront for exporting harvesting equipment and Sweden was the top exporter of dairy farm equipment to Argentina.

According to a member of the Argentinian Trade Commission, agricultural machinery imports are low presently due to government policy. The policy, which took effect in January 1984, restricted the import of items produced internally. Although it was only to last 6 months, the policy is still in effect and no change is expected in the near future.

At present, imported products are mainly components, i.e., parts and accessories for machinery that is assembled in local plants, which are subsidiaries of the United States and European firms.

Also from table 14, it can be seen that the current dollar value of tractor exports rose from 1978 to 1979, fell in 1980, rose in 1981 and fell in 1982. The current dollar value of all other agricultural machines exported from Argentina fell between 1978 and 1980, rose in 1980, and fell in 1982.

In the 1960s, Argentina began exporting agricultural machinery to the rest of Latin America. Apparently because of a reputation for poor quality and a lack of investment in production facilities and design, exports have since fallen.

Table 14. Agricultural machinery trade, Argentina (thousand $US)

	1977	1978	1979	1980	1981	1982
Tractors, non-road (722)						
Imports		6,983	20,095	50,666	32,119	128
Exports		5,976	5,902	3,638	7,440	61
Agricultural machines, except tractors (721)						
Imports		33,464	50,400	62,725	30,048	59
Exports		30,229	37,904	14,766	22,084	181
Total (721-722)						
Imports	44,177	46,423	76,397	117,029	69,607	248
Exports	34,128	36,204	94,206	81,129	59,572	302

Source: United Nations, Statistics Office, Department of International Economic and Social Affairs. Yearbook of International Trade Statistics, 1982 Edition, Vol. II, Trade by Commodity. New York, United Nations, 1983. Food and Agriculture Organization, FAO Trade Yearbook, Vol. 37, New York, United Nations, 1984.

Table 15. Domestic sales of imported tractors, Argentina (units)

Year	Deutz	Fiat	Deere	Massey Ferguson	Fiat Kubota	Total
1978	-	-	-	-	-	-
1979	3	811	220	-	-	1,034
1980	21	726	508	147	79	1,481
1981	111	574	386	398	78	1,547
1982	266	149	264	60	41	780
1983	10	110	5	1	41	167
Total imports as percentage of 1978-1983 sale	411	2,370	1,282	606	239	5,009
	6	40	27	8	100	25

Source: Huici, Nestor. "La Industria de la Maquinaria Agrícola en la Argentina". Centro de Investigaciones Sociales. Sobre le Estado y la Administración, 1984. Nachrichten für Aussenhandel, 1 March 1985, p. 3.

Table 16. Levels of imports by country to Argentina

Machine types	1982 Thousand $US	1982 Share (%)	1983 Thousand $US	1983 Share (%)
Wheel tractors	5,329	100	12,500	100
Italy	1,599	30	4,800	38
United States	1,376	26	3,750	30
Venezuela	588	11		
Other	1,766	33	3,950	32
Harvesting equipment	7,968	100	7,610	100
Federal Republic of Germany	3,045	38	3,850	50
United States	2,740	34	2,730	36
Italy	988	12	700	10
Other	1,195	15	330	4
Foraging, silage and cultivating equipment	174	100	360	100
United States	111	64	180	50
Italy	54	31	140	39
USSR	4	2		
Federal Republic of Germany	4	2	3	1
Other	1	1	37	10
Ploughing and cultivating equipment	1,487	100	755	100
United States	449	30	350	46
Italy	339	23	170	23
Brazil	323	22	110	15
Other	376	25	125	17
Planning equipment	260	100	190	100
Italy	130	50	105	55
United States	115	44	80	42
Israel	11	4		
Other	5	2	5	3
Fertilizing equipment	263	100	202	100
United States	258	98	190	94
Brazil	4	2	6	3
Italy	1	-	6	3
Grain and seed specialty equipment	346	100	295	100
United States	186	54	140	48
Italy	69	20	50	17
Brazil	68	20	40	14
Other	23	7	65	22

Table 16. Levels of imports by country to Argentina (cont'd)

Machine types	1982		1983	
	Thousand $US	Share (%)	Thousand $US	Share (%)
Poultry equipment	38	100	23	100
United States	30	79	20	87
France	7	18	3	13
Malta	1	3		
Dairy farm equipment	1,478	100	995	100
Sweden	311	21	270	27
United States	274	19	140	14
Federal Republic of Germany	240	16	120	12
Denmark	232	16	350	35
Other	421	29	115	12
Totals	17,343	100	22,930	100
United States	5,539	32	7,580	33
Italy	3,334	19	5,971	26
Federal Republic of Germany	3,605	21	6,125	27
Brazil	786	5	306	1
USSR	679	4	200	1
Other	3,400	20	2,748	12

2.2.2 Brazil

Brazil is Latin America's largest farm machinery market. Domestic demand for tractors is as large as that of Mexico and Argentina combined and is expected to grow as more land is brought into production. Only one-tenth of Brazil's arable land has been cultivated.

Brazil's market for agricultural machinery grew very quickly from 10,000 units of farm equipment a year in 1969 to 60,000 a year in the mid-1970s. Demand fell in the early 1980s, during the height of the Brazilian debt crisis, but is beginning to pick up. Table 17 contains tractor unit sales figures for the period between 1979 and 1984.

Three tractor manufacturers dominate the Brazilian market: Massey-Ferguson, Valmet do Brasil and Ford Brasil. There were considerably more about 10 years ago. The main combine manufacturers are Massey-Ferguson, Sperry New-Holland, SLC (Schneider-Logemann Company) and Ideal. Together SLC and New Holland hold about 60 per cent of the market.

Last year, Massey-Ferguson-Perkins (Brazil) was purchased by C · panhia Iochpe, a Brazilian investment company, to enable the company to recapitalize. The new venture, of which Massey-Ferguson still hold about 40 per cent interest is called Massey Perkins S.A. Iochpe also holds Ideal.

Whereas in most other Latin American countries the farm implement market is shared by a large number of small firms, in Brazil 70 per cent of the market is controlled by two firms: Tatu SA Marchesan Implementos e Maquinas Agricolas and Baldan Implementos Agricolas SA.

While Japan has successfully taken over the United States and European small tractor market, this is not the case in Brazil, according to one industry official. Most farmers who would use small tractors prefer to purchase second-hand medium size tractors, which are cheaper and in good supply.

Table 17. Agricultural tractor production and sales, Brazil (units)

Tractor type	1977	1978	1979	1980	1981	1982
All tractors						
Production	64,511	69,993	47,002	37,610	26,627	49,785
Domestic sales	58,828	60,973	35,221	31,322	26,419	45,716
Exports	7,978	8,508	10,649	6,627	2,219	3,742
Motorized cultivater						
Production	6,062	6,896	4,548	5,364	3,213	2,566
Domestic sales	6,165	6,226	4,724	5,157	2,996	2,566
Exports	193	337	179	59	103	213
Caterpillar types						
Production	3,202	4,285	3,133	1,900	751	1,348
Domestic sales	3,140	3,753	2,393	1,503	877	1,198
Exports	522	428	397	329	221	227
Wheel tractors						
Production	55,247	58,812	39,341	30,346	22,663	45,842
Domestic sales	49,523	50,994	28,104	24,662	22,546	41,952
Exports	7,263	7,743	10,073	6,239	1,895	3,302
Wheel tractors less than 49CV						
Production	6,823	5,702	3,506	2,442	1,630	3,242
Domestic sales	7,059	5,337	3,049	2,529	890	3,110
Exports	126	339	56	99	5	47
50-99CV						
Production	41,359	44,677	31,019	23,396	16,491	35,235
Domestic sales	35,539	37,969	20,570	18,017	16,191	32,367
Exports	6,788	6,847	9,501	5,850	1,706	2,687
100-200CV						
Production	(	7,946	4,439	4,309	4,306	7,087
Domestic sales	6	7,372	4,296	4,004	4,376	6,301
Exports		381	386	155	93	464
Over 200CV						
Production	251	487	377	199	236	278
Domestic sales	221	316	189	112	170	174
Exports	139	176	130	135	91	104

Source: Asociacao Brasileira da Industria de Maquinas e Equipamentos Sindicato Interstadual da Industria de Maquinas.

Table 17 breaks down domestic tractor sales and production between 1979 and 1984 by type. Sales and production of wheel tractors exceeded that of motorized cultivator and caterpillar type tractors. Among wheel tractors, those of 50-99 CV were most popular. Domestic sales and production of all tractors except motorized cultivators rose from 1979 to 1980, fell from 1981 to 1983 and picked up in 1984. The sale and production of motorized cultivators rose from 1979 to 1980, fell in 1981, picked up in 1982 and then fell in 1983. Elimination of special low-interest long-term tractor purchase loans and sharp increases in tractor prices caused demand and consequently production to drop in 1981, 1982 and 1983.

Similar trends were observed in the market for other agricultural machinery, table 18 shows that the production of self-propelled combines fell between 1981 an 1983 and picked up in 1984. Production in 1985 is exceeding that of 1984.

Table 18. Production of self-propelled cereal combines, Brazil

Year	Number of units
1978	4,287
1979	4,563
1980	6,488
1981	5,084
1982	3,545
1983	3,573
1984	6,199
1985	3,114

Note: 1985 data cover January to May.

Source: Asociacao Brasileira da Industria de Maquinas e Equipamentos Sindicato Interstadual da Industria de Maquinas.

Table 19 contains production and sales data for other agricultural equipment. Overall production and sales fell. However, sales and production of soil preparation equipment, and cultivating machinery; and production of planting, seeding and fertilizer equipment increased between 1981 and 1983. Production and sales of irrigation and drainage sytems, crop protection machinery, transportation equipment, and cattle equipment fell over the same period. And, production and sales of harvesting machinery, machinery for raising small animals, and forestry equipment rose between 1981 and 1982 only to fall in 1983.

During the early 1980s, companies varied in their responses to slow sales. Some laid off employees, while others reduced their work weeks. The former were required to pay employees two to three months severence pay while the latter required agreement from the union and labour judges. In Brazil, labour is plentiful and has been productive.

In 1983, Ford Brasil, Massey-Ferguson, Valmet do Brasil and Brasileira de Tractores had a total work force of 18,000 and accounted for 80 per cent of the domestic tractor market. All four companies were forced to lay off part of their work forces to bring production down. At the end of 1982, Ford had 1,000 unsold units or 12.5 per cent of their 1982 output. Brasileira de Tractores ceased production and dismissed 502 workers, almost 40 per cent of its work force.

1976, the best year for farm machinery manufacturers in Brazil, saw considerable investment in tractor manufacturing. A $US 200 million, 1,400 unit/year factory was built by Deere in conjunction with Schneider-Legemann (Brazil). Valmet, a Finnish enterprise spent $US 11 million to expand its tractor plants to reach a 29,000/year capacity by 1979. Ford spent $US 20 million on a new tranctor plant. J.I. Case built a new tractor plant for 18 million cruzeiros to produce 3,300 tractors/year in 1977 and 4,500/year by 1979. Since then, manufacturers have continued to invest in Brazilian agricultural machinery factories, but in small amounts.

Table 20 describes Brazil's trade situation with respect to tractors and all other agricultural machinery between 1977 and 1982. The current dollar value of tractors and other agricultural machinery imports drifted downward between 1978 and 1982. Lately, imports have fallen significantly and exports have risen.

Table 19. Agricultural machinery production and sales, Brazil (units)

Agricultural machinery	1981	1982	1983
Soil preparation equipment			
Production	91,511	144,311	182,667
Domestic sales	87,757	116,671	168,578
Exports	5,407	3,519	4,957
Planting and seeding and fertilizing equipment			
Production	327,137	334,444	440,203
Domestic sales	323,961	314,620	427,391
Exports	3,018	385	156
Cultivating machinery			
Production	15,599	46,798	65,882
Domestic sales	15,293	41,849	61,260
Exports	524	51	138
Irrigation and drainage systems			
Production	200,572	117,649	56,613
Domestic sales	199,334	110,812	56,012
Exports	1,909	1,555	8
Crop protection machinery			
Production	472,892	402,847	336,593
Domestic sales	456,032	392,807	339,102
Exports	50,921	15,391	14,274
Harvesting machinery			
Production	11,767	22,808	6,434
Domestic sales	11,386	21,340	6,987
Exports	503	243	173
Transportation machinery			
Production	23,031	20,762	21,165
Domestic sales	22,547	19,920	20,297
Exports	421	331	325
Processing and storage equipment			
Production	85,830	56,510	82,367
Domestic sales	83,505	53,257	86,013
Exports	2,491	1,331	1,291

Table 19. Agricultural machinery production and sales, Brazil (units) (cont'd)

Agricultural machinery	1981	1982	1983
Machinery for raising small animals			
Production	199,240	209,613	163,729
Domestic sales	196,771	212,099	161,257
Exports	6,635	386	103
Cattle equipment			
Production	3,892	3,228	2,682
Domestic sales	3,462	2,979	2,669
Exports	190	169	149
Forestry equipment			
Production	1,721	57,598	2,126
Domestic sales	1,789	48,815	2,001
Exports	2	9,250	7
Total			
Production	1,433,192	1,416,568	1,360,461
Domestic sales	1,401,637	1,335,169	1,331,837
Exports	172,021	32,611	21,581

Note: The data were collected from 222 firms and cover over 145 products

Source: Asociacao Brasileira da Industria de Maquinas e Equipamentos Sindicato Interstadual da Industria de Maquinas.

In 1975, as a result of Brazil's worsening balance of trade, the government began implementing several new import restrictions. These import restrictions raised the price of imported equipment considerably and increased domestic production capabilities. Brazil still has strict import regulations and according to Department of Commerce officials, Brazilian imports of agricultural machinery are low. Brazil does not allow the import of completely knocked down tractors. All parts must be manufactured domestically. Similarly, Brazil does not allow combines to be imported.

Table 20. Agricultural machinery trade, Brazil (thousand $US)

Equipment	1977	1978	1979	1980	1981	1982
Tractors, non-road (722)						
Imports		39,061	28,736	34,927	23,569	19,027
Exports		79,995	112,442	161,423	188,422	125,485
Agricultural machines, except tractors (721)						
Imports		331	14,588	8,397	6,172	4,867
Exports		18,420	28,233	40,048	44,282	26,781
Total (721-722)						
Imports	68,536	39,392	43,324	43,324	29,741	23,894
Exports	71,490	98,746	153,263	209,868	238,876	152,266

Source: United Nations Statistical Office.

Although the current dollar value of United States agricultural machinery imports rose from $US 395,000 in 1983 to $US 515,00 in 1984, both totals are still a minor percentage of other Latin American countries' United States imports.[1/] In addition, Brazilian farm machinery exports to the United States totalled $US6,328,004 in 1984.[2/] This indicates a $US 5.8 million agricultural machinery trade surplus for Brazil.

As Brazilian agricultural machinery production capabilities have increased, manufacturers have begun looking for export markets. Brazilian firms' willingness to engage in countertrading for oil and gas have made them an attractive source of agricultural machinery among developing countries.

1/ U.S. Department of Commerce. U.S. Exports - Schedule E: Commodity by Country. FT-410, December 1984 and earlier.

2/ Asociacao Brasileira da Industria de Maquinas e Equipamentos Sindicato Interstadual da Industria de Maquinas; Divisao de Economia e Estatistica. Producao Fisica Evendas 1981-1983; Industria de Maquinas e Implemento Agropecuarios - Brasil 1984.

Brazilian export markets include Latin America and Africa, as well as the United States, New Zealand and the United Kingdom. About 50 Brazilian manufacturers have engaged in export trade; Brazilian plough and disc harrow manufacturers have been particularly successful at penetrating the United States market.

Table 21 lists the current United States dollar value of Brazilian agricultural machinery exports in 1984 by type. Export sales in 1984 totalled $US 13.5 million. Government support for the capital goods industry as a source of foreign exchange earnings have stimulated the export market.

Table 21. Agricultural machine exports, Brazil 1984

Machinery	Value ($US fob)
Moldboard ploughs	59,362
Disc ploughs	1,400,432
Other ploughs	94,879
Scarifiers	89,156
Cultivators and weeders	423,538
Harrows and rollers	1,877,623
Planting, seeding and fertilizing equipment	797,329
Spare parts	8,636,195
Other	293,434
Total	13,481,948

Source: Asociacao Brasileira da Industria de Maquinas e Equipamentos Sindicato Interstadual da Industria de Maquinas.

According to table 20, although the current dollar value of exports fell in 1982, they still exceeded imports by about 6 to 1. In addition, the dollar value of tractor exports was nearly 5 times greater than that of all other agricultural machinery exports. The number of tractor units exported increased from 1979 to 1981, fell in 1982 and 1983 and picked up in 1984, as shown in table 17. Exports of all other agricultural machinery fell between 1981 and 1983, although this varied by item (see table 19).

2.2.3 Mexico

There are now only three major tractor manufacturers in Mexico: Fábrica de Tractores (FTA) (40 per cent owned by Ford (U.S.)), John Deere and Sidena, a state-owned company associated with Siderurgia Nacional, a major steel manufacturer. International Harvester and Massey-Ferguson have gone out of the tractor business in Mexico.

In 1984, International Harvester sold its Saltillo plant to John Deere. The plant has been closed in 1983. In January 1985, Fábrica de Tractores (FTA) which holds 40 per cent of the Mexican tractor market, acquired Agromak (Mexico), the Massey Ferguson's (U.K.) Mexican licensee, which had been purchased two years earlier by Alpha Group, a group of Mexican investors. The sales were the result of the decline in world-wide demand for agricultural machinery.

For a picture of how market shares are divided in the industry, see table 22. Ford has dominated the industry, though Massey-Ferguson has come close.

The tractor industry in Mexico is unique. Sidena manufactures engines for Ford and has recently begun to assemble tractors for Deere, while at the same time selling its own small tractors (25-30 hp) based on Soviet technology. In addition, it has started to use Deere components in a small Sidena tractor.

There are two major combine manufacturers in Mexico: Allis Chalmers, now owned by Deutz and John Deere.

About 20 small firms, of 50 to 80 employees make implements. Of these, Kimball (Mexico), Yamex (a Massey Ferguson associate) and John Deere hold about half the implement market.

Demand for agricultural machinery has been stronger in Mexico than the rest of Latin America. It fell in 1983, when Mexico experienced its foreign debt crisis, but picked up last year and is expected to increase slightly

this year as shown in table 23. However, due to the drop in the number of major tractor manufacturers, industry officials estimated that domestic production will be 5,000 to 6,000 tractor units below domestic demand.

Table 22. Tractor manufacturers' market shares, Mexico (percentage)

Manufacturer	1979	1980	1981	1982	1983	1984
Ford	28	34	33	44	40	40
Agromak	40	33	38	35	40	29
Deere	15	12	13	15	15	25
Other	18	21	16	6	5	6
Total	100	100	100	100	100	100

Source: Nachrichten für Aussenhandel, Bonn, Federal Republic of Germany, 14 October 1982, p. 51.

Note: 1981 does not include Sidena.

Table 23. Tractor production, Mexico

Year	Number of units
1979	14,613
1980	16,356
1981	18,500
1982	13,200
1983	8,800
1984	10,500

Source: Nachrichten für Aussenhandel, Bonn, Federal Republic of Germany, 14 October 1982, p. 51.

Tractor manufacturers are investing in plants and operations in Mexico. Ford bought the Massey Ferguson factory so as to expand its product offerings. Similarly, in late 1984 John Deere set up a joint tractor production venture with Siderúrgica Nacional (Mexico) to produce small and medium size (55-60 hp) tractors. Potential capacity is 11,000/year. Both firms invested to satisfy the Mexican government's policy objectives and to cut imports of components and reduce costs. It was estimated that the Deere tractor would be 35 per cent cheaper than the equivalent imported models.

According to government statistics, five agricultural machinery firms (probably the major tractor manufacturers) in 1980 employed 3,439 individuals. Prior to the decline in farm machinery sales, most firms were operating two shifts. Following the drop in 1983, they reduced their work forces and in some cases tried to expand their product lines.

The Mexican economy was strong in the late 1970s, experienced a severe downturn in 1982-83, resulting from the drop in oil prices and a debt crisis, but is now improving. These factors are generally reflected in the import picture.

The main source of Mexican agricultural machinery imports is the United States. Table 24 shows that United States tractor exports to Mexico largely followed the Mexican economy, falling steadily in the early 1980s and picking up in 1984. The same trend was experienced for United States exports of other agricultural machinery. This conclusion is supported in table 25 which lists United States exports of all agricultural machinery, except tractors, to Mexico.

Table 24 indicated that the U.S. dollar value of Mexican farm machinery exports has fluctuated, rising between 1977 and 1980, falling in 1981 and recovering in 1982. Though the dollar values on table 4 of Mexican farm machinery exports to the United States do not match those in table 24, they do indicate that exports to the United States have risen steadily since 1980. Most Mexican agricultural machinery exports to the United States are sold in the sunbelt (Texas, Arizona, New Mexico and California). Other buyers of Mexican agricultural machinery include Guatemala, Costa Rica and El Salvador.

Table 24. United States exports of agricultural tractors to Mexico

Wheel tractor size	1980		1981		1982		1983		1984	
	Number	1,000 $US	Number	1,000 $US	Number	1,000 $US	Number	1,000 $US	Number	1,000 $US
Under 40 hp	210	902	335	1,688	96	494			75	415
40 - 60 hp	60	702	194	2,501	63	642	12	86	20	295
60 -80 hp	40	520	128	1,804	50	527	7	68	23	202
80 - 100 hp	88	1,332	163	2,249	43	809	14	185	61	882
100 - 120 hp	176	3,193	122	2,333	86	1,524	3	74	8	115
120 - 140 hp	1,859	40,832	422	10,503	178	4,848	7	125	42	1,083
140 - 160 hp	88	22,159	220	6,159	184	5,996			41	1,108
160 - 180 hp	54	2,207	43	1,916	64	3,128			49	1,672
180+ hp	142	5,796	154	8,549	36	2,164	9	678	38	2,178
Total	2,708	77,643	1,781	37,702	800	20,132	52	1,216	357	7,950

Source: U.S. Department of Commerce. U.S. Exports - Schedule E: Commodity by Country. FT-410, December 1984 and earlier.

Table 25. United States exports of agricultural machinery to Mexico

Machine type	1980		1981		1982		1983		1984	
	Number	1,000 $US	Number	1,000 $US	Number	1,000 $US	Number	1,000 $US	Number	1,000 $US
Moldboard ploughs	233	691	378	992	111	251			67	181
Disc ploughs	1,051	2,141	1,612	3,329	759	1,255	109	170	422	670
Planting, seeding and fertilizer equipment	4,284	8,550	4,538	7,815	2,470	5,380	409	673	1,739	3,279
Cultivator and weeders	1,565	2,269	1,903	908	1,002	1,387	157	142	434	909
Harrows, rollers and cutters	1,550	4,838	1,942	5,480	654	1,645	170	448	357	790
Self-propelled combines	1,411	48,665	1,106	39,999	414	16,008	72	1,896	431	10,171
Other combines	147	2,534	232	2,634	44	859			34	490
Haying machinery	6,515	27,003	5,770	24,324	2,496	10,385	102	312	1,501	6,187
Harvesting machinery	3,365	33,889	3,267	29,511	627	6,199	234	1,353	733	6,441
Parts for above		10,989		14,089		9,997		3,808		9,552
Dairy equipment		2,645		3,990		4,152		2,084		3,365
Poultry equipment	307	9,194	211	5,767	322	1,961	26	626	124	1,767
Other barnyard machinery and parts	376	1,204	249	7,219	91	253			21	97
Horticultural equipment		5,595		8,294		3,744		414		2,101
Total	20,804	160,207	21,208	154,351	8,990	63,476	1,279	11,926	5,863	46,000

Source: U.S. Department of Commerce. U.S. Exports - Schedule E: Commodity by Country. FT-410, December 1984 and earlier.

3. EXOGENOUS FACTORS AND MANUFACTURERS' RESPONSES

3.1 Latin America

Production and sales declines in the farm machinery market in Latin America are not solely attributable to commodity prices. The most important exogenous factors are described below and then discussed with reference to the particular countries.

3.1.1 Economic indicators

(a) Low world commodity prices. Low commodity prices have adversely affected farm incomes and consequently the demand for agricultural machinery. Latin American commodity prices have plunged to their lowest level in 15 years (e.g. coffee, sugar, etc.). For example, sugar is selling for less than its cost of production. However, soybeans prices were up this year, following low United States and USSR harvests. This helped Brazil, which is the world's second largest producer, after the United States.

(b) High cost of foreign exchange. North American exports are no longer competitive because of the high cost of the dollar. Instead Western European exports are more affordable and a number of transnational firms have begun to export from Europe instead of the United States.

(c) World credit institution policies. Due in part to the high cost of foreign exchange and world credit institution policies, most Latin American countries have very little foreign exchange with which to purchase agricultural machinery.

National banks, which provide insurance policies, rate countries' credit worthiness. If a country receives a poor rating, the bank may choose not to issue a policy. Most exporters will not sell goods without insurance. In the early 1980s many Latin American countries, including Brazil and Argentina, were short of resources to support their domestic economies and stopped repaying IMF loans. In a number of cases, new repayment schedules have not been negotiated. As a result, these countries are considered poor credit risks.

3.1.2 Local government policies

(a) Agricultural policies. Most Latin American countries subsidize their agricultural sectors by funding research and development, offering special loans to farmers to buy domestically produced machinery, granting income tax discounts for purchase of locally produced machinery, etc. This has helped the farm machinery industry in some countries, including Argentina, Venezuela, Peru and Ecuador.

(b) Domestic credit policies. Tight credit policies adopted in response to high rates of inflation may discourage investment in farm machinery manufacturing. Due to high domestic interest rates, manufacturers and dealers try to maintain low inventories. Interest rates in Argentina run at about 500 per cent, 600 per cent in Brazil and 36 per cent in Mexico.

(c) Import policies. The lack of foreign exchange has caused most Latin American countries to restrict its use through strict import regulations. For example, most countries in the region prohibit or discourage the import of goods that are also produced domestically. For example, Venezuela only grants import licenses for agricultural tractors, while Peru charges 30 per cent duty on imported items. Some countries require that the use of foreign exchange to import components and parts be offset through exports (e.g. Mexico). To reduce imports, some Latin American countries require that a certain percentage of agricultural machinery be produced domestically.

Manufacturers' responses to this situation vary by country. In general, however, manufacturers have been moving into new product lines where they see a potential for growth in an attempt to diversify and broaden their income base. Where demand is dropping and expected to continue to fall, manufacturing is being cut back in favour of assembly. In the case of imports, transnational manufacturers are cutting costs by selling machinery built in Europe, rather than the United States.

Some manufacturers have engaged in counter-trading. Italian, Japanese and Eastern European firms have been more successful than United States and Canadian manufacturers.

3.2 Specific countries

3.2.1 Argentina

The present Government has instituted a new set of economic policies, which have strengthened the domestic market and reduced imports of agricultural machinery. Adopted in January 1984 and still in effect, these policies prohibit the importation of any type of good produced domestically. Established agricultural machinery manufacturers are permitted to import components, but the Argentinian Government has the option of imposing price controls on imported items. In an effort to strengthen the agricultural sector as a source of foreign exchange earnings, the Government has also offered low interest loans to farmers purchasing locally produced agricultural machinery. The political climate is now considered fairly stable and favourable to investment.

The primary sources of foreign exchange earnings in Argentina are agricultural commodities, such as leather, meat, sugar, wheat and corn in addition to other raw materials such as oil, iron and steel.

Manufacturers' response

In response to the recession of 1979-1981, most small firms producing equipment for tillage, seeding and cultivating reduced operations or shut down. By 1982, the industry was operating at 20 per cent of capacity; this increased to 40 to 50 per cent in 1984.[3/]

Due to depressed demand and the difficulties of exchanging earnings for United States currency, some Canadian and United States farm machinery firms chose to reduce production and instead import and assemble components. Consequently farmers, uncertain as to whether the transnational firms will be

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3/ R.G. Asociados, Brief on Agricultural Machinery and Equipment, prepared for U.S. Department of Commerce, Market Research Division, Office of Trade Administration, Washington D.C., 1983.

around to service their equipment and provide parts, have begun to purchase domestically produced Zanello machinery. In response to inflation, some dealers have set up barter sales.

3.2.2 Brazil

High soybean prices in 1984 were reflected in a good year for agricultural machinery. This year prices have dropped and demand is down.

Brazil is self-sufficient in farm equipment largely as a result of import and financing policies. Brazil has the highest local content law in Latin America, due to foreign exchange shortages. Under these regulations, Brazil's Minister of Finance may reject import certification where "imports are causing or threaten to cause serious damage to the national economy or imports originate in or are shipped from countries that in any way impede Brazilian exports". Under the Law of Similars, import licenses for items having national similars were suspended. These regulations were adopted in 1975.

To promote exports, Brazil has special low-interest long-term credit programmes to sell agricultural machinery to other Latin American countries. However, following payment problems, the Government has become more cautious in advancing these loans.

In addition, the Brazilian Government has been supporting the capital goods industry as a possible source of foreign exchange earnings since 1982. The focus is on the United States market. While there is not much new investment, existing firms have expanded.

Brazilian agricultural machinery firms' willingness to engage in barter agreement, have made it a desirable trading partner for developing countries. While exports slowed down over the last 3-4 years, they appear to be picking up this year.

At the end of 1981, the Government assigned top priority to ending dependency on wheat imports by 1985. Though it did not happen as fast as desired, government assistance kept domestic demand for agricultural machinery high.

Manufacturers' response

Brazil is an example of successful industrialization of the farm machinery sector. Import regulations in the 1960s and 1970s protected and nurtured the industry. Initially, implement prices were higher than they would have been on the world market. But now, due to economies of scale and a cheap, plentiful source of productive labour, Brazil's agricultural machinery industry has become competitive on the world market.

After falling in the early 1980s, production of agricultural machinery is on the increase, albeit slowly. In 1982, the industry was operating at 33 per cent of its capacity. In the early part of 1983, the major tractor manufacturers shut down for up to 5 months due to high inventories and low sales. The industry was operating at less than 25 per cent of its capacity. This was due to low commodity prices for sugar, coffee, soybeans and corn and a lack of previously available low cost agricultural credit. In late 1983, due to a poor United States and Soviet soybean crop and high Brazilian output, sales and production of farm machinery picked up.

Manufacturers have cautiously begun to invest in expanding plant capacity and have expanded exports. In addition, Brazilian manufacturers have begun to standardize their models with those produced in Europe. They have developed a reputation for good quality low-cost products.

3.2.3 Mexico

Mexico has been the politically most stable country in Latin America, which has made it attractive to investors. Mexico's prime sources of foreign exchange earnings are oil and gas. The drop in oil prices has reduced Mexico's foreign exchange reserves and caused the Government to be more selective about what may be imported.

A number of actors have adversely affected Mexico's demand for agricultural machinery. Demand for farm machinery depends predominantly upon whether farmland is irrigated. Little credit has been available to farmers, although within the last 5 years the Government has instituted a programme granting low interest loans to small farmers to dig wells on their land. Once their land is irrigated, farmers can grow higher priced crops, such as sorghum, instead of food crops, like corn.

In 1982, the Government imposed price controls on agricultural machinery to lessen the sting of the peso devaluation. More recently, the rapid rate of inflation has adversely affected the price of agricultural inputs. Prices for new tractors rose 65-110 per cent in 1984.

Mexico has an offsetting export requirement. In other words, a manufacturer must export 30 per cent of the value of the items he imports. While Mexico allows the import of completely knocked down and semi-knocked down tractors, it requires that the engine be manufactured locally. However, in the last 2-4 months, the Mexican Government has curtailed the import of components.

In response to pressure from the IMF, at the beginning of 1984 the Mexican Government began loosening its stringent import controls, widening access to controlled-rate dollars, and reducing government subsidies.

Manufacturers' response

Mexico's stable market has been attractive to foreign agricultural machinery manufacturers. Even now, Ford and Deere are expanding their production capabilities. The decline in the number of manufacturers has made investment more attractive, as the survivors compete for more market shares. However, while the Mexican economy appears to be improving, the farm machinery industry is operating at only about 50 per cent of capacity.

4. OUTLOOK

4.1 Latin America

There is no consensus on what will happen in the near future in the agricultural machinery industry in Latin America. Most industry officials expect local demand to remain constant barring any substantial changes in commodity prices or the political/economic situation. Some observers expect no resurgence in demand for machinery in Latin America due to the countries' financial status, depressed commodity prices and to the position of world financial institutions.

Investments are expected to increase slowly in Brazil and probably decline in Argentina. The situation in Mexico depends upon government policies, which are in flux at the present time. Most Latin American countries are working hard to attract private investment, in response to the lack of international bank loans. Exports of agricultural machinery may grow in Brazil and possibly Mexico.

Industry analysts expect to see a decrease in Latin American imports of components from the current level of 10-20 per cent, as local production increases. Also, more countries may require that manufacturers export goods to offset the loss of foreign exchange associated with importing.

The agricultural machinery situation in Latin America is less a result of structural changes in the United States and Western European agricultural machinery industry than the factors cited in section 3 (i.e. low commodity prices, high cost of foreign exchange, world credit institution policies, local government policies and political/economic instability. However, the structural changes have had some impact on Latin America. In the first place, the number of major manufacturers has dropped with the sale of the agricultural machinery divisions of Allis-Chalmers to Deutz, of International Harvest to Tenneco, and most recently of Sperry New-Holland to Ford. This reduced the number of major manufacturers in Mexico from 5 to 3.

The poor world market for agricultural machinery in conjunction with the difficulty of recovering profits in dollars from developing countries and a desire not to have subsidiaries compete with mother plants, have made transnationals more cautious about investing in developing countries than they were in the mid-1970s. These factors have also made these companies more willing to close down (i.e. John Deere closed down its factory in Argentina in 1983, shipped the tooling off to other facilities, and wrote off the loss) and sell facilities (i.e. Massey-Ferguson sold its Mexican plant to local investors in 1983). They are less likely to weather hard economic times, waiting for improvement. However, where there is a strong potential for market growth, multinationals continue to invest. For example, Ford is expanding its production facilities in Brazil.

Latin American countries that do not have their own agricultural machinery industry continue to depend upon foreign sources. As a result of the structural changes and the high cost of the dollar, more machinery is being shipped from Europe than from the United States, and United States manufacturers have expanded their European production facilities (Ford and Case in England and Deere in the Federal Republic of Germany). In addition, the willingness of Latin American, European and Japanese companies to engage in barter transactions has made them more attractive trading partners than United States companies.

4.2 Specific countries

4.2.1 Argentina

The overall business outlook in Argentina is somber. It appears to depend on a continuing political stability and on the country's ability to meet its international loan payment requirements.

Agricultural output is expected to grow, protected by import-substitution policies and preferential treatment of export crops (i.e. preferential credit lines to farmers to promote production). This should strengthen demand for agricultural machinery.

Anticipated reductions of export taxes on wheat and beef should further stimulate production.

Public expenditures in Argentina may be reduced. If the Government pulls out of the agricultural sector, it is unlikely that the private sector will step in as the private sector prefers to invest in local financial securities with higher yields. There is also a likelihood that commodity prices will continue to fall. The high inflation rate is not expected to come down any time soon; it can be expected to run at about 500 per cent.

Imports of fully assembled agricultural machinery are expected to stay the same or fall, due to government policies which are attempting to control the trade surplus by slowing down imports. However, an increase in imports of tractors over 230 hp, grain harvesters over 230 hp, fertilizing equipment, incubators and automatic egg processing equipment is foreseen.

As indicated before, tractor production in Argentina dropped significantly from about 23,000 units in 1977 to 7,000 the following year and has remained below the 1977 level ever since. According to industry sources, producers have had two general reactions to the decline in demand for agricultural machinery. Some have shut down their facilities and increased imports. John Deere adopted this strategy and Fiat may be following suit. A second response has been to reduce production and wait for the market to recover. This strategy is being followed by Deutz and Massey-Ferguson. No efforts to use the excess capacity to manufacture other items are mentioned. The poor state of the economy has made this option unattractive. Argentina is seen as a roller-coaster market, and manufacturers expect to bring capacity in and out of use, depending on demand.

4.2.2 Brazil

The outlook in Brazil is more favourable due to a strengthening economy. Brazil will probably try to increase agricultural exports in the next couple of years. Domestic demand is expected to grow as farmers replace machinery bought in the 1970s.

Commodity prices of Brazilian goods are down in 1985 from 1984 levels, which could hurt agricultural machinery demand. However, continuing government support for export crops could mitigate this. There is a general shift in the government's agricultural policy from subsidy towards the free market and a likelihood that the Government will support the production of food crops rather than export crops. The former policy could drastically reduce the demand for agricultural machinery while the latter could change the type of machinery used. Brazil is resisting external demands for strict economic austerity measures claiming they will result in social turmoil. Inflation is expected to run at about 200 per cent per annum. Industry officials expect Brazil to remain a strong market, with continuing high demands for tractors.

Export credit subsidies have been cut, but the potential adverse impact has been compensated for by improved prices resulting from devaluation. Brazil welcomes foreign investment in import-substitution sectors, such as agro-industry.

4.2.3 Mexico

It is expected that Mexico will remain a good, fairly stable market. Though domestic demand for agricultural machinery is weak, it is expected to recover. Only 25 per cent of the countryside is mechanized, so there is room for growth. IMF requirements will probably adversely affect the availability of credit for farmers, and it is unlikely that the private sector will take up the slack. There may be an attempt to counter this by encouraging more private investment through more attractive accelerated depreciation allotments than hitherto.

Easing of some import restrictions may help the United States agricultural machinery producers.

Agricultural production is expected to grow. Although the Government is gradually reducing subsidies, it still has guaranteed prices. There will be little increase in total irrigated or mechanized farming land.

Further declines in the price of oil may reduce supplies of foreign exchange and depress the Mexican economy.

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The present situation of the agricultural machinery industry in Latin America

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