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Preface

This report brings together background information for assessing the impacts of the 1997-99 financial crises on agriculture. It tells the story of the crises, how they affect the crisis countries' agriculture and trade, and how U.S. agricultural trade is affected.

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Summary

International Financial Crises Had Moderate Impact on U.S. Agricultural Trade

The international financial upheaval that began in Thailand in July 1997 and subsequently spread to other countries set back economic growth and trade worldwide. World economic growth slipped from 3.2 percent in 1997 to 1.6 percent in 1998.

The international financial crises led to depreciated currencies, reduced growth, and higher interest rates in Indonesia, Thailand, South Korea, Russia, Brazil, and other Latin American countries. The macroeconomic shocks affected agricultural prices, production, consumption, and trade. Currency depreciation helped agricultural producers, but hurt consumers in the crisis countries. The lower currency values that enhanced primary agricultural production and reduced imports improved the agricultural trade balance of these countries.

Non-crisis countries, including the United States, China, Japan, and Taiwan were affected as well. Capital flight from the crisis countries helped keep U.S. interest rates low, stimulating investment and boosting growth. In addition, the financial turmoil and depressed global commodity prices reduced U.S. agricultural exports and lowered costs for imports, keeping inflation in check but narrowing the agricultural trade surplus.

During the 1997-99 financial turmoil, currencies in the crisis countries depreciated 35-75 percent, growth contracted 2-14 percent, and interest rates rose 6-47 percent. The crises slowed Asian growth for at least a few years. While the value of Asian currencies stabilized in 1998, Asian economies continued to contract through the end of the year. After 2 years of setbacks, some crisis economies turned the corner to growth in 1999. Leading the way to recovery are South Korea and Thailand.

The ERS analysis of the international financial crises of 1997-99 suggests that:

- Weaknesses in financial and banking systems, high dependence on short-term foreign currency debt, and insufficient financial oversight increased the vulnerability of the crisis countries. The weaknesses in the banking and financial sectors combined with investor panic to create a situation akin to a bank run, triggering capital flight, causing stock prices to plunge, and significantly depreciating the value of currencies.
- The financial upheaval affected the crisis countries through shocks in exchange rates (prices), income, and interest rates. The effects depended on the magnitude of the shocks, existing economic conditions, policies, and the financial and banking framework in those countries prior to the crisis. The effects also depended on the responsiveness of production, consumption, and trade with respect to price and income shocks.
- The effects of exchange rate changes on consumer and producer prices varied by commodity and country. The greater the exchange rate effects on prices, the greater the responsiveness of consumers and producers of the commodity. Primary tradable commodities that had a lower share of imported inputs tended to benefit from the depreciated domestic currency relative to high value-added products that depended heavily on imported inputs and borrowed capital. Consumption effects were more severe in the original crisis countries due to a significant decline in income and higher domestic prices. For non-crisis countries, the economic effects of the crises were not as severe.
- The financial crises had a modest impact on U.S. agricultural trade. The crises and depressed global commodity prices adversely affected U.S. agricultural exports and other trade-dependent sectors in 1997-99. The decline in value of U.S. agricultural exports—23 percent (in real terms) from fiscal 1997 to fiscal 1999—was much less than the nearly 50-percent drop in the first half of the 1980's, when the dollar was strong and U.S. farm policy moved commodities into public stocks rather than onto the market and into export channels.
- The 1997-99 decline in U.S. agricultural export value was mostly a price phenomenon due to oversupplies in major exporting countries and weakened demand from crisis-affected countries and other countries such as China. The downturn of commodity prices, reinforced by weakened demand from the crisis countries, led to lower farm income for U.S. producers.
- Lower U.S. exports and higher imports widened the overall U.S. trade deficit and narrowed the agricultural trade surplus. U.S. market share in most commodities, in volume terms, in major markets such as Japan was essentially stable. U.S. agricultural exports are now expected to stabilize at $49.5 billion in fiscal 2000.
- Changes in the structure of U.S. agricultural trade from recent macroeconomic realignments have been subtle, with greater reliance on NAFTA as a market and as a supplier of imports, and less on Asia. Lower export receipts for farmers were partly offset by cheaper capital and inputs and a more robust domestic market.
- Compared with the developing country debt crisis of the 1980's, the international financial crises of 1997-99 affected the U.S. agricultural sector much less severely. The nonmetro United States did not experience a significant hit from the 1990's financial crises, although nonmetro employment growth dipped in 1997-98. This is in sharp contrast to the 1980's, when the impact of the debt crisis in nonmetro areas was severe and lingering.

Overview[1]

The 1997-99 international financial crises led to depreciated currencies, reduced growth, and higher interest rates in the crisis-affected countries. These macroeconomic shocks affected agricultural prices, production, consumption, and trade. Currency depreciation helped agricultural producers, but hurt consumers. Lower currency value that enhanced primary agricultural production and reduced imports improved the agricultural trade balance of the crisis countries. Capital flight from the crisis countries helped keep U.S. interest rates low, stimulating investment and boosting growth. The financial turmoil and depressed global commodity prices reduced U.S. agricultural exports and lowered costs for imports, keeping inflation in check but narrowing the agricultural trade surplus. [Suchada Langley (202) 694-5227, slangley@ers.usda.gov]

This report focuses on the macroeconomic and financial linkages to agriculture of the international financial crises that occurred in 1997 through early 1999. Particularly, it discusses what brought the affected countries to crisis, how the crisis-led macroeconomic linkages affected agriculture, and how they affected U.S. agricultural trade. The crisis countries examined in this report are Indonesia, Thailand, South Korea, Russia, Brazil, and other Latin American countries. The non-crisis countries include China, Japan, Taiwan, and the United States.

The 1997-99 financial turmoil led to a dramatic depreciation in currencies, reduced income (real GDP growth), and increased interest rates in the crisis countries. Currencies depreciated 35-75 percent, growth contracted 2-14 percent, and interest rates rose 6-47 percent. The international financial upheaval that began in Thailand in July 1997 and subsequently spread to other countries set back economic growth and trade worldwide. World economic growth was down to 1.6 percent in 1998 from 3.2 percent in 1997. The financial crises slowed Asian growth for at least a few years (see table 1).

While the value of Asian currencies stabilized in 1998, Asian economies continued to contract through the end of the year. After 2 years of setbacks, some crisis economies finally started to turn the corner in 1999. Leading the recovery are South Korea and Thailand.

Our analysis suggests:

- Weaknesses in their financial and banking systems, high dependence on short-term foreign currency debt, and insufficient financial oversight increased the vulnerability of the crisis countries. The weaknesses in banking and financial sectors combined with investor panic to create a situation akin to a bank run, triggering capital flight, causing equity (stock) prices to plunge, and significantly depreciating the value of currencies.
- The financial upheaval affected the crisis countries through shocks in exchange rates (prices), income, and interest rates. The effects depended on the magnitude of the shocks, existing economic conditions, policies, and financial and banking framework in those countries prior to the crisis. The effects also depend on the responsiveness of production, consumption, and trade with respect to price and income shock (table 2). The effects of exchange rate changes on consumer and producer prices varied by commodity and country. The greater the exchange rate effects on prices, the greater the responsiveness of consumers and producers of the commodity. Primary tradable commodities that had a lower share of imported inputs tended to benefit from the depreciated domestic currency relative to high value added products that depended heavily on imported inputs and borrowed capital. Consumption effects were more severe in the original crisis countries due to a significant decline in income and higher domestic prices. For non-crisis countries, the economic effects of the crises were not as severe.
- The crises and depressed global commodity prices adversely affected U.S. agricultural exports and other trade-dependent sectors in 1997-99. The decline in total value of U.S. agricultural exports—23 percent (in real terms) from fiscal 1997 to fiscal 1999—was mostly a price phenomenon due to oversupplies in major exporting countries and weakened demand from crisis-affected countries and other countries such as China. The downturn of commodity prices, reinforced by weakened demand from the crisis countries, led to lower farm income for U.S. producers. Lower U.S. exports and higher imports widened the overall U.S. trade deficit and narrowed the agricultural trade surplus. U.S. market share in most commodities, in volume terms, in major market such as Japan was essentially stable.
- Compared with the developing country debt crisis of the 1980's, the international financial crises of 1997-99

[1] ERS has released a number of analyses related to this subject. This report, part of a larger effort to assess the impacts of the financial crises, tells the story of the crises, how they affect the crisis countries' agriculture and trade, and how U.S. agricultural trade is affected.

affected the U.S. agricultural sector much less severely. In particular, trade-dependent nonmetro employment was affected significantly less.

- The effects of the macroeconomic/financial crisis on agriculture depended on the existing structure of industries, relative use of capital and labor, the share of imports in input supplies, and competition with other countries during the crises. For example, the effects of exchange rate changes on prices depended on how quickly and completely they were passed through to producers and consumers. Our case study showed that in the Japanese market, the response of market prices to changes in exchange rates (i.e., exchange rate pass-through) was relatively high for corn and soybeans, compared with beef, pork, and poultry. The following sections summarize our findings by sector.

Table 1--Real GDP growth

Region/country		1997	1998	1999	2000	2001
				Percent change		
World		3.2	1.6	2.8	2.9	3.0
	Less U.S.	3.0	0.9	2.5	2.9	3.1
Developed economies		2.7	1.8	2.9	2.6	2.5
	United States	3.9	3.9	3.9	3.1	2.5
	Canada	5.4	3.5	3.0	2.8	2.8
	Japan	0.8	-2.9	2.0	1.5	1.8
	Australia	1.7	4.0	2.7	2.5	2.5
	New Zealand	2.4	-0.4	2.0	2.6	2.6
	European Union-15	2.5	1.7	2.6	2.7	2.6
	Other Western Europe	2.5	2.8	2.1	2.6	2.8
Original crisis countries						
	Korea	5.5	-5.7	4.5	5.0	6.0
	Indonesia	4.9	-13.5	-4.0	1.5	3.0
	Malaysia	7.8	-6.7	1.6	3.5	4.5
	Philippines	5.2	-0.5	1.5	3.5	4.5
	Thailand	-0.4	-8.0	1.5	3.0	5.0
Contagioned countries						
	Brazil	3.2	0.2	-1.6	3.0	4.5
	Russia	0.8	-4.6	-1.5	-1.0	1.4
Other affected countries						
	China	8.8	7.7	6.5	6.5	7.0
	Hong Kong	5.2	-5.1	2.3	2.5	3.8
	Taiwan	6.8	4.8	5.0	5.5	5.6
Latin America		4.9	2.6	0.6	3.3	4.3
	Caribbean & C. America	3.0	4.0	3.1	2.3	4.5
	Mexico	7.0	4.6	2.7	3.8	4.0
	South America	4.4	1.8	-0.3	3.3	4.4
	Argentina	8.6	4.3	-2.0	3.1	4.5
	Other	3.8	3.5	4.0	4.0	4.0

Source: Economic Research Service, USDA.

Table 2--Effects of the international financial crises on agriculture

Country	Macro effects during the crisis stage 1/			Changes in agricultural sector 2/					
	Exchange rate 3/	Growth rate	Interest rate	Producer price	Production	Consumption	Exports	Imports	Imports from the U.S. 4/
	Percent change		Percentage point change						
Crisis importers									
Korea	-24	-5.7	28	Increase	Mix	Decline	Increase	Decline	Decline
Indonesia	-63	-13.5	47	Increase	Mix	Decline	--	Decline	Decline
Russia**	-74	-4.6	31	Increase	Mix	Decline	--	Decline	Decline
Crisis exporters									
Brazil*	-29	-1.9	18	Increase	Mix	Decline	Increase	Decline	Decline
Thailand	-34	-8	6	Increase	Mix	Decline	Increase	Decline	Decline
Non-crisis exporter									
U.S.		4	-1	Decline	Increase	Increase	Decline	Increase	
Non-crisis importers									
China	0.2	7.7	-26	Decline	Mix	Increase	Decline	Increase	Decline
Taiwan	-16.6	4.8	--	Increase	--	Increase	--	Decrease	Decline
Japan	-8	-2.9	-5	Decline	--	Increase	--	--	Decline

-- = no change. *Crisis started January 1999. **Crisis started August 1998.

1/ Crisis stage differed among countries--1997-98 for Asian countries, 1998-99 for Russia, and 1999 for Latin America. 2/ Observed change during the crisis. Includes crisis and other (i.e. weather) impacts on agriculture. 3/ A minus implies currency depreciation relative to the U.S. dollar and no sign implies currency appreciation during July 1997-June 1999. 4/ Value terms.

Source: Economice Research Service, USDA.

Sectoral Effects

Effects on Production: The crises led to increased production of some commodities and lower production for others, depending on the effects of exchange rate changes on prices and domestic terms of trade, existing economic conditions, policies, interest rates, and credit conditions.

Higher domestic prices (in domestic currency) stemming from currency depreciation during the early stages of the crises led to increased commodity production in Brazil, Indonesia, and Thailand. This was especially true for primary commodities for which prices received for output increased more than prices paid for inputs (increased domestic terms of trade). In Brazil, farmers benefited from higher prices in terms of the *real*. Domestic prices increased, which boosted beef and poultry production about 2 and 10 percent, respectively, in 1999.

The 1997-98 Asian crisis appeared to stop the rise of wage rates and slowed the exodus of labor from farms. In Korea, Thailand, and Indonesia, the financial turmoil reduced wage costs. High unemployment, particularly in big cities, encouraged people to move back to farm and rural areas. For non-crisis countries such as Japan, domestically produced pork products became relatively more competitive against imports because required inputs such as labor became less expensive due to the economic slowdown and a long-term decline in growth.

Production was adversely affected when the domestic terms of trade declined. For some commodities heavily dependent on imported inputs, such as fertilizers, feeds, seeds, or chemicals, lower currency values led to higher costs of production, resulting in a cost-price squeeze for producers, lower textile production in Thailand, and reduced poultry and textile production in Indonesia.

Agricultural production was adversely affected in some countries in the early stages of the crises because of higher interest rates. For example, in the Andean countries in Latin America, higher interest rates—ranging from 45 to 70 percent—hampered investment in rural areas, raising the cost of agricultural credit and reducing the level of working capital for agricultural production. These effects combined with high feed prices to increase animal slaughter and meat production in some cases. In Korea, as livestock producers anticipated higher feed prices and interest rates due to the depreciated won, livestock producers rushed cattle to market for slaughter in December 1997. As a result, beef production increased temporarily and the price declined.

Effects on Consumption: Consumption of agricultural commodities was adversely affected by higher domestic prices, higher import prices, and lower income. Depreciated currency initially raised inflation in all affected countries, from 8 percent in Thailand to as much as 70 percent in Indonesia. Inflation increased nearly 8 percent in the first 5 months of Brazil's crisis. Real GDP declined 2-14 percent in the crisis-affected countries. With high domestic prices, lower income, and the loss of BULOG (a state trading enterprise in Indonesia) subsidies, per capita wheat consumption in Indonesia declined more than 50 percent during 1997-98.

Higher food prices and lower incomes induced diet changes and in some cases, new buying strategies, at least in the short run, in many affected countries. Indonesian consumers substituted cheaper tofu protein products for expensive meat. Prior to the crisis, wheat products such as bread were popular among Asian countries. After the crisis, the costs of wheat and wheat flour increased, compared with other cheaper sources of carbohydrates such as rice and other domestically produced staples. Per capita wheat consumption in Thailand declined 10 percent at the peak of the crisis in 1997. Brazil importers bought less expensive milled rice and more of cheaper paddy and brown rice. Paddy rice imports from Argentina increased 160 percent during the first 11 months of 1999. Even in non-crisis countries like Japan, consumers turned to lower quality (and lower priced) cuts of imported beef. Latin American consumers adjusted their diets toward lower priced foods such as domestically produced white corn and dried beans.

Effects on Trade: Depreciated currencies raised import prices. Trading firms adjusted their trading activities when costs increased. In Indonesia, lower priced and lower quality Vietnamese rice (25 percent broken versus 5 percent broken Thai rice) became an alternate source of supply. Polyester was substituted for cotton in Thailand and Korea. Sheep hides and skins or lower quality hides and skins were substituted for higher quality cattle hides and skins (table 3).

High credit costs in some countries hindered export potential, particularly for those export commodities that depended on imported inputs such as cotton, feeds, and hides. Textile industries in Indonesia and Thailand were particularly hard hit, which set back their textile export potential. High costs of imported feed and the lack of credit led to the collapse of Indonesia's poultry industry.

The value of U.S. agricultural exports declined significantly (about 23 percent in real terms, 15 percent in nominal terms) from fiscal 1997 to fiscal 1999. In volume terms, the decline in exports to the affected countries was partly offset by increased exports to other regions, particular NAFTA members. The decline in export value was due mainly to lower commodity prices. Record world grain and oilseed output was a factor that contributed to depressed global prices.

Changing agricultural policy in response to the crises affected agricultural trade. Elimination of the monopoly authority held by BULOG was a direct result of the financial crisis and affected Indonesian rice wheat, soybean, and garlic trade. In accepting financial aid programs from the International Monetary Fund (IMF) and other organizations, Indonesia agreed to reduce import tariffs on food and open

its market for the commodities. (BULOG, however, still retains a key role in rice purchasing, distribution, and inventory management.) The United States, among other developed countries, responded to the Asian and other crises by providing the affected countries with financing to help them import agricultural products.

Summing Up

The international financial turmoil of 1997-99 severely affected the economies of the crisis countries. The effects on the agricultural sectors, however, were mixed, enhancing primary agricultural production and raising exports in some cases, or reducing the need to import and reducing production in other cases. Higher farm prices in domestic currencies helped some of those without city jobs to stay on farms, mitigating the unemployment impacts and acting like a social safety net in the crisis countries. In the United States, the crisis reinforced already low commodity prices, significantly reducing the value of agricultural exports. The crisis widened the overall U.S. trade balance and narrowed the agricultural trade surplus. Compared with the 1980's debt crisis, however, the effects of the international financial crises on the U.S. economy and agricultural exports were much less severe.

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Table 3--Changes in agricultural trade quantities for crisis countries, 1997-98*

	Rice	Wheat	Corn	Soybeans	Soybean meal	Soybean oil	Palm oil	Sugar	Cotton	Cattle hides	Beef	Pork	Poultry
						Percent change							
Crisis importers													
Brazil 2/	-26	8	-58										
Korea	156	41	-14	-10	27	9	-23	-4	-4	-30	-45	-13	-52
Indonesia 3/	-51	-24	-21	46	100			37					200
Russia		97						257	12		5	5	-79
Thailand	--		-3	-21	-36		-26						
Crisis exporters													
Brazil 2/				59	-8	90		46	143	-55	72	-4	24
Thailand	17		35	142			-25	-43					41
Non-crisis countries													
Exports													
China	-46		-43			-66	-68	15	> 200	3	36	1	-4
U.S.	--	--	30	-9	-26	-24			-44	-24 1/	2	18	-2
Imports													
China	-23	-20	5	26		-30	-19	36	-82	-10	44	> 200	-7
Japan	-12	-9	-0.3	-6	9	n/a	-3	-9	3	-16	3	-1	0.3
Taiwan		-3	1	-27						-1.1	-4	> 200	66
U.S.	14	9	127	-20	78	22	-14	9 1/		-17 1/	13	11	-33

* For period most represented in the crisis, unless separately noted, this is calendar 1998 compared to calendar 1997.

This table cannot be interpreted as solely the impacts of the financial crises. For example, Korea's rice imports increased due to government timing of purchases and wheat imports were up and corn imports were down due to the switch from corn to feed wheat. Japan's rice imports were up also due to government timing of purchases.

1/ Value terms.

2/ Changes for January-September 1999 from the same period in 1998, rice imports are for Jan.-Dec.

3/ Changes for marketing year 1999 from 1997.

Source: World Trade Atlas, countries' sources, and ERS/USDA; U.S. data are marketing year and Jan.-Dec. for other countries, except Brazil and Indonesia.

The Macroeconomic Linkages to Agriculture

The financial crises have seriously hurt countries' macroeconomies, causing currency depreciation, high inflation, and falling GDP. The effects have included changes in the key macroeconomic links to agriculture—exchange rates, consumer income, and interest rates. Shifts in these linkage variables have induced changes in countries' agricultural prices, production, consumption, and trade. [William Liefert (202) 694-5156, wliefert@ers.usda.gov and Matt Shane (202) 694-5282, mshane@ers.usda.gov]

On July 2, 1997, the Thai baht declined 15 percent against the U.S. dollar. Thus began a series of crises that started in Asia and spread to Russia and Latin America. Much already has been written on the origins of the crises. Although the specific causes might differ among countries, the causal factors discussed below appear to hold for the East and Southeast Asian nations where the crises originated.

The Origins of the Financial Crises

During the 10 years prior to 1997, the Asian economies experienced extraordinary growth. Korea had an average real GDP growth rate just under 9 percent a year, while Thailand, Malaysia, and Indonesia had growth rates of 7-10 percent. However, the rapid growth had been fueled mainly by increases in the quantity of inputs used in production (mainly labor and capital), rather than a rise in productivity. Large capital investment without accompanying productivity growth was driving the marginal productivity of capital (what additional capital inputs add to output) to low levels, thereby slowing growth and jeopardizing the ability of investors to repay the loans that funded their investment. Adding to the risk was that the bulk of the capital investment was financed by the banking system, and much of the investment funds came from abroad (foreign money lent to Asian banks) (table 4).

One apparent reason for the excessive and unprofitable investment was *institutional weaknesses* within these countries' banking and corporate systems. Banks were often willing to lend, and companies willing to borrow to invest, for

Table 4--Macroeconomic indicators for the crisis-affected countries

	1996	1997	1998	1999	2000
			Percent of GDP		
Current account:					
Brazil	-3.0	-4.1	-4.5	-3.0	-2.6
Indonesia	-3.3	-3.0	3.4	2.7	1.5
South Korea	-4.7	-1.8	13.1	7.1	4.1
Thailand	-7.9	-2.0	12.2	8.8	5.5
Russia	0.6	-1.3	0.3	8.4	8.2
	1995	1996	1997	1998	1999
			Percent of GDP		
Foreign debt:					
Brazil	26.3	26.2	27.1	30.9	
Indonesia	56.1	55.4	62.3	168.6	
South Korea	23.2	28.2	34.7	49.8	
Thailand	47.0	52.2	63.5	77.1	
Russia	30.3	28.4	31.9	55.0	
	1995	1996	1997	1998	1999
			Billion US$		
Net capital flows for Asian Crisis countries:					
Net private capital flows	60.6	62.9	-22.1	-29.6	-18.1
Net direct investment	7.5	8.4	10.3	9.7	9.4
Net portfolio investment	17.4	20.3	12.9	-7.3	4.5
Other net investment	35.7	34.2	-45.3	-32.0	-32.0
Net official flows	0.7	-4.6	30.4	20.2	-4.5
Change in reserves 1/	-18.3	-5.4	30.5	-52.1	-39.9

1/ A minus sign indicates an increase.

Source: International Monetary Fund.

reasons influenced more by government pressure, favoritism, or corruption rather than the desire to earn the highest possible return.

In 1997 growing concern over the viability of much bank lending eroded confidence in the banking system, thereby sparking capital flight (particularly of foreign capital) from the countries. The flight was accompanied by a significant drop in equity (stock) prices. In addition, the affected countries had managed pegged exchange rate systems (meaning that the central bank was committed to defending the exchange rate within a narrow band). As a result, the central banks depleted their foreign reserves in an attempt to defend the exchange rate in the face of growing capital flight. Rapidly declining reserves, though, further hurt investors' confidence and put pressure on countries' exchange rates. Thus the onset of financial crisis.

The Crises's Linkages to Agriculture

The common development that all crisis countries experienced is massive capital flight, which led to a fairly consistent chain of economic effects, for both the macroeconomy and agriculture. The general sequence of developments is that capital flight seriously hurt countries' macroeconomies, causing currency depreciation, high inflation, and falling real GDP. Among the macroeconomic variables affected were those that link the macroeconomy to agriculture: the exchange rate, consumer income and wealth, and interest rates and credit. Changes in these linkage variables in turn induced changes in agricultural prices, production, consumption, and trade.

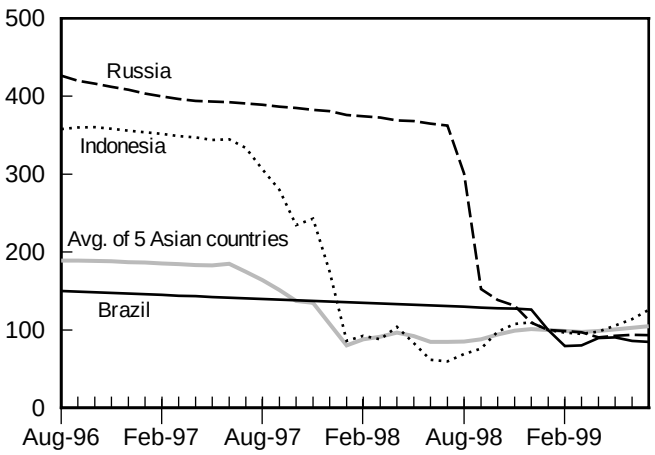
The most immediate macroeconomic effect of large-scale capital flight was a major depreciation of a country's currency, especially with respect to the U.S. dollar. For most crisis countries the depreciations ranged from 35 to 75 percent (see fig. 1). Currency depreciation quickly raised domestic prices for tradable goods, which led to high economy-wide inflation. Capital flight also caused real GDP to drop, as the exodus of capital reduced demand for both investment and consumer goods. The GDP decline ranged from 5 percent in Russia during its first year of crisis to 14 percent in Indonesia (see table 1). In some countries, such as Indonesia, the government's policy response to the crisis exacerbated the GDP decline. To stem the capital flight, the Indonesian government raised interest rates. This increased the cost of borrowing money to finance production and trade (in other words, tightened credit), which reduced output even more.

The linkages between the macroeconomy and agriculture can be summarized as follows. Changes in the value of the exchange rate directly affect prices for consumers and producers, including the prices paid for production inputs. Since prices for tradable goods adjust by more than those for nontradable goods and services, such as labor and land, the price changes alter producers' terms of trade (given by the ratio of prices producers receive for output to the prices they pay for inputs (see box, "Defining the Terms of Trade"). Changes in consumer income and wealth affect demand for goods and foodstuffs. Movements in interest rates affect supply, by altering producers' costs of production—specifically the cost of capital investment and (possibly) the cost of purchasing inputs. All of these effects induce changes in agricultural production or consumption (or both). If a country is generally free-trading, a change in output or consumption will also affect the country's trade balance by altering the volume of either imports or exports (see tables 2-3).

Figure 1

Crisis countries' exchange rates against U.S. dollar

Indonesia and Russia were harder hit



Source: Pacific Exchange Service and ERS/USDA.

Exchange Rate: The rapid depreciation of crisis countries' currencies resulting from capital flight worsened the exchange rate between their currencies and that of non-crisis countries. In all the crisis countries, changes in the exchange rate were passed through (to varying degrees) to domestic prices. This means that depreciation of the currency raised consumer and producer prices for foodstuffs expressed in these countries' domestic currencies, as well as prices for any tradable agricultural inputs used in production.

The increase in domestic consumer prices reduced food demand and consumption. The effect of currency depreciation on agricultural production depended on how it changed the prices producers received for their output relative to the prices they had to pay for inputs. If output prices rose more than input prices, producers' terms of trade improved. This benefit would motivate them to increase production. If, however, input prices rose more than output prices, producers' terms of trade worsened, and they would decrease output.

For most agricultural producers in most crisis countries, currency depreciation improved their terms of trade. The reason

Defining the Terms of Trade

The ***terms of trade*** can be defined for any producer or trader that both buys and sells goods, using the revenue gained from sales to finance purchases. The terms of trade can be examined from the point of view of an entire country, called the country's *international terms of trade*, or of producers within a specific industry, simply called *producers' terms of trade*.

A country's *international terms of trade* is the rate at which the country trades, or exchanges, goods, and is determined mainly by foreign trade prices. Say that the United States exports wheat at $160 per ton and imports oil at $20 per barrel. Since one ton of wheat earns funds that can buy 8 barrels of oil, the United States' terms of trade in these products is 8 barrels of oil for one ton of wheat. Assume that the export price of wheat then falls to $120 per ton. The U.S. terms of trade would worsen, by dropping to 6 barrels of oil for one ton of wheat.

Producers' terms of trade are determined by the relationship between the price at which producers within an industry sell their output and the prices at which they buy their inputs. Assume that producers sell their output at $100 a unit and use only one input in production, which they must buy at $25 a unit. The producers' terms of trade, or exchange, is 4 units of input for one unit of output. Since most goods require a number of different inputs to be used in production, producers' terms of trade are given by the relationship between their selling price and an aggregation of prices for all inputs that must be purchased.

stems from the point that the *primary inputs* of labor and land used in agricultural production are non-tradable, which means that their prices (that is, costs to producers) do not necessarily rise as a result of currency depreciation. Therefore, even if currency depreciation raised prices for all *intermediate inputs* (such as fertilizer, fuel, and animal feed) by the same amount as it raised output prices, output prices would increase more than prices for inputs in the aggregate. In addition, for some agricultural goods, not all intermediate inputs are tradable and therefore subject to major price changes in response to changes in the exchange rate. If so, the improvement in producers' terms of trade is even greater. The extent to which movements in exchange rate values affect producers and consumers depends largely on the degree to which changes in exchange rate values induce changes in domestic consumer, producer, and input prices (called the *exchange rate pass-through*; see the box, "Commodity Pricing in Foreign Markets: Exchange Rate Pass-Through and Price Transmission ").

Rising production from an upswing in producers' terms of trade and falling demand for agricultural goods improved the crisis countries' balance of agricultural trade. Net agricultural importers, like Korea, Indonesia, and Russia, saw their imports drop. Net agricultural exporters, such as Brazil and Thailand, saw their exports grow.

However, for some agricultural producers in certain countries, currency depreciation worsened their terms of trade, thereby causing output to decrease. This occurred if a large share of inputs (in value terms) were imported and prices for such inputs rose more than prices for the output goods. These conditions tend to hold more for producers of high value and processed goods, such as poultry farmers who import the bulk of their feed, rather than producers of bulk commodities. Poultry producers in Indonesia and soybean meal producers in Korea are examples of those in crisis countries suffering deteriorating terms of trade from currency depreciation.

For such high value and processed commodities, the effect of currency depreciation on the trade balance is uncertain. If the drop in consumption from higher domestic consumer prices exceeds the fall in production, the trade balance improves. If, on the other hand, the decline in output exceeds that in consumption, the trade balance worsens.[2]

Income and Wealth: Other major variables linking the macroeconomy and agriculture are consumer income and wealth, which fell because of the crisis. Income dropped because the decline in real GDP increased unemployment, while high inflation lowered real incomes (prices rose by a greater percentage than wages and salaries, and in fact in some countries the latter fell even in nominal terms). The sell-off of domestic financial assets that helped precipitate the crisis also reduced consumer wealth by lowering equity (stock) prices, thereby reducing the assets' market value (fig. 2).

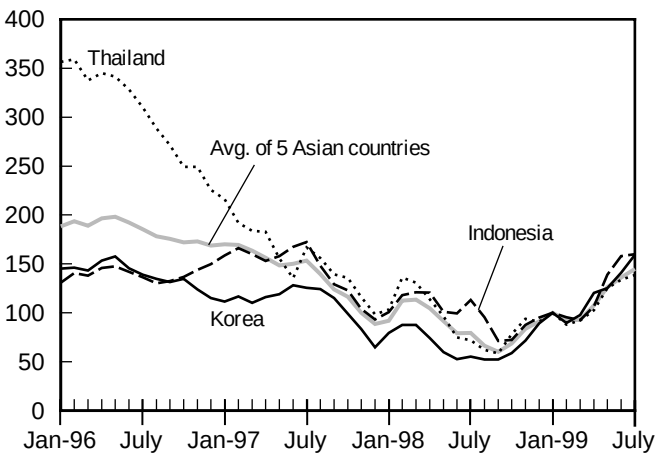
Falling income and wealth reduced consumer demand for foodstuffs, and thereby contributed to the overall drop in food consumption and to the substitution of less expensive for more expensive goods. The degree to which demand dropped for specific foodstuffs depended on how sensitive consumer demand was to changes in income (the *income elasticity*). Demand for meat, fruit, and other high value products is more sensitive to income changes than is demand for staple foods such as bread and potatoes.

[2] In discussing changes in the balance of agricultural trade, this article uses the conventional language that a change either improves or worsens the trade balance. Although the terms might imply that an improving balance—a move away from imports toward exports—is always inherently desirable, and a worsening balance—a move away from exports toward imports—is undesirable, this is not how most economists view the matter. Most economists believe that a country's most profitable pattern of trade will involve not only exporting certain goods (those relatively inexpensive to produce domestically), but also importing certain goods (those relatively costly to produce domestically). Put another way, just as exports benefit domestic producers, imports benefit consumers. Since a trade deficit is conventionally expressed as a negative number and a surplus as a positive number, the terminology of improving or worsening the trade balance simply means that the balance is moving in either a positive or negative direction in terms of the pure arithmetic of trade.

Figure 2

Stock indices for Asian crisis countries

Declines began well before crisis



Source: Pacific Exchange Service and ERS/USDA.

However, if the decline in demand for meat and other livestock products occurs in enough countries and at magnitudes sufficient to lower world prices for livestock goods, output of these products will drop. This in turn would decrease world demand for agricultural products used in animal feed, such as feed grain and soybeans.

If a country was an agricultural importer, most of the drop in food demand and consumption was at the expense of imports rather than domestic production.

Interest Rates: The last key variable linking the macroeconomy and agriculture is the interest rate. Capital flight raised interest rates in the crisis countries. In most countries, government policy contributed to the rise, as the government increased interest rates to stem the outflow of capital. Rising interest rates reduced capital investment in agriculture, as well as raised input costs in general if producers had to borrow to finance input purchases. The isolated effects of the increase in rates were therefore to worsen producers' terms of trade, which decreased production.

Combined Effects of the Linkages: The combined effects of the linkages on agriculture are that consumption falls and production is likely to rise, thereby improving a country's agricultural trade balance. For certain commodities, though, output could drop. Falling output would hurt the trade balance in these products, and if production declined more than consumption, the overall trade balance would worsen.

The deteriorating value of the exchange rate and decreasing consumer income and wealth have the same directional effect on consumption—they both cause it to fall. On the other hand, currency depreciation and the rise in interest rates could lead to either an increase or decrease in production, depending on whether the two events improve or worsen producers' terms of trade (with capital costs included in the calculation). The outcome depends on the share of tradable versus nontradable inputs used, the degree to which prices for tradable inputs rise relative to output prices, and the capital intensity of production. For most commodities, tradable inputs are not a large fraction of all inputs in value terms, prices for tradable inputs will not necessarily rise more than output prices, and interest charges are not a dominant part of total production costs. As a result, the terms of trade of most producers in most crisis countries have improved (for example, in Thailand, Brazil, and Russia). This has stimulated production and, along with the drop in consumption, improved the trade balance. The crises' net effects on agriculture would therefore be lower consumption, higher production, and an improved trade balance.

If, however, producers' terms of trade worsen, production would drop. Whether the overall trade balance improves or worsens would then depend on which falls more—consumption (balance improves) or output (balance worsens).

The Crises's Linkages to Agriculture in Non-Crisis Countries

The international financial crises affected agriculture not only in the crisis-hit countries, but also in other nations, particularly those that are major agricultural exporters, such as the United States and Canada. The fall in demand for food in the crisis countries (resulting from currency depreciation and declining consumer income) affected world agricultural markets by reducing world commodity prices. Coinciding with the drop in world demand was an increase in supplies on the world market, mainly because of large output by some traditional exporters. As a result, agricultural prices in exporting countries such as the United States fell. The *isolated effects* of the price declines should be to reduce production and exports.

Although the crises caused agricultural and food prices in the crisis-hit countries to rise, they reduced prices in the non-crisis countries (expressed in these nations' currencies, such as the U.S. dollar). Therefore, from the point of view of the non-crisis countries, world agricultural prices fell. The terms of trade of agricultural producers in the non-crisis countries worsened, because prices for tradable output fell more than the aggregate price level for agricultural inputs (not all of which are tradable). The extent to which prices in these countries changed, for both agricultural output and inputs, depended again on the exchange rate pass-through.

An alternative way of explaining how the crisis affected non-crisis, agricultural-exporting countries is to say that the crisis appreciated the currencies of these countries vis-a-vis currencies of the crisis countries. An appreciated currency means that an agricultural good exported to crisis countries buys more goods than before in these nations. Just as a

Continued on page 14

Commodity Pricing in Foreign Markets: Exchange Rate Pass-Through and Price Transmission

The steady increases in commodity trade volumes concurrent with the long-term decline of foreign trade barriers and relatively large swings in exchange rates in recent decades present the need for a clearer understanding of how U.S. commodities are priced in foreign markets. Exchange rate changes have the potential to significantly affect the pricing of products within foreign markets and thereby significantly alter the terms of trade in the highly competitive agricultural market. To better understand the exchange rate effects of these mechanisms, the following six commodities will be examined: feed corn, soybeans, fresh beef, frozen beef, pork, and broiler legs. The effects of exchange rate pass-through and the transmission of U.S. price on Japanese import prices are measured using monthly U.S. and Japanese prices of those commodities for January 1996 through April 1999. Japan is the most important foreign market for most of those commodities examined. It should note that the period chosen exhibited unusual volatility in the exchange rate.

Exchange Rates and Exchange Rate Pass-Through

In general, long-term movements of exchange rates have the capability of significantly raising or lowering the prices of all U.S.-produced goods sold to foreign markets. This effect is all the more relevant for those agricultural products that compete in the world market. Even relatively small swings in exchange rates in either direction can greatly influence U.S. competitiveness of agricultural producers in foreign markets. This transmission of price changes by way of the exchange rate is termed exchange rate pass-through.

An analysis of trade and price data, however, will reveal that the import prices of goods exported from the United States do not always reflect changes in exchange rates, an effect termed "incomplete" pass-through. That is, a firm may decide to pass on all of the exchange rate change (complete pass-through), some of the change (incomplete), or none of the price changes (no pass-through) on to the customers in an importing country.

The degree of exchange rate pass-through varies between industries and is dependent upon factors such as the competitiveness of the industry, the substitutability of products, and the exporter's share (U.S. share, for example) in the country's imports (Japan's imports for the commodity in this example). With some agricultural commodities where the markets are competitive and products are virtually homogeneous, the percentage of change in exchange rates that are passed through to import prices are expected to be high relative to other industries such as heavy manufacturing and consumer goods. In the case of commodities in which the United States captures a large share of imports and is able to exert a high measure of market dominance, the pass-through is expected to be even higher.

In cases where the United States does not maintain this market power or where a commodity is heavily regulated by the foreign state, the pass-through rate is not nearly as high. For instance, a foreign government may mandate price levels or enforce restrictive quotas and tariffs to protect its domestic industry from outside competition. In these instances, commodity prices are not as able to adjust to exchange rate changes as they would in a free market environment.

Another factor that may significantly affect buyer prices is demand shifts that raise or lower prices within either the importing or producing country (price transmission or changes of buyer prices in response to changes in seller prices). The extent to which these demand shifts are able to transmit price changes depends on the structure of the market. Firms and industries that wield a large amount of pricing power within buyer markets may be more flexible in their pricing strategies than firms or industries that operate in a highly competitive environment.

Case Study: Japanese Grain and Livestock Prices

Based on monthly trade data ranging from January 1996 to April 1999, the effects of exchange rate and U.S. price changes were measured on the following commodities: corn, soybeans, fresh beef, frozen beef, pork, and broiler legs. The estimates of exchange rate pass-through and price transmission are measured on a 2-month percentage change in the Japan import price to capture the exchange rate pass-through and price transmission effects. A 2-month interval is used because it statistically provides an effective explanation for the data. These estimates reflect the percentage that the exchange rate and price are each transmitted to Japanese markets.

Japanese corn and soybean import prices may be expected to have high degrees of exchange rate pass-through given the homogeneity of the product and the relatively competitive market environment. For Japanese corn prices, the exchange rate pass-through reaches 90 percent within a 2-month interval and it is essentially complete in the case of soybeans. The U.S. price transmission effects to Japanese corn and soybeans are less but still fairly high – 80 percent and 68 percent, respectively. Corn displays the most robust results (table 5).

The pass-through and price transmission estimates for the livestock commodities universally rank below those of corn and soybeans. Explanations for this may include a higher level of diversity in product quality, product transportability issues, especially in the case of fresh versus frozen commodities, and additional health regulations and non-tariff barriers that may exist more predominantly in meat trade than in the corn and soybean market. In addition, the presence of third party competitors in the Japanese market also influences the degree of exchange rate pass-through to meat import prices. In spite of these factors, the estimates are still high, ranging from 76 percent to 86 percent in the case of exchange rate pass-through and 14 percent to 67 percent in the case of price transmission.

The high degrees of exchange rate pass-through of Japanese imported beef prices reflects the quality differences of U.S. beef. With high quality products, U.S. beef exporters may easily pass exchange rate changes to Japanese buyers without too much concern for competitors. This is not the case for pork and broiler legs, where U.S. exporters face greater competition within the Japanese market.

Conclusions

The effects of exchange rate pass-through differ by commodity. The degree of the exchange rate pass-through is affected by market structure, the competitiveness of the commodity, government policy, and import market share. The practical effects of this analysis are a better understanding of the linkages and relationships that determine foreign market pricing and a clearer idea about the magnitude of the effects that short-term changes in exchange rates and seller prices have in buyer markets. This may eventually lead to more effective export pricing strategies despite an environment characterized by volatile exchange rates and wide swings in commodity prices.

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Additional Reading

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Table 5--Exchange rate pass-through and domestic price transmission

Japanese import prices	Exchange rate			U.S. price			R-square	Product market share
					Percent change			
	Coefficient	Std. error	t-statistic	Coefficient	Std. error	t-statistic		
Feed corn	0.89	0.08	11.07	0.81	0.06	14.40	0.91	0.93
Soybeans	1.09	0.11	10.08	0.68	0.09	7.74	0.83	0.79
Fresh/chilled beef	0.87	0.19	4.35	0.14	0.13	1.08	0.35	0.39
Frozen beef	0.84	0.29	2.87	0.67	0.14	4.78	0.48	0.55
Pork	0.59	0.21	2.79	0.63	0.19	3.34	0.35	0.28
Broiler legs	0.76	0.18	4.32	0.38	0.11	3.53	0.49	0.86
Averages	0.84	0.18	5.91	0.55	0.12	5.81	0.57	0.59

Source: Economic Research Service, USDA.

depreciating currency raises a country's domestic prices for traded goods, an appreciating currency lowers the country's domestic prices. The effect of lower prices would be to reduce production and exports.

Non-crisis countries that are mainly agricultural importers rather than exporters, such as Japan, experienced a general rise in imports. This resulted from the crisis-related decline in agricultural world market prices. From the point of view of world markets, the rise in imports has to some degree compensated for the drop in imports by the crisis countries, such that agricultural exports by the United States have not fallen significantly in volume terms. Agricultural exporters in the United States and other non-crisis countries were hurt from the decrease not so much in the volume, but rather the price (and thereby value) of exports.

The crisis also affected non-crisis countries through capital flows and interest rates. Most of the capital that fled the crisis nations went to the United States and EU. The capital inflows lowered interest rates. This had the isolated effect of reducing the cost of capital investment, which should to some degree stimulate investment and thereby production.

Nonetheless, the crises' net effect on agriculture in the exporting non-crisis countries such as the United States was (perhaps with a bit of a lag) to reduce production and exports and increase imports to the extent that they import from the crisis countries. The two main variables linking the macroeconomy and agriculture are exchange rates and interest rates. As with the crisis countries, the effect of changes in the exchange rate on producers' terms of trade (in this instance a worsening of terms of trade) would probably outweigh the impact of changes in interest rates. This means that the negative effect on production and exports from falling world (and therefore domestic) prices, which is equivalent to an appreciating currency vis-a-vis the crisis countries, would outweigh the positive effect from some decline in interest rates.

The 1980's Debt Crisis Hurt U.S. Rural Economy Far More Than the 1990's Financial Crises

The nonmetro United States did not experience a significant hit from the 1990's financial crises, although nonmetro employment growth dipped in 1997-98. This is in sharp contrast to the nonmetro experience of the 1980's, when the impact of the debt crisis was severe and lingering. Although the nonmetro labor market has been stagnant for the last 4 years, the 1990's crises have likely contributed to the lackluster performance of employment in nonmetro areas relative to the solid employment growth and tight labor markets in metro areas [David A. Torgerson (202) 694-5443, dtorg@ers.usda.gov; and Karen S. Hamrick (202) 694-5426, khamrick@ers.usda.gov].

The 1997-99 international financial crises hurt U.S. sectors that are relatively dependent on exports. The U.S. rural economy, with a disproportionate share of employment in three export-dependent industries (manufacturing, agriculture, and mining), is more sensitive than the overall economy to shifts in the world economy. Indeed, jobs in nonmetro areas are disproportionately in every major goods producing sector (see table 6). Therefore, the value of the dollar and the growth of the world economy have a relatively larger impact on nonmetro than on metro areas. A strong dollar and sluggish world growth slowed U.S. goods exports and thus slowed nonmetro employment growth.

Although nonmetro employment has plateaued since 1995, the 1997-99 international financial crises appear to have contributed to a stagnant nonmetro labor market. In addition, the large quarter-to-quarter movements in goods exports also appear to have affected nonmetro areas, contributing to short-term labor market volatility (fig. 3).

Table 6--Industry and occupational share of total employment, 1997

	Nonmetro	Metro	Total U.S
		Percent	
Industry:			
Agriculture, forestry, fishing 1/	8.4	2.0	3.2
Mining	1.2	0.4	0.5
Construction	5.6	5.3	5.4
Manufacturing	16.0	11.7	12.4
Transportation, communications, utilities	4.2	5.0	4.8
Wholesale trade	3.1	4.9	4.6
Retail trade	17.3	16.7	16.9
Finance, insurance, and real estate	4.8	8.1	7.5
Services	23.6	32.4	30.8
Government	15.8	13.5	13.9
Total employment	100.0	100.0	100.0

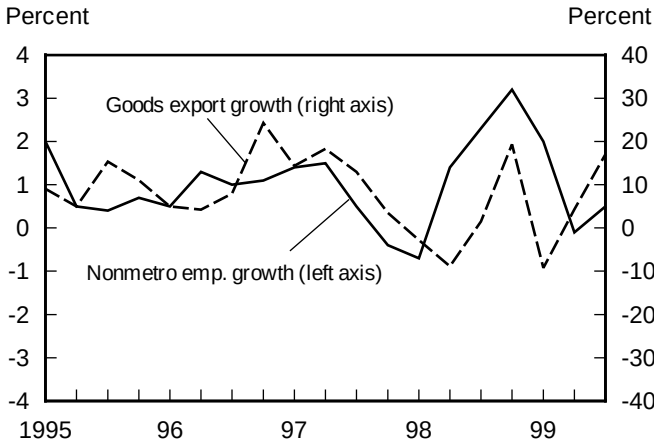
1/ Includes farm and agricultural service industries.

Source: Calculated by ERS using Bureau of Economic Analysis, U.S. Department of Commerce data.

The crises brought a decline in goods export growth in 1997 that became a sharp drop in goods exports in early 1998. Goods exports grew 11 percent in 1996 but slowed by the end 1997 to a 6.5 percent annualized rate. For the first three quarters of 1998, goods exports declined. The last time exports were this weak was the third quarter of 1983. Growth in nonmetro employment declined along with the slowdown in goods exports. As goods exports rebounded in late 1998, so also did nonmetro employment growth. Metro labor markets were largely unaffected (fig. 4). Because the metro labor force is about 80 percent of the U.S. labor force, national-level employment continued to grow and the unemployment rate declined. In addition, GDP growth was largely unaffected as lower interest rates offset the impact of a larger trade deficit.

Figure 3

Nonmetro employment growth and goods export growth decline during crisis

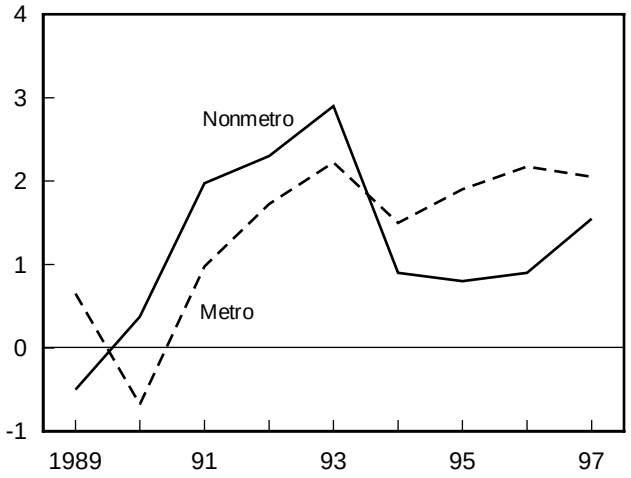


LAUS data annualized, NIPA data annualized.

Source: Calculated by ERS using Bureau of Labor Statistics, Local Area Unemployment Statistics data and from the Bureau of Economic Analysis National Income and Product Account data.

Figure 4

Nonmetro and metro employment growth



Source: Calculated by ERS using Bureau of Labor Statistics, Local Area Unemployment Statistics data.

Nonmetro Labor Market Was Hit Harder During the 1980's Debt Crisis

Both the debt crisis of the 1980's and the financial crises of the late 1990's affected the nonmetro United States but the impact of the 1980's debt crisis was severe and lingering, while the effect of the 1990's financial crises appears to be just a 1-year dip in nonmetro employment growth.[3] Although nonmetro areas have been experiencing sluggish growth over the last few years, conditions are far better now than in the 1980's.

The macroeconomic and financial situation was far less favorable during the 1980's debt crisis than in the 1990s financial crises. The 1980's saw high interest rates with tight monetary policy, high inflation and a weak domestic banking system—in sharp contrast to the situation when the Asian financial crisis hit in 1997. The only common major macroeconomic factor is the high-valued dollar. The high-valued dollar made U.S. goods more expensive abroad then and now. Although the current financial crises did indeed result in a higher-valued dollar, its rise was brief, small, and not associated with higher interest rates, which could have pushed the value of the dollar even higher. Large amounts of capital flowed into the United States in the aftermath of the financial crises, credit continues to be readily available, and interest rates are lower than before the crises.

[3] The debt crisis of the 1980's had three major aspects:(1) the excessive burden of less developed countries' (LDCs) debt relative to income; (2) the high U.S. agricultural debt relative to long-term sustainable cash receipts; and (3) the impact of the above and high levels of private indebtedness and other imbalances on the solvency of U.S. banks and savings and loans. The common role of excessive indebtedness, the interaction of the farm debt, banking system imbalances and LDC debt making each of the three individual problems worse, and all three situations coming to the crisis stage in the 1980's, while being largely resolved by 1990, justify linking the three situations as the debt crisis of the 1980's.

The late 1990's financial crises did not have the large impact on nonmetro areas that the 1980's debt crisis had. The debt crisis was more widespread and longer lasting in its impact on the U.S. economy and in particular, in its effect on financial conditions. The debt crisis resulted in a high-valued dollar and a protracted slowdown in world growth, which slowed U.S. exports. In addition, real interest rates were high and credit availability was restricted. The 1990's financial crises resulted in a higher-valued dollar, which has since retreated, lower interest rates, and only a small tightening of credit availability. While the debt crisis was fairly widespread across sectors in the United States, the negative impacts of the financial crises appear to be limited to trade-related sectors and likely to be short-lived compared to the debt crisis. Consequently, the impact of the financial crises on nonmetro areas was comparatively short lived and mild.

A Comparison of the 1980's Debt Crisis and the Late 1990's Financial Crises

Because of the structural adjustment made by the U.S. economy in the late 1980's and early 1990's, and similar adjustments of the European economies to the EU monetary union, the majority of the economies of the Organization of Economic Cooperation and Development (OECD) were sound when the Asian crisis hit. Indeed, now most analysts think that the crises in Asia, Brazil, and Russia had positive impacts on the OECD countries, overall. The main impact of the evolving crises on the OECD economies was to lower industrial material prices and to keep inflation low.

Examining the reasons for the quick turnaround in the late 1990's financial crises point to further differences than noted earlier between the 1980's debt crisis and the 1990's financial crises. Although international organizations provided needed liquidity to keep crisis economies from severely deteriorating, by 1998 all of the affected countries in Asia were in recession. The East and Southeast Asian countries could not loosen monetary policy to stimulate domestic demand as the resulting higher inflation or lower interest rates would lower their currency values even further. Weaker currency would have made the net outflow of funds even larger, making the problem even worse. These countries were under severe government budgetary restrictions and/or could not borrow to finance deficit spending. As a result, they were unable to raise government spending or cut taxes to stimulate domestic demand.

The only way out of the recession for the crisis countries in the short term was to let their weakened currencies stimulate demand for exports. The problem with that strategy is that some other country had to buy those exports. The typical Southeast Asian country had two major trading partners, Japan and other Southeast Asian countries. Japan's growth was stagnant and all the major East and Southeast Asian countries, except for China and Taiwan, were in recession. European growth was sluggish at best, leaving the United States to be the customer to absorb more exports.

Data Sources

Employment data: Data on nonmetro employment and unemployment reported in this

article come from three sources. The monthly Current Population Survey (CPS), conducted by the Bureau of the Census for the Bureau of Labor Statistics, U.S. Department of Labor (BLS), provides detailed information on the labor force, employment, unemployment, and demographic characteristics of the metro and nonmetro population. CPS derives estimates based on interviews of a national sample of about 47,000 households that are representative of the U.S. civilian noninstitutional population 16 years of age and over. Labor force information is based on respondents' activity during 1 week each month.

BLS county-level employment data, the Local Area Unemployment Statistics (LAUS), are taken from unemployment insurance claims and State surveys of established payrolls. These are then benchmarked to State totals from the CPS. The BLS data series provides monthly estimates of labor force, employment, and unemployment for individual counties.

Employment data from the Commerce Department's Bureau of Economic Analysis (BEA), unlike the household data collected by the CPS and BLS, provide establishment data on the number of jobs rather than the number of workers. The BEA data are taken primarily from administrative reports filed by employers covered under unemployment insurance laws and from information from the Internal Revenue Service and the Social Security Administration. Thus, jobs and earnings for these jobs are counted at the place of work and are based on a virtual universal count rather than a sample. The BEA data provide detailed information on the number of jobs and amount of earnings by industry at the county level. A shortcoming of the BEA data is the 2-year lag between when they are collected and when they are available for analysis.

Each of these data sets has its advantages and disadvantages. The CPS furnishes detailed employment, unemployment, and demographic data for metro and nonmetro portions of the Nation. The LAUS provides less detailed employment data than CPS, but offers very current employment and unemployment information at the county level. The BEA provides estimates of the number of jobs and earnings by industry for individual county areas. While these data sources are likely to provide different estimates of employment conditions at any point in time, they generally indicate similar trends over time.

Macroeconomic conditions: The economic indicators used to monitor macroeconomic changes in the U.S. economy are derived from Federal sources. Measures of inflation, including the consumer and producer prices indexes, and employment and unemployment data are developed by BLS. Energy prices are from the Energy Information Administration, U.S. Department of Energy. National income and product account information on capital investment, gross domestic product, and net exports are produced by the BEA. Information relating to monetary policy, including changes in interest rates and foreign exchange rates, and data on industrial production are furnished by the Federal Reserve Board.

If OECD economies had been weak, as they were in the early 1980's, the world and Asian recovery would not have happened so quickly or so smoothly. The U.S. economy, while at or above full employment, was able to continue with 3.9 percent GDP growth in 1998 and 1999 with under 2 percent inflation while absorbing a very large rise in the trade deficit. Four inter-related factors were at work in most OECD economies in the 1990's crises—(1) low oil prices and low inflation; (2) solid financial markets and banking systems; (3) a U.S. budget surplus; and (4) solid productivity and investment growth. In contrast, in the 1980's, the United States and the OECD experienced (1) high inflation; (2) weak banking systems; (3) large structural budget deficits, especially in the United States; and (4) sluggish investment and productivity growth. The differences in these underlying factors are key to explaining the difference between the two crises.

During the 1980's debt crisis worldwide inflation was high. U.S. and other Western banking systems were severely strained by the inability of less developed countries to even pay interest on their bank loans. The net result of continued high inflation was that the central banks of the developed countries were not able to significantly lower world interest rates for fear of rekindling even higher inflation. The U.S. banking system was itself part of the debt problem, so easing credit standards was not an option. The United States continued to run large Federal budget deficits during this period. Increasing trade deficits, while facilitating world economic recovery, allowed consumer and government spending to continue growing in the face of weak domestic savings. For all this to add up, investment growth had to slow.

To balance the demand for limited funds, real U.S. interest rates were high. High real oil prices and inflation further lowered business profitability. Since interest rates were high and retained earnings and profits were relatively weak,

Nonmetro Workers Important to Food Processing Industry

Food processing is an important manufacturing industry that is disproportionately located in nonmetro areas. Thirty-seven percent of the 1.8 million food processing workers live in nonmetro areas. The export category Foods, Feeds, and Beverages peaked in real dollar volume in 1995 at $44.5 (1992 $), and was followed by a modest decline in 1996. During the late 1990's crises, this category experienced only modest declines, which was consistent with the crises having little impact on high-value agricultural exports (see "Implications for U.S. Food and Agricultural Trade" in this publication). Foods, Feeds, and Beverages is one of several categories of these high-value products. Continued strength of food processing and its substantial domestic consumption likely mitigated the negative effects of the crises on nonmetro areas.

Definitions

Metro/Nonmetro areas: Metropolitan Statistical Areas (MSAs), as defined by the Office of Management and Budget, include core counties containing a city of 50,000 or more people or having an urbanized area of 50,000 or more and total area population of at least 100,000. Additional contiguous counties are included in the MSA if they are economically integrated with the core county or counties. For most data sources, these designations are based on population and commuting data from the 1990 Census of Population. The Current Population Survey data through 1993 categorize counties as metro and nonmetro based on population and commuting data from the 1980 Census. Nonmetro areas are counties outside metro area boundaries.

Unemployment rate: The number of unemployed people 16 years and older as a percentage of the civilian labor force age 16 years and older.

Civilian labor force: Noninstitutional civilians age 16 or older who are either employed or unemployed. Individuals who are neither employed nor unemployed are out of the labor force.

Real interest rate: The market interest rate minus inflation.

investment demand was relatively weak. Business investment grew only modestly, resulting in a sharp slowdown in private fixed business capital growth from over 3 percent per year in the 1970's to slightly more than 2 percent per annum in the 1980's. As a result, productivity growth slowed. The dollar's value was high during most of the debt crisis due to high U.S. long-term interest rates needed to fund the 1980's trade deficits.

In the 1990's crises, the increase in the U.S. trade deficit needed by Asia grew with minimum disruption to the U.S. economy. The trade deficit rose as exports of U.S. manufactured and agricultural goods fell and imports of manufactured goods rose. Foreign investors sought to buy American financial assets in 1998, thereby bidding up the dollar and the price of bonds, causing interest rates to fall. The U.S. economy received a large boost from low industrial material prices and falling crude oil prices. Coupled with good productivity growth, the low inflation brought increased corporate profitability and higher equity prices. Underlying this financial activity was a cycle of higher U.S. productivity growth that induced high plant and equipment investment spending, which in a low-inflation environment induces higher profits and more incentive to invest and further increases productivity.

The U.S. banking system and financial sector were in very good shape in the late 1990's, allowing small businesses to spend more on plant and equipment as well further enhancing productivity. Such an environment induced continued flows of financial capital from abroad to allow continued business investment growth without interest rates rising, as the financial crisis evolved. The agricultural story is somewhat different. Large supplies at the time of weakened demand complicated the analysis. See Coyle's article in this report for the effects on U.S. agricultural trade.

The world economy is now in recovery. Although U.S. growth may slow, the European Union and Japan are in recovery, and the prospects for Asian growth are good. While weakness persists in Latin America and other areas, overall world growth for 2000 should be strong.

Debt Crisis Affected Nonmetro Areas

The world debt crisis and the domestic banking and savings and loan crisis of the early 1980's continued through the mid- to late-1980's. As a result, credit continued to be tight, real interest rates were high, and the dollar was strong. This hit U.S. exporters even harder as the dollar was very strong until 1986. It took a full 6 years for goods exports to recover to the second-quarter 1980 level. This severely hindered the goods-producing industries–agriculture, mining, and manufacturing. U.S. foods, feeds, and beverages exports cumulatively lost $236 billion from the third quarter of 1980 to the third quarter of 1991, compared with a constant export scenario. It took a full 11 years for those exports to surpass the level of third-quarter 1980. The poor export picture of the 1980's put a severe damper on all sectors of the U.S. economy.

Although it appeared that nonmetro areas took several years to recover from the recessions of 1980-82, ERS research found that it was the particular financial market conditions of the mid-1980's–the high value of the dollar and tight domestic credit conditions–that prevented nonmetro areas from participating in the expansion. When the value of the dollar declined from its 1985 peak, and export markets started to come back, the nonmetro unemployment rate started to decline.

Summary

The negative impact on the U.S. rural economy of the late 1990's international financial crises was shallow and healed quickly. It resulted almost entirely from a temporary slow-down in export demand growth. The impact of the financial crises on nonmetro areas was moderated since the rest of the U. S. economy was largely unaffected. In particular, low inflation and oil prices, with low interest rates and readily available credit allowed the rural economy to weather the short-term storm with only a mild negative impact on employment growth.

In contrast, the negative impact of the 1980's debt crisis was both severe and long-lasting. Its impacts lingered for almost a full decade. The debt crisis's prolonged and substantial high valuation of the dollar led to costly and tight credit and other structural imbalances such as persistent relatively high inflation. As a result, the debt crisis hampered nonmetro employment growth in the 1980's. What emerged from the 1980's was a leaner nonmetro economy in a far stronger and more balanced U.S. economy, both of which were able to withstand the late 1990's financial crises.

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International Financial Crises: Impacts on U.S. Food and Agricultural Trade

The financial crises have had a modest impact on U.S. agricultural trade. The 1997-99 drop in U.S. agricultural exports, 23 percent (in real terms), is much less than the nearly 50-percent drop in the first half of the 1980's, when the dollar was strong and U.S. farm policy moved commodities into public stocks rather than onto the market and into export channels. U.S. agricultural exports are now expected to stabilize at $49.5 billion in fiscal 2000. Changes in the structure of U.S. agricultural trade from recent macroeconomic realignments have been subtle, with greater reliance on NAFTA as a market and as a supplier of imports, and less on Asia. Lower export receipts for farmers were offset by cheaper capital and inputs and a more robust domestic market [Bill Coyle (202) 694-5216, wcoyle@ers.usda.gov].

After reaching a high of almost $60 billion in fiscal 1996, U.S. agricultural exports declined to $49.0 billion in fiscal 1999, and are forecast to remain at $49.5 billion in fiscal 2000. The 1997-99 decline was largely caused by a fall in commodity prices due to declining import demand in financially distressed economies and abundant grain supplies (fig. 5). Export volumes of bulk commodities (except for some oilseed products) generally were stable (fig. 6), while those of high-value products were stable or rising (fig. 7). The decline in Asian import demand was partially offset by increased sales to other regions.

Global grain supplies in 1996-98 were abundant, responding to high mid-decade prices and in spite of weather anomalies like el Niño. Nominal U.S. export prices, across a broad spectrum of commodities, peaked in 1996-97 and declined afterwards; long-term declines in real prices continue their historical pattern. The price increases in the middle of the decade were led by grain production shortfalls in 1993-95. Wheat and coarse grain production rebounded in the second half of the decade, surpassing consumption in at least 2 of the last 4 years.

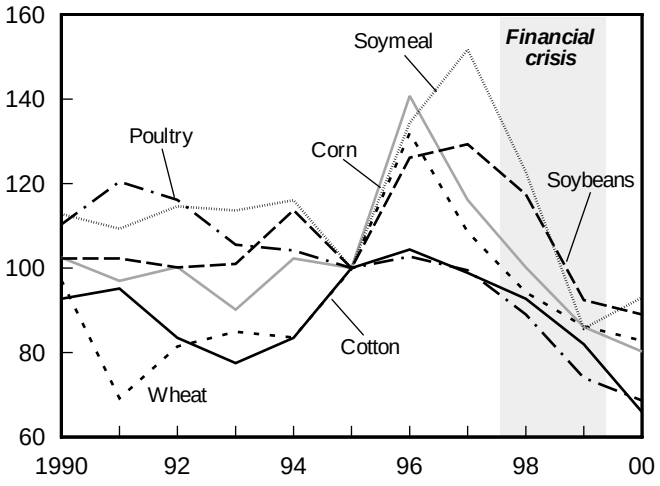
Global Financial Crises of 1997-99 Had Modest Impacts on U.S. Agricultural Trade

The markets most acutely affected were small: Collectively, the crisis-affected economies accounted for about 10 percent of global GDP and for about 14 percent of U.S. farm sales in fiscal 1997. The financial crises did not affect as greatly Asia's economic giants—Japan and China. If those countries had been drawn into the financial crises to the same extent as

Figure 5

Unit values for major U.S. export commodities

1995=100

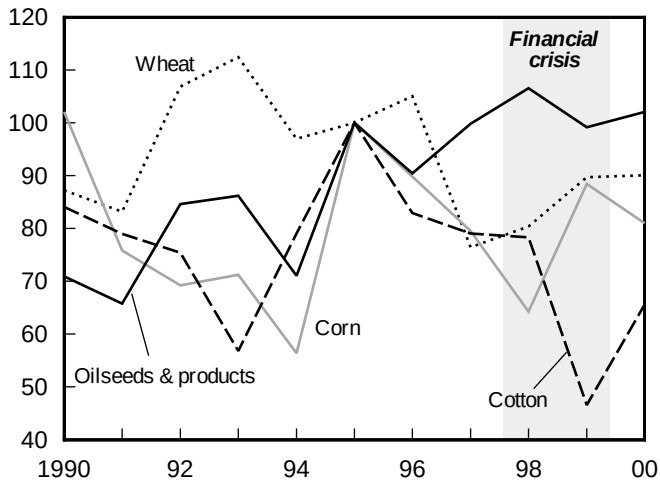


2000 forecast.
Source: FATUS.

Figure 6

Exports of major U.S. bulk commodities

1995=100 (Quantity indices)

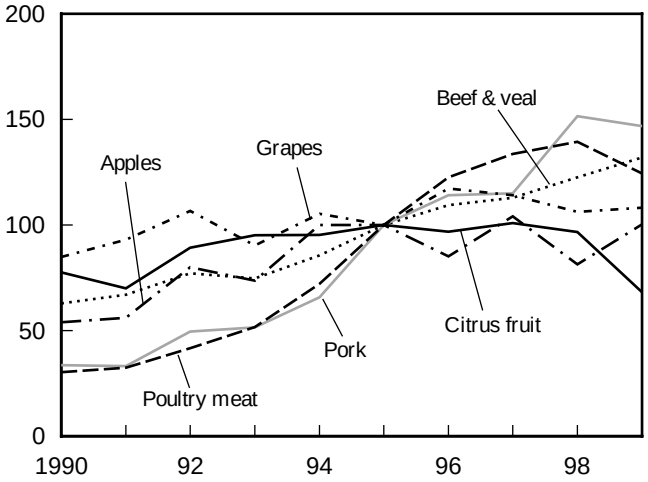


2000 forecast.
Source: FATUS, fiscal years.

Figure 7

Exports of major U.S. HVP commodities

1995=100 (Quantity indices)



Source: FATUS, fiscal years.

Southeast Asia and South Korea, the impact on U.S. food and agricultural trade would have been far more profound.

Japan's impact would have been more direct than China's because it has been the leading market for U.S. food and agricultural exports for many years, accounting for 20 percent of total U.S. exports and 50 percent of all sales to Asia. U.S. farm exports had already adjusted to Japan's slow-growing economy since 1992 and had begun to decline in 1996. At the height of the Asian crisis in 1998, U.S. exports to Japan were not down as sharply as to the crisis-stricken economies. The impact on U.S agricultural exports to Japan was mitigated by its richer consumers, an appreciating yen after July 1998 that made imports cheaper, and a milder recession than in other Asian countries in 1998. In addition, the Japanese food market had been undergoing structural change and liberalization, bringing down food prices, and thus boosting demand, including import demand. While the overall value of U.S. agricultural exports to Japan dropped 12 percent in 1998 and another 5 percent in 1999, exports of some key consumer-ready products were not readily affected. While there were some shifts toward lower quality cuts, for example, the volume of U.S. beef and pork exports to Japan remained stable in fiscal 1997-99.

The rise in the yen should continue to help boost U.S. sales of agricultural and food products to Japan in 2000. The rise should also help other countries in Asia that were hurt by the weak yen in competing with Japan in their own and in other markets. Recovery in Japan hinges on the government's commitment to banking reform and other fiscal measures to restore consumer confidence (See more discussion about Japan in Dyck's article in this report).

U.S. agricultural exports to China and Hong Kong (China) declined in 1997-99, but again not to the same extent as to the most financially distressed economies in the region. Officials estimated China's economic growth at 7 to 8 percent in 1997-99, the fastest growth for any Asian economy during the second half of the 1990's.

Most of the decline in China's agricultural imports had nothing to do with Asia's financial turmoil, but the impact of domestic policies. After a 20-million-ton shift from a net grain exporter to a net importer in 1993 and 1994, China again became a net exporter, largely due to policy reform that raised price incentives to producers. A more bearish view on China's future agricultural imports also derives from the greater potential for raising yields because of previously underreported grain area that resulted in overstated yield levels, the overstating of meat consumption, and the existence of large private and official grain stocks.

U.S. food sales to China have been relatively small and highly variable over the past 20 years, responding to marginal changes in this huge market and to political crises that erupt periodically. A clear change has been the diversification of China's agricultural imports: China now buys a broader range of agricultural and food products than just a few years ago when cotton and wheat were the two dominant imports from the United States. Products like vegetable oil, hides and skins, and animal products play an increasingly important role, although the levels are still quite small relative to the size of the market.

China could have had a serious impact on the Asian financial crisis, which it chose to avoid. Pressures were mounting for China to devalue its currency in 1997-98 when competitor currencies were being devalued as much as 35 to 75 percent, slowing exports, and slowing growth in China's current account surplus. During this period, China's political leaders implemented policies to stimulate domestic demand, and thus lessen the economy's future reliance on exports. These policies reduced the pressure to devalue its currency in the short term. (see the discussion about China in this report).

U.S. exports to Taiwan were off in fiscal 1998 but also for reasons independent of the financial crisis. Taiwan's imports declined with lower demand for feedstuffs (oilseeds and grain) after an outbreak of foot and mouth disease that started in March 1997 triggered a sharp contraction in Taiwan's hog sector, the biggest in the country's farm economy (see discussion related to Taiwan in this report). Other markets in Asia were down slightly. However, these markets have been "emerging" for many years and still account for a relatively small share of U.S. exports.

Positive supply side effects in affected economies are transitory: The currency devaluations in Asia, Russia, and Brazil not only lowered consumer demand through higher interest rates and consumer food prices, they also raised farmers' prices. Domestic agricultural production in these economies *temporarily* became more competitive *vis a vis* imports—thus displacing imports, including those from the United

States. The impact was temporary because real exchange rates rose with inflation and the economies eventually readjusted, reflecting their long-term comparative advantage. Some urban labor, which sought refuge with families in rural areas because of high unemployment in the cities, will eventually be drawn back to light manufacturing and other sectors as these economies recover.

Devaluation during July 1997-December 1998 made local agriculture and food production more competitive with products from outside the region. In Indonesia, for example, food price inflation within the country increased over 70 percent in 1998 and rose another 20 percent in 1999, providing a windfall to farmers, who represent a sizable share of the population. This phenomenon raised income in certain parts of the country, in contrast to high unemployment and declining incomes in the cities. Producers who were not greatly dependent on purchased inputs and borrowed capital and produced a staple like rice did better than livestock producers. In addition to facing a more elastic demand, livestock producers depend on imported inputs like feed and on borrowed capital. (see Liefert in Macroeconomic Linkages to Agriculture in this report).

U.S. exports of agricultural products in 1998-99 were adversely affected by this phenomenon. A good example was the increase in Korea's pork exports to Japan in 1998-99, made more competitive by a much cheaper won. These sales replaced primarily Taiwan pork exports to Japan. Indonesia's farm exports increased except for palm oil, on which a heavy export tax was imposed. Brazil became more internationally competitive in soybeans, coffee, sugar, orange juice and poultry meat, contributing to the decline in international commodity prices.

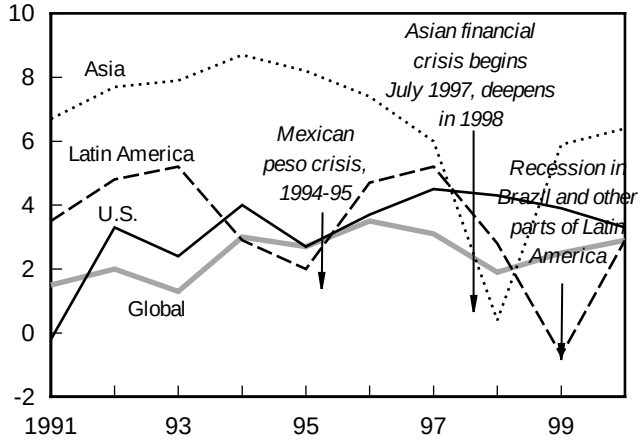
Declining U.S. agricultural exports to Asia were offset by increases to the Western Hemisphere: The evolution of a more liberal trading environment around the world has facilitated economic adjustment, making overall global economic growth more stable (fig. 8). The financial crisis in Asia, leading to slower growth and recession in parts of Asia, was offset by an economic upturn in NAFTA and in the rest of the Western Hemisphere in 1998. U.S. agricultural exports to the most financially distressed Asian economies, South Korea and Southeast Asia, declined 31 and 27 percent, in fiscal year 1998, respectively. These declines were cushioned by expanded exports to the Western Hemisphere that year (fig. 9). And then when Brazil and Russia went into recession in late 1998 and early 1999, many of the distressed parts of Asia were recovering. This was reflected in 45- and 35-percent declines in food shipments to Russia and Brazil in 1999, offset by a 10-percent rise to South Korea.

After 2 years, the financial crisis in Asia is by and large past. Interest rates have come down in the most affected economies, growth prospects have improved, the banking sectors have made positive efforts to reform, and domestic and foreign investors have shown renewed interest and confidence in Asia. Improved investor confidence is manifest in

Figure 8

Overall global growth more stable than regional growth

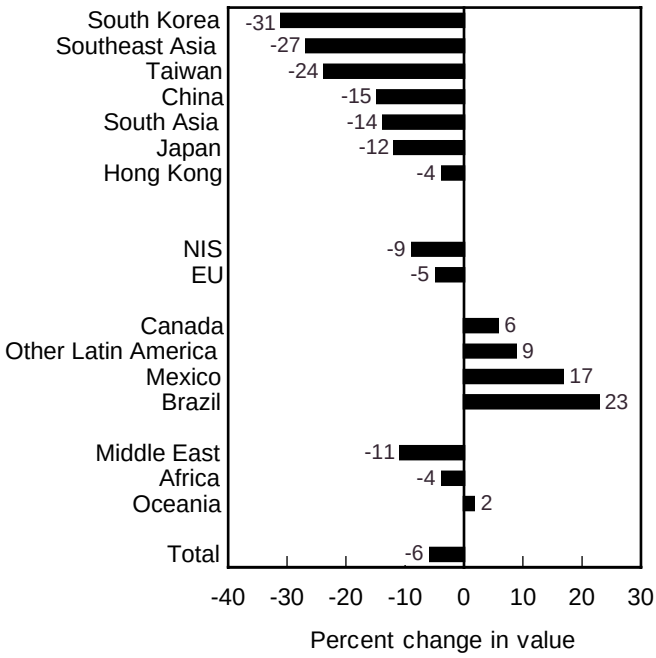
Percent change from previous year



Source: Economic Research Service, USDA.

Figure 9

Change in U.S. agricultural exports, fiscal 1997 to fiscal 1998



Source: USDA, *Outlook for U.S. Agricultural Exports*, Nov. 1999.

rising equity markets, stable currencies across Asia, and the fact that U.S. mutual funds targeting Asia outperformed the Dow Jones stock index in 1999. Prompt assistance from the IMF and other aid sources and stepped-up CCC credit guarantees in Korea and Southeast Asia aided the recovery process. The relatively rapid recovery is also attributable to a more liberal global trading regime. U.S. farm policy

reform, including the elimination of a public role in stockholding and the partial delinking of transfers from commodity prices, led to a quicker recovery in U.S. agricultural exports than in the early 1980's.

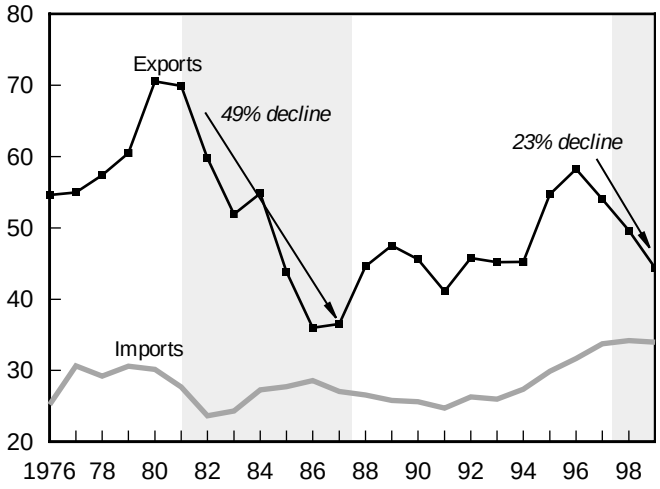
The peso crisis in Mexico, starting in December 1994, was even shorter, lasting about 18 months. U.S. agricultural exports to Mexico predictably declined (23 percent) and imports rose (33 percent) in 1995. But by 1996, with the floating of the peso, other economic adjustments, and proximity to an expanding U.S. economy, Mexico was back on an expansionary path and U.S. agricultural trade with Mexico had returned to trend growth.

The rapid recovery in Asia and Mexico contrasts with the more prolonged downturn in U.S. agricultural exports in the early 1980's, when a strong U.S. dollar and high U.S. commodity loan rates caused U.S. agricultural exports to fall 50 percent in real terms in 6 years (fig. 10). The impact on U.S. agricultural exports then was far more serious than observed in the last 2 years.

The strong dollar in the early 1980's tended to exaggerate the decline in U.S. commodity prices, breaking the loan-rate threshold more quickly than otherwise would have been the case and driving program commodities into government-financed storage rather than on to export markets. Global recession and the debt crisis in developing countries also constrained demand for U.S. bulk commodities in the early 1980's.

Figure 10

U.S. real agricultural exports and imports

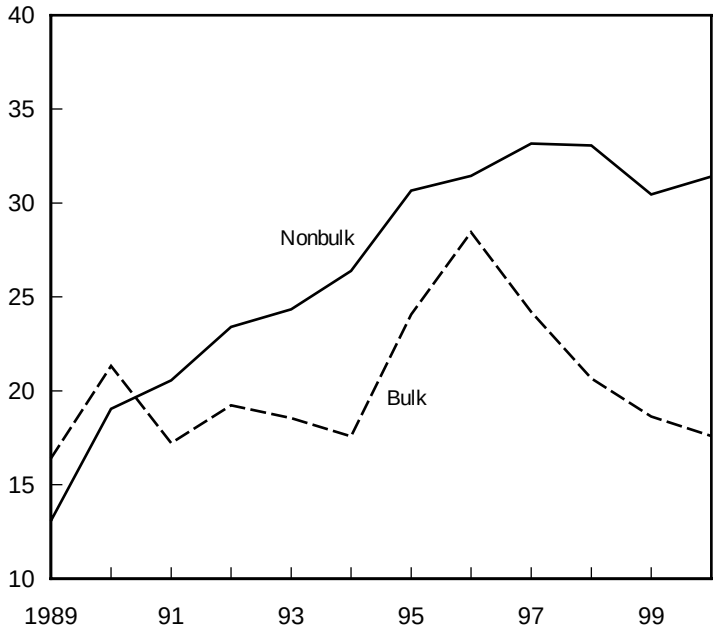


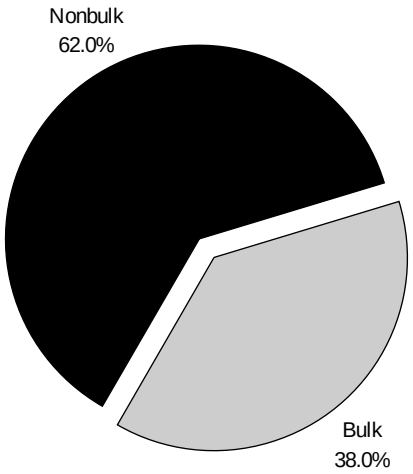
Source: FATUS; deflated using CPI for food.

The impact of the 1990's crisis was mitigated by the large component of consumer-ready and processed products in U.S. food and agricultural exports. The 1997-99 financial crises had a bigger impact on the export value of bulk commodities (stable volumes, declining prices) than on consumer-ready commodities (rising or stable volumes, more stable prices)(fig. 11) because the most affected economies were low or middle-income countries. Consumer-ready

Figure 11

Price and quantity of U.S. nonbulk exports more stable during 1997-99 financial crises





Fiscal 1999

2000 forecast.
Source: FATUS; fiscal years.

U.S. Agricultural Trade Value

The value of U.S. agricultural exports is projected to remain flat in fiscal 2000, but then grow for the rest of USDA's baseline projection period (2000-2009), reaching $75.9 billion by fiscal 2009. U.S. agricultural imports show steady annual growth to $50.7 billion in 2009. And the resulting agricultural trade surplus rises from a low in 2000 to $25.2 billion in 2009.

Continued low bulk commodity prices, large world supplies and foreign export competition, and a strong U.S. dollar led to lower export value in fiscal 1999, with exports of both bulk and high-value products (HVPs) declining. Fiscal 2000 U.S. export value is expected to remain about unchanged from fiscal 1999, at $49.5 billion, as the value of HVPs begin to recover, but bulk export value remains depressed. Starting in 2001, growth in both bulk and HVP exports is expected to rebound for the remainder of the baseline. Averaging 5.6 percent per year during 1999-2009, projected bulk commodity value growth exceeds growth in both the 1980's and the 1990's, lending strength to total export earnings. Cotton and grain exports rebound significantly from the recession of the previous decade. HVP export growth is projected to average 3.8 percent annually during 1999-2009, slower than in the 1990's. The share of bulk products in agricultural exports rises slightly in the baseline.

U.S. imports are projected to grow from $37 billion in fiscal 1999 to $51 billion in 2009, a 3.1- percent average annual increase. From 1995 to 1999, agricultural imports increased 7 percent on average per year, driven in large part by the robust U.S. economy and the strong dollar. The long-term import outlook is expected to be more in line with U.S. GDP growth over the coming decade. Imports of horticultural products, the largest component of U.S. agricultural imports, expanded 10 percent annually from 1995 to 1999. Horticultural imports are expected to slow to 4 percent growth from 2000 to 2009. Beverages, fruits, juices, and vegetables will be supplied largely by Mexico, Canada, Chile, and the European Union.

[Paul Westcott, (202) 694-5335, westcott@ers.usda.gov].

Table 7--Summary of U.S. agricultural trade projections, fiscal years

	1998	1999	2000 1/	2001	2002	2003	2004	2005	2006	2007	2008	2009	1999-2009 growth rate
						Billion dollars							Percent
Agricultural exports (value):													
Animals and products	11.2	10.1	10.8	9.8	10.5	10.8	11.2	11.7	12.0	12.5	12.8	13.3	2.8
Grains, feeds, and products	14.1	14.4	13.4	14.4	15.1	16.7	18.1	19.4	20.5	23.3	23.6	25.0	5.7
Oilseeds and products	11.1	8.7	8.6	8.6	8.8	9.3	10.0	10.7	11.4	12.1	12.6	12.5	3.7
Horticultural products	10.3	10.3	10.5	11.8	12.4	12.9	13.5	14.1	14.7	15.3	15.9	16.5	4.9
Tobacco, unmanufactured	1.4	1.4	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	-1.6
Cotton and linters	2.5	1.3	1.5	2.2	2.6	2.8	2.6	2.6	2.7	2.9	3.0	3.1	8.9
Other exports	2.9	2.8	2.9	3.2	3.3	3.4	3.6	3.7	3.9	4.0	4.2	4.3	4.3
Total agricultural exports	53.6	49.0	49.5	51.2	53.9	57.2	60.3	63.5	66.4	71.2	73.3	75.9	4.5
Bulk commodity exports	20.1	17.8	16.8	18.1	19.0	21.0	22.5	24.2	25.7	28.9	29.6	30.8	5.6
High-value product exports	33.6	31.2	32.2	33.1	34.9	36.3	37.8	39.3	40.7	42.3	43.7	45.1	3.8
High-value product share	62.6	63.7	65.7	64.7	64.7	63.4	62.8	61.9	61.3	59.4	59.7	59.5	
Agricultural imports (value):													
Animals and products	6.8	7.1	7.2	7.5	7.5	7.6	7.8	7.9	8.1	8.2	8.3	8.5	1.9
Grains, feeds, and products	2.9	2.9	2.8	2.9	3.0	3.1	3.3	3.4	3.6	3.7	3.8	4.0	3.0
Oilseeds and products	2.2	2.0	1.9	1.8	1.7	1.6	1.6	1.8	2.0	2.3	2.6	2.9	3.7
Horticultural products	13.9	15.3	15.7	16.4	17.1	17.9	18.7	19.5	20.3	21.1	21.9	22.8	4.1
Tobacco, unmanufactured	0.8	0.7	0.7	0.7	0.7	0.8	0.9	0.9	1.0	1.1	1.1	1.2	4.5
Sugar and related products	1.7	1.6	1.6	1.8	1.8	1.9	2.1	2.1	2.0	1.9	1.9	1.9	2.1
Coffee, cocoa, and rubber	6.3	5.2	5.4	5.5	5.5	5.6	5.6	5.7	5.7	5.8	5.8	5.9	1.2
Other imports	2.4	2.6	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.3
Total agricultural imports	37.0	37.4	38.0	39.3	40.2	41.4	43.0	44.4	45.8	47.4	49.0	50.7	3.1
Net agricultural trade balance	16.6	11.6	11.0	11.9	13.7	15.9	17.3	19.1	20.6	23.9	24.3	25.2	8.1
						Million metric tons							
Agricultural exports (volume):													
Bulk commodity exports	98.5	113.7	109.4	115.5	117.6	121.1	124.5	127.4	129.8	132.1	134.3	136.6	1.9

1/ The projections were completed in November 1999 based on policy decisions and other information known at that time. For updates of the nearby year forecasts, see USDA's "Outlook for U.S. Agricultural Trade" report, published in February, May, August, and December.

Notes: Other exports consist of seeds, sugar and tropical products, and beverages and preparations. Essential oils are included in horticultural products. Bulk commodities include wheat, rice, feed grains, soybeans, cotton, and tobacco. High-value products (HVP's) are calculated as total exports less the bulk commodities. HVP's include semi-processed and processed grains and oilseeds, animals and products, horticultural products, and sugar and tropical products. Other imports include seeds, beverages except beer and wine, and miscellaneous commodities.

exports are concentrated in higher-income markets, like Japan, the EU, and Canada, where food consumption is less affected by changes in income and prices. One exception was the big decline in poultry meat exports to Russia in 1998-99.

Food Imports Continued To Rise

U.S. food and agricultural imports continued to rise in 1997-99, primarily driven by continued economic expansion. Imports from the distressed economies did not increase their share of U.S. imports as one might expect. Rather, trade with NAFTA continued to grow despite the relatively cheaper products from Asia and Brazil. Scarcity of export financing in some of the affected economies may be a partial explanation.

The sustained rise in U.S. food imports reflects the robust U.S. economy, the growing demand for variety and off-season supplies of horticultural and other products, as well as continued advances in logistics and transportation technology. Rising imports and declining food exports reduced the U.S. agricultural trade surplus from $27.2 billion in fiscal 1996 to only $11.5 billion in fiscal 1999. Greatest import growth has been in the animal and horticultural product areas.

Summing Up

While the international financial crises, along with abundant grain supplies, lowered the value of U. S. food and agricultural exports, there were offsetting impacts. The international financial crises also led to adjustments in global capital and energy markets, reducing capital and input costs faced by U.S. farmers and, more broadly, stimulated U.S. economic activity in the short run, particularly in interest-sensitive and energy-intensive sectors. Thus, the short run effects of the 1997-99 financial crises on U.S. agriculture were mixed. Sectors relying more on domestic demand, such as livestock products and processed food, were hurt less by the international financial crises per se than export-oriented sectors such as food grains. Full-time producers of trade-exposed commodities (grains) were hurt more than part-time producers of domestic-oriented products (horticultural products).

With higher growth in Asia, the market for food and agricultural products will once again grow. This will certainly be the case for East Asia, including Japan, and most likely for China, where agricultural land resources, like those in other East Asian economies, are very limited.

The financial crises in Asia, now past in most countries, have had a modest impact on U.S. agricultural trade. The drop in value of U.S. agricultural exports in the past 3 years, 23 percent (in real terms) is much less than the nearly 50-percent drop in the first half of the 1980's. Changes in the structure of U.S. agricultural trade have been subtle, with greater reliance on NAFTA as a market and as a supplier of imports, and less on Asia. Low prices from reduced import demand and abundant food supplies could quickly change with economic recovery and the ever-present potential that adverse weather could reduce world output of grain and other agricultural products.

The shift from bulk to non-bulk commodity exports is also likely to continue. It has occurred with grain and meat, as meat exports substitute for grain due to an expanding middle class and dietary change in Asia and other regions. The shift will continue with reforms in trade policy and improvements in transportation technology, and as supply constraints and infrastructure bottlenecks are overcome. The shift brings with it an agenda of concerns about technical barriers to trade, sanitary and phytosanitary issues, and investment policy which will be more prominent in the future.

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The Financial Crisis Hit Korean Agricultural Imports Hard

In a short period late in 1997, Korea went into a deep recession and suffered a collapse of domestic and international confidence. The value of Korea's currency dropped sharply, making imports more expensive. Its agricultural imports dropped less than its total imports, but parts of its agricultural trade were hit very hard. Imports of meats, consumer-ready foods and beverages, and hides dropped drastically but imports of feedstuffs and cotton remained at pre-crisis levels. The economy rebounded quickly in 1999, aided by new foreign investment. Foreign involvement in Korea's food and beverage industries increased as a result of the crisis [John Dyck, (202) 694-5221, jdyck@ers.usda.gov].

South Korea was a major casualty of the financial crises that swept Asia, Russia, and Brazil in 1997-99. It experienced currency depreciation, an economic downturn, problems in securing and allocating commercial credit, and unusual difficulties with corporate debt. As a result, agricultural trade was affected, mostly through higher import prices and reduced import volume. The value of U.S. agricultural exports to Korea in 1998 fell 22 percent.[4] The crisis was especially difficult for Korea because of the shock to the commercial credit system from a year earlier. Obtaining credit, even for ordinary business transactions (such as international trading) became very difficult for a period of 2 or more months.

The Evolution of Korea's Financial Crisis

At the onset of Thailand's financial crisis in July-October 1997, Korea appeared able to handle the region's financial crisis. However, the high level of short-term debt and low level of foreign reserves shifted market expectations. While Korea's economy had many strengths, growing problems in the financial and industrial sectors led the Korean government to lose control over the won.

Depreciation began and at the end of December, almost 6 months after the crisis erupted in Thailand, Korea let the won float freely. It reached its nadir in January 1999 (at 1,707 won per dollar), and then gradually rose in value over the course of 1998, with an average rate of 1,213 won in December 1998. In the first 5 months of 1999, the won fluctuated within the range of 1,175-1,230 won per dollar, without showing a trend. Compared with January 1997, before the Asian financial crises, it was worth 28 percent less in early 1999. At the peak of the crisis (January 1998) it had lost 50 percent of its value.

Depreciation increased the foreign currency-denominated debt load of Korean firms, widening debt-to-equity ratios. Foreign creditors were alarmed by the great instability in the Korean economy. The domestic banking sector, at risk of insolvency, reduced credit and loans. In a general sense, the Korean economy and its firms temporarily lost creditworthiness. Without access to new credit, demands for timely repayment of old debts put Korean firms under extreme pressure, especially those with substantial foreign debt or those engaged in trade (which requires letters of credit for normal transactions).

The International Monetary Fund (IMF) came to the aid of Korea in December 1997 with a financial package worth $58 billion, including lending from the United States, the World Bank, the Asian Development Bank, and others. The package called for reforms in Korea's financial sector, the way business is conducted at the firm level, and foreign investment regulations. It also called for easing imports and eliminating trade related subsidies. The IMF also required government spending cuts, improved tax revenue, tight monetary policy, and higher interest rates.

The economy began to decline late in 1997, and recession persisted through 1998. Real GDP dropped 5.8 percent. Unemployment reached 6.5 percent, well above the 2-percent level prevailing before the crisis. Many consumers lost income because of across-the-board salary reductions (e.g., 10 percent for many government employees), business failures, and reduced bonuses. Many households lost wealth as their stock holdings plummeted in value. Private consumption expenditures declined almost 2 percent in 1998.

Reshaping Korea's Corporate Structure

The crisis aggravated the problems already besetting some Korean corporations and added new problems, even for previously healthy firms. Korea's industrial economy is well known for its *chaebol* (large conglomerates), mostly dating from after World War II, and often controlled by a single family. The Korean government favored the development of

[4] Calendar year 1998.

such large firms, which it believed would increase Korea's global competitiveness in manufacturing through economies of size and allow the country to quickly reach higher stages of technological sophistication. However, before and during the crisis, the *chaebol* system was widely criticized for allowing over-investment from an insufficient capital base. Even before the crisis, several *chaebol* collapsed in 1997. Among them were the Jinro group, brewers and distillers of beer, whiskey, and soju, and the Haitai group, which owned large confectionery and beverage operations.

Because Korea had prevented foreign ownership of its industries, the economic crisis and depreciation of the won affected a capital base that was located mostly inside Korea. Especially for the food industry, which had engaged in little outward investment, there were no offshore enterprises and activities to cushion the blow that fell within Korea. Many firms experienced financial distress due to the temporary loss of credit and consequent difficulty in importing inputs, lenders' sudden calls for prompt repayment of borrowed funds, and in some cases reduced demand because of the drop in consumer confidence and income.

Legal barriers to foreign investment in Korea were significantly lowered because of the crisis and the agreement with the IMF on restructuring economic policy. Lifting barriers to foreign participation led to significant equity investment by foreign firms in Korea's food and beverage market (see box "Increased Internationalization…"). The internationalization of the large brewing industry was particularly swift. Other foreign-based agricultural-sector firms found that their ability to extend credit, when Korean-based firms could not, offered a chance to expand operations. Still other food firms expanded their business in response to the sharply lowered costs of operation in Korea, as office rents, personnel costs, and other costs made Korea an attractive place to invest.

The Financial Crisis's Linkages To Agriculture

Exchange rates, income, and credit were three macroeconomic linkages affecting Korean agriculture. Lower value of the won effectively raised the price of imported goods relative to domestic ones and made Korean agricultural exports cheaper in terms of foreign currencies. Korean agricultural imports dropped significantly both in terms of U.S. dollars and in volume.

Most Korean consumers were poorer in 1998 than before, with lower incomes. Rising unemployment reduced asset values, and, often, reduced salaries made budgets tighter for Koreans. Consumption declined as a result.

Like any commerce, trade rests on an assumption by the seller that the buyer has the funds necessary to pay for a product. The inability of importers to get credit limited production and trade potential early in 1998 across all economic sectors, including agriculture-related industries.

Agriculture Affected Less than the Rest of the Economy

The crisis affected the farm sector less severely than other parts of the economy. Korea's production of grains, fruits, and vegetables appeared almost unaffected by the won depreciation. Inputs to these types of farming are mostly produced in Korea, and the weaker won did not directly affect input prices. Livestock production suffered from higher costs of imported feeds, but gained from less competition from imported meat. Data for Korea's broiler industry illustrate these effects (see fig. 12).

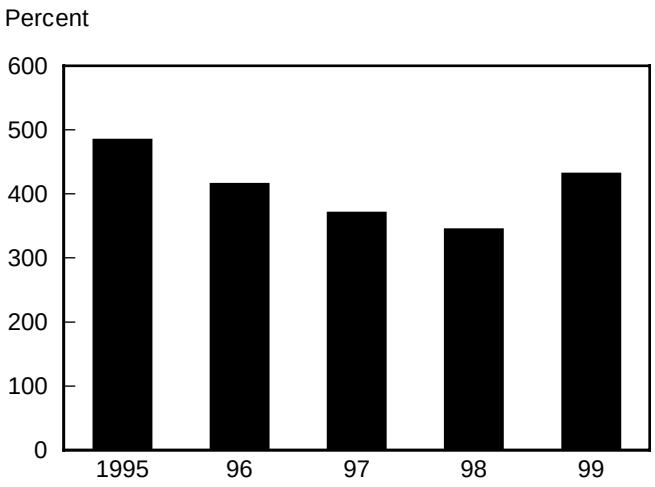
Government expenditures on farming continued, despite the fiscal austerity agreed to in the IMF assistance package. Subsidies for rice farmers were maintained and the government added major support for cattle raisers as it purchased slaughter cattle in the midst of a cyclical price drop—likely exceeding its domestic support commitment to the World Trade Organization. The government also restructured cooperative federations, ousting their leadership and announcing a plan to merge them. The cooperatives are heavily involved in rural credit and the feed sector, but changes may not affect farmers in the short run.

Effects of the Crisis on Agricultural Trade

The lower value of the won led to a higher value of Korea's imports of agricultural products from all countries in 1998 in terms of the Korean won. The volume of most major imported commodities fell (table 8). In terms of the U.S. dollar, Korean imports fell 28 percent, or $2.6 billion. This

Figure 12

Feed price ratios for Korea's broiler producers



1999 data are Jan.-June.
Source: KA9068, 8/13/99.

Increased Internationalization of the Food Sector

While trade in agricultural goods fell in 1998, internationalization was spurred by important new foreign investments. Foreign direct investment in Korea has been limited by laws that have directly banned or minimized the degree of foreign ownership permitted in a firm operating within the country. Such laws have kept foreign firms at arm's length. They have encouraged franchising of branded operations, in which a Korean firm secures exclusive distribution or marketing rights for a foreign food product or service. Given this legal framework, joint ventures (rather than sole foreign ownership) have often been the most ambitious vehicles for foreign-firm participation, and laws have capped foreign firm shares in such ventures. Besides direct legal constraints, foreign firm participation has faced cultural and extra-legal bureaucratic discrimination.

However, the internationalization of the food sector received an extra impetus because of the financial crises. Korea, as part of its commitment to the IMF, took steps to end or reduce legal barriers to foreign firm participation in its economy. Besides these important government steps, the shocks experienced by the private sector also opened the door wider to the internationalization of food industry firms in 1997 and 1998. Two of the three major oilseed crushing firms, seven feed millers, five cotton mills, and three of the four largest bakery companies sought court protection from creditors in 1998, according to FAS/Seoul reports.

In some cases, the source of their difficulties lay in enterprises outside the food/fiber sectors to which the firms were linked. Many Korean firms found that their debt-to-equity ratios rose as a result of the crisis, and that the judgment of the ratios by lenders changed as well. Debt loads that had been tolerated by lending institutions before the crisis were not tolerated as the crisis unfolded. Companies and corporate groups *(chaebol)* were forced to lower their debt/equity ratios in order to secure continued financing. This stimulated the sale of companies or parts of them. Given the general financial distress in Korea, there were relatively few Korean companies able to buy firms, and foreign buyers were a logical choice. Combined with the legal changes that raised the ability of foreign entities to own Korean firms, this development changed the investment climate dramatically.

Some major industries saw increases in international ownership. The brewing industry saw the three largest firms transformed. The Doosan group's OB beer breweries became a 50-50 joint venture with the international firm, Interbrew, based in Belgium. The Hite beer concern attracted strong investment from Carlsberg, based in Denmark, and from U.S. investors. The Jinro-Coors brewing business was the subject of an auction in the wake of the collapse of the Jinro group, and was acquired by the OB joint venture of Interbrew and Doosan. The Doosan group was among the groups selling the bottling and distribution rights to Coca-Cola Korea Company, an arm of the international Coca-Cola firm, which now has sole control of the Korean Coca-Cola market. The failure of the Haitai group led its creditors to offer for sale its important beverage subsidiary, in which several foreign firms were interested (as of 8/1/99). The Daesang group sold its lysine feed additive business to BASF, a firm based in Germany. The U.S. meat firm, IBP, purchased a major Korean leather tanning firm.

Other international companies expanded their operations in Korea and Japan in the midst of the crisis. Unlike Korean-based companies, their ability to invest was not affected by the shortage of credit within Korea, and their hands were not tied by the failure of associated firms in Korea. The Carrefour hypermarket chain announced plans to expand the number of its stores in Korea and plans to enter Japan. Cargill Korea expanded its feed sales to Korean livestock farms, helped by the fact that it could extend credit, while its competitors generally could not. The U.S.-based Kellogg company raised its ownership of its breakfast cereal joint venture in Korea from 50 to 90 percent of shares.

was the lowest agricultural import total (in nominal dollars) since 1993 (see fig. 13). The value of U.S. agricultural exports to Korea dropped 22 percent (table 9). The U.S. share of Korea's agricultural imports dropped significantly in 1997, but regained some ground in 1998 (see table 10). Korea's agricultural imports dropped somewhat less than its overall imports, which declined 35 percent.

Part of the drop in agricultural trade in dollar terms, especially for bulk imports such as grains, was not closely related to the financial crises, however, but was caused by the worldwide drop in agricultural commodity prices. Dollar prices of most major agricultural products in world trade fell in 1998. Trade data provide strong indications that the volume of Korea's imports fell less than the dollar value. For corn, for example, the drop in dollar value was 27 percent, while volume dropped only 14 percent. The value of cattle hides dropped 40 percent, but the number of hides imported by Korea was 30 percent less than in 1997. The average, or unit, dollar value of major imported commodities dropped in 25 out of 27 cases (table 11). For these large import commodities, about 44 percent of the difference between the value of agricultural imports in the peak year of 1996 and the value in 1998 can be attributed to lower dollar

Table 8--Top agricultural imports, South Korea

	Ranked by value in 1996	1996	1997	1998	1996	1997	1998	1996	1997	1998	1996	1997	1998
		Million US$			1,000 tons			US$/ton			Million won/ton		
1	Corn, feed	1,217	965	667	6,802	6,524	5,335	179	148	125	0.357	0.295	0.250
2	Cattle hides	806	813	482	13,350	12,478	8,698	60,393	65,166	55,426	120.544	130.137	110.740
3	Cotton	714	583	522	346	315	303	2,060	1,853	1,725	4.112	3.701	3.446
4	Wheat, milling	531	440	392	2,219	2,229	2,345	239	197	167	0.478	0.394	0.334
5	Beef	496	464	249	162	166	92	3,053	2,793	2,705	6.095	5.577	5.405
6	Rubber, natural	460	355	228	320	319	297	1,439	1,113	770	2.873	2.223	1.538
7	Sugar, raw	443	420	375	1,399	1,437	1,378	317	293	272	0.632	0.584	0.544
8	Soybeans, for crush	372	407	293	1,166	1,244	1,089	319	327	269	0.636	0.653	0.538
9	Corn, industrial use	350	283	240	1,870	1,787	1,774	187	159	135	0.374	0.317	0.270
10	Soymeal	294	224	207	1,113	731	930	264	306	223	0.527	0.612	0.445
	Among the top ten, 1998:												
	Wheat, feed	192	154	271	958	1,096	2,349	201	141	115	0.401	0.281	0.230
	Total above	5,876	5,108	3,925									
	Other commodities	4,627	4,249	2,775									
	Total agricultural imports	10,504	9,357	6,701									
	In billion won	8,450	8,896	9,384									

* Volumes for hides are in 1,000 pieces, not tons. Unit values are per 1,000 pieces.

Source: World Trade Atlas, Korean Republic Edition, GTI, Inc. (trademarked).

Table 9--U.S. agricultural exports to South Korea

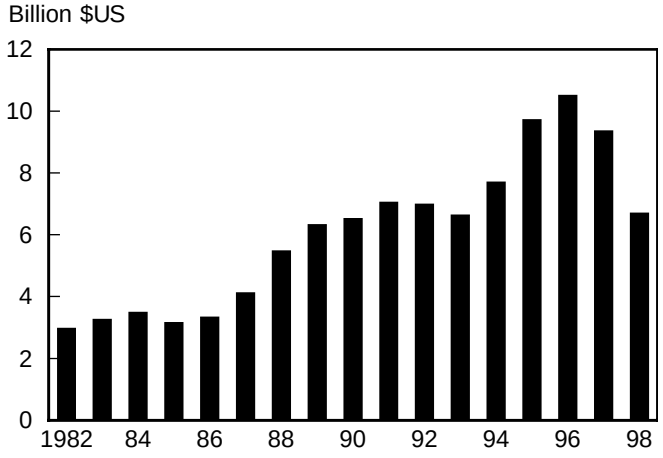
	1996	1997	1998	1996	1997	1998	1996	1997	1998
	Million US$			1,000 tons			US$/ton		
Corn	1,274	453	463	8,057	3,444	4,393	158	132	105
Cattle hides *	564	548	291	8,075	7,591	4,954	N/A	N/A	N/A
Soybeans	437	372	304	1,536	1,249	1,280	285	298	238
Cotton	257	224	266	138	127	165	1,862	1,764	1,612
Wheat	328	222	216	1,613	1,309	1,503	203	170	144
Beef	244	292	142	71	90	53	3,437	3,244	2,679
Tobacco	54	63	39	7	7	4	8,232	8,891	9,192
Soymeal	0	0	60	0	0	290	214		207
Soyoil	5	23	30	8	45	48	552	519	630
Total above	3,162	2,198	1,811						
Other commodities	709	665	416						
Total agricultural exports to Korea	3,871	2,863	2,227						

* Volumes for hides are in 1,000 pieces, and only for whole hides. Value includes pieces of hides as well.

Source: FATUS.

Figure 13

Korea's agricultural imports



Source: Statistical Yearbook of Foreign Trade, Republic of Korea.

values per unit–to a lower product price. Global commodity price movements were almost as important as economic weakness in Korea in reducing its agricultural import value. In terms of the won, however, the picture was different. All but three of the top 27 commodities had a higher unit value in won in 1998 than in 1997 (table 11). In most cases, the loss in buying power of the won outweighed the dollar decreases in world commodity prices, and import unit values in won rose.

Korea's Agricultural Exports

The value of Korean agricultural exports, in dollar terms, fell 10 percent in 1998, considerably less than imports fell. In won, Korea's exports of agricultural products rose by almost one-third. This outcome tends to confirm Korea's greater competitiveness after the large depreciation in the value of won, although nonagricultural exports from Korea fared better than the agricultural ones. Korea's export potential was raised through the devaluation, but the financial

Table 10--U.S. share of Korea's imports

	1996	1997	1998
		Percent	
Volume:			
Beef	47	50	57
Wheat (milling & feed)	51	44	31
Corn (feed & indust.)	93	50	59
Soybeans (crush & food)	92	83	96
Soyoil	45	50	90
Soymeal	0	0	34
Cattle hides	87	75	82
Cotton	45	45	56
Value:			
Total agricultural imports	43	37	39

Source: World Trade Atlas, Korea Republic Edition, Dec. 1998.

Table 11--Korea's agricultural imports

Largest commodities, arranged by type	1996	1997	1998	1996	1997	1998	1996	1997	1998	1996	1997	1998
	Million US$			1,000 tons 1/			US$/ton 1/			Million won/ton 1/		
Feed grains												
Corn, feed	1,217	965	667	6,802	6,524	5,335	179	148	125	0.357	0.295	0.250
Wheat, feed	192	154	271	958	1,096	2,349	201	141	115	0.401	0.281	0.230
Rye, feed	161	2	3	946	4	15	171	396	206	0.341	0.790	0.411
Subtotal above	1,571	1,121	941	8,706	7,624	7,699						
Meats												
Beef	496	464	249	162	166	92	3,053	2,793	2,705	6.095	5.577	5.405
Pork	143	220	138	40	61	53	3,621	3,585	2,599	7.227	7.158	5.193
Oilseed complex												
Soybeans, for crush	372	407	293	1,166	1,244	1,089	319	327	269	0.636	0.653	0.538
Soymeal	294	224	207	1,113	731	930	264	306	223	0.527	0.612	0.445
Palm oil	103	110	98	185	197	151	558	556	644	1.114	1.111	1.286
Rapeseed meal	85	72	46	576	471	357	148	153	127	0.296	0.305	0.255
Inputs to food industry												
Wheat, milling	531	440	392	2,219	2,229	2,345	239	197	167	0.478	0.394	0.334
Sugar, raw	443	420	375	1,399	1,437	1,378	317	293	272	0.632	0.584	0.544
Corn, industrial use	350	283	240	1,870	1,787	1,774	187	159	135	0.374	0.317	0.270
Soybeans, food use	102	108	86	299	324	324	340	332	266	0.679	0.664	0.531
Inputs to nonfood manufacturing												
Hides of cattle	806	813	482	13,350	12,478	8,698	60,393	65,166	55,426	120.544	130.137	110.740
Cotton	714	583	522	346	315	303	2,060	1,853	1,725	4.112	3.701	3.446
Rubber, natural	460	355	228	320	319	297	1,439	1,113	770	2.873	2.223	1.538
Furs, raw	285	147	41	4,893	3,641	1,557	58,210	40,480	26,312	116.186	80.838	52.571
Wool, uncarded	145	124	61	27	22	13	5,417	5,709	4,625	10.812	11.400	9.240
Tobacco, unmanuf.	105	96	86	16	13	12	6,679	7,405	7,236	13.331	14.788	14.458
Silk, raw	84	71	34	3	3	1	25,356	28,372	26,798	50.611	56.659	53.542
Hides of sheep	82	73	59	8,697	7,657	9,657	9,473	9,533	6,137	18.908	19.036	12.261
Consumer oriented												
Coffee	146	208	158	58	69	63	2,516	3,034	2,498	5.022	6.059	4.991
Juices	112	110	66	63	75	45	1,778	1,459	1,454	3.549	2.914	2.906
Chocolate	78	81	46	25	28	18	3,168	2,943	2,607	6.323	5.878	5.208
Other feed & food inputs												
Cassava chips & pellets	99	60	49	628	585	463	157	103	106	0.314	0.206	0.213
Molasses	86	66	60	719	726	797	120	91	75	0.239	0.183	0.150
Wheat bran	78	69	44	521	538	428	149	128	103	0.298	0.256	0.206
Whey	77	57	36	46	40	33	1,677	1,402	1,091	3.347	2.800	2.179
Total above	7,849	6,782	5,036									
Other commodities	2,655	2,575	1,664									
Total agricultural imports	10,504	9,357	6,701									
In billion won	8,450	8,896	9,384									

1/ Volumes for hides and furskins are in 1000 pieces, not tons. Unit values are per 1,000 pieces.

Source: World Trade Atlas, Korean Republic Edition, GTI, Inc. (trademarked).

crises affecting most of the countries importing from Korea weakened demand for its exports.

Commodity-by-Commodity Effects on Trade

Examination of several major import markets illustrates the ways in which economic weakness, global price changes, and other forces worked in 1998.

Meats

The financial crises intensified what was already a cyclical downturn in cattle prices that began in June 1997. Indications that feed prices and interest rates would be higher caused farmers who already intended to cut the number of cattle to rush them to market in December 1997 and January 1998. This caused cattle prices to fall even faster, and abnormally heavy slaughter didn't peak until June 1998. Therefore, domestic meat production increased.

The sharp downturn in domestic beef carcass prices made them more competitive with imported beef. The devaluation of the won, greatest at the beginning of 1998, further narrowed the price advantage that imported beef had always before enjoyed. At times in the first half of 1998, imported and domestic beef were selling for about the same price at wholesale. Imports by the government trading entity were delayed, and turmoil in the credit market made it difficult for private-sector importers to arrange for any imports in early 1998. As a result, neither the government nor the private-sector share of Korea's WTO-mandated quota for beef imports was filled. Imports dropped about 45 percent from 1997 levels. U.S. beef exports dropped 41 percent.

The heavy slaughter of Korean cattle in 1997 and 1998 affected the structure of the herd and the future supply of domestic beef. Cow numbers dropped 25 percent (almost entirely cows over 2 years of age), and the number of calves per cow also dropped. As a result, the number of cattle under 1 year old in June 1999 was one-third less than in June 1997. It will take over 2 years for herd rebuilding to restore Korea's domestic beef supply capability to pre-crisis levels. This should boost beef imports through 2001.

The economic crisis may have strengthened Korea's pork sector. Korea has both imported and exported pork in recent years, because preferences for cuts and quality are different in different countries. Before the crisis, Korea's industry was preparing for a possible doubling of imports after frozen pork trade was liberalized in July 1997. However, the devaluation and recession dramatically changed the situation. Pork imports became more expensive, and pork exports somewhat more competitive (almost all exports go to Japan, whose gate price system reduces the scope for passthrough of exchange rate variations). When the crisis hit, Korean swine producers were in the midst of herd expansion to increase exports to Japan, trying to fill the gap left in Japan's supply when Taiwan ceased pork exports after a disease outbreak in early 1997. In contrast to the cattle industry, there was not a sharp cyclical downturn for swine, and prices remained strong. In this situation, pork imports were affected by the weakness of the won, but did not have to confront sharply declining pork prices within Korea, unlike the situation with beef. While frozen pork imports did not grow, they did not fall either. Chilled pork imports almost disappeared–a trade loss of 9,000 tons.

Feed Grains

Korea's imports of grains for feed in 1998 rose modestly (about 3.8 percent) from 1997. This represents a considerable achievement, given the financial difficulties that traders faced, and was aided by the allocation of GSM credit guarantees by the U.S. government early in the crisis (see box, "GSM Export Credit…"). Korea's animal producers are totally dependent on imported feed grains, and would have had to reduce herd sizes if grain import flows had been interrupted. Strong feed use in Korea's swine sectors offset declining feed use for beef cattle.

U.S. corn exports to Korea rose almost a million tons in 1998, both for feeding and for use in the corn sweetener industry. GSM credit guarantees for 3.2 million tons of corn helped Korean importers to overcome a lack of affordable credit, especially in the first half of 1998. China's corn exports to Korea declined because credit could not be arranged. Seven Korean feed companies went into receivership and had to cut back their activities, but the rest of the industry was able to survive and to replace the lost capacity at the affected mills. Large imports of feed wheat from Europe displaced corn imports later in 1998.

The Oilseed Complex

The crisis affected Korea's market for oilseed products, and made it more likely that Korea will import vegetable oils and meals, rather than oilseeds, in the future. Two of the three major soybean-crushing companies went into bankruptcy protection in early 1998. Events related to the financial crises precipitated corporate failures that had roots in earlier policy decisions by the Korean government. The three firms had enjoyed low tariffs on soybean imports and significant tariffs on soyoil and meal for over 20 years. This allowed them to sell the soy products in the Korean market at a price above world levels. However, tariff protection for meals was largely removed in the 1980's, and progressively removed from vegetable oils in the 1990's. By 2004, the soyoil tariff will be no greater than 5.4 percent, but Korea's firms are finding crushing unprofitable even with the current tariff of 7.4 percent.

To boost their earnings, the crushing companies in the last few years had induced much of the feedmilling industry to agree to buy a portion of its meal requirements from their output, paying a premium above the price of meal imports. However, the crisis forced the crushing companies to abro-

GSM Export Credit Guarantees for Korea

At the onset of Korea's financial crisis, the U.S. government offered a $1.2-billion allocation of credit guarantees under the GSM-102 program (GSM stands for General Sales Manager in USDA). These guarantees were used by importers to secure credit so they could buy U.S. products. Repayment could be made after the products had been sold in Korea. In normal times, such transactions are routine. While GSM's relatively long repayment period had some attractions in Korea in the years before the crisis, use had been declining, and the program was in danger of ending. In the past, GSM credits had been assigned to bulk, input commodities, such as cotton and corn. In 1998, the program was designed with portions of the total allocated to meats and other consumer items, in addition to bulk commodities. Of the $1.5 billion in GSM guarantees for Korea available in fiscal 1998, $1.38 billion was applied for, a high rate of use.

gate their agreement in December 1997, when their dwindling finances left them desperate. Korea's feedmills, unable to import freely because of the general lack of credit, were left with reduced domestic and imported supply prospects. U.S. government-backed credit intervention allowed them to buy U.S. meal, and imports from the United States soared to over 300,000 tons, compared with almost no trade in 1996 and 1997.

It will be more difficult than before for the Korean soybean crushers to get feedmillers to buy domestic meal at a premium, since domestic supplies were withdrawn at a critical moment, calling into question the reliability of domestic meal suppliers. Increasingly, Korea is turning to meal imports, which exceeded domestic production in 1996 and 1998. Korea's imports of soymeal increased 4 percent in 1998. However, imports of other meals decreased, and total meal use was flat. Feed wheat, with a higher protein content than corn, substituted for some meal imports.

Similarly, soyoil imports are replacing domestic production. Korea's soyoil imports rose 8 percent in 1998 despite higher world prices (in dollar and won terms) and the difficult economic climate. Imports of soybeans for crushing declined 12 percent. Palm oil import unit values jumped 70 percent in won terms–more than for other imported goods. The volume of palm oil imports fell sharply as a result.

Food Inputs

Wheat for milling into flour, raw sugar for refining, corn for sweetener production, and soybeans for food use together represented 13 percent of the total agricultural import value in 1997. The volume of these commodities imported in 1998 changed very little. Domestic demand does not vary much with price or income changes. However, world price declines for all four commodities reduced the dollar value of the imports in 1998. GSM credit guarantees were used for Korean imports of wheat, corn, and soybeans. However, the United States continued to lose wheat market share to Australia and Canada, which also offered credit assistance.

Hides and Fibers

Agricultural inputs for producing nonagricultural products, long important parts of Korea's trade, were about a quarter of the total value of agricultural imports in 1997. Hides imported and tanned for the production of leather or leather products, cotton spun into yarn for domestic and foreign textile markets, natural rubber, raw furs, wool, and silk all benefit from a practice known as tariff escalation. Imports of raw materials are free from tariffs and other barriers, while imports of products processed from them are hindered by tariff barriers. This protects domestic manufacturing. In 1998, the volume of all these input commodities declined. Reportedly, manufacturers drew down stocks to avoid new purchases as much as possible.

Korea is a large importer of hides and the largest market for U.S. hides. Despite GSM credit assistance, U.S. exports of whole cattle hides to Korea dropped 35 percent in volume in 1998, contributing to very low prices for hides at slaughter plants in the United States. However, U.S. exports of cotton increased both in volume and value, aided by the GSM program.

Processed Foods and Beverages

Korea's imports of these items fell more than 40 percent in value from 1997 to 1998. This trade is quite new to Korea. Trade barriers and insufficient buying power within Korea largely kept imports of processed foods and beverages insignificant until Korea's partners in the GATT persuaded Korea to begin phasing in liberalizations, starting in 1989. Since then imports of fruit juices, chocolate products, wine, beer, sausages, noodles, dairy foods, frozen french fries, cola bases, seasoning mixtures, tomato paste, ketchup, canned vegetables and fruits, and many other products have grown quickly.

Declining volume accounted for most of the drop in value of processed food and beverage imports in 1998. During the crisis, consumption in restaurants fell, while supermarket sales held up well. Consumers stayed home to save money. Consistent with this, commodities that are regarded as luxuries, or as discretionary purchases showed very sharp declines in volume: wine imports fell 73 percent, beer imports 84 percent, mineral and aerated water 58 percent, jams and jellies 78 percent, ice cream 69 percent, biscuits/cookies/crackers 70 percent, chocolate foods 43 percent, sausage 41 percent, candy 42 percent, etc.

Summary

The value of Korea's agricultural imports dropped sharply in 1998, in part reflecting the low prices of agricultural commodities on world markets. However, the import volume of many consumer-ready products fell precipitously because of low consumer purchasing power, low confidence in Korea, and the depreciation of the won that made imported products more expensive. Expected expansion in meat imports was replaced with a sharp contraction instead, as consumption of meat fell and domestic price drops made imports less competitive. Imports of feedstuffs, wheat, cotton, and raw sugar held steady. The soybean and hide markets were affected by credit problems for importing firms. In a climate of high interest rates and widespread doubt about firm credit-worthiness, U.S. credit guarantees were widely used by Korean firms.

Government support for agriculture expanded, despite severe fiscal constraints agreed to with the IMF in return for financial help. Agricultural production that did not depend heavily on imported inputs was unaffected by the crisis. Exports of pork to Japan surged, mostly because of the absence of Taiwan's pork exports, unrelated to the financial crisis. Partly as a result of liberalization of the investment regime agreed to with the IMF, and partly because of the reduced cost of investment in Korea, foreign investment in the beverage and food industries increased. This may stimulate agricultural trade in the future.

Indonesia's Crisis Leads to Policy Changes Affecting Agricultural Trade

The income and price consequences of Indonesia's financial crisis sharply reduced the country's imports of U.S. agricultural commodities and products. Not all categories were equally affected. Though imports of high-value products dropped substantially, they were a relatively small part of U.S. exports to Indonesia. For bulk commodities, Indonesia remains a large and growing market for cotton and soybeans. U.S. wheat is potentially competitive in Indonesia due to the ending of the state trading system's monopoly trade rights as required by the IMF rescue package. Though economic recovery will likely lag the recovery of the other countries in the region, Indonesia should again become a rapidly expanding market for a wide range of U.S agricultural exports [Gary Vocke (202) 694-5241, gvocke@ers.usda.gov].

After years of rapid growth and political stability, Indonesia slipped into a deep economic crisis in 1997. Triggered by a regional financial crisis that began in Thailand in July 1997, Indonesia's sudden economic collapse had several contributing factors, including a rapid increase of short-term, private debt and a weakly regulated banking system. The rupiah fell from 2,437 per U.S. dollar on July 2, 1997 to as low as 16,100 in June 1998. The country's economy stalled and then collapsed. Annual GDP declined nearly 15 percent in 1998.

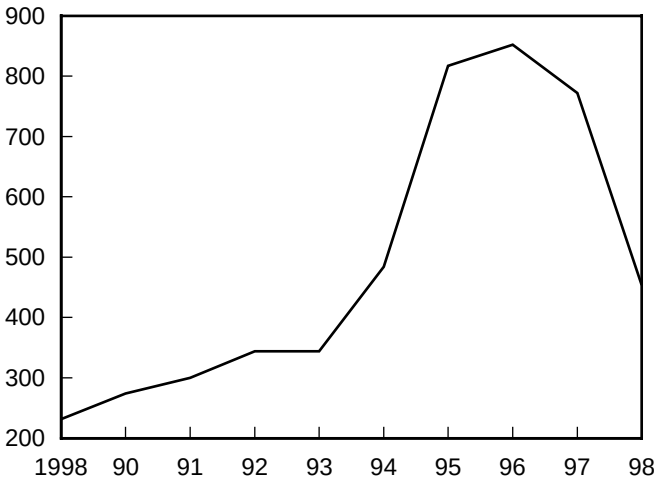
While the country's economy has not yet recovered, its currency strengthened and stabilized in 1999. However, the Indonesian Central Bureau of Statistics (CBS) expects the economy to grow at a snail's pace, 0.13 percent, in 1999. The CBS expects inflation to fall below 8 percent, compared with more than 70 percent in 1998.

The country's economy is still mired in a financial and economic crisis that has greatly affected U.S. agricultural export interests. A sharp currency depreciation and faltering economic growth have slowed U.S. exports to Indonesia through two related effects. First, through an income effect as the dramatic slowdown of growth in Indonesia reduces its demand for imports from all countries, including the United States. Second, through a price effect that makes exporting to Indonesia more difficult for the United States because the weaker Indonesian rupiah has made imported commodities and products more expensive from the Indonesian perspective.

The economic chaos cut U.S. agricultural exports to Indonesia by nearly half from $851 million in 1996 (before the crisis) to $454 million in 1998 (fig. 14). U.S. agricultural export interests in 1996 before the crisis were centered on cotton for the country's textile industry and soybeans for human consumption (fig. 15). The United States was also exporting significant quantities of feedstuffs to Indonesia: soybean meal, coarse grain, and other feeds. The country was also a significant importer of U.S. fresh and processed fruit and vegetable products. As the crisis unfolded, total U.S. exports to Indonesia fell sharply from their peak in 1996, and some export categories fell more than others. Some categories gained. U.S. rice exports, for example, rose because of U.S. government assistance.

Figure 14

U.S. agricultural exports to Indonesia



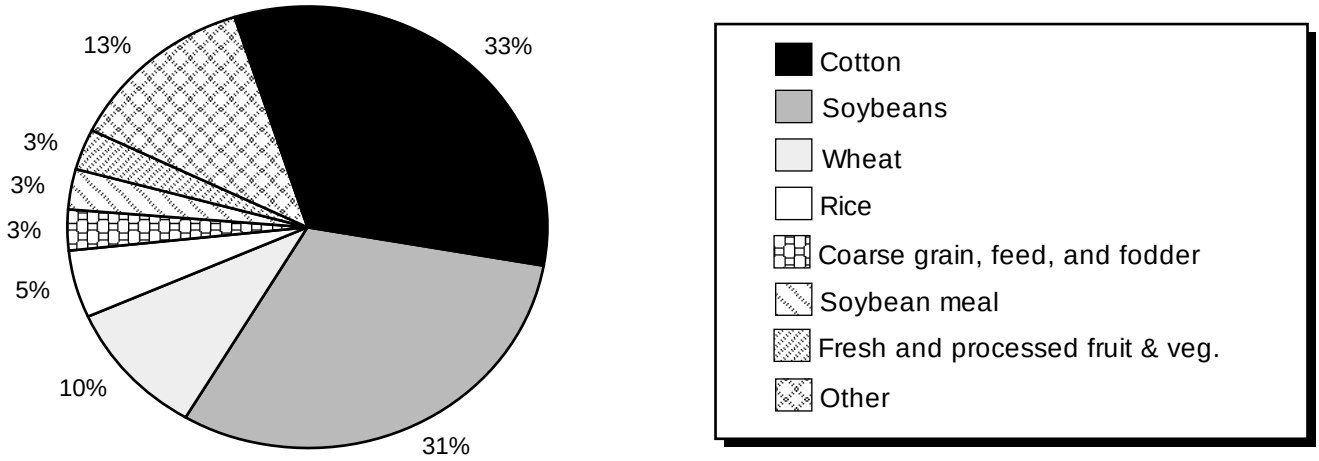
Source: FATUS, ERS/USDA.

The Asia Crisis Catches Up to Indonesia

Indonesia at first appeared to weather the Asian crisis that was sweeping through the region starting with Thailand in mid-1997. Economic growth slowed and the currency weakened some. But, the country found itself vulnerable to the crisis because of weak government oversight of the financial system, its managed exchange rates, and large inflows of short-term debt. As short-term capital initially moved out in self-fulfilling anticipation of exchange rate depreciation, the currency began depreciating rapidly in early 1998, quickly

Figure 15

Composition of U.S. agricultural exports to Indonesia in 1998, after the crisis



Source: FATUS, ERS/USDA.

creating serious problems for borrowers holding unhedged foreign loans. The ensuing scramble to buy dollars lowered the exchange rate further, making debt repayment even more difficult and raising the possibility of non-payment of loans. With the currency depreciation, firms needed so many more rupiah than before the crisis to service their dollar-denominated loans that repayments simply stopped even for the healthiest of firms.

Before the crisis, many firms had accumulated large debts in foreign currency because the interest rate was less than if the loans were made in domestic currency. Much of this foreign currency borrowing was unhedged. The government had successfully kept the country's currency in a narrow trading range, so borrowers apparently discounted the risk of exchange rate changes.

During the crisis, the country's financial sector froze. Companies could not borrow operating capital. Importers could not open letters of credit. The price of foodstuffs began to rise, not just because of the currency depreciation, but also because of a very severe El Niño drought that reduced food production in the country.

Many Indonesians were forced to change their diets. Livestock product consumption declined as prices rose beyond the means of many middle class consumers. Cooking oil prices soared, and subsequent consumer protests forced the government to ban exports of palm oil. Political unrest began as the economic welfare of the country's citizens declined. When the police attacked student demonstrators in May 1998 and several students were killed, riots began. After several days of rioting, President Suharto resigned on May 20, 1998, and B.J. Habibi was sworn in as interim president.

IMF Loan Agreements Free Agricultural Imports

As the country's crisis developed, Indonesia brought in the International Monetary Fund (IMF). Conditions agreed to by the government for IMF assistance provided for substantial reforms affecting agriculture and agricultural trade. Under the IMF loan agreements: 1) high tariffs on food items, including fruits and other high-valued products, were reduced to a maximum of 5 percent; 2) the blending/local content requirement for milk products was phased out; 3) BULOG (Badan Urusan Logistik or Government Logistical Agency), the state trading agency, lost its monopoly trade rights for rice, wheat, soybeans, and garlic; and 4) domestic restriction on the movement of agricultural products between provinces was deregulated. BULOG retains a key role in rice purchasing, distribution, and inventory management and will still purchase local rice for distribution to deficit areas and for national strategic reserves.

The Indonesian Financial Crisis's Linkages to Agriculture

The financial crisis mainly affected Indonesian agriculture through four channels—exchange rates, interest rates and credit availability, national income, and agricultural policy responses. As the exchange rate depreciated, imported goods became more expensive in domestic rupiah prices. The lower exchange rate, however, made Indonesia's exports cheaper relative to those of competitors with stronger currencies. Indonesia's export situation was complicated by the currency depreciation of the other countries caught in the financial crisis. When competing exporting countries depreciated their currencies similarly, there was little or no gain for Indonesia's exports.

The change in domestic prices with currency depreciation varied from commodity to commodity because of individual differences in each commodity market and government policy. The incentive to increase domestic agricultural production was offset to some extent through rising prices of production inputs. For example, a rise in feed or fertilizer prices with the depreciated currency reduced the profitability of livestock and crop production. In another example, rupiah prices of imported cotton fiber and hides rose for Indonesia's textile product manufacturers as the rupiah depreciated.

With the onset of the crisis, interest rates were raised sharply, greatly increasing the cost of operating capital when it was available. The higher commodity prices further added to the cost of financing the purchase of production inputs. This financing problem was compounded in Indonesia as the availability of credit was severely constrained. Financing imports of inputs became especially problematic.

Although the higher domestic rupiah prices with the depreciation stimulated domestic production, they also discouraged domestic consumers. Higher prices and declining incomes reduced domestic consumption of those items for which consumers are especially price-responsive, including textile and livestock products.

Most of the government policy changes affecting Indonesia's agriculture were negotiated with IMF as part of the crisis assistance program. The Indonesian government did take some additional steps to help small poultry producers who were devastated by the crisis. Another important policy response was the government's imposition of export taxes on certain palm oil products to avoid huge exports with the depreciated currency. The goal was to avoid a disruption in the domestic cooking oil market.

Impact of the Crisis on Agricultural Imports

With 210 million people, Indonesia is a large market for several imported agricultural commodities. Indonesia is the world's largest importer of rice, the country's principal foodstuff. Before the crisis Indonesia was a top ten importer of other foodstuffs as well, sugar (sixth largest), soybeans (eighth), and wheat (ninth). The country is also the world's largest cotton fiber importer. The following are selected commodity details.

Rice. Rice production has recovered from 2 years of drought and imports in 1999 will not be anywhere near the record levels of the previous 2 years. Because of one of its worse droughts in years, Indonesian rice imports during 1997 and 1998 equaled the total for the previous 10 years.

A major impact of the crisis on rice was the agreement with IMF to allow the private sector to import rice. However, with the recent strengthening of the rupiah, the private sector has not been active. With a lower value of the rupiah relative to the dollar, the private sector began importing substantial quantities of low quality rice (25 percent broken) from Vietnam. The change in the exchange rate created a spread between Indonesian domestic prices and lower-priced imports from a cheaper source to make importing profitable. Reportedly, imported rice was illegally sold at a profit to BULOG as domestically produced rice. BULOG is obligated to purchase all rice offered at its procurement price. In response, the government has restricted private sector imports to only the highest quality (broken content of less than 5 percent).

Due to the economic crisis, Indonesia's rice consumption declined despite an initial government policy to keep rice prices down for everyone as a safety net. This rice-price policy reduced the income of rice farmers. It also encouraged the illegal export of rice by traders exploiting the difference between low domestic prices and the higher international prices. A more narrowly targeted rice program was initiated in mid-1998 so the government would have a more cost-effective safety net by focusing just on the really poor.

To offset the adverse impact of the low-price policy for rice, the government offered fertilizer to rice farmers at less than half the world market price. However, the fertilizer subsidy was ended in December 1998 when it became evident that fertilizer was instead being sold to the plantation sector or exported. The Indonesian government also tried to limit the export of nitrogen to increase domestic supplies for agricultural production, especially rice. Rice accounts for 60 percent of nitrogen fertilizer use in Indonesia.

At this time the government also ended the monopoly on fertilizer imports and distribution held by PT. Pusri, a government-owned company. This policy action was taken because the crisis had greatly reduced the government's capacity to import needed fertilizer nutrients. The currency depreciation complicated the fertilizer situation in Indonesia because the country is dependent on imports of other nutrients. Phosphate is imported because of the low quality of domestic phosphate supplies. Sulfur and potassium are imported because of only limited domestic supplies. The currency depreciation made these imported nutrients much more expensive.

The government has taken additional steps to promote rice production. These incentives include raising rice floor prices, increasing the availability of production credit, and lowering the interest rate charged for this credit.

Wheat. The freeing of wheat imports from BULOG has led to a dramatic increase in U.S. exports, spurred by a variety of U.S. assistance programs. At the same time, the termination of consumer subsidies on flour, overall food inflation, and the severe economic downturn have greatly reduced total imports. With high domestic prices, lower income, and loss of BULOG subsidies, per capita wheat consumption in

Indonesia declined more than 50 percent from its peak in 1996 through 1998.

Though the diet of most Indonesians is centered on rice, wheat consumption, particularly instant noodles, had been increasing before the crisis. Indonesia is the world's second largest consumer of instant noodles, second only to China. In 1992, consumption was 4.7 billion packs; by 1997 the figure had risen to 8.6 billion. Because wheat is not grown in this tropical country, wheat imports had necessarily been growing quite rapidly.

The newly liberalized Indonesian market offers U.S. wheat an opportunity in a market that had been dominated by the Australian and Canadian Wheat Boards. Private mills are beginning to purchase wheat independent of BULOG. Trade financing is a key issue for all flour mills in Indonesia. USDA programs such as PL-480, 416 (b) and the GSM credit guarantee program are available to facilitate U.S. wheat sales.

Feedstuffs. Corn and soybean meal use plummeted with the collapse of Indonesia's poultry production. Poultry consumed more than 90 percent of the country's manufactured feed before the crisis. Poultry producers faced lower domestic terms of trade and a profit squeeze due to reduced consumer demand from the economic slowdown and escalating feed costs following the currency devaluation. The crisis also sharply reduced the availability of short-term operating credit for poultry producers. At its low point, broiler and egg production was only 30 percent of pre-crisis levels. The poultry sector collapse was so sharp that Indonesian corn importers were exporting corn they had imported before the crisis started.

From 1985 to 1997, broiler output had been expanding at an annual rate of 13.6 percent and poultry feed demand had been increasing more rapidly than domestic corn production.

The recent strengthening of the rupiah and improved domestic security have reportedly initiated a recovery in poultry production. The pace of recovery is being slowed by a shortage of day-old chicks. The number of breeders dropped significantly in 1998. Many of the remaining breeders culled their breeding stock because of the large increases in feed prices. Consumer purchasing power is still suffering from the crisis. Reportedly, consumers now prefer smaller, more affordable broilers than before the crisis.

Indonesia still needed to import soybean meal for what remained of the collapsed poultry sector during the crisis because the country does not have soybean-crushing facilities. The government removed the 10-percent value-added tax on imported soybean meal and other feed ingredients, including corn, meat and bone meal, and fishmeal. The United States has not been competitive in supplying Indonesia's soybean meal market. India dominates because of its competitive prices and smaller, flexible shipment volumes.

It is likely that most of the recovering demand for poultry products will be met by domestic production, not poultry meat imports. Thus, feedstuff imports will be needed. Prior to the crisis, poultry meat imports were limited by high tariffs and other restrictions to protect domestic producers. The slashing of tariffs to 5 percent in 1998 helps, but importers are still focused on the high-end restaurant and service industry trade.

Soybeans. Despite the crisis, soybean consumption and imports increased as consumers looked for alternatives to the suddenly high-priced poultry meat. The traditional Indonesian soybean-based staples are tofu and tempe (fermented soybean cake made using whole soybeans). Soybeans are an important protein source for many lower-income Indonesians and account for 15 percent of the country's protein consumption.

Imports have risen with the increased consumption and stagnant domestic production (soybeans are not well adapted to Indonesia's tropical climate). The availability of GSM-102 credit has been used, mostly by the private sector, to import soybeans from the United States. BULOG has made only limited imports from the United States under the PL-480 program.

Cotton fiber. The rise in food costs also affected other consumer purchases. Indonesians greatly slowed their purchases of clothing as the price of textile products rose along with the cost of living. Indonesian spinning, weaving, and textile firms that marketed their products domestically are suffering with the downturn of the economy. Those firms with export customers and/or small dollar-denominated borrowings are better off. Some textile mills have offset the loss of domestic sales by increasing their exports from 60-70 percent of output to as much as 95 percent.

Some mills substituted domestically manufactured fibers for cotton in their textile products. The substitution was to offset the higher price of imported cotton with the currency depreciation and the difficulty of arranging for trade financing. Interest rates are 40-60 percent and 100 percent collateral is required for Letters of Credit for imports. Buying locally produced polyester and rayon avoids the problem of opening Letters of Credit. U.S. cotton exports to Indonesia have been further compromised by currency depreciation against the dollar in competing countries, especially Australia.

Impact of the Crisis on Agricultural Exports

The Indonesia currency depreciation provided direct benefits for the export-oriented sectors of the country's agriculture (see box "Indonesia's Cocoa Farmers …"). The currency depreciation also provided a measure of increased international competitiveness for Indonesia's agricultural products. Complicating the picture were the currency depreciations

Indonesia's Overall Trade Performance During the Economic Crisis

The trade sector is critical for Indonesia's economic recovery. While trade dropped sharply in 1998 and 1999, real exports have rebounded and now exceed pre-crisis levels. However, the value of exports has not recovered because of the decline in international prices.

The situation is worse for Indonesian imports. Imports are a lead indicator of exports since most of Indonesia's imports are raw materials used by industry. Imports were about 60 percent of pre-crisis levels throughout 1998 and were even lower during the first half of 1999 (fig. 16).

Real Trade Rises

Indonesia's export performance appears much better when viewed in real terms after discounting for price changes. Lower prices account for all of the decline in natural-resource-based exports, such as rubber and textiles. In 1999, the decline in manufacturing prices (-17.9 percent) was almost identical to the decline in manufacturing exports. Real exports did decline precipitously during the latter half of 1998 and early 1999, but they have since recovered and are now above pre-crisis levels. This implies that the export sector continues to generate real gains, including employment gains, for the economy.

The Rupiah Is Up, But Still Below the Pre-Crisis Level

The competitive benefits of Indonesia's rupiah depreciation in 1997 and 1998 were eroded by the recent appreciation and by inflation. In real terms, the net depreciation of the rupiah since the beginning of the crisis is about 30 percent. After the sharp decline in 1997 to the first half of 1998, the rupiah began to climb in July 1998, reaching 7,200 to the dollar in February 2000. This has reduced Indonesia's competitive advantage in world markets and may have contributed to the recent drop in export value. Some exporters claim that even though the rupiah is still below pre-crisis levels, it is more profitable to sell on the domestic market than on the export market.

Credit Remains a Problem for Exporters

The shortage of trade financing is often mentioned as the most serious problem facing exporters. Yet, export industries that rely heavily on imported raw materials appear to be performing better than industries with low import dependence. This is because industries with a large share of imported inputs may have higher foreign ownership shares or connections with foreign buyers that make it easier for them to obtain financing. However, the shortage of trade financing is a liquidity problem that affects all exporters, not just those that rely heavily on imported raw materials.

A large number of programs have been introduced during the past 2 years to facilitate the flow of trade financing. The programs depend on a functioning banking system that can issue letters of credit and take on some risk of default by Indonesian borrowers. With the breakdown of the banking sector, none of the programs has been widely used. Until international banks resume lending in Indonesia and until capital adequacy ratios improve so that domestic banks can also lend, it is unlikely that the programs will have much impact on exports.

Smaller Exporters Perform Better

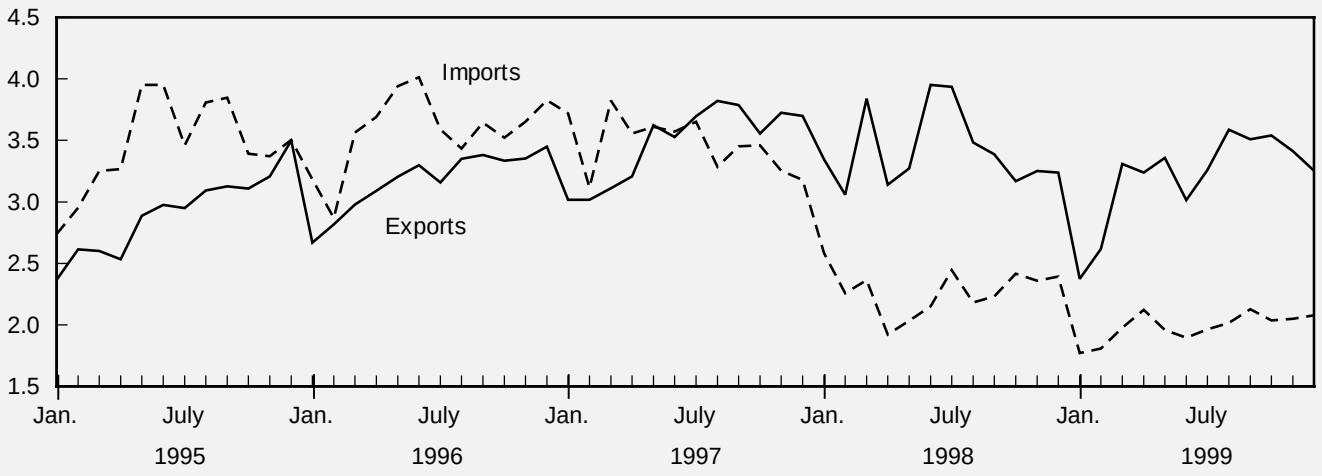
It appears that export sectors with smaller exporters have done better than those dominated by a few large firms. One reason is that small companies rely less on outside financing and are unlikely to have accumulated foreign currency debt before the crisis.

Reference

Stephen L. Magiera, Partnership for Economic Growth, Ministry of Industry and Trade-USAID, Indonesia.

Figure 16

Indonesia's non-oil exports and imports



Source: Badan Pusat Statistik (Bureau of Statistics), Indonesia.

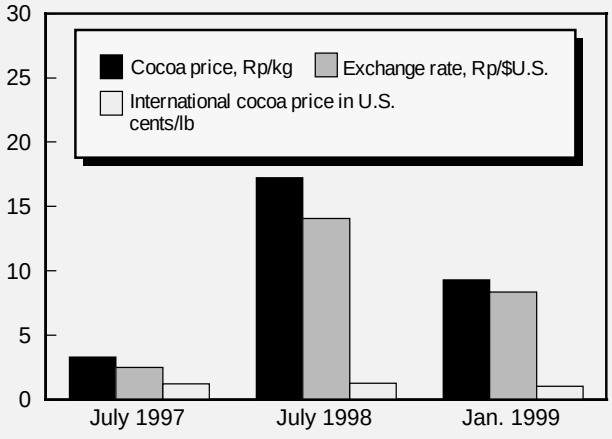
Indonesia's Cocoa Farmers Gain from the Currency Depreciation

Indonesia is the world's third largest producer and exporter of cocoa. Cocoa is principally an export crop in Indonesia and the United States is the largest market for Indonesia's cocoa exports (55 percent). The currency depreciation greatly benefited the country's cocoa producers, whose prices peaked at over 400 percent of the pre-crisis level (fig. 17). Current prices have moderated to about 300 percent above pre-crisis levels as the country's exchange rate has stabilized at much lower rates.

The huge increase in the profitability of cocoa production prompted cocoa farmers to expand cocoa tree plantings 11 percent by the end of 1998. However, cocoa trees take 4-5 years after planting to begin yielding cocoa beans, and 8-10 years to achieve maximum production. Thus, area expansion cannot greatly increase output within a year after price increases raise the profitability of production. However, Indonesia's cocoa producers could respond immediately through higher yields from large fertilizer and pesticide applications and more intensive management. Yields increased 16 percent from 1997 to 1998 despite the drought caused by El Niño in 1997 and the first half of 1998. As production has increased with rising yields, cocoa farm-level income has increased dramatically with the currency depreciation.

Figure 17

Indonesian farm-level cocoa price soared with the devaluation of the country's currency



Source: FATUS, ERS/USDA.

among Asian neighbors producing the same export commodities and products.

Indonesia is a major exporter of many agricultural commodities. It is the world's second largest exporter of several tropical tree-crop products: coconut oil, palm kernel oil, palm oil, and rubber. Indonesia is also a ranking exporter of many agricultural specialty crops, including cocoa (third largest) and tea (fifth), and nitrogen fertilizer (sixth).

With the depreciated currency, Indonesia's exports of these agricultural products were increasing. The government favored these increases with one notable exception—palm oil, which competes with U.S. soybean oil. A ban on exports of crude palm oil and some processed palm oil products was imposed after a series of palm oil export quota policies in late 1997 failed to limit a rise in domestic cooking oil prices. Later, the ban was replaced with a high export tariff. The export tax, which was as high as 60 percent on crude palm oil, reportedly led to in large-scale smuggling of palm oil to avoid tax payments. The tax on palm oil has since been lowered to 30 percent and is scheduled to be lowered to 10 percent in a commitment to IMF.

The country's palm oil exports are expected to steadily increase in the next few years as the trees planted during the particularly rapid expansion from 1995 to 1997 begin to mature. However, the climate for foreign investment in processing facilities will need to improve if the expected production increase is to be accommodated.

Outlook

While economic recovery will likely be slower for Indonesia than its neighbors, the country retains strong prospects for U.S. agricultural exports. The tourist and retail sectors provide demand for higher valued products. For bulk commodities, Indonesia remains a large and growing market for cotton and soybeans. U.S. wheat is now able to better compete due to the end of the state trading system.

However, fundamental to an economic recovery is sustained political stability to help restore investor confidence. With the problems in East Timor, the rupiah value has declined, reversing the upward trend during the first half of 1999. Economic growth will likely not be as rapid as before the crisis. Also needed to sustain economic recovery are more transparent and more closely regulated financial institutions.

However, not everything is under the Indonesian government's control. The extent to which this recovery is led by exports, particularly of nonagricultural exports, probably depends upon how quickly its Asian neighbors resume their imports from Indonesia. The resumption of Japanese imports from Indonesia is critical, but so are imports from to other countries in the region.

Thailand's Trade Prospects Vary With Its Macroeconomy

The income and price consequences of Thailand's financial crisis sharply reduced the country's imports of U.S. agricultural commodities and products. Thailand's exports, including its agricultural exports, benefited from the sharp depreciation of its currency. With the bottoming out of the crisis, the country's currency has been stable. Thailand was expected to show positive economic growth in 1999 and continue to improve in succeeding years. Long-term economic growth should be strong, but likely not as rapid as before the crisis. Thailand should again become a rapidly expanding market for a wide range of U.S. agricultural exports [Gary Vocke (202) 694-5241, gvocke@ers.usda.gov].

The Thai financial crisis that began on July 2, 1997, when the government was forced to float the Thai baht, has bottomed out. Annual real GDP growth declined about 8 percent in 1998. The Thai economy is expected to grow at least 3 percent in 2000. The lower valued baht initially increased the country's export competitiveness. Total exports increased about 24 percent in baht terms in 1998 compared to 1997. However, the crisis sharply reduced the country's wealth and consumers' purchasing power.

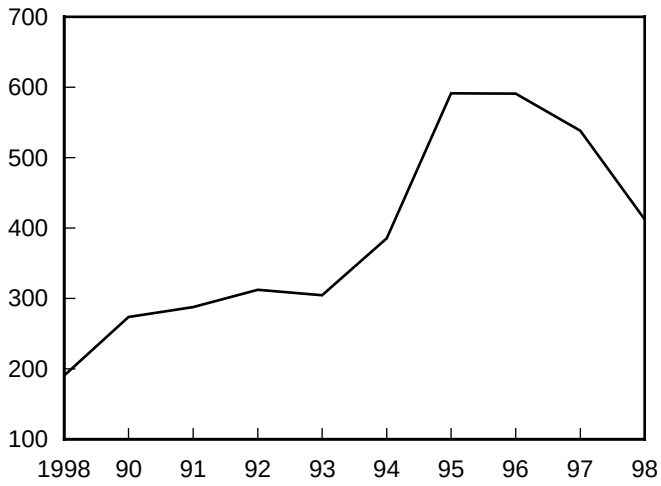
Though still well below its pre-crisis level, the value of the baht rose more than 40 percent during January 1998 to 1999 as capital inflow and investor confidence increased. Total exports in the third quarter of 1999 increased 2 percent from the same quarter in 1998.

The decline in the baht and faltering economic growth reduced Thai imports 8 percent in baht terms in 1998 from 1997. The depreciated baht made imported items more expensive in Thai currency, while reduced annual income and wealth lowered Thai demand for imports, including U.S. agricultural imports.

With the crisis, U.S. agricultural exports to Thailand dropped from $577 million in 1996 (before the crisis) to $412 million in 1998 (fig. 18). Thai imports of U.S. cotton fiber and hides and skins decreased as Thailand's exports of textiles and leather products dropped because of the tight credit. U.S. exports of coarse grain and feed ingredients fell with the decline in domestic demand for livestock products. Domestic consumption of poultry and pork products declined as per capita incomes fell. Imports of U.S. wheat and tobacco also fell off.

Figure 18

U.S. agricultural exports to Thailand



Source: FATUS, ERS/USDA.

Evolution of the Thai Financial Crisis

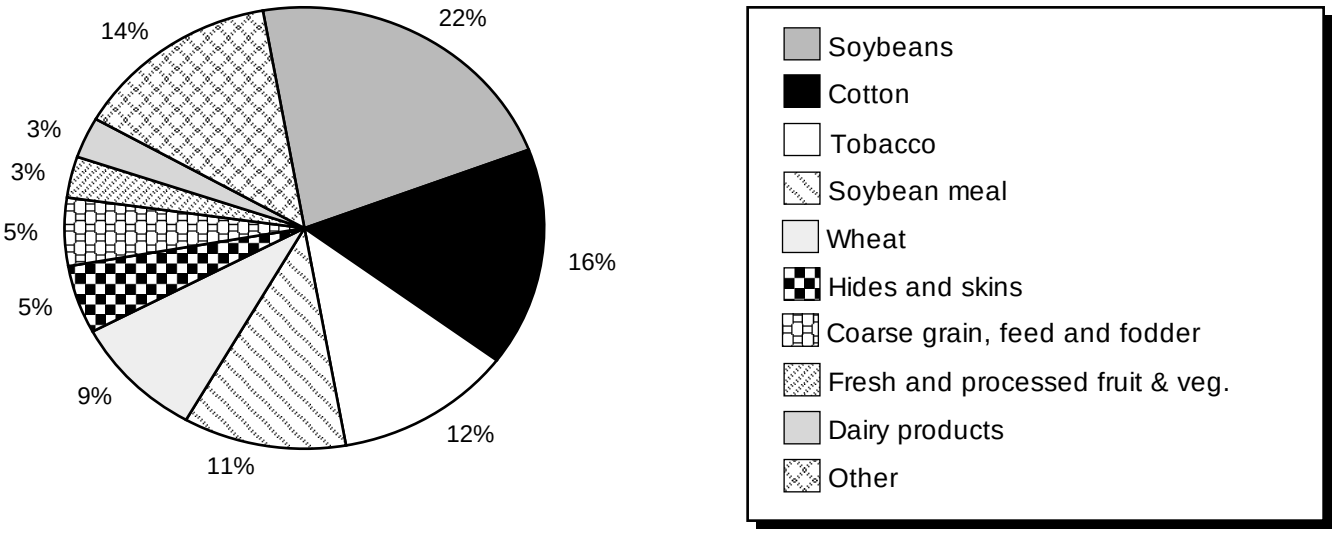
Events leading up to the crisis include the expansion of the country's financial sector with financial liberalization in the late 1980's. An important part of this development was the creation of the Bangkok International Banking Facility in 1993. This financial institution, which was intended to launch Bangkok as an international financial center, in practice, greatly facilitated the inflow of capital from foreign lenders.

The inflow of capital was apparently facilitated by the government's fixed exchange rate policy. The Thai baht was fixed to a basket of currencies, of which the U.S. dollar accounted for more than 80 percent. This policy of fixing the Thai currency primarily to the U.S. dollar evidently led borrowers to discount the risk of exchange rate changes and they made large, unhedged borrowings in U.S. dollars.

The fixed exchange rate also had trade consequences. The sudden decline of Thai exports in 1996 after years of rapid growth was attributed partly to misalignment of the exchange rate. The Thai currency had become overvalued with respect to some of its major trading partners. In late 1995 the U.S. dollar began to appreciate *vis-a-vis* the yen and the major European currencies. With the fixed rate, the Thai baht also appreciated against these currencies. Thai

Figure 19

Composition of U.S. agricultural exports to Thailand in 1998, after the crisis



Source: FATUS, ERS/USDA.

exporters were, thus, priced out of the European and Japanese markets. However, part of the decline in Thai exports can also be attributed to slow growth in Japan.

By 1997, hedge fund managers and currency traders began to make speculative attacks on the baht. Using the country's foreign currency reserves, the Bank of Thailand initially defended the baht. Eventually the reserves were nearly used up, and Thailand was forced to float its currency.

With the currency's decline, domestic firms found it difficult to repay their dollar-denominated foreign debts because the float had caused debt to rise in baht terms. With rising debts and tight credit, the Thai economy began to contract. Output shrank 8 percent in 1998.

An agreement was made with the International Monetary Fund (IMF) to provide short-term liquidity and to carry out financial sector reforms to correct the conditions causing the crisis. On August 20, 1997, the IMF approved a 3-year standby package of $4 billion along with financial assistance from the World Bank, the Asian Development Bank, Japan, and other countries, totaling $17.2 billion. The IMF-led package was aimed to restore confidence and bring financial stability. Key elements included measures to restructure the financial sector. As the financial crisis spread to other countries and conditions deteriorated, the IMF later revised the program, shifting away from a strict fiscal policy. Interest rates eventually began to decline.

The Thai Financial Crisis's Linkages to Agriculture

A large drop in the baht's value, initial high interest rates and tight credit, lower income, and changes in government policy significant affected Thai agriculture. As the exchange rate depreciated, imported goods became more expensive in domestic baht prices. The lower exchange rate, however, made Thailand's exports cheaper in foreign currency relative to those of competitors with stronger currencies. Complicating the international export picture was the currency depreciation of the other countries caught in the financial crisis. When competing exporting countries depreciated their currencies, there was little or no gain for Thailand's exports.

The change in domestic prices associated with currency depreciation varied from commodity to commodity because of differences in exchange rate pass-through to commodity prices and government policy. Prices of commodities with rapid and high exchange rate pass-through—such as poultry and shrimp—rose further than those with limited price transmission, such as sugar. The higher price pass-through provided an incentive to increase domestic production and lower agricultural imports. (See more about exchange rate pass-through in this publication.)

The incentive to increase domestic agricultural production was offset to some extent through rising prices of production inputs. For example, a rise in feed or fertilizer prices with the depreciated currency reduced the profitability of livestock and crop production. Also, baht prices of imported cotton fiber and hides rose for Thailand's textile and leather product manufacturers as the baht depreciated.

With the onset of the crisis, interest rates were raised sharply, greatly increasing the cost of operating capital. Higher prices for imported inputs further added to the cost of purchasing production inputs. This financing problem was compounded in Thailand because availability of credit was severely constrained as lenders burdened by bad loans

became reluctant to provide operating capital. The financing of imported inputs became especially problematic.

Although the higher domestic baht prices associated with the depreciation stimulated domestic production, they also discouraged domestic consumers. The higher prices and declining incomes reduced domestic consumption of those items for which consumers were especially price responsive, including textile and livestock products.

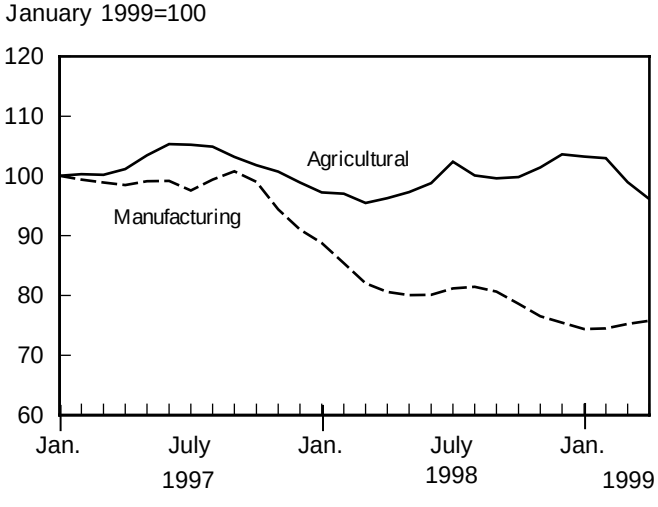
Government agricultural policy responses were generally not very significant in the early phases of the crisis, but became more important as the strengthening currency began forcing down farm prices. The government is now attempting to protect producers of several agricultural commodities, including rice, corn, shrimp, rubber, and cassava from declining revenues. The government also eliminated some import tariffs, such as those for raw cotton.

Increased Domestic Prices Help Farmers

With a few exceptions, Thai agriculture, compared with the nonagricultural sector, fared well initially from the crisis as the lower value of the baht raised most domestic agricultural prices in 1997/1998, helping to absorb the shock of the economic crisis for farmers and local merchants. Because imported inputs were a small fraction in most commodities, higher prices received by farmers raised domestic terms of trade (ratio of price received for output over price paid for inputs) for many commodities. Farm income for these commodities—rice, corn, cassava, soybeans, palm oil, chicken meat, and shrimp— increased in 1998. As a result, farm income increased 13 percent in 1998. The ratio of export over import prices for agricultural and food items stayed relatively stable compared with manufacturing terms of trade (fig. 20).

Figure 20

Terms of trade



Ratio of export over import prices.
Source: Monthly Statistical Bulletin, Bank of Thailand.

The Crisis Affects Thai Agricultural Imports

With the crisis, Thai agricultural import prices rose. Imports dropped, ranging from 3 percent for corn to as much as 36 percent for soybean meal. Thailand was a large importer of several agricultural commodities and production inputs, ranking fourth in soybean meal imports, fifth in cotton fiber and phosphate, and seventh in nitrogen. The following are selected commodity details.

Soybeans and soybean meal. The contraction of livestock product consumption with the crisis reduced the demand for feedstuffs, including soybean meal. Soybeans and soybean meal imports dropped 21 and 36 percent, respectively, from 1997 to 1998. The baht value of these imports dropped less, 18 and 17 percent, because the baht depreciation raised domestic prices.

The government extended 1998's import policies for soybeans and soybean meal. Soybeans can be imported with zero import tariffs and no surcharges, as long as importers buy locally grown soybeans at not lower than 11 baht per kilogram. Soybean meal can be imported with a 5-percent import tariff and no surcharges if the soybean meal importers buy all locally produced soybean meal at 9.50 baht per kilogram. Thai soybean producers remain at a comparative disadvantage to temperate climate soybean growers because soybeans are not a tropical crop. The United States is competitive in the Thai soybean market, but faces strong competition in the soybean meal market from Argentina and India.

Cotton fiber. Higher cotton fiber import prices due to the depreciation and tightened credit have reduced the competitiveness of Thailand's cotton textile sector. The expected export advantage of the currency depreciation was limited by the currency depreciation of competing countries in the region. The Thai textile export problem was compounded by the drop in domestic clothing purchases as income and employment declined. The lower baht value raised cotton import value 26 percent in 1998 as the quantity imported dropped about 4 percent. The quantity of imports continued to decline in 1999. U.S. cotton exports to Thailand have also been reduced because of the added impact of depreciation of the currencies of competing cotton exporting countries, especially Australia.

Some manufacturers and their domestic consumers have switched to cheaper, lower-end man-made fabrics. The production cost of domestically produced polyester fiber was about half the cost of imported cotton fiber following the currency depreciation. To make the cotton textile industry more competitive, the government eliminated its 5-percent import tariff on raw cotton.

Corn. The decline in feed consumption, as domestic livestock product consumption fell, reduced the need for corn imports even though corn production increased 16 percent

from 1997-98. This led to a more than doubling of corn exports in 1998 and corn imports dropped nearly 3 percent in volume from 1997 to 1998, but rose about 4 percent in value (in baht). Thailand had been opening its markets to corn imports prior to the crisis as the feed demands of the country's rapidly expanding poultry and pork production exceeded domestic crop supplies. Thailand switched from being a net exporter of corn to a net importer in 1994.

The decline in corn prices led to government policies to support corn prices, similar to U.S. loan programs. The government now has a loan program for farmers and has also provided funds to purchase 500,000 tons of corn. Farmers who put their corn under the loan program will receive a loan of 4 baht per kilo at specified silos. Farmers may abandon their corn if market prices are below the loan price. When the market price is above the loan rate, farmers may redeem and sell their corn.

Thailand allows corn imports under its WTO tariff-rate-quota (TRQ). The import quota of 53,253 tons has a 20-percent tariff rate while above-quota imports have a 77.8-percent tariff rate. The government normally stipulates that any corn imports be between March and May, the off-harvest months for Thai corn. This import window unfortunately coincides with the off-harvest season for U.S. corn when U.S. prices are seasonally higher and South American prices are at their harvest lows. Also, Thai feed mills prefer the orange-colored flint corn from Argentina. Consequently, Argentina dominates Thai corn imports. A recent government policy change allowing non-WTO countries into Thailand's TRQ system provides an opportunity for corn imports from China. Chinese corn has a transportation-cost advantage over U.S. corn.

Hides and leather. The Thai leather products industry has faced the same problems as the Thai cotton textile industry. Imports of hides and leather were made more expensive by the depreciated currency. The severe rationing of operating credit due to the crisis made importing and manufacturing difficult and expensive to finance. Thailand's imports of bovine hides dropped about 6 percent in baht terms from 1997 to 1998 as Thailand's leather product exports to Asia declined and its own domestic demand fell. Hide imports continued to decline in 1999, dropping about 9 percent in baht terms from January to May compared with the same period a year earlier.

Asian markets are important to the Thai leather industry. In recent years, Thailand had been developing significant export markets in the region for lower-end leather products. Australian and Chinese hide exporters have been the primary beneficiary of the Thai leather industry's demand for lower quality, lower-priced hides. The United States will retain that portion of the Thai manufacturing needing high quality hides for expensive leather products.

Exchange Rate and Credit Factors Affected Thai Export Prospects

As the baht lost its value in mid-1997, Thai agricultural exports became more competitive in world markets. Except for sugar and palm oil, Thailand increased the volume of its agricultural exports, ranging from 4 percent for rubber to 41 percent for chicken meat in 1998. Now, however, the strengthened baht has partially reversed this gain in export competitiveness. Also offsetting the gain were the higher cost of imported inputs, including feedstuffs and crop nutrients. One field survey of corn farmers suggested that fertilizer applications fell 20-30 percent because of rising prices for fertilizer made from imported nutrients.

Thailand is a major exporter for some agricultural commodities. Thailand's rice, rubber, and cassava exports are the largest in the world. The country also ranks fifth in sugar exports. The following are commodity details on major exports and the effects of the financial crisis.

Rice. The greatly depreciated baht initially improved Thailand's export competitiveness with countries such as Vietnam. The quantity of Thai rice exports increased 17 percent from 1997 to 1998, primarily due to production declines in Indonesia and the Philippines because of a severe El Niño drought. The value of Thailand's rice exports rose 33 percent due to high international demand for rice during the period. The high world price of rice and the depreciated baht, substantially raised domestic rice prices—17 percent in baht terms in 1998—greatly benefiting Thai rice farmers. The price of rice was high enough that Thai farmers began substituting corn for broken rice in livestock rations. The domestic terms of trade for rice increased.

Thai rice exports increased in quantity terms in the third quarter of 1999, up 25 percent, from the same period in 1998. The export value, however, declined 3 percent due to low prices. The Thai government has responded to the recent low rice prices with its price-support programs, including finance credit for rice exporters and direct government purchases in the domestic rice market.

Broiler meat. Thai broiler meat exports were boosted because the depreciated baht made Thai exports in foreign currency cheaper than those of their competitors. With high exchange rate pass-through (60 percent) for Thai chicken meat export prices to buyers such as Japan, Thai chicken meat exports increased about 41 percent in volume and 52 percent in value in 1998. Most of these exports went to Japan and the EU, the principal markets for Thai chicken meat. The export surge helped offset the 9-percent decline in domestic consumption in 1998 as domestic poultry prices rose with the currency depreciation causing consumers to reduce their purchases. Chicken meat price in baht terms increased 19 percent in 1998.

The depreciation of the baht helped the Thai broiler meat industry recover some of the international competitiveness the sector had lost in previous years due to rapidly rising wages and relatively high feed costs. To offset the decline in comparative advantage against the United States, China, and Brazil, Thai broiler processors had been forced into developing higher-valued, cooked products.

Although the technology used by the Thai broiler industry equals that in the United States and other developed countries, Thailand had faced problems of increasing production costs. Government policies protecting Thai corn and soybean farmers from imports increased prices in baht terms for feed ingredients for livestock producers. The liberalization of corn, soybean, and soybean meal imports in late 1996 eased this pressure somewhat.

Then, with a sharply depreciated baht in 1997, the cost of imported inputs, i.e., feed grains/meals, genetics, and health products initially rose. The Thai government responded by extending the policy of refunding feed ingredient import duties paid by poultry-export operations to cover other poultry production inputs, including medical supplies and feed additives.

In late 1998, the strengthening of the baht changed the competitive situation by reducing the competitiveness of poultry meat exports and lowering feed costs. Exports in 1999 were also dampened by the more than 30-percent depreciation of the Brazilian currency. Brazil's depreciation made its poultry meat exports more competitive with Thai exports. Thai chicken exports declined about 4 percent in the first quarter of 1999 compared with the same period of 1998. In value terms, exports declined nearly 22 percent. The volume of poultry exports has since picked up, but the value continued to decline.

Shrimp. Shrimp exports expanded with the initial currency depreciation and increase in baht prices for domestic producers. Shrimp exports increased only 4 percent in quantity but 23 percent in value in 1998. Shrimp prices in baht increased 13 percent.

The strengthening baht since late 1998 has erased part of the gain in international competitiveness from currency depreciation. In addition, Thai shrimp exports have been adversely affected by a weakening world shrimp market, due primarily to low import demand from Japan. Traditionally, Japan has been the largest importer, followed closely by the United States. In response, the government has allocated one billion baht to prop up prices. Cold-storage operators were also provided low-interest loans.

Further limiting the prospects for Thai shrimp exports is the loss of their generalized tariff preference in Europe, the world's third largest shrimp market. Thai frozen shrimps now face a 14.4-percent tariff in Europe, compared with 4.5-percent tariff for those countries still having a tariff preference. For cooked shrimps, the tariffs are 20 percent against a 6-percent tariff preference rate. The quantity of Thai shrimp imported by the EU declined about 50 percent in 1999.

Thai competitiveness is also hampered by a 1998 government ban on inland black tiger prawn farming. Historically, this marine shrimp culture has been confined to the coast due to the need for saltwater. In recent years, however, many Thai rice farmers had converted their fields to low-salinity, marine shrimp ponds. This conversion to marine shrimp ponds is irreversible and frequently results in pollution of surface water supplies to neighboring rice fields and orchards. The government ban is to prevent further loss of rice land and to stop salinity pollution of water supplies.

Sugar. Because of global market conditions, Thai sugar exports did not benefit from the currency depreciation as did other crop exports. Thai sugar exports declined 43 percent in both quantity and baht terms in 1998. More recently, Thai sugar cane prices have weakened even more with the strengthening baht and the continuing fall of world sugar prices. Domestic sugar prices declined nearly 17 percent in 1998. The depreciation of the Brazilian real is bringing more Brazilian sugar into the world market (see "Lower *Real* Boosts Brazil's Agricultural Exports" in this publication). The low sugar prices and the Thai sugar industry's current liquidity problems due to credit rationing led the government to approve loans for millers to buy sugar cane from planters.

The country's financial crisis has also constrained banks' ability to provide production-credit loans to growers for purchasing inputs. This credit financing is now being provided by the Bank for Agriculture and Agricultural Cooperatives.

Rubber. Conditions in the global rubber market were such that Thai producers had no opportunity to exploit the situation created by its currency depreciation. Competition among Southeast Asian rubber exporters, whose currencies also depreciated, was a dominating factor. The value of Thai rubber exports declined about 4 percent, even though the quantity was up in 1998. The situation worsened as the Thai baht strengthened. Rubber exports declined further, about 23 percent in value terms in the third quarter of 1999 from the same period in 1998. Domestic rubber price also declined slightly. The Thai government intervened in local markets to support farm-level rubber prices by buying a limited quantity of rubber at a set support price.

Cassava. Cassava growers did not realize trade benefits from the lower valued baht. Cassava quantity exports dropped 22 percent in 1998 from 1997. To support farmers, the government announced a policy to purchase cassava flour for government stocks totaling 200,000 tons, an amount equivalent to 880,000 tons of raw cassava. The government purchase was one baht per raw kilo, which is higher than the current farm-level prices of .76-.78 baht per kilo. As a result, prices received by farmers increased in 1998. However, the stocks to be purchased by the govern-

ment were small compared with the 17 million tons of production expected in 1999.

Future Prospects

The Asian recession has damped demand growth for U.S. agricultural products, but prospects for economic recovery appear good. Thailand's economic growth after the recovery will not be as rapid as before the crisis, but may be more sustainable. The financial sector reforms should help ensure a more efficient and sustainable use of capital in the future.

Thai agriculture faired well during the crisis. On average, producer prices rose 25 percent and farm income rose 13 percent in baht terms from 1997 to 1998. High exchange rate pass-through in some key Thai commoditities such as chicken meat may have enhanced Thai recovery.

However, not everything affecting the country's economic future is under the Thai government's control. The extent to which the recovery is led by exports depends upon how quickly its Asian neighbors resume their imports from Thailand. The increase of Japanese imports is critical, but so are exports to other countries in the region.

Lower *Real* Boosts Brazil's Agricultural Exports

Brazil had record and near-record crops of soybeans, sugar, coffee and other products to sell in the international market in the 1998/99 marketing year. Brazil's bumper crops plus the currency depreciation brought on by the financial crisis put downward pressure on international prices of these major commodities [Christine Bolling (202) 694-5212, hbolling@ers.usda.gov]

The 32-percent devaluation of the Brazilian currency (the *real*) from January to February 1999 strengthened the competitiveness of Brazilian exporters during a period of bumper crops in Brazil and weak global demand. The Asian financial crisis, the Russian crisis, and the outflow of capital from declining investor confidence exacerbated Brazil's financial crisis. Brazil's role as an important agricultural exporter made it vulnerable to the decline in demand in important importing countries such as Japan and Korea. Brazil was also affected by increased competition from other agricultural exporters, such as Thailand, whose currencies were severely depreciated in 1997. However, the lowered value of the *real* significantly increased the country's competitiveness in exports. Agricultural exports such as soybeans, soybean oil, sugar, and poultry increased significantly in terms of tonnage, but did not increase in terms of dollar value (table 12). Total exports decreased 11 percent in dollar terms during January-September 1999, compared with a year earlier.

Brazil's Financial Crisis

Brazil had enjoyed 4 years of economic stability from the Real Plan following the economic disaster of mid-1994, when inflation reached 1,141 percent, and the Brazilian currency was devalued and renamed the *real*.

The Real Plan brought economic prosperity to Brazil, but high consumer spending on imported goods also led to a trade deficit. Moreover, high government spending, particularly on retirement programs, set the stage for the government deficit. The *real* was originally set on a par with the U.S. dollar. The Central Bank, using a crawling peg system with a mini-band mechanism, allowed only small daily changes in the value of the currency. As the dollar strengthened in 1995 in relation to other currencies, however, the *real* began to appreciate relative to the dollar. The Russian financial crisis in August 1998 heightened fears among international investors concerning returns to investments in emerging markets. Capital flight increased and observers began to speculate that the Brazilian government would devalue its currency.

Table 12--Brazil's exports of major products

Product	January-September		% change
	1998	1999	
	$ billion		
Total	39.5	35.0	-11
Coffee	1.7	1.7	-1
Soybeans	2.0	1.5	-27
Sugar	1.4	1.3	-4
Soybean meal	1.4	1.0	-25
Fruit juice (orange)	0.9	0.9	-1
Poultry meat	0.6	0.7	23
Soybean oil	0.7	0.5	-19

Note. Original tables are in millions of U.S. dollars, and were rounded here to indicate the ranking of products. The percent changes reported here are based on the original data.

Source: Global Trade Information Service, The World Trade Atlas, Import Export Trade Information System

The problem started on January 6, 1999, when a provincial governor, a former president of Brazil, announced a 90-day moratorium on debt payments to the central government to protest strict fiscal measures under an agreement with the International Monetary Fund (IMF). The move raised investors' fears and spurred serious capital flight. Recognizing that the *real* was under attack, Brazil's Central Bank decided on "de facto" devaluation on January 13 by widening the band in which the *real* could be traded while preventing a free fall in the currency. The alternative would have been for the government to defend the currency and potentially deplete its foreign reserve holdings.

The new currency band lasted for 2 days, during which another $1 billion in capital reportedly left Brazil. The next step was to allow the *real* to float freely, and by February 3 it had tumbled 32 percent in value to $R1.79 per U.S. dollar. To discourage investors from withdrawing more funds from Brazil, the Central Bank of Brazil announced that short-term interest rates would increase from 29 to 39 percent. Since then, the International Monetary Fund (IMF) has paid Brazil the first portion of a $41.5-billion loan to shore up its economy. Brazil's economy appears to have strengthened in 2000; after significant gyration, the *real* was trading at $R1.78 per U.S. dollar on February 1, 2000.

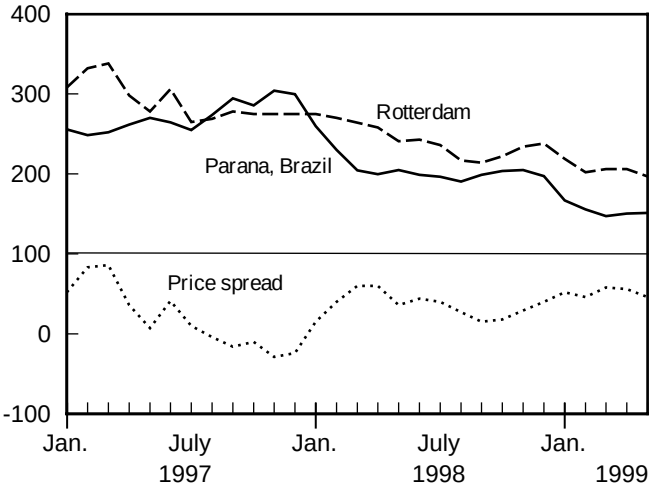
The Effect on Brazilian Farmers

The Brazilian financial crisis did not fall equally on everyone. Farmers benefited from higher prices in terms of the *real*, even though the dollar price for many commodities had already fallen well in advance of the financial crisis (fig. 21). (See box, "Price Transmission …") This is evident from

Figure 21

Soybean prices: Brazil and Rotterdam

$U.S/metric ton



Source: ABIOVE, Brazil and IMF.

the soybean prices quoted by the Brazilian Oilseed Crushers' Association (ABIOVE).

At the same time, prices for imported inputs also began to rise, in some cases leading to a cost-price squeeze for many producers. Soybean production costs in Parana (denominated in dollars) declined between 1995 and 1998 according to the Parana Department of Agriculture (SEAB/DERAL), as quoted by the U.S. Agricultural Counselor of Brazil. Costs for imported inputs could have been most affected by the devaluation. According to the U.S. Agricultural Counselor, imported seed, fertilizers, and chemicals, comprising 44 percent of total costs, were most vulnerable to increases in 1999/2000. Soybean production in the 1998/99 marketing year (beginning February 1999) was at near record levels of 31 million metric tons, and may moderate in 1999/2000. Soybean meal and oil production is also at near record levels. The 1999/2000 marketing-year soybean exports are forecast at 9.3 million metric tons. Soybean meal exports are down slightly in 1998/99 because of increased use of soybean meal in Brazil's growing broiler industry.

The poultry industry faced the same situation, as dollar prices plunged but *real* prices returned to former levels. According to the Associacao Paulista de Avicultura (Sao Paulo Association of Poultry Producers), the price of live poultry in Sao Paulo in relation to production costs began to bounce back in January-March, after declining in late 1998, mostly because corn prices had fallen in relation to live poultry prices. Live poultry prices quoted in dollars fell from 60 cents a pound in December 1998 to 47 cents in January 1999 and 43 cents in March. In terms of *reals*, live poultry prices bounced back in February and March to their November levels, after dipping sharply in January (Revista Aves & Ovos, Brazil). Live poultry prices also stayed ahead of production costs, but in March, the relationship was not as robust as it had been earlier.

There is no transmission of prices from the U.S. market to the Brazilian market, mostly because trade in poultry is restricted between the two countries.[5]

Policy Responses

The Brazilian Central Bank first raised interest rates in 1998, in response to the pressure of the Russian crisis. The IMF also saw the need to shore up the Brazilian economy to prevent the Asian crisis from spreading and causing a global recession. In November 1998, the Brazilian government signed a $41.5-billion financing agreement with the IMF and other lenders. The IMF loans included certain conditions. Retired public-sector workers were required to contribute 11 to 20 percent of their benefits to the social security program. The austerity package also increased the contribution of public sector workers to social security and introduced a minimum retirement age of civil servants.

The package also called for extending several taxes that were originally passed as temporary measures. Under the emergency stabilization fund, the federal government could impound 20 percent of all taxes destined for state and local governments. The austerity package proposed doubling the amount impounded to 40 percent and extending the fund, which was to expire in 1999, to 2006. Authorities also proposed raising the tax on financial transfers from 0.2 percent to 0.38 percent and called on the Congress to legally oblige states to limit spending on active and retired employees to 60 percent of their budgets, at the same time cutting the resources available to them. (See Brazil's Letter of Intent to IMF.)

At first, the Brazilian Congress was reluctant to accept all the austerity programs that were part of the package, even though it appeared at the time that Brazil would experience a recession even if the package were not adopted. Early forecasts were for a decline in Brazil's real GDP on the order of 3 percent. With the austerity program in place and the arrival of the first portion of IMF funds, Brazil faces a possible 1-percent decline in real GDP growth in 1999. (February 2000 estimates for Brazil's 1999 GDP growth from country sources range from 0 to 1 percent.)

[5] In a linear regression between the monthly wholesale price of whole chickens in Sao Paulo expressed in dollars and the U.S. reference price for whole chickens for January 1997 to March 1999, the equation is as follows:$ Sao Paulo price = .833 – 0.004 U.S. reference price, where SE = .003, and R-square for the equation = .03. The double logarithmic function also has no statistically significant fit.

Price Transmission from the Brazilian Farm to the World Market

The author analyzed the relationship between domestic Brazilian prices and international prices for soybeans and poultry with regression analysis to determine whether monthly international prices responded to internal Brazilian markets from January 1997 to March 1999 (price transmission). For soybeans, standard statistical tests indicate there is some pass-through of international prices and the exchange rate change to domestic prices in Brazil. For poultry, there is no pass-through from the U.S. reference price to wholesale prices for poultry in Brazil. In a linear regression analysis of monthly Parana (Brazil) soybean prices with c.i.f. Rotterdam soybean prices for January 1997 to June 1999, as in equation (1).

(1) $ Rotterdam price = 115.48+.628 $Parana price, where standard deviation (s.e) for the estimated coefficient is .095, and R-square for the equation is .62.

Logarithmic equation (2) explains the exchange pass-through between the Parana price and the Rotterdam price during the same months:

(2) Ln (Rotterdam price in $US) = 3.401 + .404 ln(Parana price in *reals*) -.641 ln(exchange rate)
(s.e. =.127) (s.e. = .087)

R-square = .72

Both the price and exchange variables in (2) are significantly different from zero according to the standard "t " test, but the pass-throughs in price and exchange rate are incomplete according to the "t" tests where the coefficients of the variables are tested to be significantly different from 1 for incomplete pass-through.

Brazil is an important competitor with the United States in European and Asian markets. Brazil's broiler production is forecast to grow from 4.5 million metric tons in 1998 to 5 million in 1999. These expectations are based on favorable net returns to producers, adequate supplies of corn and soybean meal, and production costs being held under control. Exports of whole broilers and parts are expected to increase from 612,000 metric tons in 1998 to 700,000 metric tons in 1999, largely based on Brazil's competitive position following the currency devaluation.

Frozen concentrated orange juice (FCOJ) production for 1999/2000 is forecast at 1.258 million tons (65 degree brix), up 7 percent from the previous year. Increased production is from a larger orange crop and the increased tendency to sell oranges for juice rather than fresh use. FCOJ exports are also expected to rise. Current FCOJ export prices are $1,400-$1,500 per metric ton to the European Union (Brazil's largest export customers are Belgium and the Netherlands) and $1,200-$1,300 a metric ton to Japan (Brazil's fourth largest market following the United States). The January devaluation of the *real* did not bring any significant change to the FCOJ companies. Production costs for oranges increased 15-20 percent due to higher prices for imported inputs. March 1999 prices for juice oranges in *reals* were 50 percent higher than in March 1998, according to Brazil's Institute of Agricultural Economics.

Lower coffee prices in early 1999 were mostly due to the large crop of 1998/1999. Exports in the 1998/99 marketing year were 50 percent higher than the previous year because of the larger availability of coffee. Strong bean exports in early 1999, in what typically represented the export off-season, were aided by the new competitiveness of Brazilian coffee resulting from the devaluation of the *real*. The 1999/2000 crop is estimated to be 26 percent smaller than the previous year's crop, mostly because of the off year of the biannual production cycle and higher production costs. Because of the decline, export supplies will also decrease.

The May 1999/April 2000 marketing year for sugar follows a year of record-breaking sugar production and exports. Even with low sugar prices, production and exports are expected to increase further. More sugarcane land was available for harvest in 1999/2000. Brazil's sugar production is forecast to increase from 18.3 million metric tons in 1998/99 to 19 million. Exports are expected to increase from 8.6 to 9 million metric tons. Brazil has increased sugarcane area to be harvested, but some may remain in the fields because of low prices. Alcohol made from sugar is the principal user of sugarcane, but international prices for alcohol are even more depressed than for sugar. Because of extremely low alcohol prices, Brazilian sugar mills have chosen to increase production of sugar rather than alcohol. Sugar mills, many of which are under financial stress, are producing sugar to have cash to pay off debts, but others are operating at less than full capacity or not at all. The devaluation increased the competitiveness of Brazilian sugar in the international market.

The Effect on Trade and International Prices

The lower value of the Brazilian *real* was one of several factors that led to lower international commodity prices in 1999. Because of the El Niño weather phenomenon that increased rainfall in the main producing areas, Brazil harvested large crops for nearly every major traded commodity. The Asian crisis and the continued weakening of Japan's buying power in the international market lowered Brazil's export opportunities throughout Asia. All of these factors put downward pressure on world markets. The lower *real* value had a profound effect on agricultural commodity markets because of Brazil's role as a major agricultural exporter. Products such as soybeans, sugar, orange juice, and poultry have especially felt the impact of Brazil's *real* depreciation.

Brazil became more competitive in the international market, and its increased export supplies caused international prices to decline. For U.S. exporters of soybeans and products, market share and value of exports declined because of lower prices. U.S. poultry exporters also faced increased competition from Brazil and Thailand (which had already devalued its currency in 1997.) Likewise, U.S. orange juice producers face price competition at home and abroad. U.S. importers, however, have benefited from a buyer's market, as imports of orange juice and coffee have been much lower priced. International sugar prices also declined, but U.S. importers faced protective tariffs and quotas that prevented the pass-through of lowered prices from international markets to U.S. consumers. Some specifics:

Coffee. Brazil's large coffee crop, responsible for the bulge in global production in 1998/99, initially put downward pressure on international prices, and the 40-percent devaluation of the *real* exacerbated the price drop.

Arabica and robusta coffee prices during the first quarter of 1999 fell 5.7 percent from first- quarter 1998 and 3.9 percent from the previous quarter. Prices of arabica coffee (Brazil's principal type) were off 37 percent from the first quarter of 1998.

The depreciation prompted Brazilian exporters to increase coffee exports, using inventories to reap the benefits of high domestic prices before any currency rebound. During the first quarter of 1999, Brazil's coffee exports were double those of a year earlier (World Bank).

Soybeans and products. First-quarter 1999 soybean prices fell 18 percent from the previous quarter and 22 percent from a year earlier because of record soybean and total oilseed crops worldwide. World soybean production in 1998/99 was 20 percent higher than 2 years earlier and up nearly 50 percent during the 1990's, so the outlook for the foreseeable future is for little improvement in international prices.

Following the depreciation of the *real* in January 1999, Brazilian soybean and product exports surged. Brazil is second to Argentina in total exports of soybean oil and meal, and the United States is third. The United States leads in soybean exports. Brazil also had a record soybean harvest in the spring of 1999.

The impact on the soybean complex is not clear. The farmers' debt/financing situation varied between regions and farm size. Smaller farmers in the South who were able to access Bank of Brazil local currency-based financing or use their own money to finance crop production appeared to come out well. Larger farmers, primarily from the Center-West and Northeastern states, who were financed by the industry or agricultural input supply companies, have a "dollarized" adjustment factor included in the cost formula. The lower *real* value automatically took back in higher production costs much of what it gave in the higher local currency value for soybeans.

Sugar. International sugar prices collapsed in January 1999 due to the Brazilian currency crisis, compounded with the large Brazilian sugar crop and the increasing surplus of world sugar stocks. Brazil was the world's largest sugar exporter with a 24-percent market share in 1997/98, and a near record sugarcane crop led to large exportable supplies in an already saturated market. Brazilian sugar exports have surged since January 1999, and in March 1999, were 15 times the level of March 1998.

Rice. On the import side, lower priced paddy rice increased as a share of Brazil's total rice imports. While total paddy rice imports dropped only slightly from a year earlier during the first 11 months of 1999, milled rice imports declined by 44 percent. Argentina accounted for the bulk of the switch. Milled rice shipments from Argentina declining by more than a half from a year earlier during the first 11 months of 1999. In contrast, imports of Argentine paddy increased by nearly 160 percent. Total rice imports declined 26 percent during this period, largely due to a larger Brazilian crop. The depreciation in *real* in early 1999 increased the price difference between milled and rough rice imports. In addition to a price advantage, importing paddy rice generates more employment and allows mills to operate at higher capacity.

Implications for the Brazilian Economy

The Brazilian government adopted several new policies to meet the requirements of IMF, such as a constitutional amendment for pension reform in late 1998, the flexible exchange rate in early 1999, and privatization of state banks. (See IMF citation for more details).

The Brazilian economy is expected to register a decline of 1 percent in real GDP in calendar 1999 (a smaller decline than earlier anticipated). The open unemployment rate was about 8 percent during the first 4 months of 1999, only marginally higher than during 1998. Inflation held at 7.4 percent during

Table 13--Brazil's agricultural exports

SITC Code	Product	1996	1997	1998
			Million US$	
	Total, all products	47,747	52,990	51,120
0901	Coffee	1,722	2,748	2,334
1201	Soybeans	1,018	2,452	2,175
1701	Cane sugar	1,611	1,771	1,941
2304	Soybean cake and meal	2,731	2,681	1,751
2009	Fruit juice	1,454	1,058	1,306
2401	Tobacco	1,029	1,091	940
1507	Soybean oil	713	597	829
0207	Poultry meat, offal	881	918	775
4104	Cattle hides, leather	626	701	639
2402	Cigars, cigarettes	482	568	609
1602	Meat, offal	254	253	324
2101	Extracts from coffee	413	385	271
0202	Beef, frozen	152	148	219
0801	Coconuts, Brazil nuts	184	183	164
0203	Pork, fresh or frozen	122	142	148
1804	Butter, animal fats	91	85	99
2106	Other food preparations	42	56	96
0904	Pepper	55	59	79
1704	Candies, not chocolate	70	78	74
0306	Crustaceans	89	72	68
3503	Gelatin, animal glues	58	62	60
0201	Beef, chilled	42	49	57
1806	Chocolate	45	59	54
3301	Essential oils	86	68	45
0807	Melons, papayas	31	29	39
0804	Dates, figs, pineapples	35	26	38
0903	Mate tea	40	35	34
1516	Vegetable oils, hydrogenated	37	39	29
2008	Other fruits, nuts	34	33	28
2203	Beer from malt	55	41	27
1302	Pectates	21	22	24

Source: Global Trade Information Service, The World Trade Atlas, Import Export Trade Information System.

the first 5 months of 1999, with little or no increase in consumer prices for food. In the absence of other external shocks, inflation is expected to be 12 percent for the calendar year.

The low pass-through of the exchange rate reflects the firm stance of policies, the combined absence of indexation (a prominent part of Brazilian policy prior to the Real Plan), and the favorable impact of low commodity prices and a very good harvest on the Brazilian economy. While there was a small trade deficit in early 1999, Brazil is expected to end the year with a trade surplus. However, Brazil has seen its terms of trade deteriorate since prices for major exports, particularly agricultural commodities, have remained depressed, while oil prices have recently risen in the world market. Foreign direct investment continued to flow in during early 1999, shoring up Brazil's balance of payments.

Implications for U.S. Agriculture and Trade

Brazil may embark on a new long-term economic path in which consumers have less buying power and Brazilian export products are more competitive due to the 1999 devaluation and the expected decline in real GDP. In an experimental simulation from the 1998 ERS Baseline,[6] where a scenario of the 1999 real GDP is 1 percent less than in 1998, and the nominal exchange rate is 1.80 reals per dollar, Brazil's *real* GDP in 2008 would be significantly less than was projected in the 1998 Baseline exercise.

Per capita consumption of meat from broilers would not grow as rapidly as projected in the 1998 ERS Baseline. Increased poultry production would go even more toward increased exports than reported in the 1998 Baseline.

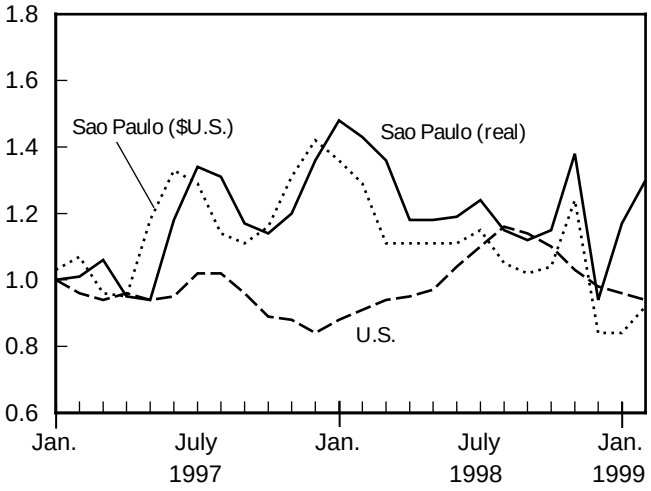
Production of raw soybeans would be even higher in response to increased world demand, according to the simulation. Soybean oil and meal exports would increase because of Brazil's increased competitiveness in the world market. Domestic use of soybean meal would be expected to decline from the earlier projections because of the lowered expectations for poultry production. Per capita consumption of soybean oil would be about the same as in 1998, because of lowered income expectations.

[6] The Baseline is an ERS simulation of global agricultural production, consumption, and trade, focusing on the grain, oilseed, and livestock complexes, with current projections to 2009. A synopsis of the Baseline is published by ERS annually and appears on the ERS web site.

Figure 22

Whole chicken prices, U.S. and Sao Paulo

Jan. 1997=100



Source: AVES e OVOS, Brazil and ERS, USDA.

Because Brazil is an important player in the international market, U.S. farmers producing competing products, such as soybeans and poultry meat, may face stiffer competition and will most likely see a decline in product prices. Consumers of tropical products will see lower prices at the grocery store for some products such as coffee. Consumer prices for sugar and orange juice may not decline much because of tariffs, despite lower prices in the international market.

The reality of Brazil's devaluation has already hit U.S.-Brazil trade. U.S. January-November agricultural exports to Brazil declined from $452 million in 1998 to $196 million in 1999. U.S. January-November agricultural imports from Brazil increased from $1.117 billion in 1998 to $1.343 billion in 1999.

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Effects of the International Financial Crises on Latin America

The international financial crises of 1997-99 and particularly the spillovers to Brazil in early 1999 have affected the Latin American economies more heavily than originally anticipated. The crises and the sharp depreciation of the Brazilian *rea*l initiated significant currency devaluation in several countries in the region. In the first half of 1999, nearly all Latin American countries were either reporting a slowdown in economic growth or a full-blown recession. The countries that most seriously affected include Argentina, Chile, Colombia, Paraguay, Peru, Venezuela, and above all, Brazil. The crises had the following effects on income and growth, output, trade, and policy adjustments.

Income Effects: Lower commodity prices following record world production and weakened Asian demand significantly affected Latin America's income and growth. The most recent World Bank forecast for the region in 1999 is a 0.4-percent contraction in economic growth. Lower grain prices have negatively affected farm sector income in various Latin American countries. The financial crises were initially felt in trade linkages through a drop in the prices of agricultural products (soybeans, fish, and wood) and raw materials, particularly oil and copper. Oil and copper are major exports for several Latin America producers (oil for Mexico, Venezuela, Ecuador, Colombia, and Argentina; copper for Chile, Bolivia, and Peru). The price index for raw materials, which had been on an upswing since early 1993, plummeted at the onset of the Asian crisis, reaching its lowest level for the decade in December 1998. Oil prices have recovered since the second half of 1999.

Output Effects: High interest rates and imported input prices negatively affected agricultural production. Agricultural production in several Latin American countries was affected as high interest rates dampened investment in rural areas. In addition, as imported input prices rose, input use fell. With disposable incomes declining, consumers adjusted their diets toward cheaper foods such as white corn and dried beans. Good weather, however, led to higher output for coarse grains and wheat.

Trade Effects: Latin America exports slowed 4 percent in volume terms in 1998. As export prices fell, the terms of trade declined significantly in Venezuela, Colombia, Ecuador, Chile, and Peru. Venezuela's terms of trade initially fell more than 20 percent in 1998 from 1997, mainly due to the plunge in international oil prices. The terms of trade have since improved, as oil prices have risen. Colombia's exports in value terms have stagnated since 1997 and the terms of trade have fallen more than 9 percent. In the case of Chile and Peru, the falls were exacerbated by the loss of markets in Asia. In Chile, the upward trend in its external income was interrupted in 1997 when copper prices plunged as Asian demand eroded. In value terms, the drop in exports was even more apparent in Peru, where the fall that began in mid-1997 accelerated thereafter due to the country's trade dependence with Asia (for the region Peru ranks second, after Chile).

Latin America's imports are expected to fall 12 percent in value in 1999 (in dollar terms) from the high level recorded in 1997, while the value of exports is expected to rise 10 percent.

Policy Measures: Trade policies such as anti-dumping and safeguard mechanisms are used to protect domestic producers from Asian exports (Argentina, Colombia, Ecuador, Peru and Uruguay) and to improve the current account balance (Brazil). Also, in March 1999, Brazil reduced its import financing restrictions, making USDA's export credit guarantee, the GSM-102 program, more attractive for U.S. exports to Brazil as it allowed for shorter-term financing (less than 360 days) than had previously been possible. This change in Brazilian regulations reflects the difficulties of Brazilian exporters and importers to obtain credit in the international market after the January devaluation of the *real*. In Colombia, a value-added tax imposed in January 1999 on feed ingredients is expected to dampen the country's import demand of U.S. soybean meal (the United States supplies more than half of Colombia's soybean meal imports).

Table 14--Importance of the United States in Latin America's agricultural trade, 1995-97

	Share of total agricultural imports from U.S.			Share of total agricultural exports to U.S.		
	1995	1996	1997	1995	1996	1997
			Percent			
Argentina	11	15	20	5	6	6
Brazil	11	10	11	9	11	9
Chile	18	11	11	24	26	27
Colombia	37	41	36	30	32	34
Ecuador	41	39	37	32	31	29
Mexico	75	75	75	83	81	75
Peru	25	30	19	32	26	35
Venezuela	33	33	35	9	19	13

Source: BICO database.

Table 15--Share of total agricultural imports from the United States, by country and category, 1997

	Bulk	Intermediate	Consumer-oriented
		Percent	
Argentina	28	28	11
Brazil	11	11	10
Chile	14	10	9
Colombia	44	34	22
Ecuador	61	35	17
Mexico	81	76	68
Peru	22	21	12
Venezuela	42	37	21

Source: BICO Database.

Effects on U.S. Agricultural Exports: Latin American countries are important markets and sources of supply for the United States. The United States ships almost one-quarter of its agricultural exports to Latin America and buys more than a third of its total agricultural imports from there. The United States exports feed grains, wheat, pulses, oilseeds and products, sugar, seeds, deciduous fruits, cattle, beef and veal, pork, poultry, and dairy products to the region and in turn imports horticultural and tropical products such as coffee, cut flowers, bananas, cattle, and fresh non-citrus fruits. Over 50 percent of U.S. agricultural exports to the Latin American region went to Mexico in 1998.

Latin America's consumer demand has slackened considerably as higher interest rates, weakening currencies and rising domestic fuel prices have reduced the population's disposable income. Reduced consumer purchasing power during 1999 is expected to reduce Latin America's demand for most imported basic commodities (deciduous fruits, poultry, and eggs) and higher valued processed foods. The forecast for 2000 is that growth in imported oilseed meals will be slow as consumption of animal protein (pork, poultry and beef) continues to go down. Soybean oil imports are forecast to increase because the amount of imported whole soybeans for vegetable oil is expected to decline (FAS Country Reports).

In addition, near-record supplies of field crops in South America last year contributed to the decline in U.S. exports. Bumper harvests in Brazil, Argentina and Paraguay (the world's second, third, and sixth largest producers of soybeans) have increased competition for U.S. exporters.

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Crisis Cuts Russia's Food Consumption and Imports

The economic crisis in Russia that began in August 1998 has strongly affected Russia's agricultural economy. Food consumption has fallen, as income declined and food prices rose. Agricultural production should be stimulated, as depreciation of the ruble improved the price competitiveness of domestic output vis-a-vis imports. Russian imports of agricultural and food products initially dropped substantially, but rebounded somewhat in 1999. U.S. agricultural exports to Russia initially plunged about 80 percent, and by the end of 1999 were still running at only about half of the pre-crisis level. [William Liefert (202) 694-5156, wliefert@ers.usda.gov]

The two events that triggered Russia's economic crisis were the government's default on its short-term debt and the devaluation of the ruble. The main causes of these developments were the drop in world prices of Russia's main exports (energy and metals), which put pressure on the ruble and reduced tax revenue, a large increase in the government's budget deficit (from about 4 percent of GDP in 1997 to 7 percent in 1998), and a spillover effect from the Asian crisis on investor confidence in Russia. The crisis has generated large-scale capital flight, depreciation of the ruble against the U.S. dollar from August to December 1998 of about 75 percent, high inflation (120 percent from August 1998 to July 1999), and falling GDP (a drop of 5 percent in 1998).

Devaluation Makes Russian Food Industry More Competitive

The crisis has reduced demand for food and lowered food consumption, for two reasons. The first is that substantial depreciation of the ruble has raised domestic prices for foodstuffs. Since reform began in 1992, Russia has liberalized its foreign trade to the point that world market prices now play a major role in determining domestic prices for food. This means that depreciation of the ruble will increase ruble-denominated prices.

The second reason is that the crisis has reduced consumer wealth and income. The government default led to a chain of events (including collapse of the banking system) that wiped out most of the value of ruble-denominated financial assets in Russia—bank accounts, bonds, and corporate stock. In addition, the fall in GDP has hurt incomes by increasing unemployment, while high inflation has reduced consumer purchasing power by substantially lowering real income.

The crisis, however, should help rather than hurt Russian agriculture. Ruble depreciation has improved the price competitiveness of all trade-competing sectors of the Russian economy—one of the few benefits the country has experienced from its current economic problems. In agriculture, Russian output has become more price-competitive relative to imports. Ruble depreciation has also raised prices for some tradeable agricultural inputs, such as energy, fertilizer, and feed, which by increasing production costs has hurt producers' competitiveness. However, since these inputs account for only a certain fraction of the value of most agricultural output, the rise in domestic prices following ruble depreciation has improved agriculture's domestic terms of trade—that is, prices received for output have increased more than prices paid for inputs. From August 1998 to spring 1999, Russian agriculture's terms of trade improved about 35 percent.

Evidence that Russian producers are responding to ruble depreciation by expanding production is that in 1999, output by the food processing industry rose 10 percent over the previous year. Anecdotal evidence from Russian sources, such as newspaper reports, also supports the argument that ruble depreciation is motivating food producers to increase output and sales. However, while ruble depreciation has clearly helped the food processing industry, which competes directly with imported processed foodstuffs, Russian primary agriculture has done less well, growing in 1999 by only 1 percent over 1998 (a year of extremely bad weather). Poor weather again in 1999 played a role, but in addition output was hurt by the systemic problems that have plagued Russian agriculture throughout the reform period. In 1999, meat production fell, as it has every year since reform began. Nonetheless, the *isolated effect* on primary agriculture of the substantial boost to the food processing industry from ruble depreciation has been to stimulate output.

Crisis Has Slashed Russian Agricultural Imports

The income-induced drop in consumer demand and depreciation-induced rise in import prices have resulted in a double hit for Russian imports of agricultural goods. According to official Russian trade statistics, agricultural imports in 1996 and 1997 totaled $9.2 and $10.3 billion, and 1998 pre-crisis import flows were about the same as in 1997. (Agricultural

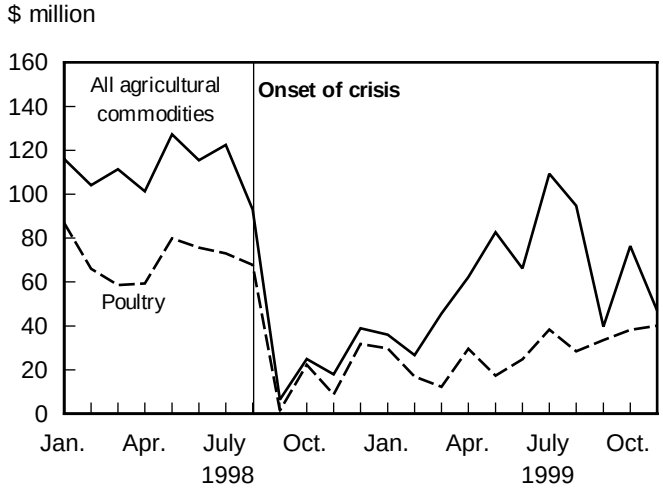
exports were $1.4 billion in 1996 and $1.2 billion in 1997.) After plunging by about three-quarters in the latter part of 1998, agricultural imports in 1999 rebounded a bit. However, in the first 6 months of 1999, commercial imports of most agricultural and food products in volume terms were still less than half the level of the first 6 months of 1998. (This excludes any imports from the United States or EU that were part of food aid—either donated foodstuffs or imports financed by the U.S. credit that was part of its food aid package.)

Russia's imports of foodstuffs consist mainly of meat and other high-value products (HVP's), such as fruit, processed foods, beverages, and confectionary products (fig.23). Consumer demand for these goods is more sensitive to changes in income than demand for more staple foods. Because the destruction of ruble-denominated financial assets during the crisis has hurt mainly the more affluent population—the driving force behind the growth of HVP imports—the crisis-generated drop in wealth and income is hitting these imports particularly hard.

Poultry is the primary U.S. agricultural export to Russia, accounting in the pre-crisis years for about two-thirds of the total value of U.S. agricultural and food exports to the country and about half of total U.S. poultry exports (fig. 24). Russians prefer poultry dark meat, which complements U.S. consumers' preference for white meat. In 1996 and 1997, imports from the United States accounted for about 55 percent of Russia's total poultry consumption. In the fourth quarter of 1998, U.S. poultry exports to Russia were down about 80 percent compared to pre-crisis levels. Although poultry exports rebounded somewhat in 1999, they were still only about half of the pre-crisis volume. The drop in exports affected U.S. poultry prices—by spring 1999 the U.S. price for chicken leg quarters (which largely determines the world price) had fallen 50 percent from the pre-crisis price.[7]

Figure 24

U.S. agricultural exports to Russia and the Baltics have plunged

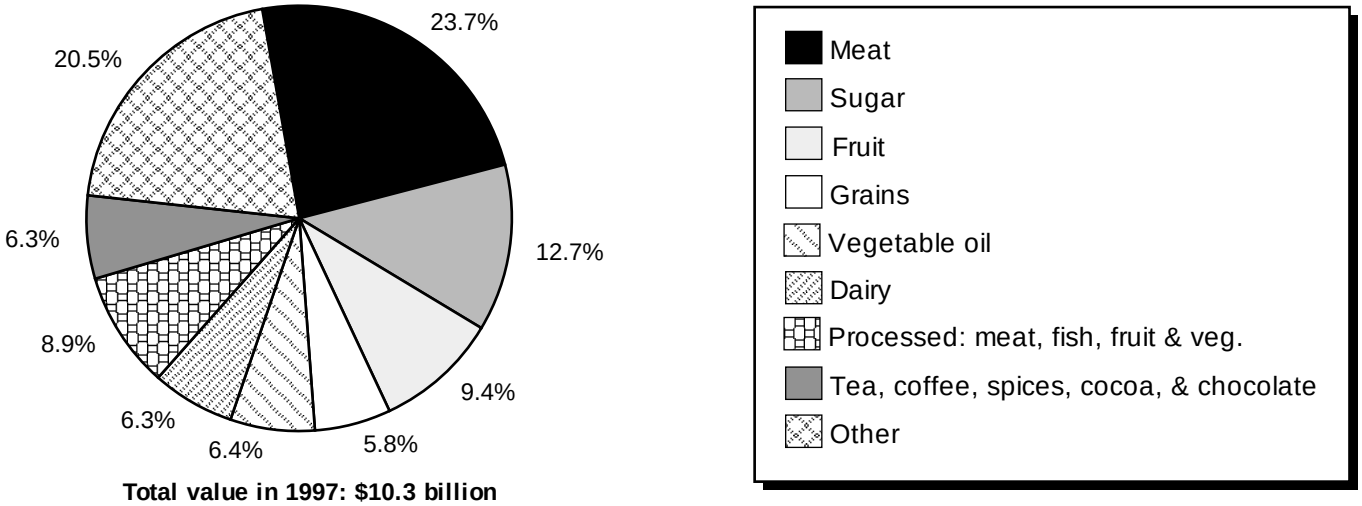


Source: Foreign Agricultural Service, USDA.

[7] Figure 23 includes U.S. agricultural exports to the three Baltic countries as well as to Russia, because beginning in 1999 much of U.S. poultry exported to Russia passed through Baltic ports. These export flows are therefore not included in either the U.S. or Russian official statistics for trade between the two countries, even though Russia is the poultry's final destination. In figure 23 the Baltic countries are the final destination of only a small fraction of total U.S. agricultural exports to both Russia and the Baltics, as well as of exports of poultry. Also in the figure, the jump in total U.S. agricultural exports to Russia in summer 1999 is from food aid.

Figure 23

Meat is Russia's main agricultural import, 1997



Total value in 1997: $10.3 billion

Source: Russian Federation Customs Statistics, 1997.

Russia's Crisis Has Hurt Its Neighbors

Russia's crisis has hurt its neighboring countries among the Newly Independent States (NIS) of the former USSR through both capital flight contagion and a disruption of trade. In 1998, capital flight triggered an aggregate drop of about 3 percent in these countries'GDP. One (perhaps ironic) reason the decline in output was less than in Russia is that most of these countries have made less market reform progress. As a result, there was less foreign investment and less market-allocated domestic capital to be frightened into flight.

As net agricultural exporters to Russia, these NIS neighbors have also suffered from a crisis-induced disruption of their trade. Particularly hard hit by ruble devaluation were Kazakstan's traditional exports of grain and meat to Russia. NIS trading partners have responded to the crisis by expanding barter trade with Russia, already strong before the crisis—supplying agricultural goods in return for energy and metals.

The reforming countries of Central and Eastern Europe (CEE), though members of the former Soviet economic bloc, have not suffered much from capital flight contagion stemming from Russia's crisis. As agricultural net exporters to Russia, however, they also have been hurt by Russia's drop in imports. Since these countries now trade with Russia using currency rather than government-negotiated barter, trade is strongly affected by movements in exchange rates. Before its crisis, Russia received 30 percent of Poland's total agricultural exports and 10-15 percent of exports from Hungary and the Czech Republic. Pork was the dominant export, followed by beef, and Hungary reported that after the crisis pork exports to Russia virtually stopped. Because of the lower quality of their output, CEE countries probably face more difficulties than Western Europe in finding alternative markets.

Crisis Has Raised Concerns About Russia's Food Security

Russia's economic crisis, in particular the drop in food imports, raised concerns about possible food shortages in the country. Adding to the worries is the fact that because of bad weather, 1998 was a poor year for Russian agriculture, especially the grain sector. The USDA figure for Russia's 1998 total grain output is 48 million metric tons (mmt), compared with an unusually high 88 mmt in 1997 and average yearly output of 80 mmt during 1993-97.

Despite 1998's poor harvest, domestic agricultural supplies appear to have been adequate in 1998-99 to prevent widespread food shortages. Russia consumes about 20 mmt of food grain a year. Food grain production in 1998 fell below that level, but the quality was high, and drawing on carryover stocks from the 1997 bumper crop, Russia was able to meet overall domestic needs. However, even with adequate food production, the economic crisis has negatively affected the *distribution* of food to segments of the population and regions of the country. As poverty increases because of rising unemployment and inflation, food is less affordable to a growing share of the population. In addition, many surplus-producing regions within Russia are restricting the outflow of foodstuffs. This can prevent food-deficit regions, particularly in the north and far east, from obtaining needed supplies even if they are willing to pay higher prices.

Both the United States and EU responded to these food security concerns with food aid packages. The United States provided 3.1 mmt of commodities (worth $1.1 billion, with $520 million being a trade credit), and the EU 1.8 mmt of products (worth $470 million). In both packages wheat and meat were the main commodities provided, with the United States also supplying corn and soybeans. (For further information concerning Western food aid to Russia, see "Russia's Economic Crisis: Effects on Agriculture Are Mixed," *Agricultural Outlook*, ERS/USDA, June-July 1999, pp. 15-18.)

As of January 2000, USDA projected Russia's grain harvest in 1999 at 55 mmt. Although such a figure would be an improvement over 1998's disastrous crop, it would still fall below the country's average annual production during the reform years (weather in 1999 was again disappointing). Therefore, in autumn 1999 Russia asked the United States for additional food aid. As of January 2000, the United States had agreed to give 500,000 tons of foodstuffs, the bulk being wheat, and was considering further donations.

Agricultural Imports Are Not Likely To Rebound Soon

The two main links between Russia's macroeconomic crisis and the agriculture and food economy have been consumer income (which has fallen) and the exchange rate (which has depreciated sharply). In August 1999 the Russian ruble was worth only one-fourth as much *vis-a-vis* the U.S. dollar and other Western currencies compared to a year earlier. In other words, it took 4 times as many rubles as before the crisis to *buy* one dollar. If the transmission between changes in the exchange rate and changes in Russian domestic prices were very strong, Russian domestic ruble prices for goods should also have quadrupled (which is equivalent to a 300-percent increase). From August 1998 to August 1999, Russian consumer prices for foodstuffs rose about 125 percent, and Russian agricultural producer prices about 100 percent. This shows that transmission between (1) changes in exchange rates and world market prices, and (2) changes in Russian domestic prices exists, but is not overly strong. Imperfect price transmission indicates that the Russian agriculture and food economy is not fully integrated into the world market. The main reasons are various state controls over prices and trade and poorly developed domestic commercial markets.

In fall 1999 the Russian economy began to recover a bit. One reason is that world prices for energy rose, thereby increasing both Russian export earnings and government revenue. Also, by improving the price competitiveness of

Russian output *vis-a-vis* the world market, the crisis-induced depreciation of the ruble has stimulated domestic production. Output of both import-competing goods and traditional exports has risen. The stimulus to production could result in a small increase in 1999 GDP (perhaps 1 percent).

However, these positive developments are not likely to quickly reverse the substantial crisis-induced fall in Russian commercial imports of foodstuffs. Capital flight and low confidence in the ruble should prevent any major increase in the value of the currency *vis-a-vis* Western currencies (as demonstrated by the fact that the turnaround in the economy's fortunes in fall 1999 has not appreciated the ruble). Although GDP might well rise marginally in 1999 and 2000, the increase will not compensate for the near 5-percent drop in 1998. A poorly valued ruble and depressed consumer income should keep Russian agricultural imports (excluding those that are part of Western food aid) below pre-crisis levels in the near to medium term.

Policy Response to Crisis Will Affect Agriculture

Russian agriculture is also affected by how government policy responds to the crisis. Despite the fears of various observers at the beginning of the crisis in August 1998, Russian economic policy during the crisis has not turned significantly away from reform. Although restrictions on agricultural flows at the regional level have grown, price and trade controls at the national level, not only in agriculture but economy-wide, have not increased substantially (an exception being the export ban on commodities Russia receives as food aid). Fiscal and monetary policy have been relatively restrained, such that by the second half of 1999 monthly inflation was running at about 1-2 percent.

The main effect of Russia's crisis on agricultural policy has been a severe drop in federal subsidies to the sector—about 80 percent in real terms compared with 1997—though subsidies from regional budgets have fallen less. The isolated effect of the drop in subsidies is to reduce output, though the stimulus to production from ruble depreciation could more than offset this response. The falling subsidies reflect the crisis-induced need to decrease spending rather than major rethinking about the general desirability of government support for agriculture.

Two major political developments occurred in Russia in December 1999. In elections for the legislature (Duma), political parties that are relatively sympathetic to reform (within the Russian political context) did better than was anticipated just a few months earlier. Also, President Yeltsin unexpectedly resigned, which moved the next Presidential election from June 2000 to March. As of January 2000, Acting President Putin appeared to be the strong front-runner in the election.

The second general approach would be to accelerate market-oriented institutional reform in agriculture that could increase productivity. Productivity growth would lower production costs, and thereby stimulate output mainly by increasing the price competitiveness of domestic producers *vis-a-vis* foreign suppliers. Any boost to output from productivity growth would reinforce the stimulus to production from the crisis-driven depreciation of the ruble.

China's Agricultural Trade and the Asian Financial Crisis

Abstract: China's domestic economy is becoming more dependent on the global economy and the macroeconomic linkages to agriculture remain strong within China. The 1994 devaluation improved China's trade balance but had a minimal impact on agricultural trade due to state intervention. The 1997-98 Asian crisis did not have a significant impact on China's grain economy, but another devaluation, in the absence of other policy responses, will improve China's agricultural trade balance [Colin A. Carter, (530)-752-6054, cacarter@ucdavis.edu, Jikun Huang and Scott Rozelle].

Economic troubles in China's economy emerged and then deepened during the mid-1990's at the same time that the financial crisis spread throughout Asia. Since 1996, the nation's growth rate has faltered and its trade position deteriorated. Officials and researchers in China believe that competitive pressures on the economy continue to build, especially with China's WTO entry. The economy's growth rate declined further in 1999 to 7.1 percent, down from 7.8 percent in 1998. Since China's currency, the *renminbi (or yuan)*, appreciated nearly 30 percent (in real terms) in the mid-1990's (World Bank, 1999), the nation's exports are expensive compared with those of other Asian countries.

In the throes of its slowest growth in the reform era (1978-1999), China's leaders were considering one of their last remaining policy options: devaluating the *renminbi* to stimulate exports. In making its decision to devalue or not, China was pondering a number of delicately balanced and competing tradeoffs. A devaluation with some of the price effects transmitted to its agricultural producers and consumers could perhaps improve China's overall trade balance. However, there was international pressure on China to maintain the current exchange rate as part of a greater effort to maintain stability in Asia. China's domestic economy would no doubt benefit from stronger, sustained growth in the region.

Surprisingly, given the importance of this issue, little systematic effort has been made to understand the impact that the Asian economic crisis has had on China's agricultural sector and the effect that a devaluation would have on the supply, demand, and trade for agricultural products between China and its trading partners. Depending on China's policy responses to the Asian crisis, how would U.S. agriculture be affected? To understand these issues better, we have undertaken a study of the Asian crisis, its impact on China, and the effect that currency devaluation would have on China's grain trade. In the first section we describe China's economic performance and policy environment in the years preceding and during the 1997-98 crisis. We next examine the effects of the Asian financial crisis on China's economy. Finally, we use our model of China's food economy to simulate the effects of a devaluation on China's grain economy.

China's Macroeconomic Environment

The Asian financial upheaval did not *directly* spread to China, in part a consequence of the more insulated nature of its economy. China's exchange rate is pegged to the dollar and current capital accounts are not freely convertible. Most foreign investments are in bricks and mortar, not short-term loans, making it more difficult and costly to shift financial assets out of the country.

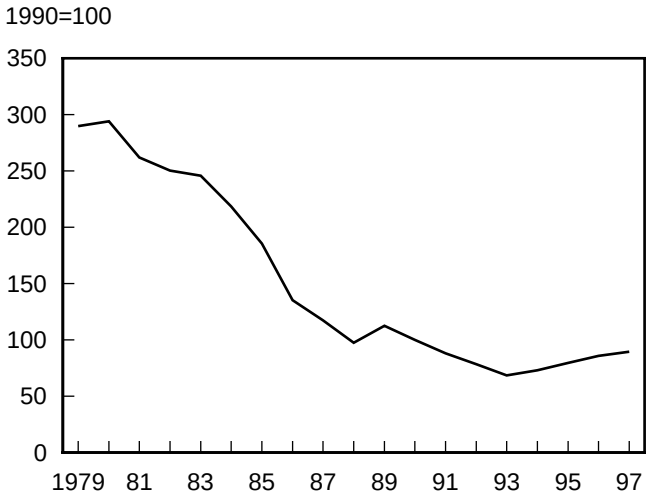
The pace of growth in China, the size of its domestic capital market, and the strength of its domestic demand allowed China to better weather the international financial crises. From 1980 to 1997, China's growth was among the highest in the world. National savings rates reached nearly 40 percent. In fact, even as the currencies of Thailand, Korea, and Indonesia began their free fall in 1997, and it was becoming clear that Japan was mired in its worst ever post-WWII recession, China's leaders were confident enough to launch a series of difficult reforms and ambitious investment programs.

The strength of the external sector can also account for at least part of China's rapid economic growth. China's total merchandise trade surged in the mid-1990's, growing at an annual rate of 16 percent from 1990 to 1997. China also built up a large merchandise trade surplus during these years, peaking at $43.6 billion in 1998. The surplus was up from $5.4 billion in 1994.

While part of China's success in building a trade surplus in the mid-1990's can be traced to its trade liberalization policies (Naughton), the exchange rate may have been just as important. China experienced a sharp depreciation of its real exchange rate from the early 1980's through 1994 (figure 25). China's managed exchange rate went from slightly less than 2 yuan per dollar in the early 1980's to 5.8 in the early 1990's. In the late 1980's, China established a secondary swap market to provide traders with more convenient access to foreign exchange at a higher, market-set rate. In the early 1990's, the market rate settled above 8 yuan to the dollar. The real value of China's currency continued to depreciate through the early 1990's, but neither the managed nor swap rate changed. Rather, China's central bankers slowly

Figure 25

Relative value of China's exchange rate against the dollar



Source: Economic Research Service, USDA.

reduced the amount of currency available at preferential rates until finally in 1994 the two-tier exchange rate policy was eliminated and the *renminbi* became pegged to the dollar at 8.3 to 1. This gradual unification was in effect a significant depreciation, as the currency lost more than 40 percent of its value between 1990 and 1994. A cheaper *renminbi* certainly accounts for part of the great success China had in attracting foreign direct investment (FDI) and expanding exports, but this trend had started earlier and the unification mainly reinforced the earlier trend.

Although China's economy enjoyed great success in the 1990's and largely escaped the financial crises that hit Asia, Russia, and Brazil, China has not been totally immune to the world's recent financial crises. China has experienced a slowdown in the growth of trade and foreign investment. As a result, after growing more than 10 percent a year during 1995-97, the economy began to slow in 1998. Sluggish domestic demand is partly to blame, but a faltering external economy also played a role.

Slowing exports have been one of China's largest problems. In the first 3 months of 1999, the value of China's exports fell to US$ 37.27 billion, 7.9 percent lower than in first-quarter 1998. Most telling, the fall in the value of exports was almost entirely due to the reduction in exports to Asia, which declined 9.9 percent in 1998 (State Statistical Bureau, 1999).

Although China's total imports also fell 0.4 percent in 1998, they jumped 16.6 percent in the first half of 1999. With more imports and fewer exports, China's trade surplus fell from $43.6 billion in 1998 to $8 billion in the first 6 months of 1999. It is expected to decline further in the second half of 1999.

A large part of the problem with the external economy, in general, and China's food trade, in particular, can be traced directly back to the problems in Asia. Asia accounted for about 60 percent of China's total exports and 72 percent of its agricultural product exports in 1997. Hong Kong and Japan are the largest agricultural markets, purchasing 22 and 25 percent of China's agricultural product exports. The crisis-battered countries of Korea, Indonesia, Malaysia, the Philippines, and Thailand purchased 16 percent of China's agricultural exports in 1997. China also competes with Asian countries in third markets, such as the EU and North America. These two regions absorbed 16 and 19 percent, respectively, of China's 1997 total exports.

At the same time, the rest of the economy has also been showing signs of stress. Urban unemployment has risen to unusually high levels. Consumer confidence is at an alltime low, even though interest rates are low and inflation is negative (the CPI changed by -0.8 percent in 1998 and by –1.4 percent in the first quarter of 1999—State Statistical Bureau, 1999). Economic growth is expected to further decline in 1999. China's government, perhaps optimistically, is now targeting a 1999 growth rate of 7 percent.

The causes of economic slowdown in China: There is debate over the causes of the current economic slowdown in China. Many economists argue it is largely outside of the control of the leadership, a consequence of external factors, including the sharp devaluations of China's Asian competitors after the onset of the financial crisis. Others believe the nation is in part a victim of its own success and the nature of the complicated reforms that it still must face. The spectacular expansion of domestic production led to an oversupply of goods and services, and falling domestic prices and profits. Lower profits are leading to firm failures. Although the failures are a natural occurrence after such rapid growth, they are triggering a slowdown in hiring, increased layoffs, and fiscal problems.

Others believe the current economic slowdown would have occurred with or without the Asia crisis, resulting primarily from the structural problems in China's industrial and financial sectors (Zhu and Brandt, 1999). China's state-owned enterprises (SOEs) have been one of the most difficult sectors to reform, given their political importance and their key position in the economy (Naughton, 1995). While there have been many notable successes, the SOE sector is still faltering. Capacity utilization was below 60 percent in one-half of the industries covered in a nationwide survey completed in 1997. Over 40 percent of state industrial enterprises were in the red during much of 1995 and 1996; another 30 percent were barely profitable; and only 20 percent were securely in the black. About 40 percent of the SOEs survive on subsidies and bank overdrafts—which then become nonperforming bank loans (World Bank, 1999).

The SOE reforms also threaten to create problems elsewhere in the economy (World Bank, 1999). A major goal of SOE

reform is employment rationalization. However, the layoffs, combined with downsizing the civil and military services, will move large numbers of workers to the ranks of the unemployed. While labor reductions should improve SOE performance, the reduced labor income will certainly erode demand. This possibility emphasizes the need for rapid growth to create new jobs for redundant labor, and to avoid political problems and stress on the nascent social welfare institutions.

Banking is a serious problem area for China (Lardy, 1999). Despite a number of major reforms in China's financial sector, China's financial markets have been liberalized at a much slower speed than other sectors (Tam, 1995). Problems of poorly performing loans and undercapitalization of China's state banking system have received increasing international scrutiny with the recent Asian financial crisis. Goals of macroeconomic management and support of SOEs have made the government eager to control the flow of financial resources in the economy, and these goals conflict with the desire to deregulate and commercialize financial institutions. China's regulated interest rates imply credit rationing, and it is likely that private entrepreneurs and firms will have difficulty gaining access to credit.

Recently, China's leaders have admitted banking reform is a key to revive banking standards in China (Park, 1999). In March 1998, the government announced that its goal for banking reforms is to establish a modern financial system in accordance with prevailing international standards. The reform strategy includes commercializing China's state banks and providing them with greater autonomy in lending decisions and better incentives (Shen, 1999). Commercial banks will be allowed to operate independently and make their own lending decisions. Previous lending quotas will be abolished. Although such reforms have been given high profile in the press, their implementation has proceeded slowly and varies greatly among provinces.

The poor performance of the banking system is closely related to the poor performance of the state-owned enterprise sector (Lardy, 1999). Though the reform program has been underway for more than 10 years, it has not yet significantly affected large state-owned enterprises. With the economic slowdown, excess capacity and rising inventories have further contributed to the state-owned enterprises' deterioration.

China's Food Economy

Agriculture contributes a relatively large share of GDP in China (20 percent), compared with many of the economically important Asian neighbors such as Thailand (11 percent), Malaysia (13 percent) or Korea (6 percent). Therefore, the macroeconomic linkages to agriculture remain strong within China. Any response by China's leaders to the Asian financial crisis will clearly have important impacts on agriculture. This linkage is critical in any decision taken by the leaders because the situation in the countryside is one of low and slowly growing farm incomes (relative to urban incomes).

China accounts for about 4 percent of global agricultural trade, valued at the official exchange rate. Even though its overall agricultural trade balance is small, China is a significant but erratic trader for certain agricultural commodities such as wheat, maize, oilseeds, edible oils, tobacco and cotton (table 16). In 1996 China shipped more than 70 percent of agricultural exports to various parts of Asia and 20 percent to Europe. Africa, Latin America, and North America play a relatively unimportant role in trade from the perspective of China's agricultural exporters. China's import shares are more diversified than its export shares.

The Impact of the Asian Crisis on China's Food Economy and Its Economic Options

In this section we employ the CAPSIM partial equilibrium agricultural model (see Huang, Rozelle, and Rosegrant, 1999) to measure the impact of an extended Asian crisis on China's grain economy.[8] The model also allows us to estimate the impacts of a devaluation on supply, demand, and trade in grains. In the first set of simulations, we examine what happens if conditions similar to the crisis are prolonged and contribute to a temporary slowdown in China's long-term growth rate. We call this the "slowdown" scenario, which attempts to predict what happens if the current economic slowdown continues and worsens for 5 years. The two main impacts on the economy are caused by 1) slower income growth that affects domestic demand for food products and 2) lower investment in agricultural research and development and in water control that is due to the economy's slowdown.[9] To simulate the impact of a currency devaluation, we examine what would happen to supply, demand, trade, and prices of major commodities if China's leaders were to alter the value of the currency by 10 to 30 percent, the extreme values being discussed by the devaluation debate.

To simulate a slowdown, we first show the impact on supply, demand, and trade of a 2-percent reduction in per capita income growth rates (comparing the results to those of the high growth scenario—scenario I in table 17). Growth rates for urban residents are assumed to fall from 4-1/2 to 2-1/2 percent and those for rural residents from 4 to 2 percent.

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[8] The Agricultural Policy Simulation and Projection Model (CAPSIM) was developed by the Center for Chinese Agricultural Policy at the Chinese Academy of Agricultural Sciences and was originally reported in Huang, Rozelle, and Rosegrant (1999). CAPSIM considers all cross price impacts for both demand and supply equations. The impact of foreign exchange rate policies on the domestic grain market (demand, supply and prices) is through the impact on exports and imports (there are equations in the model for each commodity). The model will generate a unique market equilibrium price, given any foreign exchange rate. Domestic agricultural prices are determined endogenously.

[9] As shown in Huang, Rozelle, and Rosegrant (1999), the model is largely robust to changes in all exogenous factors (such as fertilizer prices, environmental changes, other institutional changes) except income and investment. Since income and investment are examined here in conjunction with the changes that are most likely to be caused by an extended Asian crisis, our results can be considered relatively robust to other changes not considered, or to assumptions on which our baseline is based.

Table 16--China's agricultural trade by region, 1992-96

	1992	1993	1994	1995	1996
			Percent		
Export shares					
Asia	66	63	74	72	72
Africa	5	3	2	2	2
Europe	25	27	18	19	20
Latin America	1	1	1	1	1
North America	3	4	4	5	5
Total exports (million US$)	9,189	9,158	11,001	9,902	10,609
Import shares					
Asia	19	27	25	22	21
Africa	3	2	2	2	2
Europe	8	7	11	13	6
Latin America	16	11	16	14	20
North America	36	28	27	38	32
Oceania	17	26	20	10	18
Total imports (million US$)	4,930	3,408	6,578	11,376	9,936
			Million US$		
Net exports					
Asia	5,103	4,849	6,509	4,643	5,536
Africa	279	254	124	-5	-27
Europe	1,843	2,263	1,308	441	1,464
Latin America	-683	-243	-949	-1,547	-1,936
North America	-1,482	-547	-1,313	-3,887	-2,614
Oceania	-797	-824	-1,252	-1,119	-1,750
Total net exports	4,259	5,750	4,423	-1,475	673

Note: Numbers may not add due to rounding. These trade data are based on a calendar year basis. They underestimate the value of China's imports because they do not account for agricultural products smuggled from Hong Kong into China.

Source: Compiled from China's Customs Statistics.

The simulated slowdown is assumed to last 5 years, after which, growth rates resume their pre-crisis pace.

If Asia's crisis continues and prolongs China's current economic slowdown (dropping expected growth rates for 5 years), supply, demand, and trade of grains will be affected. Lowering the domestic income growth dampens demand by 2005 (table 17, scenario II). Demand for grain falls an estimated 6 million metric tons (mmt) in 2005 when compared to the high growth scenario, and lags behind the baseline for the rest of the period. Production is affected less, mainly because the impact is indirect. Falling demand takes pressure off prices and producers supply relatively less output (about 2 mmt less) in 2005. The larger drop of demand (relative to supply) implies that grain imports will fall relative to the baseline (from 22 mmt to 16 mmt) if the Asian crisis leads to the expected slower income growth.

The good news for China is that the economic slowdown's direct effect on the food economy is relatively small. In part, this small impact is due to the importance of food in the human consumption bundle and small income elasticities. Even in a short-lived slowdown, there could be other secondary impacts. For example, the income effect becomes increasingly strong over time as slower income growth leads to lower rural to urban migration and a slower rise in per capita meat demand.

A slowdown in economic growth may also take its toll on tax revenues and affect the amount of investment the government is able to channel into agriculture. If China's leaders could only increase agricultural research and water control investment by 1 percent per year (versus the authors' baseline assumption of 4 and 3-1/2 percent), grain production, even with reduced domestic demand, would eventually rise to an estimated 38 mmt by 2020, nearly 70 percent above the projected baseline level (table 17, scenario III). As shown in Huang, Rozelle, and Rosegrant (1999), China's future domestic grain supply relies heavily on new investments in water and breakthroughs in agricultural technology. Hence, the impact of an Asian crisis-induced slowdown on China's grain trade will partly depend on the relative importance of the import- reducing income effect and the import-increasing fiscal effect. A 30-percent devaluation has, as expected, an even greater impact on imports.[10]

To battle the effects due to a fiscal decline, our projections show that a devaluation, in the absence of other policy responses, will significantly improve China's agricultural trade balance. We assume that if China devalued by 10 percent, real agricultural prices inside China rise nearly an equal amount. Our findings show that producers respond

[10] While some have discussed the feasibility of devaluing the currency by as much as 30 percent, most discussion focuses on figures closer to 10 percent. Many fear that a 30-percent devaluation might trigger inflation or impose significantly high costs on urban consumers (the cost of imports, including food, would be higher), two outcomes leaders have traditionally not been willing to accept. If food costs rose and exports were rising (the scenario forecast by row 11), the leadership might decide to reimpose export embargoes as they did in 1995.

Table 17--Assessing the potential impact of the Asian economic crisis, 2005-2010

	2000			2005			2010			2020		
	Demand	Production	Net imports	Demand	Production	Net imports	Demand	Production	Net imports	Demand	Production	Net imports
						Million metric tons						
Baseline	443	430	13	483	462	21	519	497	22	582	560	22
Rice	132	132	0	138	138	0	144	144	0	151	152	-1
Wheat	119	108	11	126	115	11	132	124	8	140	138	2
Maize	120	119	1	142	133	9	163	149	14	204	183	21
Other grains	71	71	0	77	76	1	80	80	0	87	87	0
Slowdown	443	430	13	477	460	17	512	495	17	574	558	16
Slowdown and fiscal decline	443	430	13	476	458	18	510	486	24	568	530	38
10-percent devaluation	437	435	2	479	469	10	515	505	10	578	570	8
30-percent devaluation	424	445	-21	468	480	-12	504	517	-13	568	584	-16

Notes:

Authors' baseline assumptions: annual income growth rates are 4.0 percent (urban) and 3.5 percent (rural), no devaluation (constant exchange rate at 8.3 yuan/US$), annual growth rates of agricultural R&D and water investment are 4 percent and 3.5 percent, respectively.

Devaluation assumption: RMB devaluated by 10 percent from 8.3 to 9.13 after 2000.

Slowdown assumptions: annual income growth rates are 2.0 percent (urban) and 1.5 percent (rural) in 2000-2005, then the growth rate will recover to the baseline growth rates, all others are the same as the baseline.

Fiscal decline assumptions: Annual growth in R&D and water investment is 1 percent in the slowdown period (2000-2005), all others followed the baseline.

Source: Economic Research Service, USDA.

positively, consumers cut back on food demand, and trade is affected (table 17, scenario IV). In fact, with higher domestic prices, producers would increase output by an estimated 7 mmt over the baseline to 469 mmt by 2005. Consumers, on the other hand, decrease food demand by 4 mmt to 479 mmt. As a consequence, instead of rising to 22 mmt (baseline), grain imports actually fall to an estimated 8 mmt in 2005 (table 17, scenario IV, column 12), a level equal to only 60 percent of average imports in 1995 and 1996.

Experience has shown that policy makers may well intervene to offset these market driven effects. If devaluation were to lead to higher priced imports, which were viewed as hurting the interests of urban consumers, the leadership might not allow our projected effects to play themselves out. For example, following the 1994 devaluation, exports of maize should have increased, but instead policy makers, fearing high grain prices, placed an embargo on exports.

Probably the most notable feature of all of the scenarios reported here is that the Asian crisis (as modeled here) does not matter that much. Most of the estimated effects are relatively small. The slowdown effect is small, due to the importance of food as a staple (i.e., food expenditures are income inelastic). The fiscal effect could potentially lead to higher grain imports. However, with interest rates as low as they are, there is no reason the government could not borrow funds to finance public investment in agriculture.

Summary and Conclusions

The growth in China's exports slowed in 1998 and exports to Asia in particular fell sharply. This suggests that China was not immune to the Asian financial crisis. For this reason, there was domestic pressure within China to devalue in order to restore export growth and stimulate foreign direct investment.

The 1994 devaluation improved China's trade balance but had a minimal impact on agricultural trade due to state intervention. Another devaluation, in the absence of other policy responses, will significantly improve China's agricultural trade balance. If China devalued by 10 percent, and real agricultural prices inside China rose an equal amount, producers would respond positively, consumers would cut back on food demand, and exports would either rise or imports would fall.

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Financial Crisis Effects on Japan's Agricultural Markets

In 1997 and 1998, Japan experienced unusual turbulence in the international value of its currency and a recession in its economy. Some of its agricultural trade partners endured even greater shocks. However, the impacts of these developments on Japan's agricultural markets do not appear very significant. The value of Japan's agricultural trade dropped sharply in dollar terms in both 1997 and 1998, mostly because of low global prices for agricultural products. The volume of agricultural trade was stable, as were consumption and production of most agricultural products in Japan. Economic turmoil sharply affected some of the agribusiness firms in Japan, and foreign firms entered Japan's retail and wholesale food sectors [John Dyck (202) 694-5221, jdyck@ers.usda.gov].

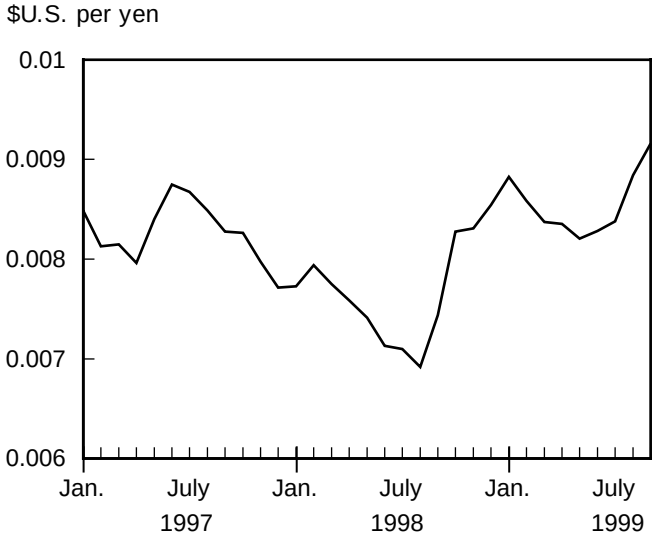
The financial crises, particularly in Southeast Asia and Korea in 1997-98, affected Japan's economy but the effects on agricultural trade were small. Japan experienced currency depreciation relative to the dollar, economic contraction, tight credit, and rising bank and corporate debt problems. The value of the yen with respect to the dollar has fluctuated significantly since Japan adopted the flexible exchange rate regime in 1985. The nominal exchange rate had appreciated strongly, from 238 yen/dollar in 1985 to less than 100 yen/dollar in 1995. However, with the Asian financial crisis and widespread suspicion of Japan's economic fundamentals, both within and outside Japan, demand for the yen dropped early in 1998. The yen-dollar exchange rate exceeded 140 for a time. Subsequently, the yen strengthened sharply from its low point in early 1998 (fig. 26).

Japan's economy was already stagnating when the Asian financial crisis hit in the middle of 1997. Since the collapse of the speculative bubble in 1989, Japan has suffered from a severe loss of confidence in its economy, which deteriorated during the 1997-98 Asian crisis.

Hoping to stimulate Japan's economy, the government responded to the Asian crisis with large spending projects and even a small direct cash infusion to consumer households. This led to an unprecedented deficit in the government budget equaling 5 percent of GDP. However, consumer confidence remained very low, and because of overcapacity in many Japanese business sectors, firms had little incentive to invest in new capacity. Access to credit for expansion also was hard for many firms, because of greater caution by banks in lending. The economy benefited in the short term from infusions of government spending for new infrastructure, but private sector contributions to growth were absent in 1998. Early in 1999, evidence of increased private sector activity returned.

Figure 26

Japan's exchange rates



Source: Pacific Exchange Service.

Asian Financial Crisis Linkages to Japanese Economy and Agriculture

The Asian financial crisis affected Japan's economy through significant changes in currency exchange rates and a heightened international concern about the credit-worthiness of nations and firms. As major investors and traders in Asia, Japanese companies were affected by the sharp depreciation of Asian currencies against the yen. After holding bad loans for almost a decade, many Japanese financial firms found that the negative consequences of these loans in their lending portfolio had worsened in the financial climate of 1997-98. Lenders began to examine the strength of financial balance sheets for all companies in Japan more carefully, and obtaining further capital became impossible for some firms, leading to their collapse. Similar conditions prevailed for

Japanese banks. The rate of failure of Japanese financial institutions and nonfinancial corporations rose in 1998. Other firms had poor prospects for long-term survival, if their balance sheets of debts and assets did not improve from the situation of 1997-98.

For agriculture, exchange rates and prices were the main linkages to the financial crisis.The lower value of the yen during the early stage of the Asian crisis (1997 to the first half of 1998) made imported products more expensive to Japanese buyers. However, the lower international purchasing power of the yen in early 1998 was offset by global weakness in the prices of agricultural commodities, particularly those used as feeds for Japan's livestock. Later in 1998, the rising value of the yen worked together with weak international prices to provide imported agricultural products at bargain prices. Within Japan, widespread (although modest) price deflation reduced the costs of many inputs to farming and the food and beverage industries. The deflation was linked to surplus capacity in much of the economy, related to the long economic malaise experienced by Japan. Relief on the side of input costs appears to have helped Japan's farms modestly, despite the effect of lower prices of imported agricultural output products, such as meat.

Government Intervention Little Affected

While Japan's government deliberately incurred enormous fiscal deficits, spending was targeted, and not all sectors received increased funding. Before the crisis, the government had pledged to spend vast sums to support the agricultural sector as it reorganized in the face of trade liberalization. Because the crisis imposed many fiscal constraints on the government, it might have been reasonable to scale back or delay the implementation of these spending plans. However, there is no evidence that such scaling back occurred. Government support for agriculture appears to have been undiminished by the crisis.

Similarly, the crisis shook confidence in government efficiency and structure. In this climate, radical suggestions were made to restructure parts of the Japanese government (e.g., the finance ministry). However, there is no evidence that the crisis actually initiated, speeded up, or changed deregulation plans affecting agriculture. Japan's ambitious plans to deregulate the domestic grain and dairy markets and to reduce the role of the government's Food Agency predated the crisis, and appear to have little linkage to it.

Effects on Japan's Agricultural Trade

Japan's agricultural imports, which reached almost $40 billion in 1996, slumped 10 percent in dollar terms in 1998, following a 10-percent decline in 1997 (table 18). The drop was $7.3 billion over 2 years. On an annual average, the value of the yen against major currencies, especially the U.S. dollar, depreciated in 1997 and 1998 from the levels seen in 1994-96. This made imports denominated in foreign currencies more expensive within Japan. Accordingly, the value of Japan's agricultural imports in yen fell less than the drop measured in dollars: an 8-percent decline in 1997 was followed by a 2-percent decline in 1998. Japan's agricultural exports gained about 14 percent over the 2-year period. U.S. agricultural exports to Japan fell 10 percent in 1997, and almost 14 percent in 1998 (table 19).

Was there a significant impact from the financial crisis of mid-1997 through 1998? Consumer confidence was low, unemployment was rising, and bonuses and salary raises were being scaled back–all factors that would reduce spend-

Table 18--Top agricultural imports, Japan

Ranked by value in 1996	1996	1997	1998	1996	1997	1998	1996	1997	1998	1996	1997	1998
	Million US$			1,000 tons			US$/ton			Million won/ton		
1 Pork, chilled and frozen	3,831	2,717	2,200	653	512	505	5,865	5,307	4,356	638	642	571
2 Beef, chilled and frozen	2,722	2,608	2,332	630	647	666	4,323	4,028	3,500	470	487	458
3 Corn for feed	2,326	1,859	1,581	12,344	12,298	12,133	188	151	130	20	18	17
4 Soybeans, all types	1,653	1,750	1,436	4,870	5,057	4,751	339	346	302	37	42	40
5 Poultry meat, chilled and frozen	1,297	1,030	964	561	509	511	2,313	2,023	1,886	252	245	247
6 Wheat for milling	1,258	1,104	885	4,774	5,144	4,663	263	215	190	29	26	25
7 Rubber, natural	1,066	888	593	733	740	686	1,455	1,199	864	158	145	113
8 Coffee	932	1,099	1,041	330	327	334	2,821	3,359	3,116	307	406	408
9 Corn not for feed	710	578	518	3,658	3,798	3,914	194	152	132	21	18	17
10 Rapeseed	673	724	680	1,922	2,062	2,078	350	351	327	38	42	43
Among the top ten, 1998												
Wine*	514	660	1,316	114	155	337	4,525	4,263	3,904	492	516	511
Total above	16,982	15,017	13,545									
Total agricultural imports	39,443	35,711	32,099									
In billion won	4,724	4,331	4,247									

* Units for wine are million US$; 1,000 kiloliters; US$/kiloliter; 1,000 yen/kiloliter.

Source: World Trade Atlas, Japan Edition, GTI, Inc. (trademarked).

Table 19--U.S. agricultural exports to Japan

	1996	1997	1998	1996	1997	1998	1996	1997	1998
	Million US$			1,000 tons			US$/ton		
Corn	2,460	1,915	1,480	14,948	15,452	13,991	165	124	106
Beef	1,505	1,387	1,302	337	346	369	4,466	4,009	3,528
Soybeans	1,128	1,109	862	3,771	3,702	3,443	299	300	250
Pork	750	681	596	179	163	174	4,190	4,178	3,425
Wheat	637	554	472	2,918	3,194	3,125	218	173	151
Edible offals	431	279	310	185	107	127	2,330	2,607	2,441
Cotton	318	247	252	164	134	151	1,939	1,843	1,669
Sorghum	269	263	134	1,747	2,233	1,273	154	118	105
Tobacco	231	220	211	40	37	39	5,775	5,946	5,410
Beverages (ex. juice, wine)	181	174	126						
Cattle hides *	177	139	88	2,863	2,266	1,722	62	61	51
Poultry meat	171	134	139	129	107	109	1,326	1,252	1,275
Essential oils	153	105	47	4	4	4	36,612	26,276	13,288
Soymeal	59	86	59	215	282	264	274	305	223
Wine **	29	36	88	177	233	491	164	155	179
Total above	8,499	7,329	6,166						
Other commodities	3,205	3,207	2,925						
Total agricultural exports to Japan	11,704	10,536	9,091						

* Volumes for hides are in 1,000 pieces, unit values are per hide.

** Volumes for wine are in hectoliters, and unit values are per hectoliter.

Calendar years.

Source: FATUS.

ing. On the other hand, many prices were falling, and food is considered a basic expenditure, with few 'big-ticket' items that consumers might hesitate to purchase. The popularity of the 'Mediterranean' cooking style appears to have swung a large chunk of consumer spending toward relatively expensive new products (pasta, wine, olive oil, etc.). On the other hand, imports of beef and pork shifted to lower-valued cuts.

On the whole, imports were stable in volume, as they have been through much of Japan's period of economic malaise that began in 1989. Japan is a wealthy, stable country, with an aging population. The reaction of food consumption to changes in income and exchange rates appears to be quite limited (despite food expenditures that are 22-23 percent of total living expenditures). The situation for firms was less stable, and there were important points of stress on many Japanese food firms and cooperatives (see box, "Effects of the Crisis on Japan's Food Sector").

Japan's agricultural trade is characterized by several distinct components that obey signals from markets that have relatively little direct connection with each other. A closer examination of each of these agricultural trade categories provides more information about the degree to which the drop in Japan's trade was linked to the global financial crisis, or to other factors.

The value of the U.S. dollar and the currencies of other agricultural-exporting nations shifted significantly relative to each other during the crisis. However, there was very little change in the U.S. share of high-profile Japanese imports such as beef, pork, poultry meat, and wheat, and little evidence of any loss of U.S. share in other commodity markets.

Meats

Lower global meat prices affected Japan's meat imports more than the lower value of yen. Effects of the bad economic climate in 1997 and 1998 are not obvious in aggregate data, and sometimes hard to identify for specific commodities. While the volume of meat imports increased, the dollar value of Japanese meat imports in 1998 dropped more than 11 percent from 1997, and 20 percent from 1996. In terms of yen, the value of imports fell almost 4 percent. The volume increase for all meats was 1.4 percent in 1998. Of this, 1 percent came from rising imports of prepared meat, and .4 percent represented growth in chilled and frozen meat imports. Consumption of red meat grew slightly from 1997 levels, but broiler consumption appears to have declined.

Average import unit values (in dollar terms) for beef fell 13 percent in 1998. Nevertheless, pork import values fell even more, and, for the first time, beef surpassed pork to become the most valuable agricultural commodity imported by Japan. The volume of beef imports rose almost 3 percent, by far the strongest performance among the major meat categories. In general, beef consumption has been growing in the 1990's, and domestic supply has not grown much. The import volume has generally increased, helped by declining tariff levels mandated in the Uruguay Round Agreement.

The drop in beef import prices in dollars during 1997-98 reflected partly the prices in major meat exporting countries, which fell significantly, allowing Japan to realize savings on whatever combination of cuts it chose to import. Although the buying power of the yen fell, world beef prices fell even more sharply. Frozen beef imports increased, while chilled

Table 20--Japan's agricultural imports

	1996	1997	1998	1996	1997	1998	1996	1997	1998	1996	1997	1998
	Million US$			1,000 tons			US$/ton			Million won/ton		
Meats												
1 Pork, fr., chilled, frz.	3,831	2,717	2,200	653	512	505	5,865	5,307	4,356	638	642	571
2 Beef, fr., chilled, frz.	2,722	2,608	2,332	630	647	666	4,323	4,028	3,500	470	487	458
5 Poultry meat, fresh, chilled, frozen	1,297	1,030	964	561	509	511	2,313	2,023	1,886	252	245	247
12 Beef offal	635	424	457	113	104	108	5,618	4,062	4,237	611	491	555
30 Chicken preparations	262	288	317	65	78	92	4,040	3,699	3,445	439	448	451
33 Pork preparations	235	179	155	87	66	68	2,690	2,723	2,280	293	329	299
Feeds												
3 Corn for feed	2,326	1,859	1,581	12,344	12,298	12,133	188	151	130	20	18	17
14 Hay, except alfalfa	558	553	483	2,136	2,191	2,147	261	252	225	28	31	29
20 Sorghum	455	396	326	2,406	2,781	2,686	189	142	121	21	17	16
26 Barley	335	267	216	1,598	1,608	1,470	210	166	147	23	20	19
31 Wheat for feed	249	211	163	953	986	898	261	214	182	28	26	24
36 Soybean meal	218	265	199	739	803	874	296	330	227	32	40	30
Vegetable oils and oilseeds												
4 Soybeans	1,653	1,750	1,436	4,870	5,057	4,751	339	346	302	37	42	40
10 Rapeseed	673	724	680	1,922	2,062	2,078	350	351	327	38	42	43
35 Palm oil	219	221	241	361	370	357	606	597	674	66	72	88
6 Inputs for food milling and manufacturing												
9 Wheat for milling	1,258	1,104	885	4,774	5,144	4,663	263	215	190	29	26	25
15 Corn not for feed	710	578	518	3,658	3,798	3,914	194	152	132	21	18	17
23 Sugar, raw	533	509	410	1,662	1,710	1,561	321	298	263	35	36	34
38 Malt	397	337	300	766	762	770	519	442	389	56	53	51
39 Modified starches	198	180	165	282	280	269	701	643	612	76	78	80
Scents for the food industry	195	205	157	3	4	4	56,857	51,314	44,633	6,185	6,208	5,846
Inputs for nonfood manufacturing												
7 Rubber, natural	1,066	888	593	733	740	686	1,455	1,199	864	158	145	113
11 Cotton, not carded or combed	672	554	535	323	293	303	2,080	1,891	1,767	226	229	231
25 Hides, raw	336	308	208	5,358	4,936	3,909	63	62	53	7	8	7
27 Wool, not carded or combed	276	268	150	60	57	38	4,585	4,681	3,942	499	566	516
Consumer-oriented commodities												
8 Coffee	932	1,099	1,041	330	327	334	2,821	3,359	3,116	307	406	408
13 Dog and cat food for retail sale	586	596	577	476	426	434	1,231	1,397	1,329	134	169	174
16 Wine	514	660	1,316	114	155	337	4,525	4,263	3,904	492	516	511
17 Cheese and curd	514	522	560	164	171	183	3,132	3,043	3,051	341	368	400
18 Food preparations (other in 2106)	492	504	461	207	223	218	2,373	2,265	2,111	258	274	277
19 Fruit and nut preparations, except juice	465	422	405	365	336	335	1,272	1,257	1,206	138	152	158
21 Bananas	435	438	469	819	885	865	531	495	542	58	60	71
22 Frozen vegetables	419	432	487	294	310	361	1,425	1,394	1,348	155	169	177
24 Chocolate food	356	316	291	151	135	125	2,359	2,335	2,334	257	283	306
28 Rice	273	326	277	445	569	499	613	573	554	67	69	73
29 Grapefruit	269	255	202	270	284	230	993	899	878	108	109	115
32 Potatoes, frozen	237	240	263	221	235	260	1,070	1,023	1,013	116	124	133
34 Mushrooms, fresh	231	227	216	28	30	35	8,353	7,617	6,096	909	922	799
37 Tea	201	196	180	49	52	45	4,134	3,740	3,956	450	452	518
Total above	27,232	24,656	22,415									
Total agricultural imports	39,443	35,711	32,099									
In billion yen	4,724	4,331	4,247									
Exchange rate, yen/US$	109	121	131									

Source: World Trade Atlas, Japan Edition, GTI, Inc.

beef imports declined. In terms of yen, the prices of both categories declined slightly, but frozen beef declined more (6 percent) than the average import value of chilled beef (down 3 percent). The value per kilogram of chilled beef imported into Japan is about twice the value of frozen beef, so that it is decidedly a more expensive product. There may have been an income effect in this market, reflecting a retreat from luxury spending by consumers, but such a retreat is hard to see in other commodities.

While beef consumption in 1998 may have grown more slowly than if there had been strong economic growth in Japan, and while consumers may have substituted cheaper cuts of beef for more expensive ones, it is difficult to make a firm judgment. Overall beef consumption no longer appears to be highly sensitive to income changes in Japan, but some income effect remains.

Beef consumption and production had dropped sharply in 1996 because of health scares, and imports slipped more modestly at the same time. While consumption has been gradually recovering, it still has not achieved the 1995 level. Consumption growth in 1998 appears to have been 1.2 percent. Beef production has stabilized, but has not recovered, and was unchanged from 1997 to 1998. Import growth resumed in 1997, and in 1998 chilled/frozen imports were 3 percent higher than in 1995. Growth continued, albeit more slowly, in 1999.

Imports of beef offals dropped somewhat in volume in the wake of the 1996 health scare, but suffered a sharp drop in average value in 1997. In 1998, volume and unit values both rose, and the import value in dollars again approached the half-billion mark.

Pork imports fell more than $500 million in 1998. Chilled and frozen imports declined 7,000 tons (1.3 percent) as large stocks were drawn down, but pork preparations (e.g., cooked or cured hams) rose 2,000 tons (3 percent). All types of pork imports had slumped in value and volume in 1997, mostly because of the sudden disappearance of pork exports from Taiwan, the result of a foot and mouth disease epidemic there. The overall results from 1998 show no sign of recovery from the depressed levels of 1997. The volume of chilled pork imports increased, but frozen pork imports declined.

When imports from Taiwan fell, domestic Japanese pork production expanded in 1997, following a decade of steady decreases (see fig. 27). Preliminary data for 1998 show that pork production held at the 1997 level. Imported feed costs declined. Total consumption rose .5 percent in 1998, indicating that consumption per person was flat – typical of most years in the 1990's.

Japan's pork market is protected by a gate price system that requires each container of imported pork to enter the Japanese market at or above a specified price in yen. When the yen was depreciating, the gate price fell in dollar terms,

Figure 27

Pork production in Japan

Million tons

Source: USDA PS&D, 4/99.

allowing cheaper cuts to be mixed into the containers without the average yen price falling below the gate price. When the yen appreciated after mid-1998, the gate price rose in dollar terms, and the mix of cuts would have shifted to higher-valued cuts. The net effect is difficult to determine. The absence of Taiwan from the market changed the quality of imported pork. Reportedly, pork from Canada and South Korea sometimes had the quality characteristics favored in Japan, and U.S. pork characteristics increasingly met Japanese preferences as well.

Poultry meat import unit values in dollar terms declined across the board in 1998, but imports shifted to higher-valued processed chicken imports. As a result, the decline in total import value (3 percent in dollar terms) was less than for pork or beef. In yen terms, the unit price was up slightly from 1997. Japan's consumers like the convenience of prepared chicken products, and lower labor costs elsewhere in the world have made prices for these products attractive in Japan. Imports of chicken preparations grew almost 18 percent in 1998, to 92,000 tons.

Imports of fresh, chilled, and frozen poultry meat grew 2,000 tons in 1998. Domestic production declined 4 percent, according to preliminary data, and absorbed a drop in consumption that may have been caused by food safety concerns. Prices of imported feedstuffs such as corn and soymeal fell at the border, even in yen terms. Moreover, the price of imported poultry products rose slightly (in yen), while the import unit value for beef and pork declined. Nevertheless, pork and beef production was unchanged, while poultry production dropped. Aside from the sources of Japan's poultry meat imports, which shifted to reflect the lower values of the Thai baht and Brazilian real, there is little evidence of a direct impact of the financial crisis in this market.

Feeds

Imports of feedstuffs for animal production are about one-tenth of Japan's agricultural imports. The vast majority of Japan's feed rations are derived from imported ingredients. In 1998, production of poultry meat, milk, and eggs declined modestly, according to preliminary data, while pork and beef production did not change. Consistent with this, the volume of most major imported feedstuffs fell slightly from 1997. Imports of major feeds dropped more than 2 percent in volume, and somewhat more in value. Import unit values in yen fell more than 6 percent for feed corn and 25 percent for soymeal. Domestic farm prices for feed mixtures showed no decline for much of 1998 (see fig. 28), but began dropping in the fall and continued to decline in early 1999. No direct impact of the financial turmoil is apparent.

Vegetable oils and oilseeds

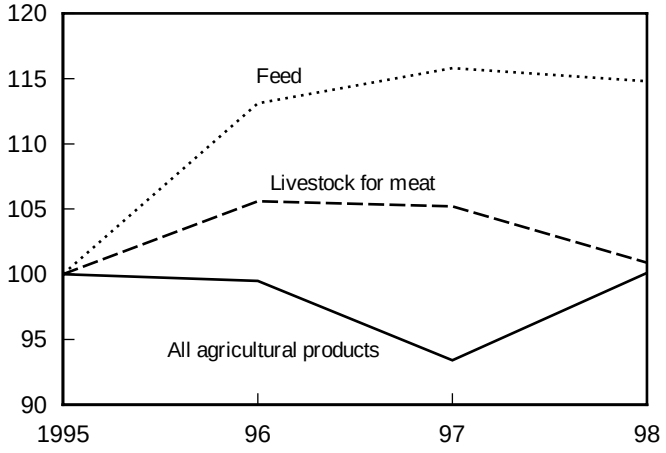
The volume of imported oilseeds for crushing fell slightly in 1998, with prices at the border, in yen, remaining stable. Japan imposes a high tariff on imports of soy oil, canola oil, and their closest substitutes. Annual reductions in this tariff are pushing crushing margins downward. However, there were no indications in 1998 that the crushing firms were in financial difficulty. Soybean imports declined 6 percent, while rapeseed imports increased by less than 1 percent in volume. This indicates a slight shift toward crushing of the more oil-rich rapeseeds. Consistent with the shift away from soybean crushing, imports of soybean meal grew almost 9 percent in volume in 1998. However, the shifts were relatively small, and the impact of the global crisis on this sector was modest at best.

Palm oil prices rose on world markets, and in terms of yen were 22 percent higher at the border in 1998 than in 1997, in part because of the economic turmoil in Southeast Asia. The volume of palm oil imported fell more than 4 percent. Imports of the upscale commodities, sesame seeds and olive oil, appeared to respond to price changes at the border. In yen, sesame seed prices rose while olive oil prices fell, leading to higher olive oil and lower sesame imports. Olive oil is part of the 'Mediterranean diet,' which is very popular in Japan.

Figure 28

Producer price indices, Japan

1995=100



Source: Monthly Statistics of Agriculture, Forestry, and Fisheries, Japan (6/99, pp. 7-8)

Inputs for food milling and manufacturing

Whether to import inputs for milling and manufacturing is influenced by market conditions for the outputs, as well as by the input prices. Often, the input's cost is a small fraction of the output price, in which case input use is often quite stable. Thus, it is somewhat surprising that wheat imported for milling declined nearly 10 percent in volume in 1998. Wheat is imported by the government's Food Agency, which raised the price for imported wheat about 2 percent in 1998. Retail wheat flour prices were unchanged.

Imports of corn for producing high-fructose corn syrup and other manufactured products increased. Imports of raw sugar, for which corn syrup is substituted, decreased almost 9 percent. Prices at the border in yen were slightly lower in 1998 both for corn and sugar.

Inputs for nonfood industries

Imports of some of these inputs declined precipitously in 1998. Hide imports fell 21 percent from 1997 and 27 percent from 1996. Wool imports fell about 33 percent from 1997 and 37 percent from 1996. Natural rubber import volume fell less—7 percent from 1997 levels. Cotton fiber imports rose 3 percent in volume. Except for cotton, import unit values for these commodities fell in 1998, in yen terms. Thus, the declines in import volume are not easily explained by price factors.

As with food industry inputs, price may be a minor part of the import decision. The industries that use these inputs have been in decline in Japan for two decades. High labor costs have caused the manufacture of apparel and footwear to move to other countries. The financial health of the processing industries that produce intermediate products, such as yarn and leather, has been generally mediocre or poor. Perhaps the financial shocks in 1998 accelerated the decline of tanning and woolen yarn spinning that is evident from the trade data. It's paradoxical that cotton imports rose while imports of other nonfood industry inputs declined. Domestic cotton thread (for high-quality fabrics) reportedly replaced some imported thread because it was cheaper to produce in Japan.

Consumer-oriented imports

Imports ready for the supermarket or the consumer showed strong growth early in the 1990's and their value held steady during the downturn in 1997/98. Imports of a subset of major items in this category increased 1.6 percent in value in 1998. Some of the items that grew most strongly could be

Effects of the Crisis on Japan's Food Sector

Barriers to entry in Japan's food and beverage industries, as well as trade policies and cultural and linguistic differences, have kept these industries distinct from food and beverage industries in North America, Oceania, and Europe. The barriers, which have been weakening over time, leading to increased internationalization, were jolted in the financial turmoil of 1997 and 1998. Foreign firms invested in the wholesale and retail sectors of Japan's food industry in ways that differed from the past. Direct, wholly owned investments in retailing promised to bring foreign firms face-to-face with Japanese customers. Foreign investment by Japanese firms in food industries in the rest of the world is likely to have slowed down. A notable exception was the acquisition of a controlling interest in Lion Nathan breweries, headquartered in Oceania and active in China, by the Kirin company of Japan.

The shocks experienced by the private sector in 1998 opened the door wider to internationalization. In December 1997, the bankruptcy of Toshoku Ltd., the fourth-largest bankruptcy in Japan since WWII, led to an arrangement with Cargill Japan to financially back Toshoku, and Cargill openly expressed an interest in one day taking ownership of Toshoku. Toshoku has been a major trader and distributor of food in Japan, and a link to Cargill would represent increased convergence between Japan's food industry and the world's. Toshoku's bankruptcy was reportedly caused by the debts of a financial subsidiary, precipitated by the general financial crisis. The financial difficulties of other food industry firms in 1997 and 1998 appear to have a similar scenario. Prior investments in financial firms, real estate, and construction became onerous obligations as the crisis hit. Firms were financially weakened not by conditions in the food markets, but by linkages outside the food sector that were exposed to the financial crisis and resulting treatment of corporate debt obligations.

Other international companies expanded their operations in Japan in the midst of the crisis. The Carrefour and Costco hypermarket (extra-large supermarkets offering a larger variety of general merchandise, besides food) chains announced plans to enter Japan. Large-scale operation of retail groceries by foreign firms has not yet occurred in Japan, so that the arrival of the two foreign firms will represent a new departure for Japan.

The internationalization of Japan's food and beverage industries does always translate directly to increased imports of agricultural products by Japan. For example, the Dole company has become a major buyer of produce from Japan's farmers. However, international firms in Japan may be more likely to use foreign ingredients or products, and better able to source them. Such firms may be less likely to support protection of Japan's products and inputs, and more likely to support free access to the full variety of world-market products.

characterized as luxuries–certainly as nonessential products. Wine imports rose 117 percent in volume and doubled in value. Wine was Japan's fifth largest agricultural commodity import, at $1.3 billion in 1998. Other commodities showing strong volume growth were cheese (up 7 percent), frozen vegetables (16 percent), frozen potatoes (10 percent), fresh mushrooms (16 percent), pasta (10 percent), tomato preparations (canned tomatoes, pastes, and purees–up 11 percent), onions and garlic (19 percent), sauces and condiments (14 percent), and natural waters (7 percent). Lower border prices did not appear to assist these fast-growing imports. In most cases, the import unit value rose at the same time as the volume, in terms of yen.

Consumer-oriented commodity imports that declined in volume were chocolate food (down 7 percent from 1997), grapefruit (19 percent), tea (13 percent), beer (38 percent), sweetened condensed milk (22 percent), oranges (12 percent), instant coffee (17 percent), dried beans (7 percent), preparations based on dairy products (7 percent), and sweetened waters (26 percent). As with the growth in onion imports, the decline in citrus fruit imports was related to weather. The import unit values for tea, instant coffee, chocolate, beer, and sweetened waters rose markedly. Since the volume of these imports declined, higher prices may have been the reason.

Summary

The financial troubles experienced by Japan and other countries left traces in Japan's agricultural and food markets in 1998, but two factors counter-balanced the financial crisis, making it difficult to sort out its particular effects. First, the yen moved in both directions in 1998, first falling in value, and then sharply reversing course. Second, global commodity prices fell, more than compensating for the weaker value of the yen during 1997 and part of 1998. While the volatility of the exchange rate in both directions was quite unusual, trade impacts are not discernable from the annual data.

Aggregate food and beverage consumption appeared to be little affected by Japan's economic troubles. Some evidence of more thrifty buying behavior in the beef market is juxtaposed with the intensity of the shift to expensive imported

products such as wine, olive oil, and cheese to satisfy the sudden popularity of the 'Mediterranean diet' in Japan.

Japan's agricultural producers were threatened by cheaper world prices for livestock products but aided by cheaper world prices for livestock feeds. They were first helped by the weakness of the yen and then hurt after it strengthened. This mix of effects left their position little changed from 1997. Agricultural trade was relatively stable in volume, but fell significantly in value because of global price weakness.

The most significant impacts of Japan's economic weakness in 1997 and 1998 may be the increased presence of foreign food firms within Japan itself. Foreign firms arrived to infuse needed capital into collapsing Japanese firms or to take advantage of new opportunities to compete in the wholesale and retail markets offered by the lower cost of doing business in Japan after 10 years of economic malaise.

Taiwan Stands Out in the Financial Crisis

Although Taiwan remained an island of relative calm in the financial storm racing across Asia in late 1997, its agricultural imports decreased substantially in 1998. The decline, however, was due more to the restructuring of Taiwan's livestock industry than by the slowdown in its economy. In particular, the lingering effects of the sudden outbreak of foot-and-mouth disease (FMD) in March 1997 not only dealt a heavy blow to the island's hog sector, but also adversely affected food production across the board including the feed, slaughtering, and edible oils/fats sectors. Because Taiwan depends almost entirely on imports for its feed needs, the chain effect of the FMD outbreak greatly affected Taiwan's agricultural imports in 1998 [Sophia Huang, (202) 694-5225, shuang@ers.usda.gov].

Taiwan has weathered the financial crisis in much better shape than many of its neighbors. In 1998, while most Asian countries were in recession, Taiwan's economy grew 4.8 percent, the fifth highest in the world. Neither a member of the World Bank nor the IMF, Taiwan has to rely on its own resources with little prospect of outside assistance in a financial crisis. Thus far, Taiwan has managed well.

A cautious approach to liberalization has kept Taiwan's financial markets partially insulated from international pressures, while Taiwan's enterprising small and medium businesses—the backbone of the economy—have given the economy greater flexibility and a broader base, enabling it to adapt to the vagaries of international markets. For a long time, Taiwan has enjoyed a high growth rate and low inflation and unemployment rates. It has maintained a current account surplus since 1981; it has the world's third largest foreign reserves and one of the world's lowest foreign debts. Unlike many of its troubled neighbors, Taiwan's banks have the lowest bad-loan ratios in Asia, and Taiwan's companies have the lowest debt-to-equity ratios.

Yet the financial crisis had a spillover effect on Taiwan's economy in many aspects. For example, as many Asian currencies lost value against Taiwan's currency and incomes fell, demand for Taiwan's exports contracted. Taiwan's exports fell 9.4 percent from 1997 to $110.6 billion in 1998, the sharpest decline in some 40 years, while imports dropped 8.5 percent to $104.7 billion. As a result, Taiwan's trade surplus in 1998 dropped 23 percent from the previous year to $5.9 billion, the lowest since 1984.

Although fast by regional standards, the economic growth rate of 4.8 percent in 1998 was Taiwan's slowest in 16 years. The financial crisis, however, had little impact on the unemployment rate: It was 2.69 percent in 1998, slightly lower than 2.72 percent in 1997. Taiwan's financial markets also suffered from the financial turmoil, which caused Taiwan's exchange rate, interest rates, and stock prices to experience sharp fluctuations. For example, in the 12 months to the end of June 1998, the local currency—the New Taiwan Dollar (NT$)—depreciated 19 percent (the largest depreciation in 11 years) and the stock market index slipped 16.4 percent. In comparison, there was a 35-percent depreciation in the South Korean currency as well as a 39-percent slide in the Malaysian currency over the same period. Also, there were 60-percent and 57-percent falls in their respective stock market indices.

Feed-related Products Accounted for Most of Drop in Agricultural Imports

The currency devaluation and economic slowdown have had the effect of stifling domestic demand and reducing imports. Although Taiwan's 1998 imports followed this logical pattern, the substantial decline in agricultural imports was out of the ordinary. While Taiwan's total imports decreased 8.5 percent in value, agricultural imports dropped 18 percent in value from the previous year.

Until 1997, Taiwan had been an important and fast growing market for agricultural products since the 1970's. Partly because of relatively high production costs, and partly because higher valued products are produced on its limited farmland, Taiwan depends on imports for many agricultural products. Basically, Taiwan's import demand derives mainly from three sources: (1) inputs for making feed (coarse grains, soybeans, and meals and other vegetable residues), (2) raw materials for export-oriented manufacturing industries (cotton and bovine hides), and (3) food goods, mainly wheat and goods for direct consumption such as beef, dairy products, fruits, vegetables, and wine and beer.

Taiwan's sharp decline in agricultural imports stemmed mainly from decreased imports of feed-related products, which accounted for nearly 60 percent of the decline in 1998 (table 21). In comparison, major raw materials for export-oriented textile and leather goods industries (cotton and bovine hides) accounted for only 3 percent of the

decline, while the 16 food goods listed in tables 21 and 22 accounted for 19 percent.

Feed-related Products a Large Part of Agricultural Imports

Taiwan's rise to prominence as a major world importer of feed-related products stems from the rapid growth of its hog and chicken industries during the past three decades. To develop a domestic livestock industry, Taiwan's leaders relaxed import controls on those products over the years. For example, since 1988 regulations on feed-related imports have been minimal except for an import duty, currently 0.5 percent for corn but duty-free for soybeans. In line with the rapid development of the domestic hog and chicken industries, imports of feed-related products, notably corn and soybeans, grew from a negligible amount before the mid-1960's to about 5.8 and 2.8 million tons in 1997, the last full year before the big drop. In particular, feed-related products accounted for about 33 percent of the value of Taiwan's total agricultural imports (excluding fishery and forestry products) for that year.

Over the years, feed-related imports have become indispensable to Taiwan's feed, livestock, and oil-crushing industries. Over 90 percent of Taiwan's coarse grain consumption is

Table 21--Taiwan's agricultural import value

				Change	
	1996	1997	1998	1997/96	1998/97
		Million US$		Percent	
Net agricultural imports	6,780.39	6,488.12	5,322.81	-4.31	-17.96
Feed-related products:					
Soybeans	852.91	851.90	530.70	-0.12	-37.70
Corn	1,168.81	841.58	604.53	-28.00	-28.17
Sorghum	20.22	12.20	10.08	-39.63	-17.44
Barley	41.56	37.05	32.42	-10.86	-12.49
Other alpha starch for fodder use	12.57	9.57	4.70	-23.90	-50.87
Alfalfa meal and pellets	20.43	14.99	13.05	-26.65	-12.92
Lupines	14.80	15.41	10.11	4.13	-34.42
Vegetable materials for forage	11.59	12.67	11.32	9.27	-10.66
Other cane molasses	56.79	38.04	23.42	-33.02	-38.43
Bran, sharps and residues of rice	8.94	2.46	0.92	-72.54	-62.70
Bran, sharps and residues of wheat	14.32	11.46	5.57	-19.95	-51.43
Oilcakes, solid	4.43	2.47	2.93	-44.21	18.49
Fats of bovine animal, sheep or goats, rendered	47.68	39.57	36.35	-17.00	-8.16
Fish meal	245.19	210.06	117.03	-14.33	-44.29
Flours, meals and pellets, of meat or meat offal	16.43	16.26	21.13	-1.06	29.96
Other solid residues	7.09	2.64	2.25	-62.73	-14.95
Total feed-related products	2,543.77	2,118.33	1,426.48	-16.72	-32.66
Share of feed-related products to net ag imports	37.52	32.65	26.80		
Inputs for textile and leather goods industries					
Raw hides & skins of bovine or equine animals	269.45	338.91	266.70	25.78	-21.31
Cotton, not carded or combed	563.02	450.50	485.69	-19.98	7.81
Total of hides and cotton	832.47	789.41	752.39	-5.17	-4.69
Share of cotton and hides to net ag imports	12.28	12.17	14.14		
Direct consumption goods:					
Wheat	245.72	203.60	185.76	-17.14	-8.76
Beef, fresh, chilled, or frozen	163.78	203.30	171.40	24.13	-15.69
Pork, fresh, chilled, or frozen	19.96	0.16	12.47	-99.17	7,469.83
Meat & edible offal of poultry, fresh, chilled, or frozen	9.55	8.49	9.78	-11.02	15.10
Dairy products	318.05	278.52	247.55	-12.43	-11.12
Snack foods	109.28	119.42	96.38	9.28	-19.30
Petfoods	45.21	41.20	36.46	-8.88	-11.50
Wine	38.00	171.38	79.13	351.05	-53.83
Beer	138.08	141.66	135.08	2.59	-4.64
Fruit juice	32.38	32.27	35.72	-0.33	10.69
Fresh fruit	261.41	286.55	263.75	9.62	-7.96
Fresh vegetables	20.93	23.97	32.71	14.54	36.46
Vegetables, frozen	10.18	10.26	6.93	0.77	-32.49
Canned sweet corn	21.87	21.65	22.13	-1.00	2.20
Potatoes	17.54	21.47	22.50	22.41	4.78
Tree nuts	41.43	42.11	31.11	1.63	-26.12
Total food goods from above	1,493.37	1,606.03	1,388.84	7.54	-13.52
Share of food goods to net ag imports	22.02	24.75	26.09		

Source: World Trade Atlas, Global Trade Information Services.

Table 22--Taiwan's agricultural import volume

	1996	1997	1998	Change 1997/96	Change 1998/97
		Metric tons		Percent	
Net agricultural imports					
Feed-related products:					
Soybeans	2,689,785	2,757,532	2,002,136	2.52	-27.39
Corn	5,987,345	5,786,226	4,757,862	-3.36	-17.77
Sorghum	97,982	79,516	80,194	-18.85	0.85
Barley	197,777	212,325	225,704	7.36	6.30
Other alpha starch for fodder use	18,253	14,914	8,125	-18.29	-45.52
Alfalfa meal and pellets	125,030	92,947	89,942	-25.66	-3.23
Lupines	79,150	75,226	54,219	-4.96	-27.93
Vegetable materials for forage	83,951	106,306	102,558	26.63	-3.53
Other cane molasses	536,555	493,080	376,089	-8.10	-23.73
Bran, sharps and residues of rice	62,094	21,593	8,879	-65.23	-58.88
Bran, sharps and residues of wheat	94,983	84,631	48,465	-10.90	-42.73
Oilcakes, solid	20,412	11,098	16,954	-45.63	52.77
Fats of bovine animal, sheep or goats, rendered	99,365	84,299	76,225	-15.16	-9.58
Fish meal	367,151	313,656	164,735	-14.57	-47.48
Flours, meals and pellets, of meat or meat offal	44,576	40,586	69,395	-8.95	70.98
Other solid residues	26,013	8,697	12,367	-66.57	42.20
Total feed-related products	1,557,533	1,347,033	1,027,952	-13.51	-23.69
Share of feed-related products to net ag imports					
Inputs for textile and leather goods industries:					
Raw hides & skins of bovine or equine animals	124,424	140,602	138,995	13.00	-1.14
Cotton, not carded or combed	308,396	265,773	308,870	-13.82	16.22
Total of hides and cotton	432,820	406,375	447,865	-6.11	10.21
Share of cotton and hides to net ag imports					
Direct consumption goods:					
Wheat	948,414	965,807	1,017,682	1.83	5.37
Beef, fresh, chilled, or frozen	49,054	62,467	60,250	27.34	-3.55
Pork, fresh, chilled, or frozen	11,410	94	12,867	-99.17	13,532.12
Meat & edible offal of poultry, fresh, chilled, or frozen	6,394	6,083	10,076	-4.87	65.64
Dairy products	133,425	127,221	120,281	-4.65	-5.46
Snack foods	40,697	47,069	38,067	15.66	-19.13
Petfoods	48,145	42,786	38,879	-11.13	-9.13
Wine	NA	NA	NA	NA	NA
Beer	126,719	141,094	145,371	11.34	3.03
Fruit juice	30,787	32,202	32,573	4.60	1.15
Fresh fruit	306,125	336,800	347,149	10.02	3.07
Fresh vegetables	54,726	60,385	90,674	10.34	50.16
Vegetables, frozen	11,139	12,211	9,263	9.63	-24.14
Canned sweet corn	20,840	20,374	21,481	-2.23	5.43
Potatoes	19,998	25,201	27,213	26.02	7.98
Tree nuts	16,053	16,998	15,608	5.88	-8.18
Total food goods from above					
Share of food goods to net ag imports					

Source: World Trade Atlas, Global Trade Information Services.

used in feed rations, with about 85 percent of soybeans crushed for oil and meal, the latter a key protein ingredient in feed rations. The production of mixed feed in Taiwan has become a highly specialized business. Taiwan's feed supply, including commercial and farm-processed feeds, peaked at 9.2 million tons in 1996, with 45.7 percent of the feed supply for hogs and 45.9 percent for poultry, mainly chickens.

FMD Led to Decreased Feed-related Product Imports

A major reason for the decline in imports of feed-related products in 1998 was the restructuring of Taiwan's livestock industry. In particular, the lingering effects of a sudden outbreak of foot-and-mouth disease (FMD) in March 1997 devastated Taiwan's hog industry and effectively eliminated a major pork exporter from the world market. The outbreak adversely affected Taiwan's food production across the board, including the feed, slaughtering, and edible oils/fats sectors. Because Taiwan depends almost totally on imports, mainly from the United States, for its feed needs, the FMD outbreak had a substantial impact in trade.

Formerly the leading supplier of Japan's pork imports, Taiwan culled nearly 4 million pigs after the FMD problem was announced. As a result, Taiwan lost its export market in

Japan, where it used to sell between 30 and 40 percent of its pork. Taiwan's hog inventory totaled 6.5 million head in November 1998, down from 10.7 million just before the FMD outbreak. In addition, lower domestic supplies and limited imports caused Taiwan's pork prices to sharply increase in 1998.

Other Factors Affected Taiwan's Feed-related Imports in 1998

Increased meat imports by Taiwan in 1998 also dampened feed imports, but to a much lesser degree than the FMD outbreak. Meat exports to Taiwan are subject to trade barriers that bar imports of chicken, some pork cuts, and all animal offals. While Taiwan allows imports of prime cuts of pork such as loin or tenderloin, imports of belly, variety meats, bones containing over 5 percent of meat, and other popular cuts are banned. In the WTO pre-accession bilateral deal reached with the United States in February 1998, however, Taiwan agreed to allow annual imports from the United States of 10,000 tons of chicken, 7,500 tons of pork offals, 5,000 tons of pork bellies, and 5,000 tons of beef offals beginning in 1998. In addition, high domestic hog prices and low international pork prices in 1998 also stimulated pork imports of non-quota cuts, primarily picnic shoulders. Thus competition from imported meat and poultry products led to some reduction in local hog and chicken production, and a corresponding decrease in the import demand for feed.

Taiwan's hog and poultry production decreased 14 percent and 1 percent from a year earlier in 1998. In turn, feed-related imports decreased substantially in 1998. For example, corn imports fell 18 percent to 4.8 million tons, while soybean imports declined 27 percent to 2 million tons. Even so, feed-related imports still accounted for 27 percent of the total value of Taiwan's agricultural imports in 1998.

Cheap international prices for feed-related products were also responsible for the decline in the import value of these products. For example, Taiwan's unit price fell 13 percent for corn imports and 14 percent for soybean imports. As a result, the value of Taiwan's feed-related product imports decreased 33 percent from 1997 to 1998, but the volume dropped only 24 percent.

Import Demand for Cotton and Hides Is Resilient

Taiwan's export-oriented textile and leather goods industries depend almost totally on imported raw materials. The intervention in imports of cotton and hides is minimal; both are duty free and there are no nontariff barriers. The volume of Taiwan's cotton and hide imports depends on the movements of its textile and leather goods industries. Since the mid-1980's, Taiwan's labor-intensive textile and leather goods industries have relocated to low-cost producing areas such as those in Southeast Asia and China. As a result, cotton and hide imports peaked in 1986, declined substantially thereafter, and then stabilized recently. Taiwan, however, remains a large importer of cotton and hides, and the financial crisis has not shown any negative effects on Taiwan's import demand for these two products. Cotton and hide imports accounted for 14 percent of total Taiwan's agricultural imports in 1998.

Taiwan's cotton imports increased 16 percent in volume but only 8 percent in value in 1998 from the previous year. According to one USDA report, three major factors have contributed to Taiwan's import resilience despite regional economic problems. First, domestic demand for high quality foreign branded apparel, which is generally produced on Taiwan under license, is on the rise. Second, Taiwan's overseas spinning operations elsewhere in Southeast Asia continue to manufacture lower quality products in demand in the economically depressed countries of the region. All cotton purchases for these overseas operations, however, are placed from Taiwan. Finally, Taiwan consumer demand for cotton apparel has increased steadily since 1989 when U.S. Cotton Council International began promoting the "Cotton USA" trademark. This supply-push/ demand-pull promotional strategy has been equally beneficial for the local textile industry and U.S. cotton.

In 1998, Taiwan's hide imports decreased only 1 percent in volume, but dropped 21 percent in value because of low international hide prices. More than 99 percent of Taiwan's demand for hides, mainly from the shoe industry, is met by imports. Strong currency, high labor costs, and concern over pollution by the tanning industry have forced many footwear firms to close their businesses or move offshore since the mid-1980's. China has been the favorite relocation site. As a result, Taiwan's hide imports declined drastically, and by 1990 were about half of their 1986 peak. Since then, they have recovered some. The gain in imports was attributed to the increased exports of leather to China. Reportedly, Taiwan shoe manufacturers who relocated to China were not satisfied with the locally produced leather and began buying finished leather from Taiwan.

Food Imports Down, but not Uniformly

The financial crisis had some impact on Taiwan's imports of food goods. Decreased import unit prices of many major items such as wheat, apples, and cherries, however, exaggerated the degree of the impact. Even so, the total import value of 16 major products in this category as shown in tables 21 and 22 decreased 14 percent from the previous year in 1998. The decline was responsible for 19 percent of the total decline in agricultural import value. The 16 products accounted for 27 percent of Taiwan's total agricultural imports in 1998. The degree of impact, however, varied with products. Discussion of the major products follows.

Meats, Offals, and Processed Meats

Taiwan substantially increased pork, chicken meat, and offal imports in 1998, mainly because of the bilateral deal

reached with the United States. Because of low import prices for pork and frozen beef, however, Taiwan's import value for meats, offals, and processed meats declined 4 percent in 1998 from the previous year.

Beef, Taiwan's dominant import in this category, decreased both in quantity and value. Imports cover over 90 percent of Taiwan's total beef demand. Beef imports decreased 16 percent in value, but less than 4 percent in volume in 1998. In addition to the impacts from the financial crisis, the negative growth of beef imports in 1998 was mainly due to a return to normal pork consumption. Taiwan's beef imports grew significantly in 1997 because consumers substituted beef for pork after the FMD outbreak in March.

Dairy Products

Except for fresh milk, Taiwan relies almost totally on imports for its dairy products. Over the years, demand for dairy products has increased rapidly with Taiwan's income growth and social and demographic changes. In 1998, dairy product imports fell 5 percent in volume and 11 percent in value.

Fresh Fruits

The financial crisis appeared not to affect Taiwan's fresh fruit imports. Taiwan produces different kinds of fruits but is also a major importer, with the United States as the dominant supplier. Fresh fruits are the leading consumer-ready farm import in Taiwan. Because of low prices, particularly for apples (Taiwan's number one fruit import) and cherries, Taiwan's fresh fruit imports increased 3 percent in volume but decreased 8 percent in value in 1998 from the previous year.

Vegetables—Fresh, Frozen, and Canned

The financial crisis did not affect imports of these particular consumer-oriented goods. With year-round production, Taiwan produces a large variety of vegetables. However, Taiwan must supplement its vegetable consumption with imports. Strong demand from restaurants for canned corn and frozen potatoes is one main reason Taiwan imports vegetables. In addition, the frequency and severity of tropical storms each summer affect domestic vegetable production and cause variation in import demand. For the four major categories of imports in this group—fresh vegetables, frozen vegetables, canned sweet corn, and potatoes (mainly French fries)—Taiwan increased its imports 26 percent in volume and 9 percent in value in 1998.

Beer and Wine

Since Taiwan opened its beer market in 1987, imports have increased rapidly. Despite the financial crisis, Taiwan's beer imports increased 3 percent in volume, but decreased 5 percent in value in 1998.

Similar to the beer market, Taiwan's wine imports, particular red wine, increased rapidly until 1997. However, the growth in wine consumption has not been big enough to take up all the increased import volume because consumption of imported table wine is a relatively new trend. Wine imports reached $171 million in 1997, when the red wine craze was at its peak. Soon after, however, red wine prices began to decline, mainly because of excess supplies. Industry executives estimate the current stock of red wine to be over 20 million bottles. With per capita consumption at 1.6 liters, it will take approximately 2 years to exhaust supplies. With large inventories in storage, wine imports declined 54 percent in value in 1998.

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List of Acronyms and Abbreviations

BLS	Bureau of Labor Statistics
BULOG	A state trading enterprise in Indonesia
CBS	Indonesia's Central Bureau of Statistics
CCC	Commodity Credit Cooperation
CEE	Central and Eastern Europe
CHAEBOL	Korea's large conglomerates
CPS	Current Population Survey
ERS	Economic Research Service
EU	European Union
FCOJ	Frozen concentrates orange juice
FAS	Foreign Agricultural Service
FDI	Foreign direct investment
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GSM	General Sales Manager
HVPs	High Value Products
IMF	International Monetary Fund
NAFTA	North American Free Trade Agreement
NIS	Newly Independent States
OECD	Organization of Economic Cooperation and Development
SOEs	State-owned enterprises
TRQs	Tariff-Rate Quotas
USDA	United States Department of Agriculture
WTO	World Trade Organization

Appendix table 1--A chronology of the 1997-99 Brazil, Indonesia, Thailand, and Russia financial crises

1997		
June 29	Thailand	Operations of 16 financial companies were suspended.
July 2	Thailand	Baht was floated and depreciated 15 percent.
July 11	Indonesia	Rupiah's band was widened.
July 13	Korea	Rating agencies gave Korean banks negative credit rating.
July 24	Southeast Asia	Currency meltdown.
Aug. 5	Thailand	Operations of 42 financial companies were suspended.
Aug. 14	Indonesia	Rupiah was floated.
Aug. 20	Thailand	The IMF package approved ($17.2 billion).
Oct. 31	Indonesia	16 commercial banks closed.
Nov. 5	Indonesia	1st IMF package approved.
Nov. 19	Korea	Korea's won band widened.
Dec. 4	Korea	The IMF package approved ($58.2 billion).
Dec. 8	Thailand	56 suspended financial companies closed permanently.
Dec.	Korea	14 banks were suspended and government took over 2 banks.
Dec.	Indonesia	Run on banks.
1998		
Jan. 15	Indonesia	Second IMF package announced ($42.3 billion).
Jan.	Korea	10 of 14 suspended commercial banks closed.
Jan. 28	Korea	Private creditors agreed to rescheduling of short-term debt.
May	Indonesia	Widespread riots.
May 21	Indonesia	President Suharto stepped down.
June 29	Korea	Government closed 5 small commercial banks.
Aug.	Russia	Government defaulted on domestic debt and devalued the ruble.
Aug. 14	Thailand	Comprehensive financial sector restructuring plan announced.
Sept.	Colombia & Ecuador	First two Latin American countries to devalue.
1999		
Jan. 12	Brazil	Government widened the *real's* trading band.
Jan. 15	Brazil	The *real* allowed to freely traded.
Mar. 31	Indonesia	Government closed 38 banks.
April	Indonesia	Government planned to recapitalize state banks.
June 30	Indonesia	Private banks recapitalized.
Sept. 2	Chile	Trading band for the peso was suspended, freed the exchange.
Sept.26	Ecuador	The government announced that it would make only half of Brady Bond payment and sought to restructure some of its foreign debts.
Sept.27	Colombia	Colombia peso was floated and would receive $6.9 billion in emergency loans from the IMF and other international lenders.

Source: Balino, Tomas J. T., Charles Enoch, Anne-Marie Gulde, Carl-Johan Lindgren, marc Quintyn, and Leslie Teo, "Financial Sector Crisis and Restructuring: Lessons from Asia," IMF, September 1999; and countries' sources.

Appendix table 2--Macroeconomic data

Country and item	Units	1993	1994	1995	1996	1997	1998
UNITED STATES							
Population, midyear estimates	Million	258.14	260.68	263.17	265.00	268.00	271.00
Foreign exchange reserves	Bil. US$	41.53	41.22	49.10	38.29	31.00	36.00
GDP	Bil. US$	6,642	7,054	7,400	7,813	8,300	8,760
Real GDP	Bil. US$ (1992)	7,054	7,338	7,537	7,813	8,165	8,516
Real per capita GDP*	1992 US$/person	27,326	28,149	28,639	29,483	30,466	31,424
Real GDP growth	Percent	2.5	4.0	2.7	3.7	4.5	4.3
Change in CPI	"	3.0	2.6	2.8	2.9	2.3	1.6
Current account balance	Bil. US$	-86	-122	-114	-129	-144	-220
Merchandise exports, f.o.b.	"	459	514	578	614	681	673
Merchandise imports, f.o.b.	"	590	669	750	803	877	919
Balance	"	-131	-155	-172	-189	-196	-246
Agricultural exports, f.o.b.	Mil. US$	42,911	46,243	56,347	60,445	57,245	51,829
Agricultural imports, c.i.f.	"	25,165	27,074	30,336	33,655	36,300	37,073
Balance	"	17,746	19,169	26,011	26,790	20,945	14,756
CANADA							
Population, midyear estimates	Million	28.94	29.25	29.61	29.96	30.00	30.30
Exchange rate	CAN/US	1.29	1.37	1.37	1.36	1.38	1.48
Foreign exchange reserves	Bil. US$	11	10	13	18	15	20
GDP	Bil. $CAN	725	767	807	833	874	896
Real GDP	Bil. $CAN (1992)	714	748	769	782	813	838
Real per capita GDP*	1992 US$/person	20,412	21,157	21,487	21,595	22,421	22,881
Real GDP growth (local currency)	Percent	2.2	4.8	2.8	1.7	4.0	3.1
Change in CPI	"	1.8	0.2	2.2	1.6	1.6	1.0
Current account balance	Bil. US$	-22	-13	-4	3	-10	-11
Merchandise exports, f.o.b.	"	145	165	193	205	218	217
Merchandise imports, f.o.b.	"	137	152	167	175	201	205
Balance	"	8	13	26	30	17	12
Agricultural exports, f.o.b.	Mil. US$	10,351	11,239	12,789	14,702	15,191	15,394
Agricultural imports, f.o.b.	"	7,984	8,607	9,080	9,523	10,516	10,855
Balance	"	2,367	2,632	3,709	5,180	4,675	4,539
Trade with U.S.:							
Total U.S. exports to	Mil. US$	100,444	114,439	127,226	134,210	151,767	156,603
Total U.S. imports from	"	111,216	128,406	145,349	155,893	168,201	173,256
U.S. agricultural exports to	"	5,327	5,575	5,812	6,146	6,795	7,016
U.S. agricultural imports from	"	4,668	5,303	5,634	6,798	7,456	7,797

See footnote at end of table.

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Appendix table 2--Macroeconomic data--continued

Country and item	Units	1993	1994	1995	1996	1997	1998
MEXICO							
Population, midyear estimates	Million	91.21	93.01	91.00	96.58	96.00	100.00
Exchange rate	New peso/US$	3.12	3.38	6.42	7.60	7.92	9.14
Foreign exchange reserves	Mil. US$	24,886	6,101	15,250	19,176	28,136	31,461
GDP	Bil. new peso	1,256	1,423	1,840	2,508	3,179	3,791
Real GDP	Bil. new peso (1993)	1,256	1,312	1,239	1,295	1,381	1,448
Real per capita GDP*	1990 US$/person	4,414	4,521	4,364	4,298	4,611	4,641
Real GDP growth (local currency)	Percent	0.3	4.5	-5.6	4.5	6.6	4.9
Change in CPI	"	9.8	7.0	35.0	34.4	20.6	15.9
Current account balance	Mil. US$	-23,400	-29,622	-1,576	-2,330	-7,454	-15,960
Merchandise exports, f.o.b.	"	51,885	60,882	79,542	96,000	110,431	117,500
Merchandise imports, c.i.f.	"	68,439	83,075	75,858	93,654	114,846	130,811
Balance	"	-16,554	-22,193	3,684	2,346	-4,415	-13,311
Agricultural exports, f.o.b.	"	3,585	4,032	5,718	5,622	6,292	6,863
Agricultural imports, c.i.f.	"	5,862	7,135	5,333	7,550	7,764	8,501
Balance	"	-2,277	-3,103	385	-1,928	-1,472	-1,638
Trade with U.S.:							
Total U.S. exports to	Mil. US$	41,581	50,844	46,292	56,792	71,388	78,773
Total U.S. imports from	"	39,917	49,494	61,685	74,297	85,938	94,629
U.S. agricultural exports to	"	3,619	4,593	3,540	5,447	5,184	6,163
U.S. agricultural imports from	"	2,720	2,895	3,836	3,765	4,112	4,691
AUSTRALIA							
Population, midyear estimates	Million	17.70	17.80	18.00	18.30	18.50	18.75
Exchange rate	A$/US$	1.47	1.37	1.35	1.28	1.35	1.59
Foreign exchange reserves	Bil. US$	11	11	11	14	16	14
GDP	Bil. A$	437	464	492	521	549	579
Real GDP	Bil. A$ (1993)	460	485	503	523	542	569
Real per capita GDP*	1993 US$/person	8,330	8,733	8,957	9,160	9,390	9,726
Real GDP growth (local currency)	Percent	2.9	5.4	3.7	4.0	3.6	5.0
Change in CPI	"	1.8	1.9	4.6	2.6	0.3	0.9
Current account balance	Mil. US$	-9,870	-17,416	-19,655	-16,015	-12,591	-17,932
Merchandise exports, f.o.b.	"	42,723	47,538	52,692	60,479	62,902	55,899
Merchandise imports, c.i.f.	"	45,577	53,425	61,283	65,427	65,892	64,630
Balance	"	-2,854	-5,887	-8,591	-4,948	-2,990	-8,731
Agricultural exports, f.o.b.	"	11,108	11,955	12,691	16,085	16,946	14,344
Agricultural imports, c.i.f.	"	1,870	2,029	2,590	2,789	2,834	2,639
Balance	"	9,238	9,926	10,101	13,296	14,112	11,705
Trade with U.S.:							
Total U.S. exports to	Mil. US$	8,277	9,781	10,789	12,008	12,063	11,918
Total U.S. imports from	"	3,297	3,202	3,323	3,869	4,602	5,387
U.S. agricultural exports to	"	330	409	340	322	354	330
U.S. agricultural imports from	"	1,075	988	851	856	959	1,137

See footnote at end of table.

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Appendix table 2--Macroeconomic data--continued

Country and item	Units	1993	1994	1995	1996	1997	1998
NEW ZEALAND							
Population	Million	3.45	3.49	3.54	3.57	3.76	3.79
Exchange rate	NZ/US	1.85	1.68	1.52	1.45	1.51	1.87
Foreign exchange reserves	Mil. US$	3,195	3,561	4,245	5,771	4,273	3,846
GDP	Bil. $NZ	81	87	92	95	98	99
Real GDP	Bil. $NZ (1991-92)	77	81	84	86	88	88
Real per capita GDP*	1990 US$/person	13,367	13,915	14,123	14,355	13,963	13,852
Real GDP growth (local currency)	Percent	0.5	5.3	2.9	2.5	2.4	0.0
Change in CPI	"	1.4	2.4	3.3	1.7	1.2	1.2
Current account balance	Mil. US$	-746	-2,384	-3,069	-4,005	-4,750	-3,192
Merchandise exports, f.o.b.	"	10,537	12,180	13,738	14,422	14,076	12,071
Merchandise imports, f.o.b.	"	9,636	11,913	13,958	14,725	14,519	12,495
Balance	"	901	267	-220	-303	-443	-424
Agricultural exports, f.o.b.	"	4,945	5,374	6,136	6,603	7,034	5,719
Agricultural imports, c.i.f.	"	715	831	1,005	1,187	1,183	984
Balance	"	4,230	4,543	5,131	5,416	5,851	4,735
Trade with U.S.:							
Total U.S. exports to	Mil. US$	1,249	1,508	1,691	1,729	1,962	1,887
Total U.S. imports from	"	1,208	1,421	1,452	1,463	1,579	1,645
U.S. agricultural exports to	"	79	76	99	91	113	122
U.S. agricultural imports from	"	763	776	756	759	849	958
CHINA (MAINLAND)							
Population, midyear estimates	Million	1,196.00	1,209.00	1,221.00	1,232.00	1,244.00	NA
Exchange rate	RMB/US$	5.80	8.60	8.40	8.30	8.30	8.30
Foreign exchange reserves	Bil. US$	21	52	74	105	140	145
GDP	Bil. US$	3,450	4,669	5,851	6,833	7,489	7,985
Real GDP	Bil. RMB (1995)	4,697	5,293	5,841	6,401	6,974	NA
Real per capita GDP*	1990 US$/person	821	915	1,000	1,086	1,172	NA
Real GDP growth (local currency)	Percent	12.3	12.7	10.4	9.6	9.0	NA
Change in CPI	"	14.6	24.2	16.9	8.3	2.8	-0.8
Current account balance	Bil. US$	-12	7	2	7	29	29
Merchandise exports, f.o.b.	"	91	121	149	151	183	183
Merchandise imports, c.i.f.	"	103	116	129	139	142	140
Balance	"	-12	5	20	12	41	43
Agricultural exports, f.o.b.	Mil. US$	12,197	14,580	14,363	14,343	13,418	12,196
Agricultural imports, c.i.f.	"	8,569	12,419	18,271	17,513	15,973	14,073
Balance	"	3,628	2,161	-3,908	-3,170	-2,555	-1,877
Trade with U.S.:							
Total U.S. exports to	Mil. US$	8,763	9,282	11,754	11,993	12,862	14,241
Total U.S. imports from	"	31,540	38,787	45,543	51,513	62,558	71,169
U.S. agricultural exports to	"	379	1,084	2,635	2,092	1,613	1,359
U.S. agricultural imports from	"	454	444	493	598	682	741

See footnote at end of table.

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Appendix table 2--Macroeconomic data--continued

Country and item	Units	1993	1994	1995	1996	1997	1998
JAPAN							
Population, midyear estimates	Million	124.70	124.90	125.20	125.80	126.00	126.40
Exchange rate	Yen/US$	111.20	102.21	94.06	108.78	120.99	130.91
Foreign exchange reserves	Bil. US$	89	115	172	207	208	203
GDP	Trillion yen	475	479	483	500	508	495
Real GDP	Trillion yen (1990)	452	455	462	485	492	478
Real per capita GDP*	1990 US$/person	25	25	25	27	27	26
Real GDP growth (local currency)	Percent	-0.2	0.7	1.5	5.0	1.4	-2.8
Change in CPI	"	1.3	0.7	-0.1	0.1	1.7	0.6
Current account balance	Bil. US$	132	130	111	66	94	121
Merchandise exports, f.o.b.	"	362	397	443	411	421	388
Merchandise imports, c.i.f.	"	242	275	336	349	339	280
Balance	"	120	122	107	62	82	108
Agricultural exports, f.o.b.	"	1,526	1,636	1,750	1,582	1,639	1,558
Agricultural imports, c.i.f.	"	31,720	37,704	41,181	41,790	38,205	34,757
Balance	"	-30,194	-36,068	-39,431	-40,208	-36,566	-33,199
Trade with U.S.:							
Total U.S. exports to	Mil. US$	47,892	53,488	64,343	67,607	65,549	57,831
Total U.S. imports from	"	107,246	119,156	123,479	115,187	121,663	121,845
U.S. agricultural exports to	"	8,847	9,463	11,170	11,704	10,536	9,110
U.S. agricultural imports from	"	265	291	309	289	303	301
SOUTH KOREA							
Population, midyear estimates	Million	44.00	45.00	45.00	46.00	46.00	46.00
Exchange rate	Won/US$	802.70	803.40	771.30	804.40	951.30	1,401.40
Foreign exchange reserves	Bil. US$	20	25	32	33	20	52
GDP	Bil. won	277	323	377	418	453	450
Real GDP (1995)	Bil. won	320	346	377	403	423	398
Real per capita GDP	1990 US$/person	10	11	12	12	13	12
Real GDP growth (local currency)	Percent	4.8	5.7	9.0	6.9	5.0	-5.9
Change in CPI	"	4.8	6.2	4.5	4.9	4.4	7.5
Current account balance	Bil. US$	1	-4	-9	-23	-8	40
Merchandise exports, f.o.b.	"	82	96	125	130	136	132
Merchandise imports, c.i.f.	"	84	102	135	150	145	93
Balance	"	-2	-6	-10	-20	-9	39
Agricultural exports, f.o.b.	Mil. US$	1,104	1,330	1,650	1,760	1,810	1,656
Agricultural imports, f.o.b.	"	6,685	7,844	9,673	10,736	9,710	6,762
Balance	"	-5,581	-6,514	-8,023	-8,976	-7,900	-5,106
Trade with U.S.:							
Total U.S. exports to	Mil. US$	14,782	18,025	25,380	26,621	25,046	16,486
Total U.S. imports from	"	17,118	19,629	24,184	22,655	23,173	23,942
U.S. agricultural exports to	"	1,940	2,339	3,759	3,871	2,863	2,268
U.S. agricultural imports from	"	67	71	74	89	91	90

See footnote at end of table.

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Appendix table 2--Macroeconomic data--continued

Country and item	Units	1993	1994	1995	1996	1997	1998
TAIWAN							
Population, midyear estimates	Million	20.82	21.03	21.21	21.37	21.55	21.78
Exchange rate	NT/US	26.39	26.46	26.49	27.46	28.70	33.46
Foreign exchange reserves	Mil. US$	83,573	92,454	90,310	88,038	83,502	90,341
GDP	Mil. $NT	5,875	6,377	6,892	7,478	8,131	8,720
Real GDP	Mil. $NT (1990)	5,344	5,669	6,001	6,326	6,734	7,042
Real per capita GDP*	1993 US$/person	9,726	10,215	10,721	11,217	11,841	12,252
Real GDP growth (local currency)	Percent	6.3	6.5	6.0	5.7	6.8	4.8
Change in CPI	"	2.9	4.1	3.7	3.1	0.9	1.7
Current account balance	Mil. US$	7,042	6,498	5,474	11,002	7,204	3,511
Merchandise exports, f.o.b.	"	84,778	92,719	111,214	115,462	121,725	110,178
Merchandise imports, f.o.b.	"	73,328	80,870	97,979	97,919	107,843	99,862
Balance	"	11,450	11,849	13,235	17,543	13,882	10,316
Agricultural exports, f.o.b. 1/	"	4,194	4,843	5,619	5,485	3,985	3,155
Agricultural imports, c.i.f. 1/	"	7,768	8,847	9,704	9,987	9,919	7,794
Balance	"	-3,574	-4,004	-4,085	-4,502	-5,934	-4,639
Trade with U.S.:							
Total U.S. exports to	Mil. US$	16,168	17,109	19,290	18,460	20,366	18,164
Total U.S. imports from	"	25,102	26,706	28,972	29,907	32,628	33,125
U.S. agricultural exports to	"	2,046	2,149	2,601	2,965	2,616	1,801
U.S. agricultural imports from	"	112	118	142	160	173	173
INDONESIA							
Population, midyear estimates	Million	188.00	191.00	195.00	197.00	200.00	204.40
Exchange rate	Rupiah/US$	2,087.00	2,161.00	2,249.00	2,342.00	2,909.00	10,014.00
Foreign exchange reserves	Bil. US$	11	12	13	18	16	22
GDP	"	330	382	454	532	626	943
Real GDP (1993 price)	"	330	355	384	414	434	375
Real per capita GDP*	1990 US$/person	953	1,009	1,069	1,140	1,178	996
Real GDP growth (local currency)	Percent	4.7	7.6	8.2	7.8	4.8	-13.6
Change in CPI	"	9.7	8.5	9.4	8.0	6.7	57.6
Current account balance	Bil. US$	-2	-3	-6	-8	-5	4
Merchandise exports, f.o.b.	"	37	40	45	50	53	49
Merchandise imports, c.i.f.	"	28	32	41	43	42	27
Balance	"	9	8	5	7	12	22
Agricultural exports, f.o.b.	Mil. US$	3,618	4,844	5,493	5,905	6,040	5,054
Agricultural imports, f.o.b.	"	2,353	3,129	4,884	5,624	4,467	3,655
Balance	"	1,265	1,715	609	281	1,573	1,399
Trade with U.S.:							
Total U.S. exports to	Mil. US$	2,770	2,809	3,360	3,977	4,522	2,299
Total U.S. imports from	"	5,435	6,547	7,435	8,250	9,188	9,341
U.S. agricultural exports to	"	344	484	817	852	772	454
U.S. agricultural imports from	"	819	1,019	1,431	1,556	1,569	1,358

See footnote at end of table.

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Appendix table 2--Macroeconomic data--continued

Country and item	Units	1993	1994	1995	1996	1997	1998
MALAYSIA							
Population, midyear estimates	Million	19.06	19.65	20.14	20.55	21.00	21.39
Exchange rate	Ringgit/US$	2.57	2.62	2.50	2.52	2.81	3.92
Foreign exchange reserves	Mil. US$	26,814	24,888	22,945	26,156	20,013	24,728
GDP	Mil. ringgit	165,202	190,274	218,671	253,732	281,889	284,475
Real GDP	Mil. ringgit (1990)	146,665	160,218	175,379	190,520	205,448	191,683
Real per capita GDP*	1990 US$/person	2,845	3,014	3,219	3,428	3,617	3,313
Real GDP growth (local currency)	Percent	5.8	9.2	9.5	8.6	7.8	-6.7
Change in CPI	"	3.5	3.7	5.3	3.5	2.7	5.3
Current account balance	Mil. US$	-2,991	-4,520	-8,469	-4,596	-4,792	NA
Merchandise exports, f.o.b.	"	47,131	58,844	73,913	78,327	78,740	73,304
Merchandise imports, f.o.b.	"	45,650	59,600	77,691	78,418	79,030	58,326
Balance	"	1,481	-756	-3,778	-91	-290	14,978
Agricultural exports, f.o.b.	"	5,014	6,565	8,228	7,822	7,304	7,756
Agricultural imports, c.i.f.	"	2,734	3,182	3,877	4,383	4,366	3,534
Balance	"	2,280	3,383	4,351	3,439	2,938	4,222
Trade with U.S.:							
Total U.S. exports to	Mil. US$	6,064	6,969	8,816	8,546	10,780	8,957
Total U.S. imports from	"	10,563	13,982	17,453	17,829	18,027	19,000
U.S. agricultural exports to	"	198	231	537	612	480	281
U.S. agricultural imports from	"	311	372	461	442	470	454
PHILIPPINES							
Population, midyear estimates	Million	66.98	68.62	70.27	71.90	73.53	75.15
Exchange rate	Peso/US$	27.12	26.42	25.71	26.22	29.47	40.89
Foreign exchange reserves	Mil. US$	4,546	5,866	6,235	9,902	7,147	9,101
GDP	Bil. peso	1,475	1,693	1,906	2,172	2,424	2,662
Real GDP	Bil. peso (1990)	1,098	1,146	1,201	1,289	1,335	1,328
Real per capita GDP*	1990 US$/person	674	687	703	737	747	727
Real GDP growth (local currency)	Percent	-0.4	4.4	4.8	7.3	3.6	-0.5
Change in CPI	"	6.9	8.4	8.0	9.0	5.9	9.7
Current account balance	Mil. US$	-3,016	-2,950	-1,980	-3,953	-4,351	-1,287
Merchandise exports, f.o.b.	"	11,129	13,304	17,502	20,407	25,088	27,782
Merchandise imports, c.i.f.	"	18,772	22,641	28,340	34,126	38,622	31,513
Balance	"	-7,643	-9,337	-10,838	-13,719	-13,534	-3,731
Agricultural exports, f.o.b.	"	1,359	1,441	1,881	1,756	1,803	1,713
Agricultural imports, c.i.f.	"	1,473	1,872	2,378	2,805	2,544	2,773
Balance	"	-114	-431	-497	-1,049	-741	-1,060
Trade with U.S.:							
Total U.S. exports to	Mil. US$	3,529	3,886	5,295	6,142	7,417	6,737
Total U.S. imports from	"	4,894	5,719	7,007	8,161	10,445	11,947
U.S. agricultural exports to	"	484	577	766	892	873	721
U.S. agricultural imports from	"	438	435	568	596	630	608

See footnote at end of table.

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Appendix table 2--Macroeconomic data--continued

Country and item	Units	1993	1994	1995	1996	1997	1998
SINGAPORE							
Population	Million	3.26	3.36	3.47	3.61	3.74	3.87
Exchange rate	S/US	1.62	1.53	1.42	1.41	1.48	1.67
Foreign exchange reserves	Mil. US$	48,066	57,890	68,349	76,491	70,883	74,417
GDP	Mil. $S	93,102	106,677	118,602	129,023	142,451	141,328
Real GDP	Mil. $S (1990)	85,484	94,352	102,556	110,152	120,587	120,889
Real per capita GDP*	1990 US$/person	15,031	16,097	16,942	17,491	18,482	17,906
Real GDP growth (local currency)	Percent	8.5	10.4	8.7	7.4	9.5	0.3
Change in CPI	"	2.3	3.1	1.7	1.4	2.0	-0.3
Current account balance	Mil. US$	4,211	11,400	14,436	14,509	15,032	17,614
Merchandise exports, f.o.b.	"	74,012	96,825	118,268	125,014	124,985	109,895
Merchandise imports, c.i.f.	"	85,234	102,670	124,507	131,338	132,437	104,719
Balance	"	-11,222	-5,845	-6,239	-6,324	-7,452	5,176
Agricultural exports, f.o.b.	"	3,410	4,015	4,320	4,222	4,131	3,476
Agricultural imports, c.i.f.	"	4,623	4,931	5,249	5,217	5,298	4,165
Balance	"	-1,213	-916	-929	-995	-1,167	-689
Trade with U.S.:							
Total U.S. exports to	Mil. US$	11,678	13,020	15,333	16,720	17,696	15,694
Total U.S. imports from	"	12,798	15,358	18,561	20,343	20,075	18,356
U.S. agricultural exports to	"	229	266	294	284	278	209
U.S. agricultural imports from	"	46	59	67	48	61	78
THAILAND							
Population, midyear estimates	Million	58.01	58.71	59.40	60.00	60.60	61.20
Exchange rate	Baht/US$	25.32	25.15	24.92	25.34	31.36	41.36
Foreign exchange reserves	Mil. US$	24,078	28,884	35,463	37,192	25,697	28,434
GDP	Bil. baht	3,179	3,635	4,195	4,690	4,676	4,604
Real GDP	Bil. baht (1990)	2,772	3,015	3,292	3,474	3,459	3,182
Real per capita GDP*	1990 US$/person	1,868	2,007	2,166	2,263	2,231	2,032
Real GDP growth (local currency)	Percent	6.9	8.8	9.2	5.5	-0.4	-8.0
Change in CPI	"	3.4	5.0	5.8	5.8	5.6	8.1
Current account balance	Mil. US$	-6,364	-8,085	-13,554	-14,692	-3,024	14,230
Merchandise exports, f.o.b.	"	36,396	45,261	56,439	55,721	57,388	54,456
Merchandise imports, c.i.f.	"	46,077	54,459	70,786	72,332	62,854	42,971
Balance	"	-9,681	-9,198	-14,347	-16,611	-5,466	11,485
Agricultural exports, f.o.b.	"	5,991	7,121	9,022	9,518	7,750	7,353
Agricultural imports, c.i.f.	"	2,093	2,387	2,876	3,230	2,481	2,269
Balance	"	3,898	4,734	6,146	6,288	5,269	5,084
Trade with U.S.:							
Total U.S. exports to	Mil. US$	3,766	4,865	6,665	7,198	7,349	5,239
Total U.S. imports from	"	8,542	10,306	11,348	11,336	12,602	13,436
U.S. agricultural exports to	"	305	385	592	591	538	431
U.S. agricultural imports from	"	727	715	903	904	855	749

See footnote at end of table.

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Appendix table 2--Macroeconomic data--continued

Country and item	Units	1993	1994	1995	1996	1997	1998
ARGENTINA							
Population, midyear estimates	Million	34.00	34.00	34.77	35.22	35.67	36.12
Exchange rate	Peso/US$	1.00	1.00	1.00	1.00	1.00	1.00
Foreign exchange reserves	Mil. US$	13,339	13,764	13,749	17,705	22,153	24,488
GDP	Mil. Peso	236,505	257,440	258,032	272,151	292,859	298,131
Real GDP	Mil. peso (1993)	236,505	250,308	243,186	256,626	277,441	288,195
Real per capita GDP*	1993 US$/person	14,196	15,024	14,274	14,870	15,873	16,283
Real GDP growth (local currency)	Percent	4.8	5.8	-2.8	5.5	8.1	3.9
Change in CPI	"	10.6	4.2	3.4	0.2	0.5	0.9
Current account balance	Mil. US$	-8,003	-10,992	-4,985	-6,521	-11,954	-14,528
Merchandise exports, f.o.b.	"	13,118	15,659	20,967	23,811	26,370	26,441
Merchandise imports, c.i.f.	"	16,784	21,527	20,122	23,762	30,450	31,404
Balance	"	-3,666	-5,868	845	49	-4,080	-4,963
Agricultural exports, f.o.b.	"	6,697	7,828	10,131	9,760	12,285	12,431
Agricultural imports, c.i.f.	"	991	1,214	1,197	1,305	1,740	1,658
Balance	"	5,706	6,614	8,934	8,455	10,545	10,773
Trade with U.S.:							
Total U.S. exports to	Mil. US$	3,776	4,462	4,189	4,517	5,810	5,886
Total U.S. imports from	"	1,206	1,725	1,761	2,279	2,228	2,231
U.S. agricultural exports to	"	93	119	131	163	344	204
U.S. agricultural imports from	"	395	383	494	704	717	640
BRAZIL							
Population, midyear estimates	Million	151.57	153.73	155.82	157.87	159.64	161.79
Exchange rate	Reais/US$	0.03	0.64	0.92	1.01	1.08	1.16
Foreign exchange reserves	Mil./US$	30,602	37,069	49,707	58,322	50,826	42,578
GDP	Bil. Reais	14,097	349,205	646,192	778,887	864,111	899,814
Real GDP	Mil. $Reais (1990)	12,176	12,888	13,432	13,789	14,286	14,269
Real per capita GDP*	1993 US$/person	2,498	2,607	2,680	2,716	2,783	2,742
Real GDP growth	Percent	3.1	5.8	4.2	2.7	3.6	-0.1
Change in CPI	"	1,928.0	2,075.9	66.0	15.8	6.9	3.2
Current account balance	Ml. US$	20	-1,153	-18,136	-23,248	-30,491	-33,829
Merchandise exports, f.o.b.	"	38,555	43,545	46,506	47,747	52,990	51,120
Merchandise imports, c.i.f.	"	27,740	35,997	53,783	56,947	65,007	57,550
Balance	"	10,815	7,548	-7,277	-9,200	-12,017	-6,430
Agricultural exports, f.o.b.	"	9,697	12,555	13,354	14,308	16,002	15,216
Agricultural imports, c.i.f.	"	3,326	4,433	6,237	6,280	6,580	5,825
Balance	"	6,371	8,122	7,117	8,028	9,422	9,391
Trade with U.S.:							
Total U.S. exports to	Mil. US$	6,058	8,102	11,439	12,718	15,915	15,142
Total U.S. imports from	"	7,479	8,683	8,830	8,773	9,626	10,102
U.S. agricultural exports to	"	199	493	522	588	579	489
U.S. agricultural imports from	"	1,404	1,327	1,154	1,348	1,472	1,224

See footnote at end of table.

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Appendix table 2--Macroeconomic data--continued

Country and item	Units	1993	1994	1995	1996	1997	1998
CHILE							
Population, midyear estimates	Million	13.77	13.99	14.20	14.42	14.62	14.82
Exchange rate	Peso$/US$	404.17	420.18	396.77	412.27	419.29	460.29
Foreign exchange reserves	Mil. US$	9,639	13,087	14,137	14,781	16,991	15,049
GDP	Bil. peso	17,975	21,395	25,876	28,268	31,774	33,578
Real GDP	Bil. peso (1990)	11,733	12,231	13,276	14,235	15,135	15,931
Real per capita GDP*	1990 US$/person	2,795	2,867	3,066	3,238	3,395	3,526
Real GDP growth (local currency)	Percent	4.9	4.2	8.5	7.2	6.3	5.3
Change in CPI	"	12.7	11.4	8.2	7.4	6.1	5.1
Current account balance	Ml. US$	-2,554	-1,585	-1,350	-3,510	-3,728	-4,139
Merchandise exports, f.o.b.	"	9,199	11,604	16,024	15,404	16,663	14,830
Merchandise imports, c.i.f.	"	11,134	11,820	15,900	17,823	19,662	18,779
Balance	"	-1,935	-216	124	-2,419	-2,999	-3,949
Agricultural exports, f.o.b.	"	1,540	1,803	2,238	2,628	2,541	2,761
Agricultural imports, c.i.f.	"	698	842	1,069	1,277	1,292	1,308
Balance	"	842	961	1,169	1,351	1,249	1,453
Trade with U.S.:							
Total U.S. exports to	Mil. US$	2,599	2,774	3,615	4,140	4,368	3,979
Total U.S. imports from	"	1,462	1,821	1,931	2,262	2,293	2,453
U.S. agricultural exports to	"	111	103	170	131	133	136
U.S. agricultural imports from	"	458	543	547	753	746	789
COLOMBIA							
Population, midyear estimates	Million	37.13	37.85	38.54	39.30	40.06	40.83
Exchange rate	Peso/US$	863.06	844.84	912.83	1,036.69	1,140.96	1,426.00
Foreign exchange reserves	Mil. US$	7,285	7,453	7,724	9,183	8,979	7,523
GDP	Bil. peso	43,898	67,533	84,439	100,711	121,708	NA
Real GDP	Bil. peso (1994)	63,000	67,533	71,046	72,507	74,994	NA
Real per capita GDP*	1994 US$/person	3,378	3,552	3,670	3,673	3,727	NA
Real GDP growth (local currency)	Percent	4.9	7.2	5.2	2.1	3.4	NA
Change in CPI	"	22.6	23.8	21.0	20.2	18.5	20.7
Current account balance	Mil. US$	-2,102	-3,596	-4,624	-4,828	-5,954	-5,293
Merchandise exports, f.o.b.	"	7,116	8,418	10,056	10,587	11,522	10,852
Merchandise imports, c.i.f.	"	9,831	11,882	13,852	13,683	15,378	14,634
Balance	"	-2,715	-3,464	-3,796	-3,096	-3,856	-3,782
Agricultural exports, f.o.b.	"	2,379	3,418	3,341	3,179	4,026	3,785
Agricultural imports, c.i.f.	"	794	1,078	1,354	1,730	1,766	1,763
Balance	"	1,585	2,339	1,987	1,449	2,260	2,022
Trade with U.S.:							
Total U.S. exports to	Mil. US$	3,235	4,064	4,624	4,714	5,197	4,816
Total U.S. imports from	"	3,032	3,171	3,751	4,424	4,737	4,656
U.S. agricultural exports to	"	223	308	465	631	543	590
U.S. agricultural imports from	"	814	1,025	1,138	1,130	1,433	1,300

See footnote at end of table.

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Appendix table 2--Macroeconomic data--continued

Country and item	Units	1993	1994	1995	1996	1997	1998
VENEZUELA							
Population, midyear estimates	Million	20.70	21.20	21.80	22.30	22.80	23.44
Exchange rate	Bolivares/US$	90.80	148.50	176.80	417.30	488.60	547.60
Foreign exchange reserves	Mil. US$	8,531	7,393	5,688	11,124	14,000	11,612
GDP	Bil. bolivares	5,454	8,675	13,886	29,438	43,212	52,030
Real GDP	Bil. bolivares (1984)	558	545	567	566	601	601
Real per capita GDP*	1990 US$/person	575	548	555	541	562	547
Real GDP growth (local currency)	Percent	-2.0	-2.3	4.0	-0.2	6.2	0.0
Change in CPI	"	38.1	60.8	59.9	99.9	50.0	35.8
Current account balance	Mil. US$	-1,993	2,541	2,014	8,914	3,467	-2,562
Merchandise exports, f.o.b.	"	14,686	16,089	18,457	23,060	21,624	17,193
Merchandise imports, c.i.f.	"	12,511	9,187	12,650	9,880	14,606	15,967
Balance	"	2,175	6,902	5,807	13,180	7,018	1,226
Agricultural exports, f.o.b.	"	350	416	465	452	540	546
Agricultural imports, c.i.f.	"	1,312	1,163	1,648	1,473	1,528	1,765
Balance	"	-962	-747	-1,183	-1,021	-988	-1,219
Trade with U.S.:							
Total U.S. exports to	Mil. US$	4,590	4,039	4,640	4,749	6,602	6,516
Total U.S. imports from	"	8,140	8,371	9,721	13,173	13,477	9,181
U.S. agricultural exports to	"	493	403	481	483	572	514
U.S. agricultural imports from	"	73	76	48	108	68	72

NA = Not available.

* Calculated as real GDP or GNP in local currency at 1990 prices, converted to U.S. dollars at 1990 exchange rate, divided by population.

Sources: Agricultural exports and imports: Food and Agriculture Organization, FAOSTAT database.

Total U.S. exports (f.a.s.) and imports (customs): U.S. Department of Commerce, Bureau of the Census.

U.S. agricultural exports and imports: USDA, Foreign Agricultural Trade of the United States database.

All others: International Monetary Fund, International Financial Statistics, latest available.

Appendix table 3--U.S. agricultural exports (calendar years)

Country and commodity	1991	1992	1993	1994	1995	1996	1997	1998
				Million dollars				
ARGENTINA								
Animal & animal products	10.7	14.8	16.5	15.6	18.7	19.7	26.4	45.9
Beef & veal	0.1	0.6	0.8	0.4	0.8	1.2	1.0	0.8
Pork	0.2	0.1	0.1	0.1	0.0	0.1	0.5	0.4
Poultry meat	--	--	0.2	0.7	0.5	0.5	0.7	0.6
Dairy products	0.7	1.8	2.2	3.2	5.9	7.0	6.7	8.1
Grains & feeds	1.8	7.6	6.5	14.3	14.2	21.9	28.0	22.5
Fruits & preparations, ex. juice	0.2	1.0	1.4	1.4	1.7	2.6	1.1	1.2
Fruit juices incl. frozen	0.1	0.4	0.4	3.7	5.4	2.4	1.5	1.0
Nuts & preparations	5.8	6.4	3.4	7.6	3.7	4.4	6.1	4.4
Vegetables & preparations	2.2	11.5	12.0	16.2	15.4	12.3	14.6	17.7
Oilseeds & products	1.0	8.8	3.1	4.4	5.0	8.7	136.5	24.4
Total U.S. agricultural exports	56.0	56.0	92.5	118.6	131.0	163.2	344.3	204.0
AUSTRALIA								
Animal & animal products	17.5	23.8	25.4	30.6	27.5	28.1	34.8	37.2
Beef & veal	0.2	0.3	0.1	0.7	0.7	0.2	0.5	0.1
Pork	0.9	0.7	0.3	0.1	0.1	0.4	3.5	5.3
Poultry meat	0.1	--	0.2	0.0	--	--	0.1	0.1
Dairy products	6.4	10.7	11.2	5.4	4.7	6.2	4.2	4.8
Grains & feeds	11.9	13.0	16.4	47.5	43.1	25.7	44.8	37.3
Fruits & preparations, ex. juice	13.0	15.7	16.4	17.1	15.8	20.4	20.7	25.8
Fruit juices incl. frozen	1.0	1.1	0.8	1.2	7.2	2.5	2.9	6.8
Nuts & preparations	18.5	18.3	18.2	19.3	16.3	22.0	18.6	13.5
Vegetables & preparations	31.3	41.4	56.5	42.8	44.6	45.0	46.9	49.6
Oilseeds & products	59.6	35.2	54.4	78.2	66.5	86.3	86.6	67.3
Total U.S. agricultural exports	283.2	283.2	329.6	409.0	340.1	321.9	353.3	330.1
BRAZIL								
Animal & animal products	43.0	28.9	32.1	48.7	72.8	53.8	64.7	70.1
Beef & veal	0.2	--	0.1	0.4	0.8	6.5	10.9	11.5
Pork	0.4	0.1	0.2	1.7	1.9	1.3	2.1	1.8
Poultry meat	--	--	0.1	0.7	1.2	1.0	1.0	1.4
Dairy products	0.3	4.3	1.2	3.5	17.8	11.0	10.8	10.2
Grains & feeds	160.7	25.5	39.1	119.5	112.7	236.0	50.0	184.5
Fruits & preparations, ex. juice	2.6	2.7	4.2	17.2	24.6	25.9	19.3	14.1
Fruit juices incl. frozen	0.1	0.0	0.1	0.4	2.3	0.7	1.4	1.1
Nuts & preparations	3.0	2.6	3.6	9.4	11.9	13.0	10.7	8.9
Vegetables & preparations	18.8	13.7	14.3	28.8	53.5	42.7	59.3	54.9
Oilseeds & products	8.3	58.7	4.9	143.9	32.3	66.2	228.9	41.0
Total U.S. agricultural exports	256.6	150.3	199.0	493.5	522.1	588.0	578.7	488.5

See footnote at end of table.

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Appendix table 3--U.S. agricultural exports (calendar years)--continued

Country and commodity	1991	1992	1993	1994	1995	1996	1997	1998
				Million dollars				
CANADA								
Animal & animal products	892.6	905.4	961.7	1,047.1	1,053.0	1,088.6	1,198.1	1,229.0
Beef & veal	385.1	355.1	350.0	364.8	363.5	322.3	308.1	285.0
Pork	27.8	28.1	31.9	38.1	45.6	74.2	105.9	95.3
Poultry meat	128.6	147.4	164.4	162.6	169.0	169.1	201.6	230.8
Dairy products	48.0	58.1	64.9	69.2	83.9	110.5	120.2	140.2
Grains & feeds	641.4	811.8	882.7	960.3	1,031.5	1,129.5	1,195.4	1,270.0
Fruits & preparations, ex. juice	689.3	707.8	728.1	686.5	709.1	714.3	763.4	751.5
Fruit juices incl. frozen	148.0	158.7	162.0	171.2	203.6	220.2	221.6	241.0
Nuts & preparations	117.3	132.5	134.4	125.7	145.5	153.6	159.9	159.8
Vegetables & preparations	982.7	1,068.5	1,149.0	1,265.0	1,231.3	1,236.6	1,420.2	1,485.5
Oilseeds & products	301.2	285.5	369.0	328.5	357.1	458.8	574.5	465.3
Total U.S. agricultural exports	4,580.5	4,938.4	5,326.5	5,575.2	5,811.5	6,145.9	6,794.7	7,016.0
CHINA (MAINLAND)								
Animal & animal products	27.6	31.6	48.7	96.7	204.2	207.4	228.1	250.8
Beef & veal	--	0.1	0.2	1.3	1.0	1.1	3.2	4.2
Pork	0.9	0.3	0.1	0.1	0.4	0.9	3.8	6.6
Poultry meat	2.8	5.6	17.6	23.6	33.9	60.3	52.5	38.5
Dairy products	3.6	1.3	0.7	2.2	5.2	4.6	11.3	13.9
Grains & feeds	365.0	273.7	279.6	173.5	1,148.9	464.5	57.2	107.2
Fruits & preparations, ex. juice	0.4	0.1	0.7	0.8	2.6	1.0	1.4	12.1
Fruit juices incl. frozen	0.3	0.2	0.4	0.2	0.8	0.5	0.7	1.5
Nuts & preparations	--	5.0	7.3	4.1	0.4	2.3	2.5	2.4
Vegetables & preparations	0.4	1.5	1.3	2.9	4.2	12.5	18.9	21.5
Oilseeds & products	2.8	39.0	26.2	141.4	409.6	651.8	686.8	791.2
Total U.S. agricultural exports	724.9	547.0	378.6	1,084.2	2,634.5	2,092.4	1,612.7	1,358.7
TAIWAN								
Animal & animal products	229.9	204.4	239.6	329.4	380.1	341.6	376.3	319.2
Beef & veal	16.3	18.9	21.1	27.2	43.5	44.8	46.7	28.1
Pork	0.4	0.2	0.3	0.7	7.7	13.7	2.8	14.5
Poultry meat	1.1	0.8	0.8	1.4	2.8	8.0	7.8	7.8
Dairy products	61.1	38.0	64.5	70.8	50.3	51.9	71.8	59.0
Grains & feeds	776.9	758.3	802.5	800.6	1,027.1	1,288.0	952.1	618.7
Fruits & preparations, ex. juice	99.8	165.2	139.2	201.4	165.8	191.7	201.7	170.7
Fruit juices incl. frozen	7.0	11.1	11.4	9.3	12.7	12.3	9.5	9.9
Nuts & preparations	20.3	25.6	25.9	21.8	23.0	23.2	20.3	13.6
Vegetables & preparations	52.9	63.4	77.4	95.2	88.0	94.7	108.3	107.9
Oilseeds & products	493.5	475.7	573.3	462.7	627.1	806.4	679.1	324.6
Total U.S. agricultural exports	1,901.1	1,903.2	2,045.9	2,148.9	2,601.4	2,964.5	2,616.3	1,801.4

See footnote at end of table.

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Appendix table 3--U.S. agricultural exports (calendar years)--continued

Country and commodity	1991	1992	1993	1994	1995	1996	1997	1998
				Million dollars				
JAPAN								
Animal & animal products	2,067.8	2,483.4	2,530.1	2,634.1	3,497.1	3,423.3	3,004.5	2,757.8
Beef & veal	889.3	1,124.2	1,242.8	1,342.1	1,699.1	1,505.0	1,386.6	1,302.3
Pork	202.7	305.6	335.7	363.5	594.4	750.1	680.6	595.8
Poultry meat	169.3	152.2	142.0	172.8	171.2	171.5	133.7	139.0
Dairy products	46.3	71.2	64.6	71.8	99.0	107.9	115.0	110.7
Grains & feeds	2,577.5	2,754.3	2,896.6	2,997.4	3,414.0	4,187.9	3,597.5	2,900.5
Fruits & preparations, ex. juice	530.3	526.8	538.7	623.2	684.9	590.8	561.8	488.2
Fruit juices incl. frozen	89.1	121.7	91.5	121.0	156.4	150.1	128.9	114.3
Nuts & preparations	113.9	133.7	158.3	136.7	164.0	176.9	152.8	126.5
Vegetables & preparations	380.0	381.9	467.1	655.7	719.0	694.1	706.1	733.8
Oilseeds & products	962.5	1,008.1	1,141.2	997.2	1,185.3	1,342.5	1,349.4	1,044.5
Total U.S. agricultural exports	7,794.5	8,494.7	8,847.1	9,463.5	11,169.8	11,703.7	10,536.2	9,110.4
MEXICO								
Animal & animal products	1,125.8	1,258.8	1,177.7	1,364.3	825.6	1,091.4	1,540.5	1,677.2
Beef & veal	185.4	211.5	116.3	232.5	85.8	162.9	299.8	397.8
Pork	67.8	76.8	58.8	95.7	37.8	46.2	67.7	99.1
Poultry meat	116.5	169.5	205.0	228.8	164.3	208.1	227.0	231.1
Dairy products	123.1	165.2	252.2	183.8	124.6	109.5	172.6	182.8
Grains & feeds	739.9	1,061.3	887.4	1,227.9	1,062.3	2,068.8	1,164.7	1,639.4
Fruits & preparations, ex. juice	56.3	76.9	110.7	184.5	85.3	95.0	117.3	128.1
Fruit juices incl. frozen	5.6	6.8	7.9	12.4	6.0	7.2	7.6	15.0
Nuts & preparations	25.9	37.0	37.0	43.7	33.3	44.8	44.3	46.7
Vegetables & preparations	119.0	158.0	172.5	249.9	140.9	249.4	280.6	432.4
Oilseeds & products	524.2	715.5	654.8	850.2	831.6	1,098.3	1,190.7	1,154.9
Total U.S. agricultural exports	3,006.9	3,802.4	3,619.1	4,593.4	3,539.8	5,447.2	5,183.9	6,163.1
NEW ZEALAND								
Animal & animal products	5.1	8.6	9.9	5.8	7.8	14.8	21.9	16.1
Beef & veal	0.1	0.2	0.2	0.5	0.3	0.4	0.3	0.3
Pork	0.1	0.2	0.2	0.2	0.5	1.2	1.5	1.9
Poultry meat	0.2	0.1	0.4	0.2	0.4	0.3	0.4	0.5
Dairy products	1.0	4.0	4.2	0.7	0.4	0.7	1.6	0.8
Grains & feeds	8.3	7.1	10.0	6.7	19.3	6.7	10.3	13.7
Fruits & preparations, ex. juice	7.6	10.5	10.3	14.8	14.5	19.9	23.1	16.9
Fruit juices incl. frozen	0.1	0.1	0.5	1.2	2.9	2.7	1.7	3.6
Nuts & preparations	2.6	2.5	3.6	2.2	3.5	3.6	3.1	3.4
Vegetables & preparations	3.1	3.6	6.4	6.1	5.8	7.2	8.1	8.4
Oilseeds & products	9.6	11.4	13.2	14.7	27.5	20.5	21.7	22.6
Total U.S. agricultural exports	52.7	62.0	79.1	76.2	99.0	90.6	112.6	122.1

See footnote at end of table.

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Appendix table 3--U.S. agricultural exports (calendar years)--continued

Country and commodity	1991	1992	1993	1994	1995	1996	1997	1998
				Million dollars				
SOUTH KOREA								
Animal & animal products	866.8	877.9	791.7	972.6	1,224.6	1,042.7	1,036.8	547.4
Beef & veal	177.1	212.1	151.3	227.3	320.8	244.1	292.4	142.3
Pork	4.2	3.2	1.8	6.2	27.4	23.6	25.9	18.5
Poultry meat	8.2	20.8	20.0	26.0	30.8	28.1	27.7	13.3
Dairy products	6.6	6.5	8.4	10.7	24.0	38.2	35.3	21.7
Grains & feeds	412.8	465.9	308.9	510.5	1,422.0	1,688.1	751.2	767.1
Fruits & preparations, ex. juice	17.2	18.4	19.8	26.8	40.7	39.4	46.9	35.1
Fruit juices incl. frozen	16.3	17.8	26.8	31.8	36.5	33.9	36.0	20.4
Nuts & preparations	19.0	23.1	28.9	23.2	23.0	24.6	26.3	13.5
Vegetables & preparations	46.5	59.6	68.0	81.3	103.5	142.4	131.4	69.6
Oilseeds & products	274.4	312.7	292.9	270.9	413.4	489.8	445.6	455.2
Total U.S. agricultural exports	2,110.1	2,228.2	1,939.7	2,339.4	3,758.9	3,871.4	2,862.8	2,267.8
SOUTHEAST ASIA								
Animal & animal products	120.9	144.1	153.8	183.2	235.9	264.0	302.1	172.7
Beef & veal	14.3	14.8	16.5	14.8	16.0	12.5	16.9	9.3
Pork	1.2	2.0	1.5	2.8	5.1	10.6	11.3	8.7
Poultry meat	31.1	31.5	32.4	47.1	43.7	42.8	36.9	18.5
Dairy products	36.9	43.7	38.2	33.0	30.4	42.0	97.6	58.1
Grains & feeds	265.9	356.7	427.3	505.5	1,009.2	991.3	653.4	523.5
Fruits & preparations, ex. juice	89.9	112.8	124.3	156.7	188.3	200.2	211.6	108.9
Fruit juices incl. frozen	8.7	7.6	7.6	8.5	9.6	11.7	12.4	8.5
Nuts & preparations	13.6	19.0	23.9	26.4	26.1	24.4	22.0	11.4
Vegetables & preparations	83.0	90.4	96.0	125.2	155.0	174.6	185.1	125.2
Oilseeds & products	116.5	249.2	285.5	270.9	487.0	829.8	852.0	642.9
Total U.S. agricultural exports	1,310.7	1,554.1	1,562.2	1,967.6	3,036.5	3,270.1	2,988.0	2,119.2

-- = less than $1 million.

Source: USDA, Foreign Agricultural Trade of the United States database.

Appendix table 4--U.S. agricultural imports (calendar years)

Country and commodity	1991	1992	1993	1994	1995	1996	1997	1998
				Million dollars				
ARGENTINA								
Animal & animal products	254.8	160.3	148.3	136.4	183.2	151.3	164.7	161.5
Beef & veal	228.2	146.7	131.9	117.6	155.1	129.2	122.5	118.4
Dairy products	12.4	6.9	7.9	11.7	20.4	9.8	23.2	24.1
Grains & feeds	9.7	4.1	2.6	1.2	0.6	3.6	9.3	1.1
Fruits & preparations, ex. juice	10.6	20.1	15.4	14.8	12.6	19.8	28.3	29.8
Fruit juices incl. frozen	101.8	150.0	64.2	61.0	121.2	169.4	164.2	86.2
Nuts & preparations	4.4	3.5	3.3	2.6	1.8	5.1	5.5	12.6
Vegetables & preparations	20.2	19.5	13.0	13.7	11.5	11.5	12.9	18.5
Sugar & related products	48.8	32.1	31.9	52.2	67.4	96.9	115.3	92.8
Oilseeds & products	23.0	11.5	4.5	11.0	27.8	34.5	47.8	69.8
Noncompetitive ag. imports	33.4	38.7	38.6	42.6	42.4	43.0	54.0	69.9
Total U.S. agricultural imports	545.9	545.9	394.5	383.0	494.1	703.9	716.7	640.2
AUSTRALIA								
Animal & animal products	999.4	929.3	885.5	795.5	636.5	516.3	615.2	751.5
Beef & veal	809.8	738.2	685.9	604.4	385.7	282.3	354.2	467.6
Pork	2.0	2.7	1.5	0.2	0.1	--	0.1	0.2
Dairy products	19.3	20.4	25.6	26.3	29.5	32.3	39.0	51.9
Grains & feeds	22.3	27.2	28.1	36.5	32.8	45.2	37.3	45.6
Fruits & preparations, ex. juice	6.1	7.2	10.1	15.9	10.5	22.9	36.0	41.1
Fruit juices incl. frozen	4.4	0.7	1.0	0.5	0.3	0.6	1.5	0.5
Nuts & preparations	11.4	10.2	15.9	10.0	13.5	11.9	14.7	19.1
Vegetables & preparations	6.7	7.1	6.4	6.4	3.2	4.2	3.4	4.7
Sugar & related products	66.6	61.6	60.9	44.9	67.7	127.4	89.7	75.6
Oilseeds & products	2.1	4.6	3.7	6.9	3.5	4.9	12.7	17.8
Noncompetitive ag. imports	8.9	12.2	13.8	12.5	13.7	9.3	12.4	16.4
Total U.S. agricultural imports	1,180.0	1,180.0	1,075.1	987.8	850.7	856.2	958.5	1,137.4
BRAZIL								
Animal & animal products	25.1	73.9	97.0	106.7	74.9	95.1	125.5	173.7
Beef & veal	6.3	51.1	74.7	88.2	54.4	60.3	66.8	102.3
Dairy products	--	--	0.8	1.0	1.4	2.1	3.2	4.0
Grains & feeds	0.9	1.3	2.2	1.7	1.6	2.4	2.9	3.4
Fruits & preparations, ex. juice	5.7	5.0	11.2	10.4	9.8	10.1	8.6	8.8
Fruit juices incl. frozen	250.2	250.8	222.5	232.6	92.5	205.2	126.2	144.2
Nuts & preparations	97.5	131.0	105.8	92.4	120.8	134.5	135.4	113.0
Vegetables & preparations	7.6	9.2	7.2	8.6	5.5	6.2	9.7	9.5
Sugar & related products	81.1	67.5	88.1	62.3	112.1	153.2	134.2	138.1
Oilseeds & products	27.9	21.7	25.6	18.3	33.5	25.1	90.0	21.8
Noncompetitive ag. imports	650.1	519.0	458.5	637.9	615.6	463.9	594.3	526.0
Total U.S. agricultural imports	1,293.0	1,324.1	1,404.1	1,327.4	1,153.8	1,347.8	1,472.5	1,224.5

See footnote at end of table.

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Appendix table 4--U.S. agricultural imports (calendar years)--continued

Country and commodity	1991	1992	1993	1994	1995	1996	1997	1998
				Million dollars				
CANADA								
Animal & animal products	1,493.4	1,852.3	2,009.3	1,941.3	2,139.8	2,627.7	2,824.1	2,862.2
Beef & veal	191.7	290.1	367.4	377.3	359.1	462.4	611.9	736.4
Pork	380.4	348.2	376.9	385.2	430.6	486.7	483.1	415.9
Poultry meat	13.7	9.0	9.4	7.8	11.0	14.4	18.9	23.9
Dairy products	18.4	21.8	45.2	48.0	68.2	82.2	100.0	139.6
Grains & feeds	562.9	775.4	947.8	1,287.0	1,297.8	1,540.8	1,704.0	1,550.7
Fruits & preparations, ex. juice	66.8	70.3	66.2	79.9	94.7	108.2	109.4	131.9
Fruit juices incl. frozen	7.6	10.7	11.1	8.5	13.7	14.3	24.9	16.4
Nuts & preparations	9.1	13.3	21.2	24.1	21.8	25.6	26.9	26.7
Vegetables & preparations	257.8	263.2	321.5	366.1	439.4	567.7	716.3	935.5
Sugar & related products	153.1	212.8	214.5	240.5	212.8	233.5	260.3	292.7
Oilseeds & products	268.5	317.8	411.4	635.9	608.8	781.9	771.4	823.1
Noncompetitive ag. imports	190.4	244.2	279.5	288.5	372.8	396.8	471.7	567.0
Total U.S. agricultural imports	3,328.4	4,141.8	4,667.6	5,303.0	5,633.9	6,798.2	7,456.3	7,797.3
CHINA (MAINLAND)								
Animal & animal products	63.9	70.7	61.4	75.5	94.7	96.7	117.2	144.4
Dairy products	0.2	0.2	1.4	3.3	1.9	1.9	2.8	3.3
Grains & feeds	8.1	10.3	13.1	20.7	24.7	27.1	33.5	31.2
Fruits & preparations, ex. juice	14.2	29.0	21.2	20.2	18.2	43.2	46.0	48.3
Fruit juices incl. frozen	0.9	0.9	1.3	1.2	3.0	8.2	26.1	30.1
Nuts & preparations	7.2	12.7	21.7	16.3	12.8	20.5	20.6	24.9
Vegetables & preparations	85.9	78.5	102.8	106.8	136.0	141.0	141.8	137.5
Sugar & related products	19.0	27.0	30.0	26.4	18.6	35.7	30.6	30.1
Oilseeds & products	3.0	3.4	4.3	3.7	2.7	8.0	7.8	10.1
Noncompetitive ag. imports	88.8	104.1	123.2	126.4	128.0	153.3	182.5	203.7
Total U.S. agricultural imports	329.8	382.8	453.9	444.1	492.9	597.7	681.9	741.4
TAIWAN								
Animal & animal products	12.0	11.3	13.5	21.2	41.2	42.2	47.3	35.3
Dairy products	0.9	0.7	2.0	2.5	2.7	2.9	2.6	3.1
Grains & feeds	24.9	21.5	21.1	20.1	19.8	21.9	22.7	22.4
Fruits & preparations, ex. juice	5.2	4.0	4.6	5.0	5.5	7.0	7.3	6.9
Fruit juices incl. frozen	0.7	0.4	0.3	0.1	0.1	0.1	0.1	0.3
Nuts & preparations	0.2	0.2	0.4	0.2	0.4	0.3	0.1	0.2
Vegetables & preparations	74.1	47.3	40.1	38.9	39.6	44.3	47.5	43.8
Sugar & related products	8.5	18.1	11.1	12.1	12.5	16.4	21.2	30.3
Oilseeds & products	1.4	2.8	2.5	3.1	4.1	3.9	4.1	4.9
Noncompetitive ag. imports	32.6	6.4	5.6	6.3	6.1	9.3	6.4	8.5
Total U.S. agricultural imports	176.2	127.9	111.9	117.7	141.8	160.5	173.4	173.3

See footnote at end of table.

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Appendix table 4--U.S. agricultural imports (calendar years)--continued

Country and commodity	1991	1992	1993	1994	1995	1996	1997	1998
				Million dollars				
JAPAN								
Animal & animal products	18.2	21.2	21.4	28.4	34.3	28.9	37.3	28.5
Beef & veal	0.7	0.5	0.3	0.4	0.4	0.5	0.7	0.9
Dairy products	2.1	2.4	2.4	4.0	3.6	3.4	3.3	3.2
Grains & feeds	38.8	39.2	39.9	52.4	51.0	39.3	47.3	49.6
Fruits & preparations, ex. juice	23.5	14.9	14.8	14.5	15.0	11.7	9.9	11.4
Fruit juices incl. frozen	9.7	5.8	3.0	1.4	2.0	1.8	0.4	0.4
Nuts & preparations	0.7	0.4	0.2	0.3	0.4	0.3	0.4	0.3
Vegetables & preparations	65.8	65.4	69.2	74.6	77.2	69.6	68.4	67.4
Sugar & related products	8.4	7.1	5.9	6.3	6.5	6.5	7.1	7.3
Oilseeds & products	18.5	15.2	14.6	17.3	19.6	19.5	20.3	19.8
Noncompetitive ag. imports	33.9	38.2	40.1	42.9	50.3	56.0	59.2	63.5
Total U.S. agricultural imports	267.5	259.3	265.3	291.2	308.9	288.8	303.2	301.4
MEXICO								
Animal & animal products	392.1	375.1	460.5	388.0	602.0	174.3	231.5	273.0
Beef & veal	1.9	1.4	2.7	3.9	6.8	12.6	11.1	13.0
Dairy products	3.1	4.0	2.7	7.2	16.5	16.0	13.7	17.6
Grains & feeds	40.2	52.7	60.4	85.1	105.4	128.1	158.5	155.9
Fruits & preparations, ex. juice	331.3	320.6	313.7	357.7	475.4	508.1	529.7	676.3
Fruit juices incl. frozen	62.7	26.2	30.6	58.0	80.2	73.8	65.5	90.6
Nuts & preparations	51.3	63.5	50.8	55.2	65.6	44.6	48.7	86.3
Vegetables & preparations	902.3	809.2	1,057.7	1,124.8	1,306.3	1,498.7	1,484.6	1,791.7
Sugar & related products	36.8	31.2	38.4	69.0	91.4	121.0	129.1	157.8
Oilseeds & products	42.9	41.8	29.0	27.5	32.4	37.1	32.6	51.7
Noncompetitive ag. imports	424.8	399.5	394.7	433.4	707.0	683.9	804.4	645.2
Total U.S. agricultural imports	2,531.8	2,379.0	2,720.2	2,895.4	3,836.2	3,765.3	4,112.2	4,691.0
NEW ZEALAND								
Animal & animal products	761.0	712.1	674.3	681.6	637.1	630.0	721.1	840.0
Beef & veal	530.3	506.1	459.6	414.7	359.8	272.2	329.9	329.2
Dairy products	169.3	140.8	143.3	187.1	175.4	235.5	255.8	360.5
Grains & feeds	4.5	4.2	4.7	5.4	6.8	9.3	13.5	10.5
Fruits & preparations, ex. juice	58.8	51.3	42.1	42.6	63.2	67.3	44.3	50.7
Fruit juices incl. frozen	4.6	4.1	3.4	2.1	2.0	5.3	10.4	2.6
Nuts & preparations	0.1	--	0.0	0.1	--	--	0.0	--
Vegetables & preparations	2.2	1.9	2.1	4.8	2.9	3.2	3.8	4.0
Sugar & related products	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.2
Oilseeds & products	0.1	--	--	--	--	--	0.3	0.2
Noncompetitive ag. imports	18.2	22.1	20.5	26.2	29.2	26.7	29.7	25.5
Total U.S. agricultural imports	862.9	809.3	763.1	775.7	755.8	759.3	849.3	957.8

See footnote at end of table.

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Appendix table 4--U.S. agricultural imports (calendar years)--continued

Country and commodity	1991	1992	1993	1994	1995	1996	1997	1998
				Million dollars				
SOUTH KOREA								
Animal & animal products	0.9	1.9	2.5	3.3	3.6	7.7	9.7	11.2
Dairy products	0.5	0.6	0.9	1.0	1.4	1.7	2.0	4.7
Grains & feeds	19.4	20.3	22.3	24.6	24.4	29.4	30.6	29.5
Fruits & preparations, ex. juice	4.7	5.0	5.9	5.5	5.8	6.7	7.7	7.3
Fruit juices incl. frozen	0.4	0.1	0.2	0.2	0.4	0.2	0.4	0.5
Nuts & preparations	0.9	0.7	0.7	1.2	1.3	1.1	1.6	3.4
Vegetables & preparations	15.0	15.6	16.5	18.2	16.3	17.6	18.5	15.2
Sugar & related products	1.6	3.0	4.3	4.1	4.0	2.8	2.8	4.1
Oilseeds & products	0.1	0.1	0.4	0.3	0.3	0.7	0.5	0.6
Noncompetitive ag. imports	8.8	8.4	7.6	6.3	8.2	7.4	8.2	8.0
Total U.S. agricultural imports	56.8	60.5	67.4	71.3	73.5	88.7	90.8	89.8
SOUTHEAST ASIA								
Animal & animal products	15.5	31.6	31.1	34.1	36.8	55.6	49.0	48.5
Dairy products	2.2	2.2	1.9	1.6	3.2	4.1	4.5	4.4
Grains & feeds	123.6	137.6	137.1	156.2	147.6	183.5	226.2	205.6
Fruits & preparations, ex. juice	208.7	267.1	259.6	226.7	212.4	271.1	284.8	256.0
Fruit juices incl. frozen	69.7	74.0	67.9	56.0	68.2	81.9	79.9	67.6
Nuts & preparations	39.5	48.8	44.7	49.7	42.4	59.4	74.0	85.6
Vegetables & preparations	130.2	133.4	117.9	127.8	140.5	123.6	113.3	102.3
Sugar & related products	105.4	95.8	72.5	55.4	82.0	116.3	119.1	100.0
Oilseeds & products	231.6	417.8	315.0	437.1	551.2	574.2	649.8	638.0
Noncompetitive ag. imports	1,003.0	1,155.1	1,164.8	1,420.7	2,250.9	2,106.6	2,020.7	1,847.8
Total U.S. agricultural imports	1,979.2	2,437.7	2,343.9	2,648.5	3,595.2	3,689.1	3,739.2	3,446.1

-- = less than $1 million.

Source: USDA, Foreign Agricultural Trade of the United States database.