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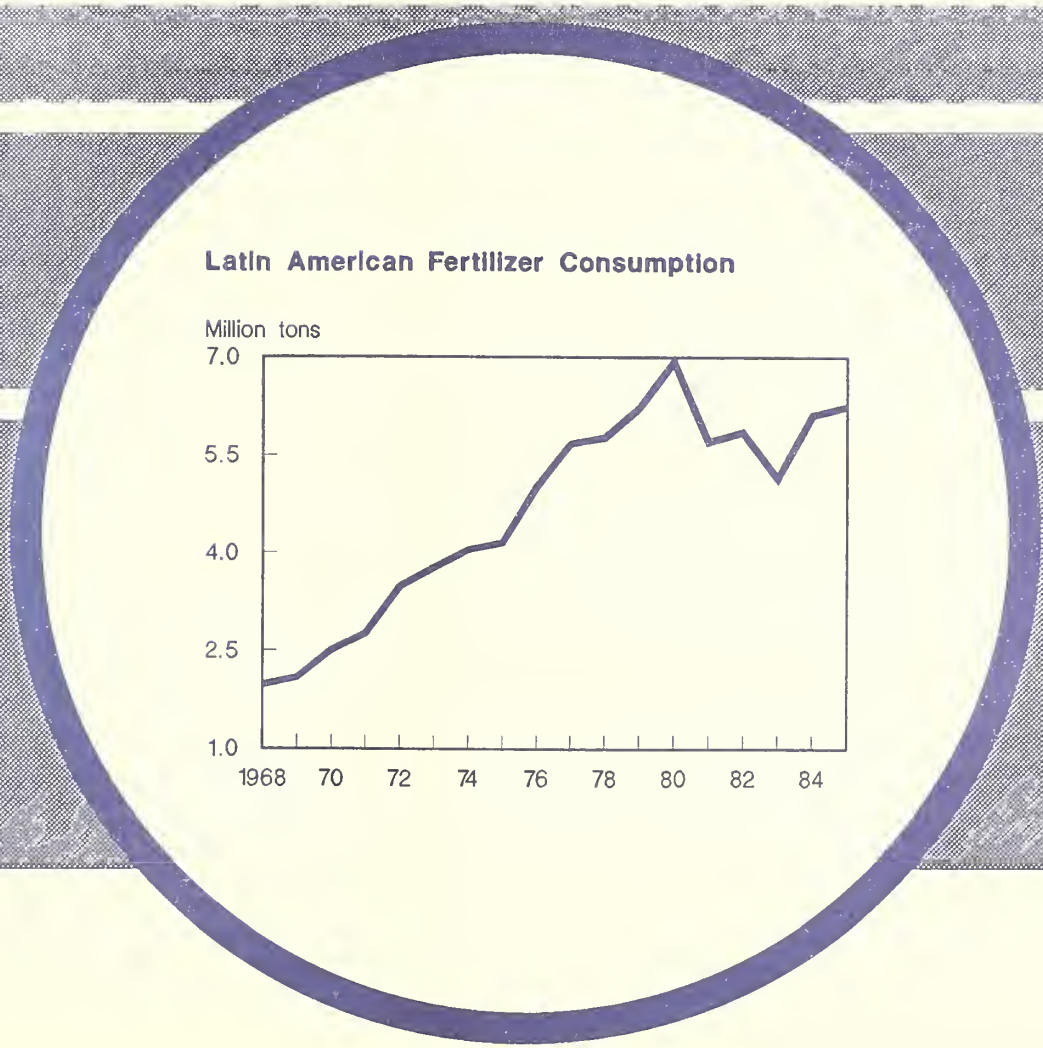
World Agriculture

Situation and Outlook Report



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This is the final issue of the *World Agriculture Situation and Outlook Report* in this format. ***World Agriculture,*** a new and enlarged two-color magazine, will be published quarterly beginning March 1991. It will continue to report on significant issues and trends in global agriculture and trade and their implications for U.S. agriculture.

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Summary

Growth in world economic activity (real GNP) will decline 1 full point from last year's 3.1-percent pace and remain around 2 percent in 1991. This trend is in line with lower projected growth in the developed countries and output contraction in Eastern Europe. Growth in world trade is also expected to moderate in real terms in 1990, before expanding again in 1991. World inflation will almost double this year, largely reflecting the transmission of higher petroleum prices in developing countries.The expectation is for inflation to subside in 1991, however, this will hinge in large part on resolution of the Gulf crisis.

Reduced economic activity and improved supplies in some commodity markets will again dampen non-oil commodity prices, resuming a trend begun in 1989 when prices fell sharply. Food prices declined 6.5 percent in the first half of 1990, but prices of agricultural raw materials remained stable. The runup in oil prices has not affected most non-oil commodity prices, and a further 8-percent decline in the latter is projected for this 1990. Since 1980, non-oil commodity prices have dropped 40 percent relative to the export price of manufactures of industrial countries. Further price deterioration is anticipated for 1991, although lower prices are expected to be largely confined to minerals and metals.

Among the developing countries, fuel exporters face favorable yet gradually declining terms of trade, assuming lower oil prices in 1991. The purchasing power of exports (export earnings deflated by import prices) for these countries follows a similar pattern. The Middle East is the only region that will enjoy positive terms of trade through 1991. Fuel importers, on the other hand, face negative but improving terms of trade, again assuming lower oil prices in 1991. In regard to the purchasing power of exports, however, fuel importers as a group will maintain positive growth on this basis. Oil imports in Asia have dropped as a percentage of total imports. In addition, East Asian trade competitiveness, as measured by effective exchange rates, is still formidable.

U.S. agricultural exports are expected to decline in fiscal year 1991. Export value is expected to fall $1.6 billion to $38.5 billion, its first decline since fiscal 1986. Export volume is expected to fall 6 percent to 139.5 million tons, as coarse grain exports decline. Lower world grain trade is expected following larger harvests by traditional grain import-ers, and the U.S. share of world grain trade is expected to fall following increased competitor production. U.S. corn exports will decline largely because of a forecast one-third drop in USSR corn imports from all sources. Larger world wheat production is resulting in sharply lower wheat prices.

Higher prices are forecast for soybeans and soybean meal in fiscal year 1991, offsetting expected declines in volume. Exports of high-value products are expected to continue rising in fiscal 1991, reaching a record level. High-value exports will be boosted by continued strong economic growth in major markets and the lower value of the dollar on foreign exchange markets.

U.S. agricultural imports are expected to fall slightly, to $22 billion. Imports rose $1 billion to a record $22.5 billion in fiscal 1990 following destructive winter freezes in Texas and Florida. In 1991, vegetable and fruit imports are expected to return to 1989 levels as prices and import volumes average lower.

Because agricultural exports are expected to fall more than imports, the U.S. agricultural trade surplus is expected to fall in fiscal 1991, dropping $1.1 billion to $16.5 billion.

The new farm bill (The Food, Agriculture, Conservation, and Trade Act of 1990), signed by President Bush on November 28, makes major changes in U.S. food aid programs and in the responsibilities of the agencies involved in implementing them.

This year's annual gathering of representatives of internationally funded agricultural research centers, known as Centers Week, was hosted by the Consultative Group on International Agricultural Research (CIGAR) at its secretariat at the World Bank in Washington, D.C. The meetings were reported to have been dominated by discussions of the best means of incorporating environmental concerns into research programs.

World egg production has benefitted from technological innovations that have made it an increasingly efficient contributor to improved diet. Innovations such as mechanical feeders for laying hens have been adopted on a wide scale. A "Current Trends" feature examines how this came about.

This issue contains two special articles. The first documents and analyzes a rapid rise in the use of agricultural inputs in Latin America and investigates the complementarity of Latin America's input imports and agricultural exports. The second examines the shift in Japan's textile trade from importing raw fibers to importing intermediate and finished goods.

The World Economy and Exchange Rates

Growth in world economic activity (real GNP) will decline 1 full point from last year's 3.1-percent pace and remain around 2 percent in 1991. This trend is in line with lower projected growth in the developed countries and output contraction in Eastern Europe. Growth in world trade is also expected to moderate in real terms in 1990, before expanding again in 1991. World inflation will almost double this year, largely reflecting the transmission of higher petroleum prices in developing countries.The expectation is for inflation to subside in 1991, however, this will hinge in large part on resolution of the Gulf crisis.

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World Economic Activity

The Developed Economies

The deterioration of economic conditions in the developed countries will continue through next year, with real GDP growth slowing to 2.1 percent from 2.6 this year. Despite the doubling of oil prices since July, consumer price inflation in 1990 will rise by only 1 percentage point from 1989's 4.5 percent because of significant erosion in real domestic demand. Indeed, the GDP price deflator for the industrial economies will be the same as last year's 3.9 percent.

Gross fixed investment through 1991 in the developed countries will again grow faster than consumption and government spending, but at a much slower pace than in the past 2 years. An average 6.3-percent growth in fixed investment is projected in Japan, about half the rate in the past 3 years. Germany's investment expenditure is slated to advance 7.4 percent through 1991, a slightly higher rate than in 1989, due largely to investment in the former East Germany. In contrast, U.S. investment will expand by only 1 percent, and the European Community's by 4.2 percent.

The moderation in the volume of world trade is in line with the weakening of recent investment growth, which is relatively trade-intensive. Among major industrial countries, steady declines in export growth are projected in Europe, most prominently in Germany, reflecting the diversion of trade to the former East Germany. This development, nevertheless, would increase world market shares of non-oil exports for France, Italy, and the United Kingdom. Current account surpluses in Japan and Germany are forecast to narrow substantially to about 2 and 2.5 percent, respectively, of GNP by 1991, whereas the U.S. current account deficit is forecast to continue to improve to 2 percent of GNP.

Eastern Europe and the USSR

Production activity in Eastern Europe and the USSR this year has been beset by inefficient equipment and distribution systems. These problems are compounded by the high energy intensity of industries there and economic, political, and financial turmoil. The area is thus experiencing falling output. The former East Germany and Poland, being the first to implement the most far-reaching reforms, are projected to be the first to reap efficiency gains from the market system. In the other countries, underlying inflation pressures continue because the pace of freeing prices has been slow and the implementation of privatization measures has been even slower. Privatization by itself, however, does not guarantee greater efficiency, as witnessed in market exploitation by Poland's State monopolies.

Widespread shortages and a sizable money overhang will keep underlying inflation pressures high. Earlier hyperinflation in Poland and Yugoslavia has subsided dramatically as a result of the lifting of price controls (in Poland) and a sharp devaluation of their currencies. In turn, trade competitiveness will be enhanced, not only because large nominal depreciations will sharply lower real exchange rates in Poland, but also because of full currency convertibility. With the subsequent adoption of fixed exchange rates by these two countries, along with their tight monetary and fiscal policies, inflation is expected to be relatively low.

The Developing Countries

Higher oil prices have produced mixed economic growth paths for the developing regions this year, with only the Middle East showing a positive gain—owed to sharply higher export earnings. Negative growth in Latin America, no change in Asia, and a slowdown in Africa are projected for 1990. However, an opposite growth pattern is expected in

1991 when Latin America and Asia are expected to rebound, while output growth in the Middle East will slow and in Africa will remain the same. Overall, developing countries will have 3.4 percent more real GDP in 1990 and 4.3 percent more in 1991.

The impressive GDP gains anticipated next year for Latin America (from a recession to a forecast 3.5-percent real growth) are attributed to a spurt in exports and to a revival of direct foreign investment (a $9 billion rise in 1990). A major paring of inflation rates is assumed for the region—in Brazil, a 23-percent jump in required reserves for bank deposits; in Argentina, a much lower fiscal deficit; and in Peru, reduced government spending and money supply growth. Complementing these reforms are deep depreciations in currency exchange values.

In Asia, the expected continuation of GDP expansion this year has slowed until next year. This has been in reaction to higher oil prices and the temporary loss of import demand from the slumping U.S. economy. While the Asia-Pacific region is no longer as vulnerable to a U.S. downturn as in the past, 50 percent of its exports go to developed countries. In addition, intraregional trade will be handicapped in part by shrinking demand for imports in Japan, the area's growth generator. Domestic financial difficulties in Japan, Taiwan, South Korea, and Hong Kong will slow investment flows to Southeast Asia. Foreign investment is relied upon to relieve increasing capacity constraints in the region. Thus, along with deteriorating terms of trade, inflationary pressures are not expected to abate.

Latin America's External Debt

Yearend arrears on interest payments grew from $8 billion in both 1987 and 1988 to $14 billion in 1989. As a share of total debt, arrears grew from almost 2 percent in 1987 to 4 percent in 1989. The average price of regional debt in the secondary market sank from 65 percent of its nominal value in 1986 to 28 percent in 1989. The liquidity of the market increased when U.S. banks, starting in 1987, joined in creating large reserves against loan losses.

Of the voluntary debt reduction achieved by the region from 1985 to 1988, about $12.5 billion was in debt-equity swaps; $7 billion was in private debt restructuring; $2.1 billion was in repatriation of flight capital, by means of debt-for-equity swaps (Chile); $5 billion was in debt-to-bond conversion (Mexico); and $600 million was in the form of buybacks (Bolivia and Chile). Brazil, Chile, and Mexico accounted for $6.2 billion each.

Since 1984, investment has again been growing, though only at half the rates in the two previous decades. The external debt overhang still discourages investment, because high taxes necessary for debt service eat into expected returns. The drain on domestic savings by net resource transfer has made it difficult for many countries in the region to finance investment requirements. It has been shown that economic growth is reduced in direct proportion to the size of the net resource transfer with respect to GDP.

Petroleum Supply and Demand

Total OPEC output is estimated to have exceeded its pre-crisis ceiling of 22.5 million barrels a day (mbd) and may approach 23 mbd by yearend. The restoration of the supply-demand balance should keep a lid on further crude price increases in the absence of hostilities in the Persian Gulf. Average prices have not fallen substantially because most of OPEC's extra production is made up of heavy crudes, which have pushed prices of highly demanded superior grades even higher.

Prospects for stable or gradually falling prices depend on normal winter temperatures in the northern hemisphere, continued weak industrial demand, and adequate inventories of crude oil and petroleum products. Including strategic reserves of 1 billion barrels, petroleum stocks in the industrial countries are already 3.6 billion barrels, more than 3 months' supply in terms of monthly average consumption in 1989. In addition, 440 million barrels are estimated to be in ships currently at sea.

In response to both higher prices and slower economic activity, oil demand is projected to drop below that of fourth-quarter 1989. Barring a newly enforced production ceiling by OPEC, crude oil prices should edge downward if 1991 GDP growth in the industrial countries is lower as forecast. The only source for continued strong demand would be higher-than-normal oil stocks because of the risk of war and the related reluctance by oil companies to draw down stocks in the spring, a normal practice.

World Credit Markets

The slowed pace of economic activity in the industrial countries was brought about by monetary tightening and exacerbated by higher petroleum costs. In Japan, the Central Bank's initiatives to prevent the transmission of asset (property and equity) price inflation to the real sector will cut capital spending growth—in double digits since 1987—in half by 1991. As a result, Japanese financial institutions are scrambling to shore up their depleted liquid capital, particularly commercial banks now complying with larger reserve requirements. West Germany's massive bailout of the former East Germany through government borrowing will not be accommodated by the Bundesbank, and thus, as in Japan, short-term interest rates have shot up.

The ensuing repatriation of investment funds to Japan and Germany, mainly from the United States, has reduced credit availability in international money markets. The demand for credit, however, has also fallen along with the U.S. current account deficit and will weaken further as world activity

slows. Furthermore, surplus "petrodollars" of oil-exporting countries, primarily OPEC members, should find their way to the Eurocurrency market, where they can be recycled back to oil-importing countries. Thus, the world shortage of funds for loans is partially alleviated by larger Eurodollar deposits from oil exporters.

Higher domestic interest rates in Japan and Germany, lackluster equity and bond markets, and weakened capital bases of banks have already caused a precipitous contraction of cross-border portfolio flows between the major industrial countries. This development, plus nonaccommodating monetary policies that absorb, not sterilize, higher oil-import costs, should ensure control of inflation, a lesson learned from the two previous oil crises. However, higher interest rates increase the risk of recession.

Exchange Rates

Significantly higher real deposit rates for Euromarks and Euroyen have sent the U.S. dollar reeling from midyear levels, reaching record post war lows against the mark and approaching its record low against the yen. The retreat of foreign investors from the U.S. stock and bond markets has weakened the dollar further. If oil prices remain high, the demand for dollars for oil payments by oil importers will provide some support for the dollar. Moreover, the unexpected demand for dollars from East European countries and the USSR as the currency of choice—along with the German mark—should offer added support.

As the U.S. economy has slowed, the Federal Reserve has lowered interest rates at a time when shrinking excess savings in Japan and Germany—due to falling trade surpluses—have raised their interest rates. It appears that a more stable dollar, if not a turnaround, would hinge more on the U.S. economy's recovery, as robust activity in the Japanese and German economies is not likely to substantially abate.

In terms of real purchasing power (price comparison of similar goods), the dollar is undervalued against the mark and the yen. Thus, if the long-run exchange value between currencies is consistent with purchasing power parity, then expectations of a long-term retreat by the dollar may be unfounded. *[Alberto Jerardo (202) 219-0708]*

World real economic growth

Calendar year	1989	1990	1991
		Percent change	
World	3.1	2.1	2.0
World less U.S.	3.3	2.4	2.3
Developed countries	3.5	2.6	2.1
DC's less U.S.	4.0	3.3	2.7
United States	2.5	1.1	1.0
Canada	3.0	0.7	0.6
Japan	4.9	5.1	4.0
EC-12	3.5	3.0	2.4
Developing countries	3.0	3.4	4.3
Latin America	1.6	-0.5	3.5
Mexico	2.9	2.8	4.3
Asia	5.0	5.0	5.4
South Korea	6.1	9.0	7.9
Taiwan	7.4	4.9	7.3
China	4.0	3.3	8.3
Middle East	6.6	7.3	3.8
Africa	3.2	2.6	2.6
Eastern Europe	1.0	-3.3	-3.5
USSR	1.6	-2.5	-3.9

Sources: The WEFA Group (October 1990).

World Trade and Agricultural Policy

U.S. Agricultural Trade

U.S. agricultural exports are expected to decline in fiscal year 1991. Export value is expected to fall $1.6 billion to $38.5 billion, its first decline since fiscal 1986. Export volume is expected to fall 6 percent to 139.5 million tons, as coarse grain exports decline. Lower world grain trade is expected following larger harvests by traditonal grain importers, and the U.S. share of world grain trade is expected to fall following increased competitor production. U.S. corn exports will decline largely because of a forecast one-third drop in USSR corn imports from all sources. Larger world wheat production is resulting in sharply lower wheat prices.

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Because agricultural exports are expected to fall more than imports, the U.S. agricultural trade surplus is expected to fall in fiscal 1991, dropping $1.1 billion to $16.5 billion.

The volume of wheat and flour exports is forecast to show little change from a year earlier, reaching 28.7 million tons. The substantially lower prices brought on by record world production, however, will drop the forecast's export value about $1.1 billion below fiscal year 1990.

U.S. coarse grain export volume for fiscal 1991 is forecast down 9.2 million tons from fiscal year 1990, to 59.8 million tons. The decline is due in part to a decrease in projected

corn sales as the Soviet Union is forecast to reduce corn imports by one-third. Coarse grain imports are also forecast down in Mexico and a number of smaller importers. Expected export value of $6.9 billion is also forecast down from 1990 to account for the reduced volume outlook.

Within the oilseed complex, fiscal 1991 soybean exports are expected to drop 600,000 tons from fiscal 1990, totaling 16.6 million tons. An increase in foreign production, larger-than-anticipated carryin stocks from South American countries, and reduced demand in major importing countries are the major causes of this decline. However, slightly higher soybean prices will leave export value nearly unchanged at $3.9 billion. Soybean meal exports are expected to increase in both value and volume to reach 5 million tons and $1.1 billion in fiscal year 1991.

Despite prospects for higher cotton production, the combination of low carryin stocks and strong domestic use is projected to slightly lower 1991 exports of U.S. cotton to 1.6 million tons. Throughout the year, cotton prices, global production, and use are expected to be in close balance. Export value is expected to remain unchanged from fiscal year 1990's $2.7 billion, despite the drop in volume.

The value of livestock, dairy, and poultry exports for fiscal 1991 is forecast up slightly from the last fiscal year. Exports are expected to finish fiscal 1991 at a record $6.9 billion, due mainly to expected gains in sales of beef and veal, hides and skins, poultry meat, butter, cheese, and nonfat dry milk. Increased sales of livestock products to Japan and Korea are expected to more than offset projected declines in sales to the European Community.

Horticultural product exports are forecast to reach a new record of $5.5 billion in fiscal year 1991, $300 million more than fiscal year 1990's record $5.2 billion. Exports of citrus fruits, almonds, and pistachios are expected to register marked increases, accounting for much of the expected gain. Continued strong demand from Canadian and East Asian markets is a major factor behind this projected growth. *[Stephen A. MacDonald (202) 219-0822]*

New Food Aid Provisions

The new farm bill (the Food, Agriculture, Conservation, and Trade Act of 1990) was signed into law by President Bush on November 28. Among its many provisions, the bill makes major changes in U.S. food aid programs and in the responsibilities of the agencies involved in implementing them.

The bill creates a new grant food aid program, changes the rules governing the use of local currencies generated by food aid, and gives more control over the humanitarian and development objectives of U.S. food aid to the U.S. Agency for International Development (AID).

Title I (concessional sales) programs will remain focused primarily on market development objectives and will be administered by the U.S. Department of Agriculture (USDA). Title I sales may be either dollar or local currency sales. The criteria for self-help measures have been eliminated. Local currencies may be used for a variety of purposes, including trade development, agricultural development, trade promotion, loans for agribusiness or agricultural facilities development, or agricultural research. USDA will manage Title I local currencies. Any other U.S. Government agency using local currencies will reimburse the Commodity Credit Corporation in dollars for the amount of currency used.

AID will administer Title II (emergency) programs, as well as the new grant food aid programs created under Title III. Both programs will focus heavily on promoting food security in recipient countries, including programs that directly reduce malnutrition and increase child survival. A new Food Aid Coordinating Committee for Title II was created to broaden participation in food aid programs. It will be chaired by the AID Administrator, with representation from USDA (Assistant Secretary for International Affairs and Commodity Programs) as well as from participating private voluntary organizations and representatives from Asian, African, and Latin American indigenous private voluntary organizations (PVO's).

Title III provides a grant food aid program for the least developed countries. Eligible countries must meet the World Bank's poverty criteria and have food deficits and significant malnutrition problems. Proceeds from the sale of such food aid may be used for economic development activities. Local currency would be placed in a separate account and would be considered an integral part of AID's development aid budget. *[Cheryl Christensen (202) 219-0008]*

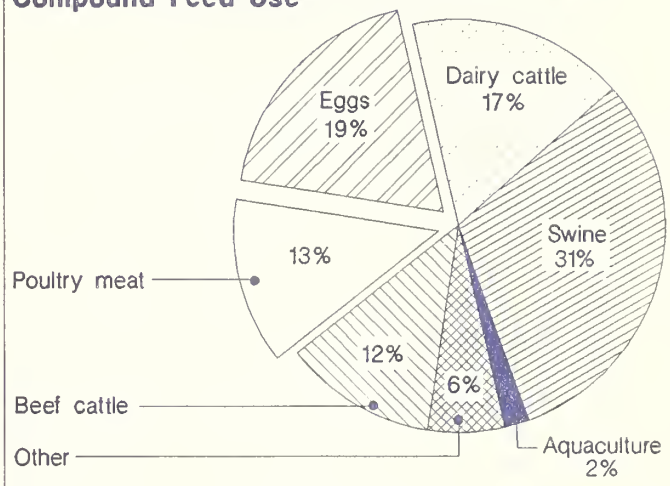
Current Trends

Egg Production: a Case Of Successful Technological Transfer

World egg production has benefited from technological innovations that have made it an increasingly efficient contributor to improved diet. Innovations such as mechanical feeders for laying hens have been adopted on a wide scale. Today, poultry (including turkeys and ducks) accounts for an estimated 32 percent of world compound feed use, more than any other sector (fig. 1). Egg producers feed an estimated 60 percent of the total consumed by poultry. Thus, world egg production uses about 19 percent of world feed production.

Large poultry feed use is the result of a very rapid expansion due to successful technological innovation in the industry. Beginning in the United States in the 1940's, when farmers learned to care for large flocks in confinement, this new technology began to transform egg production in Western Europe and Japan in the 1950's. The profitability allowed by modern technology, including the mechanizing of many tasks, has shifted egg production from outdoors to confinement buildings. Confinement poultry production has continued to spread to the more prosperous developing countries because the technology involved is not limited by either climate or land.

Figure 1
Poultry Feed Represents World's Largest Compound Feed Use



Sources: (3,4,7)

Some early U.S. milestones in the development of the technology for confined egg production were (5): 1920's—vitamin D in cod liver oil found to prevent rickets, making it possible to raise chickens indoors the year around, independent of sunlight and inclement weather; 1930's—cross-breeding of inbreds provided hybrid vigor, and at the same time the discovery that heat treatment of soybeans provided high-quality protein for poultry. The rapid increase in soybean production provided necessary supplies of low-cost protein for expanding poultry production; 1940's—the beginning of commercial cage housing for layers and the development of coccidiostats to control coccidiosis; 1950's—the introduction of mechanical feeders for caged layers reduced labor costs.

Once the problems of confinement housing had been overcome, the technology for mechanization permitted a quantum increase in production efficiency. Less feed is required because hens in houses are less subject to environmental stress. With higher stocking densities possible in cages, houses can be kept at higher temperatures; 20 degrees C is the optimum for efficient feed conversion. Feed use rises 1.5 percent for each 1 degree C below this level. As a result of these advances, real production costs in the United States (in terms of cents per dozen eggs) were reduced 65 percent between 1950 and 1980 (6).

Figure 2
Technology Increases U.S. Flock Size

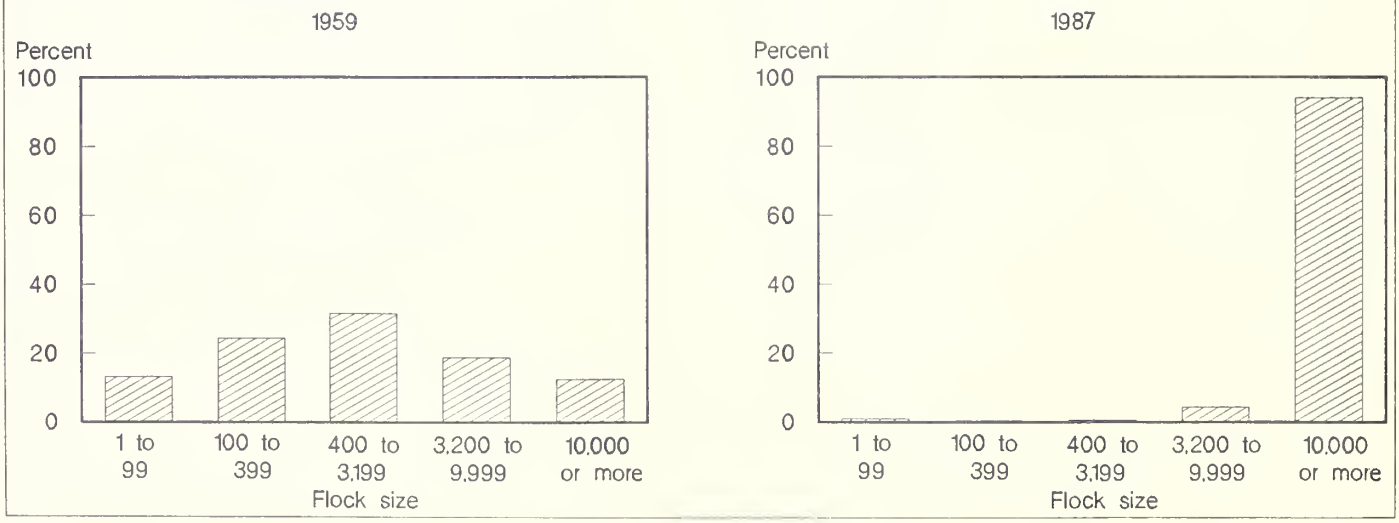
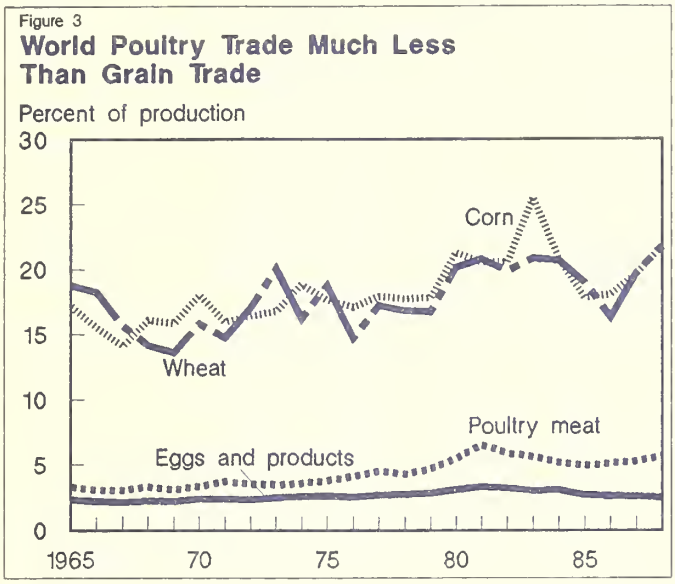


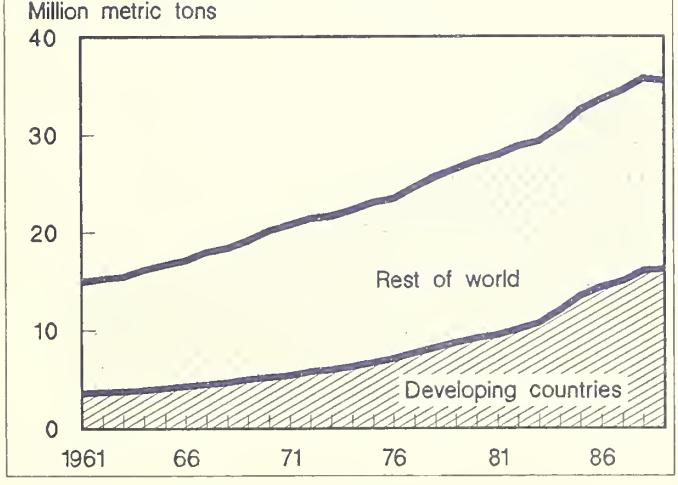
Figure 3
World Poultry Trade Much Less Than Grain Trade



One result of the use of new technology was to increase flock size. Cages and mechanized egg collection systems greatly increase the numbers of layers that one worker can manage—upwards of 100,000 hens, compared with 1,200 under the traditional pasture system. Figure 2, based on U.S. agricultural census data, shows the dramatic change that has occurred since 1959. The technology, however, has concentrated the industry even more than this figure reveals. Today's new operations average 500,000 layers or more in a series of large houses connected to an egg processing plant (*2*). Egg production systems must be this size to make efficient use of the capacity of modern egg processing equipment.

Trade in eggs is constrained by people's preference for fresh eggs and by the ease of transferability of production technology. Economic incentives for local production of eggs lead to the transfer of the technology for confinement production, even though the necessary feedstuffs must often be supplied by imports. A few breeding companies in North America and Europe distribute the best genetic stock throughout the world. Health products are also distributed globally. The pharmaceutical industry provides the vaccines, drugs, and medicines essential to healthy flocks. Equipment and housing products are broadly applicable around the world. Thus, as USDA data show, a significantly smaller proportion of world egg production is traded than crop production (fig. 3).

Figure 4
Almost Half of World's Egg Production Now In Developing Countries



Due to these factors, egg production is increasing rapidly in the more prosperous developing countries and represents an increasing share of world output (fig. 4). Technology transfer is allowing production to expand. In some developing countries, simple, inexpensive equipment and housing is used. Foreign exchange will be used to import chicks of the best genetic potential as well as the drugs and vitamins needed for efficient feed conversion and flock health. Water is usually the first service to be automated. Although manual egg collection is still preferred where labor costs are low, and because automated feed delivery systems are a major investment, they have a lower priority where labor is plentiful. Once such equipment is installed, however, the enterprise usually switches from bag to bulk feed, saving money in the process (*3*). This trend of technology transfer is expected to continue, leading to increased imports of feed ingredients, genetic stock, health products, and equipment.

[*Gary Vocke (202) 219-0718*]

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International commodity prices

Year	Wheat			Corn		Soybeans	Soyoil	Soymeal 44%	
	U.S. 1/	Arg. 2/	Can. 3/	U.S. 4/	Arg. 2/	U.S. 4/	U.S. 5/	U.S. 5/	Ham. 6/
1980	176	203	192	129	159	272	522	217	271
1981	176	190	194	135	139	272	464	223	269
1982	161	166	165	110	109	233	404	197	233
1983	158	138	167	137	133	269	518	222	255
1984	153	135	166	138	132	271	678	184	210
1985	137	106	173	114	103	214	596	140	171
1986	117	88	161	89	83	200	361	174	197
1987	114	89	134	77	80	204	349	194	215
1988	146	125	178	107	105	287	519	259	285
1989	171	151	202	112	111	260	446	239	256
1990									
Jan.	169	143	193	106	105	223	431	189	221
Feb.	162	137	189	107	105	222	453	178	216
Mar.	157	123	191	110	106	226	505	181	211
Apr.	162	124	179	119	113	229	511	186	217
May	151	122	171	122	116	235	540	195	215
June	136	119	165	121	122	229	550	187	206
July	125	112	148	115	127	232	541	189	208
Aug.	118	95	139	110	127	236	546	189	206
Sept.	115	79	130	102	94	237	527	194	212
Oct.	116	79	128p	101	98	233	487	190	227

p = Preliminary. 1/ No. 2 hard winter, ordinary protein, f.o.b. Gulf ports. 2/ F.o.b. Buenos Aires. 3/ No. 1 western red spring, 13.5% protein, in store Thunder Bay. 4/ U.S. No. 3 yellow, f.o.b. Gulf ports. 5/ Decatur. 6/ Hamburg, ex-mill.

Research Centers Highlight Sustainability

This year's Centers Week, an annual gathering of representatives of internationally funded agricultural research centers, was dominated by discussions of how best to incorporate environmental concerns into research programs, according to participants. The meetings, October 29-November 2, were hosted as usual by the Consultative Group on International Agricultural Research (CGIAR), which has its secretariat in the World Bank in Washington, D.C.

Participants report that environmental concerns are becoming equal in importance to the historic missions of increasing the quantity and improving the quality of food supplies in developing countries. Environmental concerns promise to be major discussion topics again at the CGIAR's midyear meeting in May 1991. The CGIAR, founded in 1971, oversees broad support for more than a dozen international agricultural research centers in various parts of the world.

Several of these centers have already embarked on research programs on sustainable agriculture, or agriculture that does not destroy nonrenewable natural resources, in developing countries. An important component of this type of research is an analysis of policies, including trade policies, affecting the production and consumption of developing countries' agricultural products, including forest and fishery products. Another aspect of this research, which is linked to long-standing farming systems research in developing countries, is the testing of models capable of measuring inputs and outputs of cropping and livestock systems and of evaluating comparative total factor productivities—counting natural resource stocks and flows such as soil fertility as well as variable factors like land area, labor, and capital. *[Arthur J. Dommen (202) 219-0075]*

Correction

Several lines of the article by Vollrath and Skully in the September 1990 issue of *World Agriculture Situation and Outlook Report* were inadvertently dropped. The full paragraph in question should have read as follows:

The dynamic Asian economies (DAE's) of Hong Kong, Malaysia, Singapore, South Korea, Taiwan, and Thailand experienced the highest rates of growth, reaching 7.48 percent annually in 1972 while averaging 5.70 overall between 1961-87. In addition to the DAE's, the Middle East and North Africa region, the OPEC countries, and Latin America grew more rapidly during the 1961-87 period than did the developed countries. But the 5-year annual growth rates sharply fell in OPEC countries after 1974, in the Middle East and North Africa after 1976, and in Latin America after 1980.

Agricultural Input Trade In Latin America

by

Carlos Arnade*

Abstract: This article documents a rapid rise in the use of agricultural inputs throughout Latin America. It describes and compares Latin American trade of agricultural outputs and agricultural inputs. It shows that, while Latin America is a net exporter of agricultural goods, it remains a net importer of agricultural inputs. The article also investigates the complementarity of the two types of trade.

Keywords: Agricultural inputs, agricultural trade, input trade, Latin America.

Latin American agricultural trading patterns have undergone rapid change over the past two decades. In the 1970's, imports of both agricultural goods and inputs rose as urban populations grew and fertilizer-intensive commercial farming techniques replaced traditional farming techniques. In the 1980's, this increase in agricultural imports slowed as the world entered a recession and as Latin American countries found themselves in the midst of an economic crisis brought on by excessive international debt.

With the advent of the 1990's, these countries fear that their agricultural trade may be hindered by their exclusion from the large trading blocs now developing in their traditional export markets. The advent of protectionist trading blocs has led some Latin American countries to emphasize the future of input trade, in the belief that it will substitute for output trade and preserve overall economic gains from trade. [1]

This article reviews Latin America's agricultural trade over the past two decades, with an emphasis on the rapidly growing trade in agricultural inputs. It illustrates the growth of imports of agricultural inputs by Latin American countries in the 1970's and the subsequent slowing of this growth. Latin American agricultural input trade is then compared with the region's agricultural output trade over the past two decades.

General Trends

The value of all agricultural inputs imported by Latin American countries increased steeply from 1968 until the 1980's. This impressive rise could be attributed to increased use of high-yielding grain varieties that are relatively input-intensive. The advent of the debt crisis in the early 1980's, which limited the capacity of Latin American countries to spend foreign exchange, coincided with an equally impressive decline in agricultural input imports.

Figure A-1a
Imports of Agricultural Inputs Latin America

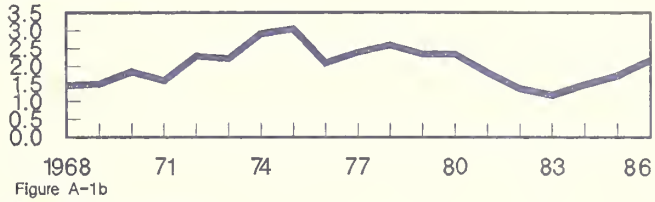
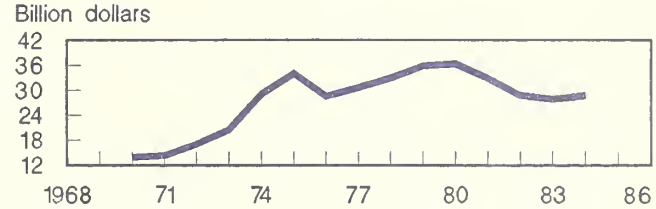


Figure A-1b
Rest of World



As a basis for analysis of these trends, import values of fertilizers, pesticides, harvesters, and tractors were added for each of 16 Latin American countries from 1968 to 1986 (see box).[2] The country data were then added to obtain total value figures for the region. The input import values were deflated using a Latin American index of import unit value for all imports.[3]

Latin American imports of agricultural inputs rose rapidly from a real value of $1.4 billion in 1968 to almost $3.1 in 1975, falling and then recovering to a real value of $2.5 billion in 1978 (fig. A-1a). This was followed by a sharp decline to almost $1.1 billion in 1983. Beginning in 1984 and continuing to the end of the study period, there was a gradual increase in the real value of Latin America's imports of agricultural inputs.

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[1] On the other hand, if the GATT negotiations succeed in liberalizing world trade, there could be a significant growth in Latin American agricultural exports. Generally, if input trade complements (substitutes for) output trade, then imports of inputs may be expected to rise (fall).

[2] Data from Panama were excluded because that country serves as a trans-shipment zone. Data from Nicaragua and Cuba were also excluded because both countries have faced trade embargoes over the period of analysis.

[3] All data in the following analysis, including figures and tables, are given in constant 1985 dollars.

Figure A-2
Latin American Fertilizer Use

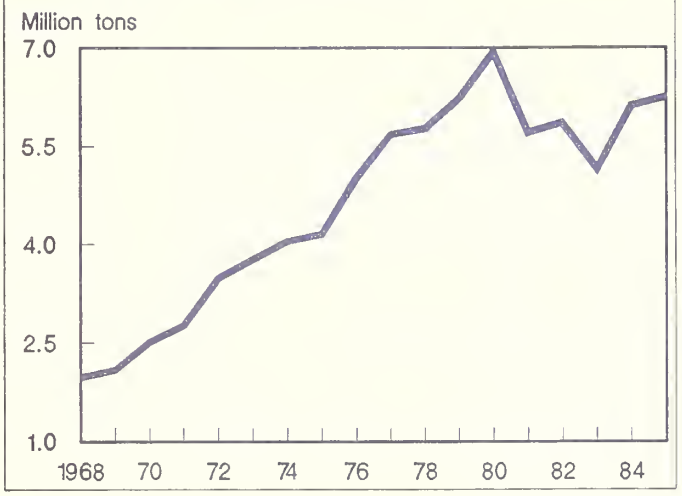
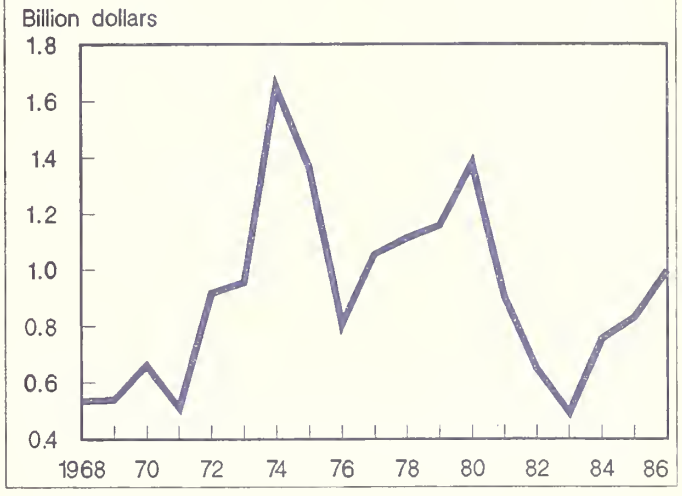


Figure A-3
Latin American Fertilizer Imports



In constrast, imports of agricultural fertilizers, machinery, and pesticides for the rest of the world rose, in real 1985 value terms, from approximately $13.8 billion in 1970 to $36 billion in 1980 (fig. A-1b). There was less of a fall in imports of the rest of the world's inputs in 1975 than was the case in Latin America. Also, the rest of the world's real value of input imports fell 20 percent from 1980 to 1982. In contrast, the real value of Latin America's imports of inputs fell 54 percent over these years.

Agricultural Input Use

Farmers' adoption of high-yielding, fertilizer-intensive grain varieties was a significant factor in increasing imports of agricultural inputs by Latin American countries in the 1970's. Yet farmers in many of these countries often faced budget constraints which could have prevented large increases in fertilizer use. To overcome these constraints, many Latin American countries offered subsidies to fertilizer users. The most commonly used subsidies were interest-rate ceilings on loans for fertilizer.

Interest-rate ceilings were in effect in Brazil, for example, where Santana (*8*) found that, when combined with Brazil's high inflation rate, they meant that producers paid negative real interest rates for credit to buy fertilizer. Subsidies such as these, combined with the growth of high-yielding, fertilizer-intensive varieties of grain, encouraged widespread use of chemical inputs.

Fertilizer consumption for Latin American countries exhibits a pattern similar to that of imports of agricultural inputs from 1968 to 1975 and from 1977 to 1985 (fig. A-2). Fertilizer consumption rose rapidly from 1968 until 1980 and then fell. It began to recover in 1984. The pattern for fertilizer is not as pronounced as it is for the value of imported agricultural inputs, but it does demonstrate that, to a large extent, the fluctuations since 1980 in figure 1 arose from changes in the quantities of inputs used. Fertilizer consumption numbers also indicate that the 1976 decline in the dollar value of imported inputs can be attributed to factors other than fertilizer consumption, such as declines in fertilizer prices or the value of the dollar relative to Latin American currencies.

Figure A-3 illustrates the changing value of fertilizer imports for the 16 countries. First note that the pattern of fertilizer imports is similar to total imported inputs. The real value of fertilizer rises steeply until 1974, when it falls, recovers quickly, and then falls dramatically again in the 1980's with the advent of the debt crisis. The decrease in fertilizer imports in the 1980's may be attributed to a cutback in subsidies. For example, in the early 1980's, when international and domestic debt reached intolerable levels, Brazil raised the interest rate paid for fertilizer loans.

Latin American countries have not directly subsidized pesticide and machinery as extensively as they have fertilizer use. Figure A-4 shows that pesticide imports followed a pattern similar to fertilizer imports, rising from a real value of $240 million in 1968 to a peak of nearly $500 million in 1978, and then dramatically falling to $280 million in 1982. Unlike fertilizer imports, however, pesticide imports had almost completely recovered their peak by 1986.

The contrast between the response of fertilizer and pesticide imports to Latin America's foreign-exchange constraints in the 1980's most likely reflects differences in subsidy policies. In general, pesticide use was not as heavily subsidized as fertilizer use in the 1970's. Therefore, the structural adjustment policies undertaken by many Latin American countries in the wake of the debt crisis had less of an impact on pesticide subsidies. While pesticide imports did fall dramatically after 1978, there was little change in government policies among the 16 countries that limited pesticide imports for a sustained period.

Figure A-5 illustrates changes in the value of harvester and tractor imports. Agricultural machinery is used on large grain crops and is purchased when future grain revenues are expected to rise. Agricultural machinery, unlike fertilizers and pesticides, is considered a capital good, which is not purchased on a regular basis by individual farmers. In other words, individual farmers purchase agricultural machinery not only on the basis of expected income and output and machinery price, but also on the basis of expected depreciation of existing machines.

These factors could produce a different demand pattern for agricultural machinery than for nondurable inputs. Yet, remarkably, the data show that the value of imports of agricultural machinery follows very closely the pattern found for fertilizers. There is a steep rise until 1975, followed by a short 2-year drop and a modest recovery, followed by a prolonged drop during the debt crisis, and then a sharp recovery.

Figure A-4
Latin American Pesticide Imports

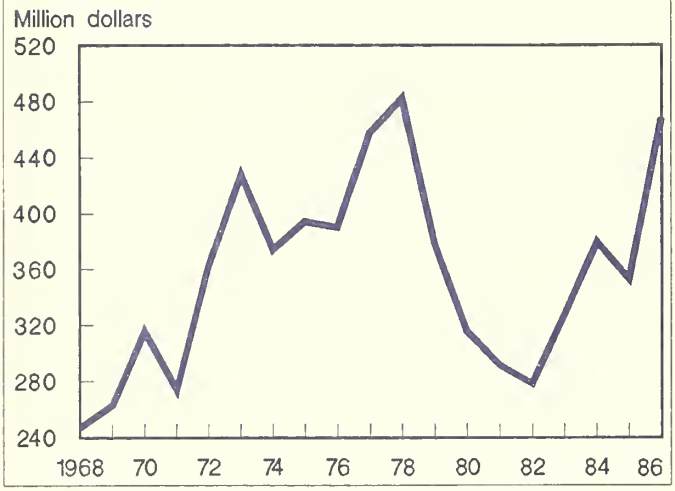
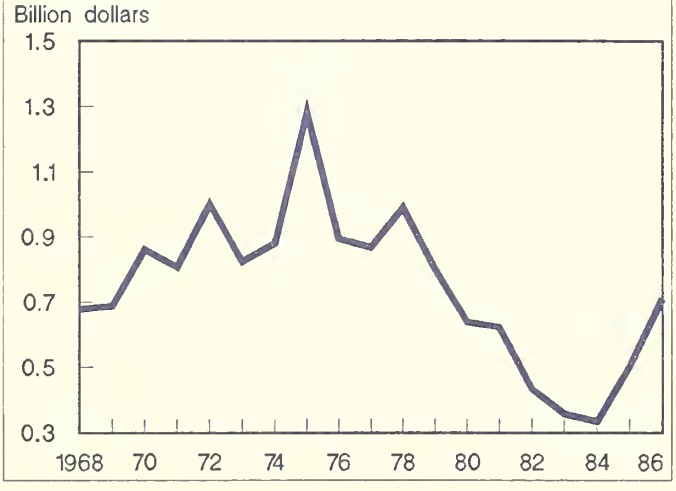


Figure A-5
Latin American Agricultural Machinery Imports



In fact, as expected, these import trends are more pronounced for machinery than for fertilizers and pesticides. Demand for durables is typically more price-elastic and income-elastic because producers can use old (depreciated) machines until conditions are favorable for a purchase.

The above data imply large increases in purchases of agricultural inputs throughout Latin America in the 1970's, followed by either stagnation, or a fall, in value. During the debt crises of the 1980's, foreign-exchange shortages in the region constituted a critical channel through which conditions outside the agricultural sector influenced agriculture.

Magnitude and Growth of Input and Output Trade

A comparison of the magnitudes and relative growth rates of Latin American input and output trade clearly shows that countries of the region were net exporters of agricultural goods and net importers of agricultural inputs in both the 1970's and 1980's. It also appears that the debt crisis had less of an effect on imports of agricultural inputs than it did on imports of agricultural goods.

Several important points emerge from a comparison of growth in agricultural input and output trade (tables A-1 and A-2). First, the real value of Latin American trade in both agricultural goods and agricultural inputs increased significantly from 1968 to 1979. Estimated compounded growth rates for imports of agricultural goods over this period reached as much as 11 percent annually for Mexico. Estimated compounded growth rates for imports of inputs reached almost 14 percent annually for Venezuela. Growth rates of exports of agricultural goods reached as much as 14 percent annually for Bolivia. Estimated growth rates for exports of inputs reached as much as 41 percent annually for Brazil. Overall, these growth rates are high and indicate a rapid expansion in agricultural trade in Latin America from 1968 to 1979.

Table A-1--Growth rates of imports of agricultural goods and inputs

Country	Agricultural goods				Agricultural inputs			
	Ratio	68-86	68-79	80-86	Ratio	68-86	68-79	80-86
	Ratio 1/	---Percent 2/----			Ratio 1/	---Percent 2/---		
Argentina	0.8	-2.3	0.27	-8.47	1.6	3.1	3.79	-0.4
Bolivia	0.7	-3.0	3.04	-4.28	2.6	4.0	11.32	4.3
Brazil	1.6	2.6	6.52	-2.09	0.6	-5.6	5.26	-12.0
Chile	0.8	-3.0	0.57	-9.18	0.7	-3.2	-4.32	1.7
Colombia	1.8	3.8	4.88	-2.99	1.2	1.9	1.09	2.6
Costa Rica	0.8	-2.2	1.14	-4.54	1.0	-1.0	4.64	-0.2
Dominican Rep.	1.5	1.8	4.75	-0.45	1.1	1.8	3.98	-9.4
Ecuador	1.7	2.7	8.36	-0.41	2.8	6.3	9.52	11.2
El Salvador	1.2	1.6	2.53	-0.47	0.8	-2.2	2.19	11.2
Guatemala	0.7	-1.7	0.44	-6.95	1.3	0.4	6.41	1.9
Honduras	0.9	-0.4	0.71	-3.36	0.9	0.6	3.26	-5.0
Mexico	3.8	7.7	11.18	-2.04	1.3	1.3	4.91	6.0
Paraguay	1.4	3.6	7.90	-0.07	2.5	7.6	8.54	0.1
Peru	0.8	-1.3	-2.60	-0.07	1.0	-0.3	4.50	-5.4
Uruguay	0.6	-4.6	-3.17	-6.56	1.6	1.5	8.39	-4.6
Venezuela	1.7	4.0	9.07	-4.72	2.2	3.2	13.86	0.6

1/ Ratio of 1984-86 average value to 1968-70 average value. 2/ Annual growth rates over period indicated estimated by regressing natural log of data on time.

Source: (5).

Table A-2--Growth rates of exports of agricultural goods and inputs

Country	Agricultural goods				Agricultural inputs			
	Ratio	68-86	68-79	80-86	Ratio	68-86	68-79	80-86
	Ratio 1/	---Percent 2/----			Ratio 1/	---Percent 2/---		
Argentina	1.3	1.6	3	2.1	0.7	-4.1	17	-7.1
Bolivia	1.2	-0.1	14	-9.3	NA	0.0	0	0.0
Brazil	1.6	1.7	5	3.2	46.0	25.0	41	-2.2
Chile	3.3	8.6	11	4.2	5.1	3.8	15	4.1
Colombia	1.6	2.4	5	6.3	7.4	8.7	17	5.4
Costa Rica	1.2	0.6	4	4.7	0.9	-0.8	11	-10.2
Dominican Rep.	0.7	-3.1	2	-3.9	0.2	-8.2	-5	3.8
Ecuador	1.5	1.7	5	6.4	3.9	5.9	24	-15.4
El Salvador	1.0	-0.2	7	-1.1	0.2	-12.5	-1	-3.9
Guatemala	1.2	0.6	6	0.4	17.0	16.6	26	7.2
Honduras	1.4	2.3	2	5.4	0.0	0.0	0	0.0
Mexico	1.0	-0.9	1	0.9	0.5	-7.4	-9	3.9
Paraguay	1.8	2.7	7	7.0	NA	0.0	0	0.0
Peru	0.3	-8.3	-6	-4.2	1.6	0.4	14	6.0
Uruguay	1.1	0.7	-2	0.7	1.1	-1.2	6	25.8
Venezuela	0.7	-4.7	-2	11.8	2.8	6.9	18	-7.7

1/ Ratio of 1984-86 average value to 1968-70 average value. 2/ Annual growth rates over period indicated estimated by regressing natural log of data on time.

Source: (5).

Secondly, the debt-crisis years seem to have had a more consistent impact on imports of agricultural goods than on imports of agricultural inputs. The 1980-86 estimated growth rates of imports of agricultural goods were negative for every Latin American country reported (table A-1). However, the estimated growth rates of agricultural input imports were negative for only 7 of the 16 countries.

These results are surprising because many Latin American countries protect their fertilizer and chemical industries through tariffs and import quotas. It would be expected that a protected industry would be developed to the point that countries could withold imports of agricultural inputs if they faced foreign-exchange shortages. However, measures adopted to protect domestic fertilizer and chemical industries could have been offset by government subsidies for users of agricultural inputs. As already noted, credit, fertilizer, and gasoline subsidies were common in Brazil, Mexico, and many other Latin American countries throughout the 1970's and early 1980's.

Imports of Agricultural Goods

Table A-1 illustrates that Latin American imports of agricultural goods (mainly food) increased dramatically from 1968 to 1986. Mexico experienced the most dramatic increase. The average 1984-86 real value of Mexico's imported agricultural goods was nearly 4 times as large as the 1968-70 average. There also were large increases of imported agricultural goods in the other major oil-producing nations. Venezuela's and Ecuador's average 1984-86 real values of imports were 1.7 times as large as their 1968-70 average. Countries earning considerable foreign exchange, such as Brazil and Colombia, also had large increases in food imports. Bolivia, Guatemala, Honduras, and Peru had the smallest increases. These four countries have a high percentage of subsistence farmers who use few commercial inputs.

The debt crisis appears to have had a major impact on imports of agricultural goods in Latin America. Whereas estimated growth rates of imports are negative for only two countries over the 1968-79 period, all estimated growth rates for all countries in the region were negative from 1980 to 1986. Factors other than debt, such as the rising value of the dollar, may have played a role in reducing imports of agricultural goods. Mexico and Venezuela, oil-exporting countries which lost revenues from the fall in oil prices, had the most dramatic changes in growth rates between the two decades. Mexico's estimated rate of growth of agricultural imports fell from approximately 11 percent annually to less than -2 percent annually. Venezuela's fall was even more dramatic.

Imports of Agricultural Inputs

Table A-1 also illustrates the rapid rise in imports of agricultural inputs in Latin America. The real value of imports of inputs increased over 200 percent between 1968 and 1986 in Bolivia, Ecuador, Paraguay, and Venezuela. Brazil's real value of imports of inputs grew over 5 percent annually from 1968 to 1979, and then fell dramatically from 1980 to 1986. In general, estimated compounded annual growth rates for imports of agricultural inputs were high and positive for all countries except Chile from 1968 to 1979.

However, the impact of the debt crisis on agricultural inputs was quite different for each Latin American country. As previously stated, estimated growth rates turned negative for 7 out of 16 countries. However, Mexico's estimated 1980-86 growth rate of imported inputs is higher than its 1968-79 growth rate, even though Mexico was considered to be one of the most heavily indebted Latin American countries. Similarly, Ecuador's and Salvador's growth rates rose in the later time period.

Agricultural input imports are broken down into three categories: fertilizers, pesticides, and machinery (table A-3). Machinery imports apply only to harvesters and tractors and do not include imports of other farm equipment.

As a share of the value of agricultural input imports, fertilizer maintained a steady gain, reaching roughly 50 percent of the total value in 1980-85. Much of that gain throughout the region was at the expense of machinery imports. Imports of pesticides showed some gain during 1980-85. Much of the regional trend in agricultural imports reflects the patterns in Mexico and Brazil, the largest and most industrialized economies.

Table A-3--Breakdown of input imports

Input	1968-73	1974-79	1980-86
		Percent	
Fertilizer	38.0	46.4	50.5
Agricultural machinery	44.4	37.3	29.8
Pesticides	17.6	16.3	19.7

Source: (5).

Table A-4--Exports of agricultural inputs

Country	Fertilizers			Pesticides			Machines		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
	Percent								
Argentina	89.9	94.2	60.9	3.6	0.3	13.3	6.6	5.5	25.7
Bolivia	na	na	na	na	na	na	na	na	na
Brazil	65.6	79.3	68.4	7.4	4.0	7.2	27.0	16.7	24.5
Chile	1.7	0.0	0.0	94.8	96.2	94.7	3.5	3.8	5.3
Colombia	7.5	9.1	4.2	35.6	13.8	4.4	56.9	77.1	91.4
Costa Rica	1.4	1.5	1.4	80.6	60.1	46.4	18.0	38.5	52.2
Dominican Rep.	0.1	0.0	0.0	99.6	99.2	99.8	0.3	0.8	0.2
Ecuador	0.0	0.0	na	0.0	0.0	na	100.0	100.0	na
El Salvador	1.1	3.8	6.5	54.2	57.9	0.4	44.6	38.3	93.1
Guatemala	3.6	0.2	0.0	17.6	17.5	14.8	78.8	82.3	85.2
Honduras	0.0	0.0	0.0	40.9	1.9	0.0	59.1	98.1	100.0
Mexico	10.6	7.4	1.5	71.3	66.1	71.2	18.1	26.5	27.3
Paraguay	na	na	na	na	na	na	na	na	na
Peru	43.6	10.4	0.0	7.2	17.7	1.5	49.2	71.9	98.5
Uruguay	26.2	0.0	0.0	58.6	89.4	82.0	15.2	10.6	18.0
Venezuela	48.0	9.8	3.3	35.3	85.8	94.3	16.7	4.3	2.4

na = Not available. Note: (1) = 1968-73; (2) = 1974-79; (3) = 1980-86 (annual averages).

Source: (5).

Exports of Agricultural Goods

Exports of agricultural goods registered the largest absolute gains in Latin American agricultural trade over the 1968 to 1986 period. For example, Argentina's agricultural goods exports grew by $1 billion, on average, from 1968-72 to 1980-86. Brazil's grew even more, by $2 billion, over the same period. However, Chile, a country well known for its export-oriented trade policy, stands out as being the only Latin American country in which the real value of agricultural exports increased over 100 percent. The average real value of Chile's 1984-86 exports of agricultural goods was over 3 times that of 1968-70.

The debt crisis of the 1980's did not appear to dampen exports of agricultural goods. (This is remarkable given the large decline in imports of agricultural inputs.) Estimated growth rates were negative for only four countries. One of these, El Salvador, experienced a high degree of political instability in the period. Peru's exports continued their downward path inherited from the 1970's.

In 1980, Bolivia faced a major economic crisis that included factors beyond economic debt. The most interesting case, however, is Venezuela. The average level of agricultural exports for 1980-86 was above the 1973-79 level, but the growth rate for these exports was significantly higher in the later period. This reflects the collapse of agricultural exports from Venezuela between the two periods.

Exports of Agricultural Inputs

Only Chile and Mexico exported a significant amount of agricultural inputs in the late 1960's. In the 1970's, exports of agricultural inputs increased dramatically in Brazil, Colombia, Ecuador, Guatemala, and Venezuela, only to decline during the crisis years of the 1980's.

Despite this growth in exports of agricultural inputs in several Latin American countries, revenues from exports of agricultural inputs are only a fraction of expenditures on imported agricultural inputs. While input exports peaked in 1981 at approximately $400 million, imports of agricultural inputs totalled over $2 billion.

The few countries that exported agricultural inputs in 1968-73 tended to concentrate on one type of input (table A-4). Argentina exported fertilizers, Chile, Costa Rica, and Dominican Republic exported pesticides. Only Brazil diversified by exporting both fertilizers and machines. This specialization remained from 1968 to 1986 in all countries except Argentina, which diversified over the later two periods, 1974-79 and 1980-86.

Relationship of Input and Output Trade

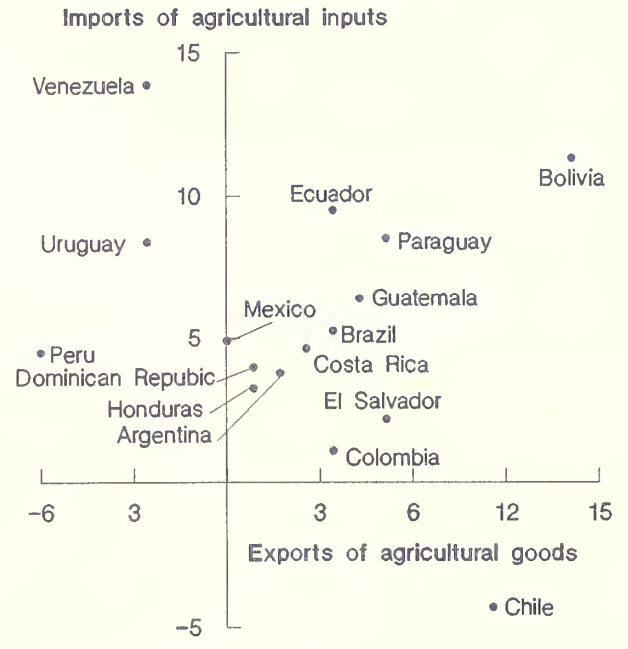
This article has shown a large growth of agricultural trade in Latin America from 1968 to 1979, followed by a more stagnant agricultural trade pattern in the 1980's. As the 1990's begin, Latin American agricultural policymakers have two major concerns. First, they fear that there will not be enough investment to ensure growth of capital-intensive, export-oriented agricultural industries. Second, they fear that trading blocs emerging in Europe and North America may erect trade barriers which will exclude Latin American countries from their most lucrative market.

It has been argued by several Latin American economists and agricultural policymakers that, if these trading blocs do emerge in the 1990's, Latin American countries should rely to a greater extent on trade in agricultural inputs to maintain the gains of agricultural trade. Such a belief implicitly assumes that trade in agricultural inputs substitutes for trade in agricultural goods.

Economists disagree on whether input trade will substitute for or complement output trade. Mundell showed that if output trade is restricted, inputs will be traded to the extent that losses from trade restrictions will be wholly offset by the increased trade in inputs (*7*). A critical assumption of Mundell's work is that technology is the same across countries, but factor endowments are different across countries. Markusen took a similar approach but assumed technology, rather than factor endowments, differed across countries (*6*). He showed under this assumption that input and output trade were complements.

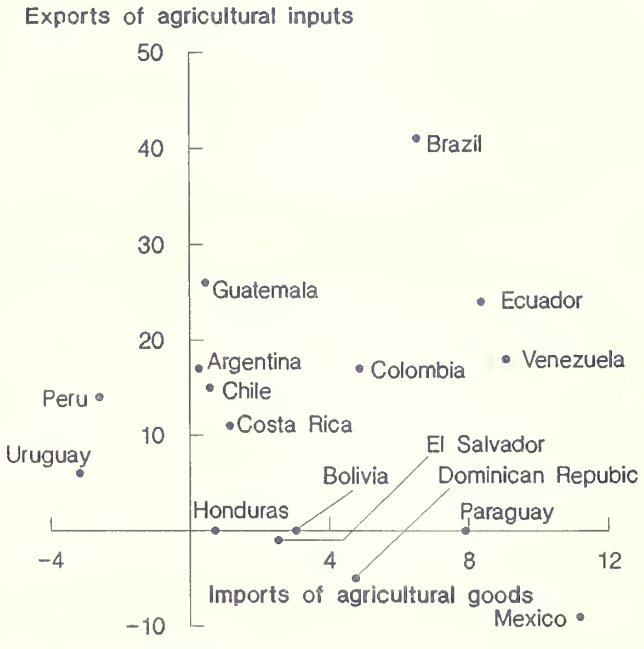
In an effort to identify a significant relationship between input and output trade, figures A-6 and A-7 were plotted for each country's growth rate over 1968-79 for imports (exports) of agricultural inputs against exports (imports) of

Figure A-6
Relationship Between Imports of Agricultural Inputs and Exports of Agricultural Goods



Note: Numbers on axes represent average annual growth rates, 1968–79.
Source: Table A–1 and A–2.

Figure A-7
Relationship Between Exports of Agricultural Inputs and Imports of Agricultural Goods



Note: Numbers on axes represent average annual growth rates, 1968–79.
Source: Table A–1 and A–2.

agricultural goods. (Growth rates after the debt crisis are less useful indicators of such a relationship because trade exhibited severe instability, falling and then rising, in the latter period.)

The countries lie along several northeast-to-southwest diagonals in figure A-6, indicating a complementary relationship between input trade and output trade. However, Chile lies far off any diagonal. The upper half of figure A-7 supports a complementary relationship. A few countries with negative growth rates for exports of agricultural inputs appear to indicate a substitute relationship. Because exports of agricultural inputs grew from a small base in 1968, however, the estimated growth rates in figure A-7 may be less stable and dependable than those in figure A-6.

Though formal testing is required to determine whether input trade and output trade complement each other, the above patterns suggest that the Latin American boom in agricultural input trade in the 1970's did indeed complement a growing trade in agricultural goods. Such a complementary relationship has major implications for Latin American agricultural trade and trade policy for the 1990's.

First, it implies that Latin American nations cannot expect to use input trade to offset any losses arising from increased protectionism. This should further the effort by these countries to pursue free trade policies. Second, it implies, if GATT policies are successful in reducing trade barriers in agricultural goods, then Latin American trade in agricultural inputs which thrived in the 1970's should continue to thrive into the 1990's.

Conclusion

This article reviews and analyzes the evolution of Latin American trade in agricultural inputs and outputs from 1968 to 1986 and documents a large increase in both over the 1968-79 period. The data showed this trade declining in the early 1980's and growing slowly in the late 1980's. Latin American countries are found to be major exporters of agricultural goods, but they are importers of agricultural inputs. The data also indicate that, during the slower trading years of the early 1980's, some Latin American countries continued to increase their imports of agricultural inputs but did not increase imports of agricultural goods.

Policy decisions in the coming decade may have a major impact on the amount and composition of agricultural trade in Latin America. A widely held view in Latin America is that the newly formed trading blocs will limit imports of Latin American agricultural goods and that the Latin American countries should increase net exports of agricultural inputs. However, the information in this article indicates that Latin American countries have a long way to go before becoming net exporters of agricultural inputs. Yet, rapid increases in input exports by countries such as Brazil show that at least some Latin American countries have the potential to be net exporters of agricultural inputs.

Method Used

The values of imports of fertilizer, pesticides, and agricultural machinery were summed to obtain the total value of imports of agricultural inputs for 16 individual Latin American countries. Import data were obtained from the IICA Program I data base (SIAPA) (*5*). To obtain the traded value of agricultural imports (exports) the value of food imports (exports) was added to the value of cotton, tobacco, and wool imports (exports). The data were then deflated by an index of Latin American unit import values. (For analysis of the rest of the world, data were deflated by the Consumer Price Index.)

Trade within Latin America was not netted out.

Three periods were chosen for the analysis. They are the pre-OPEC period from 1968 to 1973, the surplus petrodollar years from 1974 to 1979, and the debt-crisis years of 1980 to 1986.

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Adjustment in Trade: The Case of Japanese Textiles

by

Fawzi A. Taha*

Abstract: Japan's textile trade has shifted from importing raw fibers to importing intermediate and finished goods. Exports of fabrics and finished goods have declined but increasingly consist of specialized top-quality cotton and man-made products. Japanese competitiveness is unlikely to improve unless the industry develops technologically advanced, labor-saving textile production methods to overcome high labor costs.

Keywords: Japan, textile trade, trade adjustment, competitiveness.

Japanese textile production and trade have changed substantially since the industry's rebirth following World War II. After accelerating rapidly and resuming international trade on a competitive basis, the Japanese textile industry was set back in the early 1970's by high labor costs, a strong currency, and international competition. Technological advances and rationalization programs initiated by the industry, and assisted by the Government, strengthened and revitalized the sector's competitiveness in the mid-1970's. By the early 1980's, however, trade in textiles again suffered as Japan faced a series of input price increases which followed the second oil crisis—renewed currency appreciation, world recession, and strong competition from other low-cost exporters in Asia (*6*).

The textile industry realized that it had lost its comparative advantage in most textiles and recognized the need for structural adjustments by shifting resources to other economically viable production activities. The adjustments targeted three major objectives: reducing excess capacity in Japan, shifting production to higher-value products, and diversifying into nontextile businesses (*5*). To achieve these objectives, the industry cut its workforce and production capacity, moved production of lower-valued textile products to subsidiaries in low-wage countries, modernized the remaining textile plants, and diversified at home. Textile manufacturers also started an "emigration" policy of increasing investment in the textile industries of countries having lower costs (*8*).

A turning point became evident in 1984. The Japanese textile industry failed to meet expanding domestic demand which was spurred by a strong economic recovery as well as a switch in consumer preference toward natural fiber clothing. Domestic demand for fashionable items rose, but production remained virtually unchanged from the previous year. Imports of textiles consequently soared 29 percent in value and 33 percent in volume. Since 1984, the global competitiveness of Japanese textile mills has continued to deteriorate and profit margins have seriously declined (*3*). Finally, the strong appreciation of the yen vis-a-vis the U.S. dollar since the fall of 1985 compounded the damage, and made it attractive for many Asian producers to increase textile shipments to Japan.

Japanese textile products also became more expensive to sell abroad, except for high-quality and very specialized items like composite polyester filament materials, linen-cotton fabrics, and polyester-rayon blends. Between 1984 and 1988, exports of textiles declined by 45 percent in value terms. The aggregate result was an unprecedentedly sharp deterioration in the textile balance of trade.

Trade Analysis of Japan's Textile Industry Since 1969

The share of textiles in Japan's trade has been declining for the past four decades (fig. B-1). Rapid growth in overall industrial capacity has caused Japan's total commodity exports to increase faster than textile exports. In 1969, exports of textile goods accounted for 13.7 percent of total exports, down from 47 percent in 1950. They decreased to 4.8 percent in 1980, and only 2.5 percent in 1988 (*7*).

Adjustment in Japan's textile industry has affected the commodity composition of trade and fostered a smooth transition from imports of predominantly raw fibers to value-added textiles (fig. B-2). In percentage terms, the change is even more dramatic. From 1969 to 1988, the share of raw fiber imports declined from 82.2 to 25.3 percent of Japan's total textile imports, while imports of finished goods climbed from 6.0 to 52.4 percent (fig. B-3).

The decrease in imports of raw fibers and the increase in imports of textile items were signs of a growing comparative disadvantage for the Japanese spinning, weaving, and apparel industries. Currently, it is less expensive to import selected intermediate and finished products than to manufacture them locally from imported fibers.

In 1969, Japan's total textile trade (imports plus exports) amounted to 1.2 trillion yen ($3.3 billion), with exports

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Figure B-1
Imports and Exports of Textiles in Japanese Trade

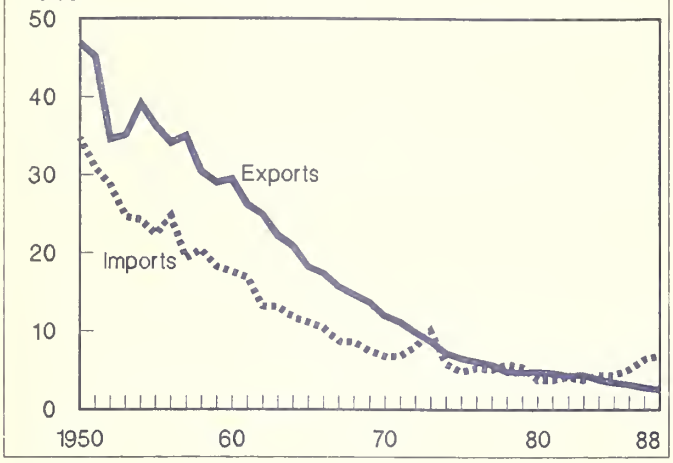


Figure B-2
Japan's Textile Imports, 1969-88

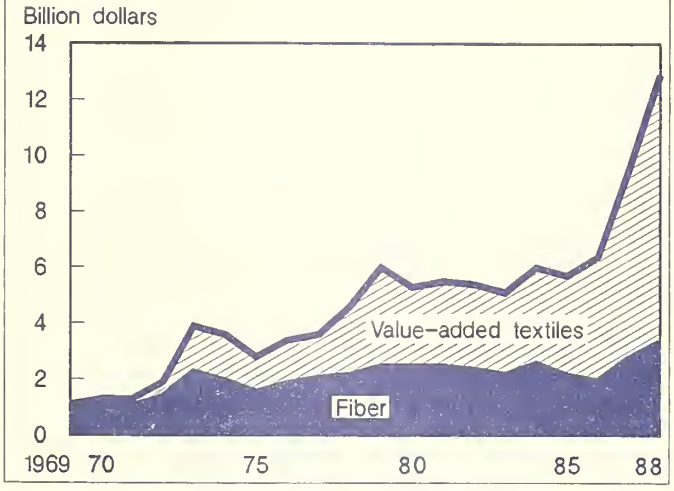
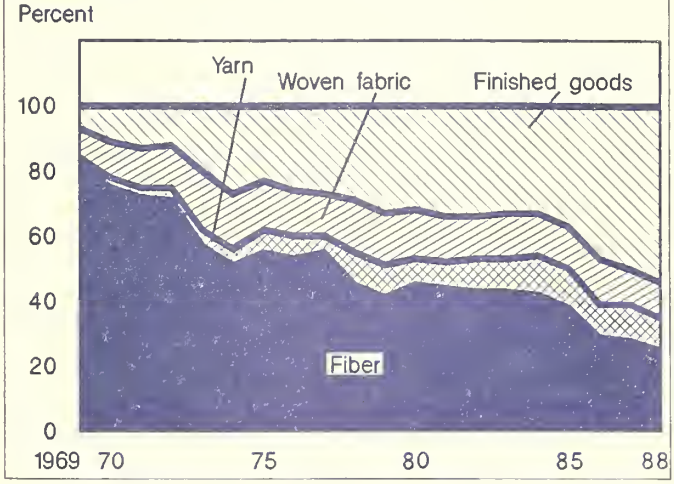


Figure B-3
Composition of Japan's Textile Imports, 1969-88



exceeding imports by 94 percent. In 1988, trade stood at 2.5 trillion yen ($19.5 billion), but imports exceeded exports by a margin of nearly 2 to 1, indicating the sharpest trade deficit in the history of the Japanese textile trade (fig. B-4).

Textile trade can be divided into four main subsectors or groups of commodities: textile fibers (raw materials), yarn, woven fabrics, and finished goods (over 80 percent clothing). These subsectors account for over 95 percent of total trade. The remaining 5 percent consists of knitted fabrics and products made from linen, hemp, jute, and ramie. The pattern of trade adjustment of these four main subsectors over the last 20-year period is analyzed below.

Japan's Trade of Textile Fibers

Japan produces no cotton and depends totally on imports. Raw cotton accounted for 45 percent of total fiber imports in 1969, followed by wool fiber at 42 percent, with silk, rayon and synthetic fibers making up the rest. The United States is Japan's largest supplier of raw cotton, providing 43 percent of Japanese imports in 1989, down from 53 percent in 1984 due to increased competition from countries such as Australia, Pakistan, and China. The value of Japan's natural fiber imports decreased by 29.3 percent between 1984 and 1988.

Being poor in natural raw fibers, Japan primarily exports synthetic and rayon fibers. Synthetic fibers account for nearly two-thirds of the total, while rayon exports account for most of the rest. Exports of silk and wool fiber are minimal. Over the past two decades, Japan's comparative disadvantage in textile fibers could be traced in two ways: a fall in imports of natural fibers (raw cotton, wool, and silk), and a decline in exports of manmade fibers to the rest of the world. From 1984 to 1986, Japan's cotton fiber imports declined by 57 percent in yen value, wool by 35 percent, and exports of manmade fibers (rayon and synthetics) declined by 23 percent. The trade balance of synthetic and rayon fibers is still in surplus.

Japan's Yarn Trade

Cotton yarn imports increased from 10 percent of the total value of imported yarns in 1969 to over 50 percent in 1988. In the import-surge year of 1984, cotton yarn imports soared by 92 percent compared with the previous year. After retreating in 1986, cotton yarn imports surged by 46 percent (in value terms) between 1986 and 1988 (fig. B-5). The later increase was due to appreciation of the yen in 1985 which widened the gap between domestic and world prices, making imports more attractive for local textile manufacturers. The flood of imported cotton yarn added substantially to the damage already inflicted by 1984's import surges of cotton textile and apparel on Japan's spinning mills. The main suppliers of cotton yarn—Pakistan, South Korea, and China—accounted for nearly 90 percent of total cotton yarn imports in 1988.

Figure B-4
Japan's Textile Trade Balance, 1950-88

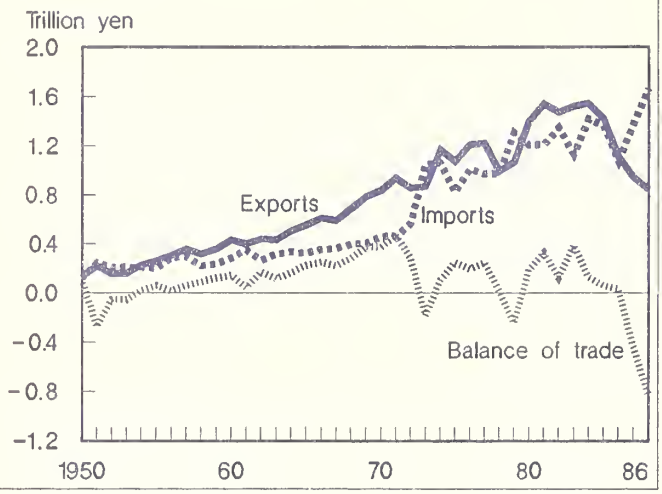
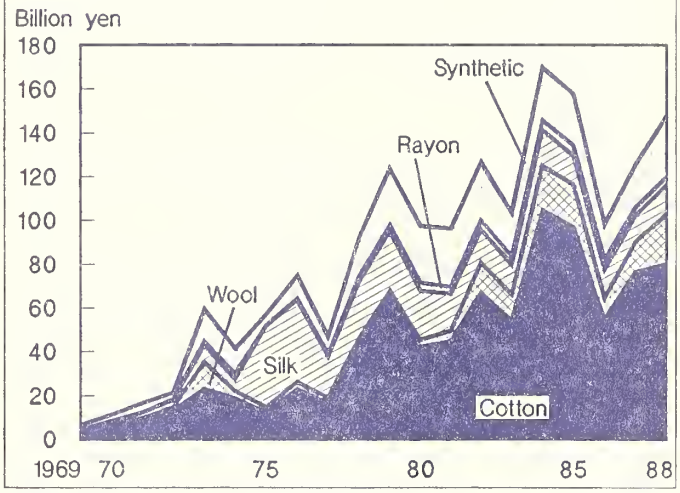


Figure B-5
Japan's Yarn Imports



During the 20-year period (1969-1988), synthetic yarn imports increased from 2,251 to 70,423 tons, with most yarn originating in Taiwan and the United States. Wool and silk yarn imports were up from 592 and 935 tons to 9,721 and 2,744 tons, respectively, over the same period.

On the export side, synthetic and rayon made up over 77 percent of Japan's 1969 yarn exports; wool yarn, 20 percent; and cotton yarn, less than 1 percent. From 1984 to 1988, total yarn exports plummeted 50 percent; cotton yarn dropped by nearly 42 percent, and synthetic yarn by 51 percent (fig. B-6). The yarn trade balance had shown a persistent surplus due to exports of synthetic and rayon yarn, but it showed a deficit of 34 billion yen in 1988—the first deficit in 20 years.

Japan's Fabrics Trade

Imports of woven fabrics increased tenfold to 1.1 billion square meters between 1969 and 1988; those of woven cotton fabric soared from 41 to 689 million square meters; synthetic fabric from 4 to 297 million square meters, with about half of the rise occurring since 1985. Imports of wool fabric increased in volume, but silk fabric imports decreased. From 1969 to 1988, Japan's imports of all kinds of fabrics increased over fivefold, with the largest jump occurring in 1973 (fig. B-7).

Exports of woven fabrics became more important relative to other textile export items. They rose from 45 percent of Japan's total textiles sales in 1969 to 52 percent in 1988. Synthetic fabric exports were the predominant export item, increasing from 50 percent of total fabric exports in 1969 to 57 percent in 1988. Over the same period, the share of woven cotton fabric declined by one percentage point to 24 percent. Between 1984 and 1988, however, the value of cotton fabric exports declined by 38 percent, due to the yen's high value and price competition from other exporters (fig. B-8).

Woven fabric exports declined rapidly to 437 billion yen in 1988 after reaching a peak of 793 billion yen in 1983, with synthetic fabrics taking a 55-percent dive. The drop in synthetic fabric exports can be attributed to keen competition from South Korea and to the growing consumer preference for natural fiber products.

Japan's Finished Goods Trade

Imports of finished goods increased more than 36 times, from 24.2 billion yen in 1969 to 871.3 in 1988, while exports declined from 205.5 billion yen to 135.1 during the same period (fig. B-9). Following 1985's currency appreciation, import demand accelerated rapidly as imports became attractive due to decreasing import costs, coupled with increasing domestic labor cost.

Figure B-6
Japan's Yarn Exports

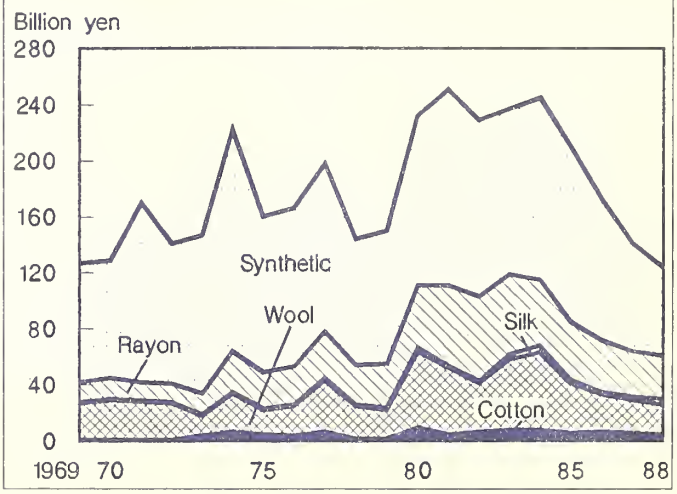


Figure B-7
Japan's Fabric Imports

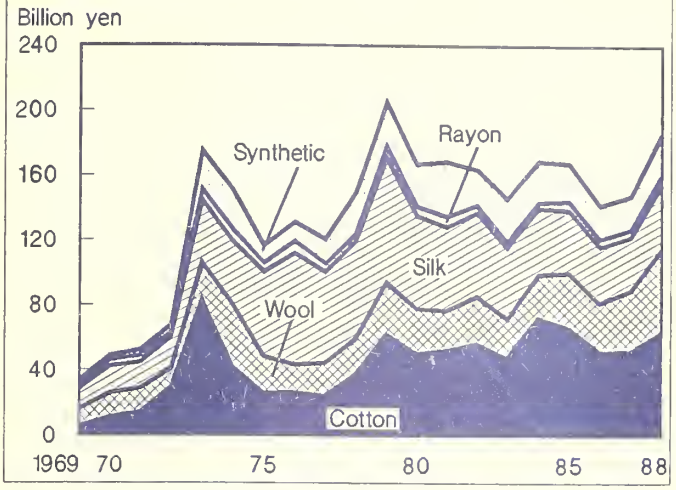
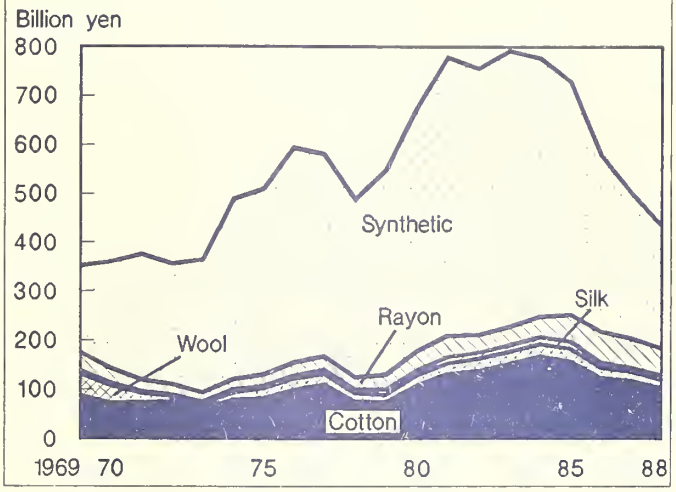


Figure B-8
Japan's Fabric Exports



The share of finished goods exports to all textile exports fell from 26 percent of total textile exports in 1969 to 16 percent in 1988. Since 1973, Japan's imports have exceeded exports, causing a small deficit in the trade balance of finished goods. However, the rapid upgrading in the value of the yen since late 1985 widened this gap by a large margin and deepened the deficit to 746 billion yen in 1988. The magnitude of this deficit caused an overall sharp deficit in Japan's textile trade balance in 1987 and 1988 (fig. B-10).

In 1988, South Korea, China, Taiwan, and Hong Kong shipped over 75 percent of Japanese imports of made-up goods, up from 63 percent in 1980. For a number of years, South Korea has been Japan's major single supplier, with a 26-percent share in 1980 and a 33-percent share in 1988. China's share of made-up goods rose from 19.5 percent in 1980 to 25 in 1988. The world's largest cotton producer, China encourages textile producers to export value-added textile products rather than raw cotton. China has low labor costs and has also benefited from Japanese technology. China took advantage of the rising Japanese demand for natural fiber clothing, while Japanese production was declining.

Implications of Trade Adjustment

Japan's industrial adjustment policy over the last 20 years has implications which can be applied to other countries, industries, and commodities. The lessons learned from Japan's textile adjustments are a direct application of the theory of comparative advantage in international trade: the Japanese industry gradually shifted away from products in which it had a growing comparative disadvantage. The domestic textile industry improved its profitability by restructuring production to emphasize quality over quantity, where its comparative advantage and international competitiveness remain.

Figure B-9
Japan's Trade in Finished Goods

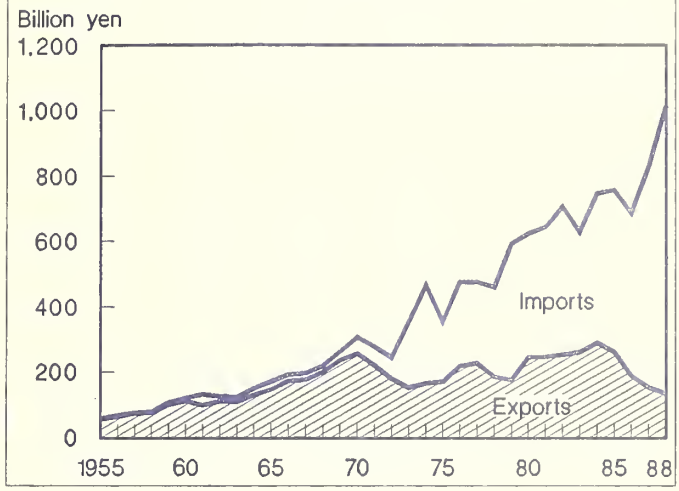
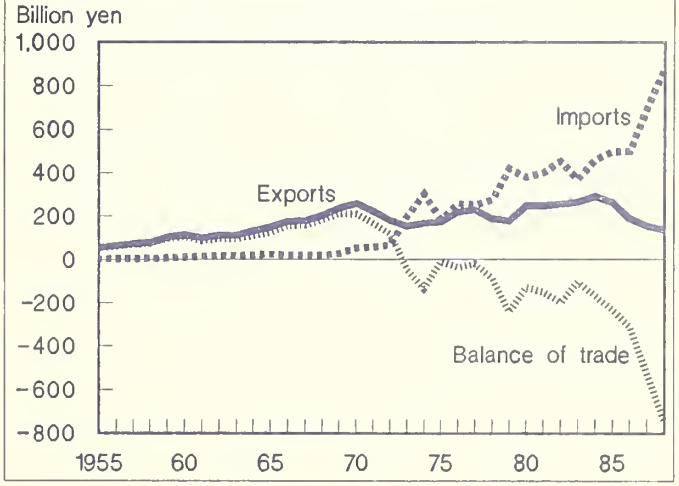


Figure B-10
Japan's Trade Balance for Finished Goods, 1955-88



For example, the industry targeted the high-grade textile markets of Europe, the United States, and oil-producing Middle Eastern countries. Adjustment required a substantial investment, principally in the stage of spinning and weaving. As a whole, however, shifting to quality did not improve the total value of textile exports, and the industry has had declining total sales in both domestic and international markets.

In the past, the Japanese Government's support for research and development has been significant, and has led to new technological innovations which have increased the sector's productivity (*4*). This partnership is likely to continue in the present situation posed by Japan's loss of competitive position in world textile markets. With government assistance, Japan's textile industry has intensified research to develop new processes and products that would revitalize its competitive position.

For example, Japanese engineers foresee the development of almost labor-free textile plants as their next strategic goal. Also, in a joint venture with the Government, the textile industry has started to develop the Automated Sewing System. If successfully completed, the new system would represent the first full automation of the clothing sector and would certainly revolutionize the whole industry and have a widespread impact on the world textile economy. Currently, however, no breakthroughs are expected before the turn of the century (*4*).

Meanwhile, until the Japanese textile industry overcomes its high domestic labor cost, the present trend of importing yarn, fabrics, and—most important—finished goods will continue. In addition, the Government has relaxed import restrictions on textiles as it seeks closer association with many Asian countries, particularly Korea, Taiwan, Hong Kong, and Singapore, by granting them access to the Japanese market.

This is considered to be a realistic approach and contrasts with the industry's immediate reaction following the import surge of 1984. At that time, the Japanese textile industry called on the Government to exercise import restrictions based on the "market disruption" principle of the Multi-Fiber Arrangement (MFA) initiated by GATT in 1961 (*6*).

The decline of Japan's textile industry and the willingness to continue importing from low-cost exporting countries are clear evidence of the sector's growing comparative disadvantage. As this trend advances in the future, import demand for raw cotton into Japan will continue to decline.

Table B-1--Value and share of Japan's textile imports, 1969-88

Year	Total	Fiber	Yarn	Fabric	Finished goods	Knit fabric	Other
			Billion yen (percent) 1/				
1969	406 (100.0)	334(82.2)	9 (2.1)	37 (9.0)	24 (6.0)	3 (0.6)	0 (0.0)
1970	460 (100.0)	347 (75.4)	13 (2.9)	51 (11.1)	47 (10.3)	2 (0.3)	0 (0.0)
1971	466 (100.0)	334 (71.7)	18 (3.8)	54 (11.7)	56 (12.0)	4 (0.8)	0 (0.0)
1972	572 (100.0)	409 (71.5)	23 (3.9)	71 (12.4)	64 (11.2)	5 (0.9)	0 (0.0)
1973	1,051 (100.0)	594 (56.6)	62 (5.9)	180 (17.1)	199 (19.0)	15 (1.4)	0 (0.0)
1974	1,062 (100.0)	544 (51.2)	47 (4.5)	159 (15.0)	300 (28.3)	11 (1.1)	0 (0.0)
1975	823 (100.0)	452 (54.9)	59 (7.1)	121 (14.7)	183 (22.3)	8 (1.0)	0 (0.0)
1976	1,010 (100.0)	532 (52.7)	77 (7.6)	136 (13.4)	257 (25.4)	8 (0.8)	0 (0.0)
1977	972 (100.0)	538 (55.3)	49 (5.1)	126 (12.9)	250 (25.7)	10 (1.0)	0 (0.0)
1978	974 (100.0)	442 (45.3)	95 (9.7)	155 (15.9)	274 (28.1)	9 (0.9)	0 (0.0)
1979	1,308 (100.0)	536 (41.0)	129 (9.8)	213 (16.3)	413 (31.6)	13 (1.0)	4 (0.3)
1980	1,205 (100.0)	542 (44.9)	101 (8.4)	175 (14.5)	374 (31.0)	10 (0.8)	4 (0.3)
1981	1,210 (100.0)	530 (43.8)	100 (8.2)	175 (14.4)	395 (32.6)	7 (0.6)	4 (0.3)
1982	1,346 (100.0)	579 (43.0)	134 (9.9)	172 (12.8)	448 (33.3)	9 (0.6)	5 (0.3)
1983	1,132 (100.0)	493 (43.5)	114 (10.0)	154 (13.6)	363 (32.0)	5 (0.4)	5 (0.4)
1984	1,417 (100.0)	589 (41.6)	183 (12.9)	181 (12.8)	453 (32.0)	6 (0.4)	5 (0.3)
1985	1,363 (100.0)	513 (37.7)	170 (12.5)	179 (13.2)	489 (35.9)	5 (0.4)	5 (0.4)
1986	1,078 (100.0)	314 (29.1)	110 (10.2)	151 (14.0)	493 (45.7)	6 (0.6)	5 (0.4)
1987	1,374 (100.0)	390 (28.4)	141 (10.3)	157 (11.4)	671 (48.8)	9 (0.7)	6 (0.4)
1988	1,661 (100.0)	420 (25.3)	159 (9.6)	193 (11.6)	871 (52.4)	10 (0.6)	7 (0.4)

1/ Values in current yen; shares in parentheses.

Source: Textile Exports of Japan, and JETRO Office in New York.

Table B-2--Value and share of Japan's textile exports, 1969-88

Year	Total	Fiber	Yarn	Fabric	Finished goods	Knit fabric	Other
			Billion yen (percent) 1/				
1969	787 (100.0)	61 (7.7)	128 (16.3)	354 (44.9)	205(26.1)	31 (4.0)	8 (1.0)
1970	836 (100.0)	80 (9.5)	129 (15.5)	361 (43.2)	213 (25.4)	45 (5.4)	8 (1.0)
1971	939 (100.0)	82 (8.7)	171 (18.2)	377 (40.2)	222 (23.6)	78 (8.3)	10 (1.0)
1972	855 (100.0)	91 (10.7)	142 (16.6)	358 (41.9)	180 (21.0)	73 (8.5)	11 (1.3)
1973	869 (100.0)	122 (14.0)	147 (16.9)	364 (41.9)	153 (17.6)	71 (8.1)	12 (1.4)
1974	1,169 (100.0)	189 (16.2)	222 (19.0)	489 (41.8)	167 (14.2)	87 (7.4)	15 (1.3)
1975	1,075 (100.0)	135 (12.6)	160 (14.9)	510 (47.4)	172 (16.0)	83 (7.7)	15 (1.4)
1976	1,210 (100.0)	142 (11.7)	167 (13.8)	594 (49.1)	219 (18.1)	69 (5.7)	19 (1.5)
1977	1,223 (100.0)	136 (11.1)	198 (16.2)	582 (47.6)	227 (18.6)	59 (4.8)	22 (1.8)
1978	994 (100.0)	112 (11.3)	144 (14.5)	489 (49.2)	186 (18.7)	42 (4.2)	20 (2.0)
1979	1,064 (100.0)	120 (11.3)	150 (14.1)	548 (51.5)	175 (16.5)	45 (4.3)	25 (2.4)
1980	1,399 (100.0)	150 (10.7)	232 (16.6)	675 (48.3)	247 (17.6)	63 (4.5)	32 (2.3)
1981	1,540 (100.0)	163 (10.6)	251 (16.3)	779 (50.6)	247 (16.0)	66 (4.3)	34 (2.2)
1982	1,474 (100.0)	149 (10.1)	230 (15.6)	758 (51.4)	254 (17.2)	52 (3.5)	32 (2.2)
1983	1,522 (100.0)	146 (9.6)	240 (15.7)	793 (52.1)	262 (17.2)	51 (3.3)	30 (2.0)
1984	1,546 (100.0)	148 (9.6)	248 (16.0)	781 (50.5)	290 (18.7)	49 (3.2)	31 (2.0)
1985	1,424 (100.0)	142 (10.0)	213 (15.0)	732 (51.4)	263 (18.4)	53 (3.7)	22 (1.6)
1986	1,112 (100.0)	111 (10.0)	174 (15.6)	583 (52.4)	189 (17.0)	39 (3.5)	16 (1.5)
1987	945 (100.0)	97 (10.3)	142 (15.0)	505 (53.4)	153 (16.2)	34 (3.6)	14 (1.5)
1988	844 (100.0)	102 (12.1)	125 (14.8)	437 (51.8)	135 (16.0)	28 (3.4)	16 (2.0)

1/ Values in current yen; shares in parentheses.

Source: Textile Exports of Japan, and JETRO Office in New York.

Table B-3--Japan's imports of textiles by volume, 1969-88

Year	Fibers	Yarn	Fabrics	Finished goods	Fibers	Yarn	Fabrics	Finished goods
	Million tons	Thousand tons	Million m2	Thousand tons	Index (1985 = 100)			
1969	1,261.91	15.80	105.31	NA	119.5	6.6	13.5	NA
1970	1,357.11	26.80	130.06	NA	128.5	11.1	16.7	NA
1971	1,282.69	39.50	158.82	26.44	121.4	16.4	20.4	15.2
1972	1,379.68	54.45	363.23	35.35	130.6	22.6	46.6	20.3
1973	1,445.92	90.79	1,008.86	113.65	136.9	37.6	129.3	65.3
1974	1,191.51	71.77	465.82	176.34	112.8	29.8	59.7	101.4
1975	1,068.18	45.76	318.59	83.26	101.1	19.0	40.8	47.9
1976	1,131.03	66.86	337.25	96.58	107.1	27.7	43.2	55.5
1977	1,043.40	51.77	333.61	96.16	98.8	21.5	42.8	55.3
1978	1,145.25	141.01	554.29	122.98	108.4	58.5	71.0	70.7
1979	1,195.80	170.15	610.04	158.16	113.2	70.6	78.2	90.9
1980	1,096.48	128.68	533.80	137.92	103.8	53.4	68.4	79.3
1981	1,055.52	130.41	632.53	128.40	99.9	54.1	81.1	73.8
1982	1,160.15	174.75	581.32	132.84	109.8	72.5	74.5	76.4
1983	1,024.69	158.65	629.36	127.09	97.0	65.8	80.7	73.0
1984	1,103.18	233.00	823.64	157.03	104.4	96.6	105.6	90.3
1985	1,056.31	241.15	780.17	173.98	100.0	100.0	100.0	100.0
1986	1,067.32	214.77	891.30	229.89	101.0	89.1	114.2	132.1
1987	1,257.61	264.63	961.30	317.54	119.1	109.7	123.2	182.5
1988	1,045.76	300.03	1,149.84	420.83	99.0	124.4	147.4	241.9

Source: Textile Exports of Japan, and JETRO office in New York.

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