

GAO

United States General Accounting Office 131505

Briefing Report to Congressional Requesters

October 1986

# U.S. AGRICULTURAL EXPORTS

## Factors Affecting Competitiveness in World Markets



131505

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United States  
General Accounting Office  
Washington, D.C. 20548

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Resources, Community, and  
Economic Development Division

B-224873

October 9, 1986

The Honorable Tom Harkin  
United States Senate

The Honorable Gary Hart  
United States Senate

On July 3, 1986, you asked us to address the issue of declining U.S. agricultural exports and the waning competitiveness of U.S. agricultural products in foreign markets. Specifically, you requested a brief description of the principal factors affecting U.S. agricultural competitiveness and their role in the decline of U.S. agricultural exports. In meetings with your offices, we were requested to expedite our work and provide you with the results by the end of September 1986. On September 30, 1986 we met with your offices to brief you on the results of our review. This briefing report summarizes those results.

The Farm Security Act of 1985, among other things, reduced commodity price supports and subsidized agricultural commodity exports. One of the important objectives of these changes was to increase sales of U.S. agricultural commodities in the world marketplace. Although it may be too early to tell, changes brought about by the act and recent declines in the value of the dollar have yet to produce a noticeable change in U.S. agricultural trade.

No simple explanations can account for the current decline of U.S. agricultural exports. On the contrary, many factors have an impact on how well the United States competes in the world agricultural market. This briefing report addresses the principal factors that affect U.S. agricultural competitiveness.

We have divided the report into five sections. The first section provides background on the competitiveness of U.S. agricultural commodities in the international marketplace. The second section describes those factors that are of a public policy origin, such as price supports, embargoes, and countertrade agreements. The third section details the principal economic factors that influence U.S. competitiveness, including costs of production, interest rates, economic recession, and exchange rates. In regard to the sections on public policy factors and economic factors, we are providing information where available on the significance and outlook for each of these factors. The

fourth section identifies and describes factors involving natural resource constraints that affect U.S. competitiveness, including climate, weather, and geography.

We did not quantify the role of the above factors relative to the decline in U.S. competitiveness in agricultural trade. Industry experts have many explanations for the loss of U.S. farm markets and a consensus opinion does not yet exist. One reason is that some data, such as cost of production data, do not exist for most countries. Moreover, many countries have different accounting standards, policies, and practices, making trade comparisons among the different countries difficult.

The last section describes our objectives, scope, and methodology in preparing this report. Our study was conducted in August and September 1986. We gathered and analyzed information from public and private sources. We also interviewed experts from the private and public sectors of the agriculture industry. For this briefing report, we refer to competitiveness as the ability to sell U.S. products at a level sufficient to at least maintain the U.S. share of the world market. This definition includes public policy factors as well as economic factors that affect competitiveness.

Some of these factors have been addressed in detail in past GAO reports and others are being addressed in ongoing work. A list of those reports issued in the past year and our ongoing work is included in appendix I.

Portions of the briefing report have been discussed with officials of the U.S. Department of Agriculture. Their suggestions were incorporated where appropriate. However, because of the informational nature of this briefing report, we did not obtain official agency comments.

As arranged with your office, unless you publicly announce its contents earlier, we do not plan to distribute this report further until 30 days from its issue date. At that time, we will send copies of this briefing report to the Secretary of Agriculture, the Secretary of Commerce, the Secretary of State, and other interested parties. If we can be of further assistance, please contact me at (202) 275-5138.



Brian P. Crowley  
Senior Associate Director

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ABBREVIATIONS

CCC	Commodity Credit Corporation
EEC	European Economic Community
EEP	Export Enhancement Program
GATT	General Agreement on Tariffs and Trade
IMF	International Monetary Fund
LDC	Lesser Developed Country
MMT	Million metric tons
MT	Metric tons
USDA	U.S. Department of Agriculture

## SECTION 1

### SUMMARY

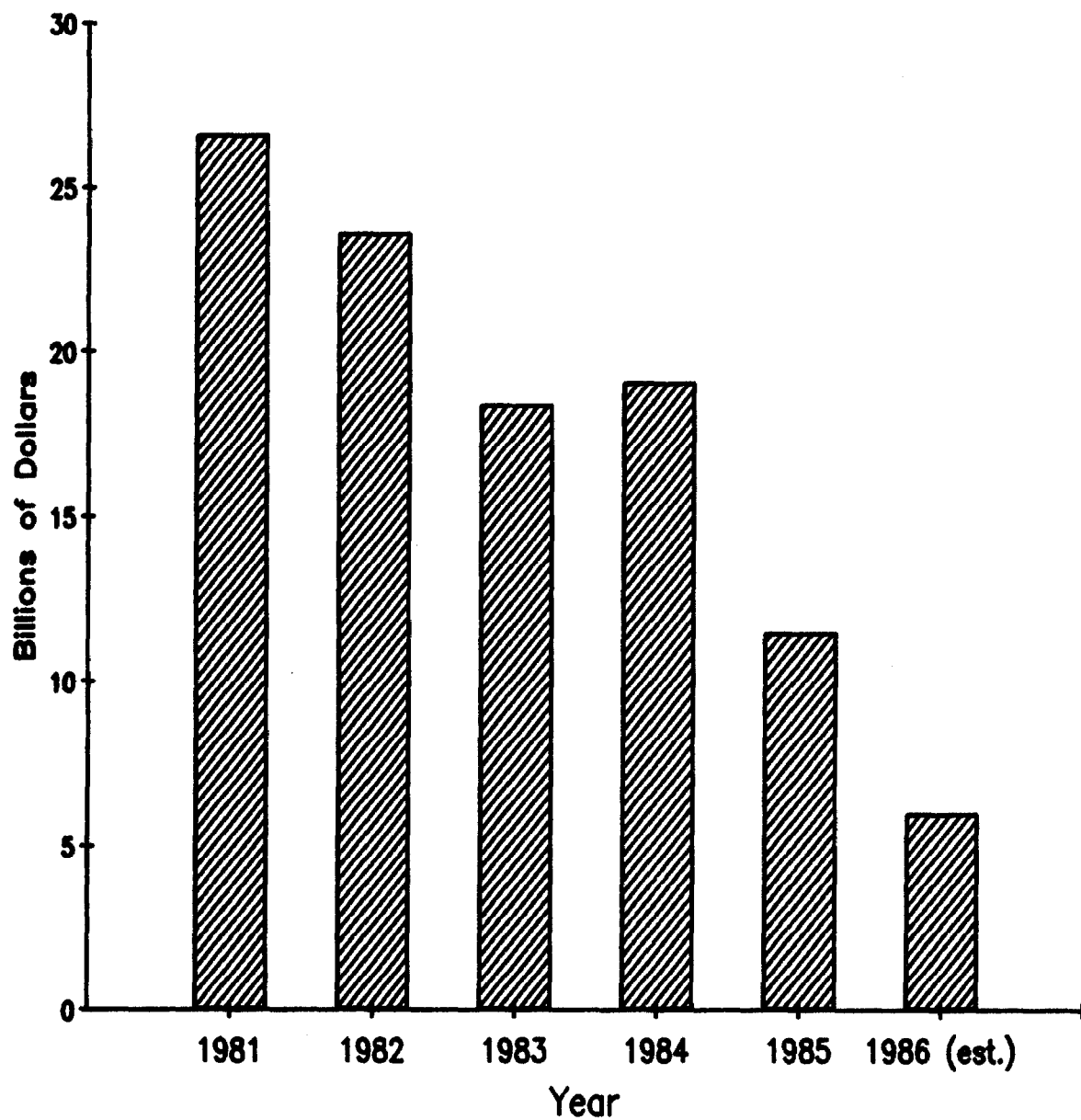
#### BACKGROUND

In the 1970's U.S. farm prosperity seemed assured. According to the U.S. Department of Agriculture (USDA), in the early 1980's agriculture was the nation's largest industry, accounting for one-fifth of the gross national product and generating 23 million jobs. By 1981 agriculture contributed \$27 billion to the U.S. balance of payments and was the largest positive contributor to our merchandise trade balance. The mid-1980's, however, have thus far seen a reversal of the prosperous trends of the 1970's. USDA estimates that in 1986 U.S. farmers will export \$26.5 billion worth of agricultural commodities, weighing 108 million metric tons (mmt). This represents a \$17.3 billion decline since 1981, when U.S. agricultural exports totaled \$43.8 billion, and weighing 162.3 mmt. During the same period, U.S. imports of agricultural commodities have risen from \$17.2 billion to an estimated \$20.5 billion. Between the decline in exports and the increase in imports, the 1986 annual U.S. agricultural trade balance has dropped to an estimated \$6 billion (see fig. 1.1), its lowest since 1972. Moreover, the most recent 3 months for which data exist (May, June, and July) have seen negative agricultural trade deficits for 3 months in succession for the first time in over 25 years.<sup>1</sup>

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<sup>1</sup>Data reported by the U.S. Department of Commerce. These are the official trade statistics for the United States. USDA also reports trade statistics that are generally about 10 percent lower for agricultural trade due to the omission of shipping charges. For this reason June reflects a positive agricultural trade balance by USDA and a negative agricultural trade balance by Commerce.

Figure 1.1  
Declining U.S. Agricultural Trade Balance  
(\$Billions)



Source: Economic Research Service, USDA



This briefing report discusses the decline of U.S. competitiveness as a major force contributing to reduced U.S. exports of agricultural products. However, another major factor --the shrinking world market--has also contributed considerably to the reduced level of U.S. exports. Between 1981 and 1985, when U.S. agricultural exports declined from \$44 billion to \$31 billion (see table 1.1), total world agricultural exports declined from \$233 billion to \$207 billion. The U.S. share of the world market declined during this period from 19 percent to 15 percent. Even this statistic tends to conceal significant changes in regional markets and in individual commodities. For example, in 1985, the International Trade Commission reported that the U.S. share of world trade in wheat fell from 48 percent in 1982 to 38 percent in 1984. Therefore, while the shrinking world market is a major contributor to reduced U.S. agricultural exports, marked declines in the exports of some farm commodities may be more directly linked to declining U.S. agricultural competitiveness.

Table 1.1

Agricultural Export Values

<u>Year</u>	<u>Exports</u>		<u>U.S. percentage of world exports</u>
	<u>World<sup>a</sup></u>	<u>U.S.<sup>b</sup></u>	
	-----(\$Billions)-----		
1981	232.9	43.8	19
1982	212.5	39.1	18
1983	208.7	34.8	17
1984	218.5	38.0	17
1985	206.6	31.2	15
1986	c	26.5 (est)	-

<sup>a</sup>Food and Agriculture Organization of the United Nations data.

<sup>b</sup>USDA data.

<sup>c</sup>Data not yet available.

Over time U.S. agriculture today has become more closely tied to other sectors of the economy both here and abroad. This interdependence means that the world market has become increasingly important to the U.S. farm sector as farmers rely on exports for a large percentage of gross sales. In 1983 alone, U.S. wheat, soybean, corn, and cotton producers exported 40 percent or more of their production.<sup>2</sup>

The world marketplace consists of competing sellers and buyers, operating within a changing economic environment. This

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<sup>2</sup>For a more detailed treatment of current farm conditions in general see Agriculture Overview: U.S. Food/Agriculture in a Volatile World Economy (GAO/RCED-86-3BR; 11/6/85).

environment is often controlled by factors well beyond the control of individual U.S. farms, current U.S. agricultural policy, or general U.S. trading policies. In order for U.S. farmers to compete successfully and in order to better frame U.S. farm policy, it is important to understand what these factors are and how they operate within the agricultural sector and other sectors of the economy.

Industry experts have many explanations for the loss of U.S. farm markets. However, a consensus as to the actual cause or causes of this loss and their relative importance does not yet exist. Contributing to the difficulty of these analytical efforts is the fact that some data, such as cost of production data, do not exist for many countries. Moreover, many countries have different accounting standards, policies, and practices, making trade comparisons among countries difficult. Consequently, in this briefing report, we describe some of the major factors influencing the competitiveness of U.S. farm products in today's international marketplace and illustrate how each of these factors operates, without quantifying or weighting each factor.

#### DEFINING COMPETITIVENESS

The term "competitiveness" has been used in a variety of ways in policy debates and technical analyses. Experts in the field have referred to the competitiveness of the U.S. agricultural commodities on the international market, to the competitiveness of U.S. farm production as compared with foreign production, and to the competitiveness of the United States as a nation with other nations as exporters of agricultural products in world trade.

As the term is used in this report, the competitiveness of U.S. farm exports refers to the ability of the United States to successfully market farm products worldwide. The term therefore refers to the combined ability of the U.S. agricultural export system--comprised of U.S. commodity producers; international trading companies; the transportation, storage, and marketing infrastructure; and the U.S. government (in setting policies, regulations, standards, etc.)--to sell U.S.-produced commodities in the international marketplace. More specifically, it refers to the ability to sell U.S. products at a level sufficient to at least maintain the U.S. share of the world market.

In accordance with this definition, we examined the three major categories of factors affecting U.S. producer competitiveness contained in the summary below. These categories are (1) public policy factors, (2) economic factors, and (3) natural resources.

## PUBLIC POLICY FACTORS

Public policies are an important determinant of U.S. agricultural export competitiveness. The policies may enhance or reduce participation in the international marketplace. In either case, they affect the ability of the United States to maintain its relative share of agricultural trade.

### Trade agreements and countertrade practices

Trade agreements and countertrade agreements are public policies which influence the performance of buyers and sellers. They seek to protect each party from some types of competition and thereby strengthen market competitiveness within the trade agreement. Countertrade is a negotiated trade procedure that allows the trading partners to deliver payment in some form other than hard currency and usually requires subsequent trade. These agreements can be viewed as restricting trade and hence inhibiting worldwide competition or as facilitating trade that would otherwise not take place.

### Price supports and other subsidies

Subsidies influence market behavior for the commodities they cover and competing commodities. When subsidies increase the market price of U.S. commodities abroad, they reduce the competitiveness of the products in world trade. Conversely, when subsidies reduce the market price of U.S. commodities overseas, our competitiveness is improved.

### Government organizational structures

Governments may limit the type of organizations that can participate in their countries' markets. Most important countries in the world grain trade have state trading agencies. Their objectives include protecting domestic agriculture and/or generating additional revenues for the state. These objectives generally reduce price competition in world trade. Chase Econometrics estimates that 95 percent of international grain transactions are at least partially handled by government trading agencies.

### Nontariff barriers

Nations may use nontariff barriers (quotas, standards, testing, labeling, etc.) to influence agricultural trade. Generally speaking, nontariff barriers, although aggravating, do not represent a major cause for the decline of U.S. agricultural exports. They can, however, reduce U.S. sales in certain markets.

## Levies

Some nations use levies, such as the European Economic Community's (EEC's) duty on certain grain imports, as a public policy tool to remove another country's cost advantage in relation to their domestic producers. Such levies can exclude U.S. producers from certain markets and affect their competitive position.

## Credit policies

Although U.S. producers would like to sell their product for hard currency, not all buyers have the necessary capital. Thus, credit policies of sellers can have a significant impact on who purchases, what they purchase, and how much they purchase. The U.S. government, for example, has provided some credit at below-market interest rates to foreign purchasers of U.S. agricultural products. Such credit policies generally facilitate additional sales and enhance U.S. competitiveness. Other countries also provide credit assistance, which competes with U.S. credit programs.

## Sales suspensions, moratoriums, and embargoes

Another government policy that directly affects agricultural sales involves sales suspensions, moratoriums, and embargoes. These public policy tools can affect U.S. competitiveness because they tend to reduce the potential market for U.S.-produced commodities, reduce the price farmers could have secured, and cause foreign purchasers to look elsewhere for supply arrangements.

## ECONOMIC FACTORS

Economic factors, on both the production and consumption (supply and demand) sides of the international market, may also influence the competitiveness of U.S. agricultural products. The decline in market share that several U.S. agricultural exports have experienced since 1981 may be attributed in part to a combination of changes in both supply- and demand-side factors. While it is well recognized that policy factors heavily influence the prices and quantities of agricultural exports, the economic factors mentioned below form the underlying relationships, which are then affected or altered by policy measures.

We classified production- or supply-side factors influencing the competitiveness of U.S. agricultural exports as follows:

- costs of production,
- productivity and technological change,
- product quality and differentiation, and
- infrastructure costs.

Major demand-side factors influencing U.S. competitiveness are

- world economic recession/expansion,
- exchange rate fluctuations, and
- population changes.

These factors are addressed to the extent that they affect U.S. competitiveness.

### Costs of Production

An important economic factor influencing the competitive position of U.S. export products is the cost of production. The major production costs are interest, capital replacement, fertilizer, and fuel expenses. If U.S. costs are low relative to those of foreign competitors, then the United States enjoys a cost advantage in the world market. Historically, U.S. farm production costs (in dollars per metric ton) have been considered low in comparison with foreign competitors. Some experts now believe that the United States is losing that advantage; however, others believe this is not the case. Inter-country comparisons cannot be made with certainty because of the lack of comparable data.

### Productivity and technological change

Productivity gains due to technological change are important causes of changes over time in production costs. Productivity increases in other developed exporter countries tend to increase export supply, reducing world market prices. If productivity gains in developing countries are greater than their respective growth in demand, exports to those countries would be reduced, which would intensify the global competition for agricultural export markets. Over the past decade, developing countries have achieved higher rates of productivity growth in some commodities than have occurred in the United States but they have also had very high rates of growth in demand.

### Distribution costs

In addition to costs of production are distribution, or infrastructure costs, which include those associated with the transportation, storage, and marketing of U.S. agricultural products. The U.S. infrastructure, which supports farm production, is considered by many industry analysts to be unsurpassed in the world and, consequently, contributes to an economic cost advantage for U.S. agriculture. Traditional marketing practices, however, are often insufficient in today's buyer's market, where export sales are not made on the basis of sales price alone. Many buyers want technical services, special financing, or other arrangements to accompany their purchases.

## Product quality and differentiation

To sell their products in today's world export market, some exporters are using forms of product differentiation to make their products more attractive. These include improvements in product quality or special services and agreements to accompany a sale, such as reciprocal trade, new technology, development aid, or countertrade agreements. Some importers have stated that U.S. grain is of a lower quality than that of several other major exporting countries. This, together with other forms of product differentiation on the part of the competing exporters, may have been a contributing factor to the decline of U.S. market shares in several products during the 1980's.

## World economic recession/expansion

Fluctuations in the growth rate of the world economy can have an important effect on the demand for U.S. commodities. Many observers believe that U.S. agriculture is the residual supplier in the world market for many commodities. As world markets have shrunk, the United States has lost more than its proportionate share of sales. As foreign sellers compete for more sales in the smaller world market, the competitive position of the United States may suffer. In contrast, as sellers compete in an expanding market, the United States gains export sales and enhances its competitiveness.

## Exchange rate fluctuations

Exchange rate fluctuations can also affect U.S. agriculture sales. Most experts we interviewed stated that the unprecedented rise in the exchange value of the dollar during the early 1980's had the effect of raising the price of U.S. agricultural commodities abroad. Because foreign exchange rate changes have such a significant impact on the effective price paid by importers, these changes may overwhelm most actions taken by U.S. producers to stay competitive.

## Population

U.S. farm competitiveness is affected by population change. World population increases create expanded world markets. The U.S. is more competitive in an expanding marketplace because of its flexibility in production and distribution of commodities and its large stores of supplies.

## NATURAL RESOURCE FACTORS

A third major category of factors involves natural resources, including climate/weather, and geography (arable land and water supply). Taken together, these resources play a significant role in a country's ability to compete in world agricultural markets.

### Climate/weather

Favorable climatic conditions in the United States allow for crop variety and abundant yields. Nevertheless, the uncontrollable nature of weather in the United States and elsewhere can have either an adverse or a positive effect on crop yields and the supply/demand balance in the international marketplace.

### Geography (arable land and water supply)

While the United States may be favorably endowed in terms of land and water supplies, proper maintenance of these resources is essential to farm productivity. Adequate care of soil and water supplies is necessary in order to keep U.S. farm producers competitive in the future.

## SECTION 2

### PUBLIC POLICY FACTORS

Public policies can significantly affect participation in the world marketplace. For example, a government can enhance participation through export subsidies. It can reduce participation abroad by establishing artificially high prices domestically. It can preclude participation through embargoes. It can encourage production through target prices or preclude outside participation in domestic markets through trade barriers. U.S. competitiveness is affected by these policies, whether established by the U.S. government or foreign governments. In many instances, the public policies noted here deal with problems or concerns much greater than agriculture trade. Nevertheless, to the extent they have significant impact on U.S. competitiveness in world agricultural trade, they are dealt with here.

Public policies include

- o Trade agreements and countertrade practices
- o Subsidies and price support programs
- o Government organizational structures
- o Nontariff barriers
- o Levies
- o Credit policies
- o Sales suspensions, moratoriums, and embargoes



## TRADE AGREEMENTS AND COUNTERTRADE

### Trade Agreements

Trade agreements by two or more governments, which bind the represented parties to the terms and conditions of the agreement, are generally designed to facilitate trade among the participants, although some may actually restrict trade. Examples of trade agreements include various tax treaties (such as the U.S.-United Kingdom or U.S.-Netherlands tax treaties), the General Agreement on Tariffs and Trade (GATT), and the long-term grain agreement between the United States and the USSR.<sup>1</sup>

A principal objective of any trade agreement is to influence the performance of the buyers and sellers in the marketplace and open or strengthen trade relations between the treaty signatories. In so doing, a trade agreement may seek to eliminate or establish tariffs and duties, eliminate unfair trade practices, and provide a mechanism for resolving disputes involving trade between members of the agreement.

While a trade agreement may have positive objectives, it may also tend to restrict trade to cosigners, especially in the case of bilateral trade agreements. Bilateral trade agreements generally preclude nonparticipating countries from participating in the trade specified in the agreement. Since agreements do not supersede the trading partners' sovereign powers, trade agreements lack the enforcement authority to rectify unfair trade practices or agreement violations. Without the approval of the offending trade partner, remedies and penalties cannot be imposed.

GATT is one example of an international trade agreement. It has reduced tariffs over the years and provided a mechanism for discussing and resolving trade disputes. It also provides the vehicle for ongoing multilateral trade negotiations.

GATT, however, lacks enforcement powers and cannot implement its decisions and recommendations without the approval of the offending nation. The GATT subsidies code for agriculture is so loosely defined that the United States has insisted that this issue, especially major exporter subsidies, be raised in a new round of multilateral trade talks. The United States claims that its competitive position is being adversely affected by such practices and views the decision to include agriculture in the current round of GATT talks as a positive step.

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<sup>1</sup>For a more detailed treatment of multilateral trade agreements see Current Issues in U.S. Participation in the Multilateral Trading System (GAO/NSIAD-85-118; 9/23/85).

## Countertrade

Countertrade is a negotiated trade agreement, generally involving payment in some form other than hard currency, and often involving such transactions as barter, offsets, buybacks, and counterpurchases. (See table 2.1.) Although barter and countertrade accounted for only 2 percent of \$1 trillion in world trade in 1976, prevailing economic trends have made countertrade more attractive to certain countries in recent years. Experts polled at a Business International Convention on countertrade in January 1986 estimated that countertrade now accounts for 25-30 percent of world trade, which is generally estimated at slightly less than \$2 trillion. Countertrade, an increasingly popular trade tool, therefore has significant impact on world trade and the performance of competing buyers and sellers by removing "tied" or subsequent trade from open market competition.

Table 2.1  
Types of Countertrade Agreements

Barter	Requires straight exchange of goods and services without hard currency by participating parties.
Buyback	Requires a company making sales to or investing in a foreign plant or project to take its payment-in-kind, i.e., the goods produced by the plant.
Counterpurchase	Requires exporting companies to buy a certain amount of goods from a country whenever they sell to it.
Offset	Requires large exporters or contractors to make investments or purchases in the importing country equal to some percentage of the exporter's contract with the importing country.
Switch-trading	Allows an intermediary or third party to enter the countertrade group to facilitate the terms of trade.

Recent trends in countertrade show more low-margin commodities, such as agriculture products, being traded. The outlook is for stable or increasing countertrade in agriculture.

U.S. policy toward countertrade is officially neutral. However, some of those we interviewed feel countertrade is discouraged because of U.S. efforts to encourage multilateral free trade. Contrasted with overt countertrade support by other governments, U.S. participation in this area of the international marketplace is often lacking, and actual sales are lost. According to a USDA official, since many U.S. firms lack the size, expertise, or capital necessary to participate in countertrade, they are not competitive in this portion of the world marketplace. Hence if the United States used these types of agreements it would enhance U.S. competitiveness.

## SUPPORT PROGRAMS AND OTHER SUBSIDIES

### Support programs

U.S. support programs stabilize and support farm income and prices through deficiency payments and nonrecourse loans. The government establishes a target price for a commodity and makes a deficiency payment of up to \$50,000 to the farmer if the market price or loan rate, whichever is higher, is below the target price. A side effect is to encourage production without regard to market conditions, because producers may receive payments based on their production volume. As seen in figure 2.1, the target price has exceeded the market price of wheat for the last 5 years.

The nonrecourse loan rate acts as a price floor for U.S. farmers who participate in government programs.<sup>2</sup> The loan rate provides a minimum guaranteed price for commodities to help buffer dramatic changes in commodity prices and maintain a basic farm capacity in the United States. When the loan rate exceeds the market price as it did for wheat in 1985, for example, farmers have an incentive to produce wheat for the government at the guaranteed loan rate of \$3.30/bushel. In addition a deficiency payment of \$1.08/bushel was also an incentive to produce wheat. (See fig. 2.1.) This encourages continued production even though the world market price is decreasing. The net result is an increase in government-owned surpluses and a price signal to farmers that does not represent marketplace reality.

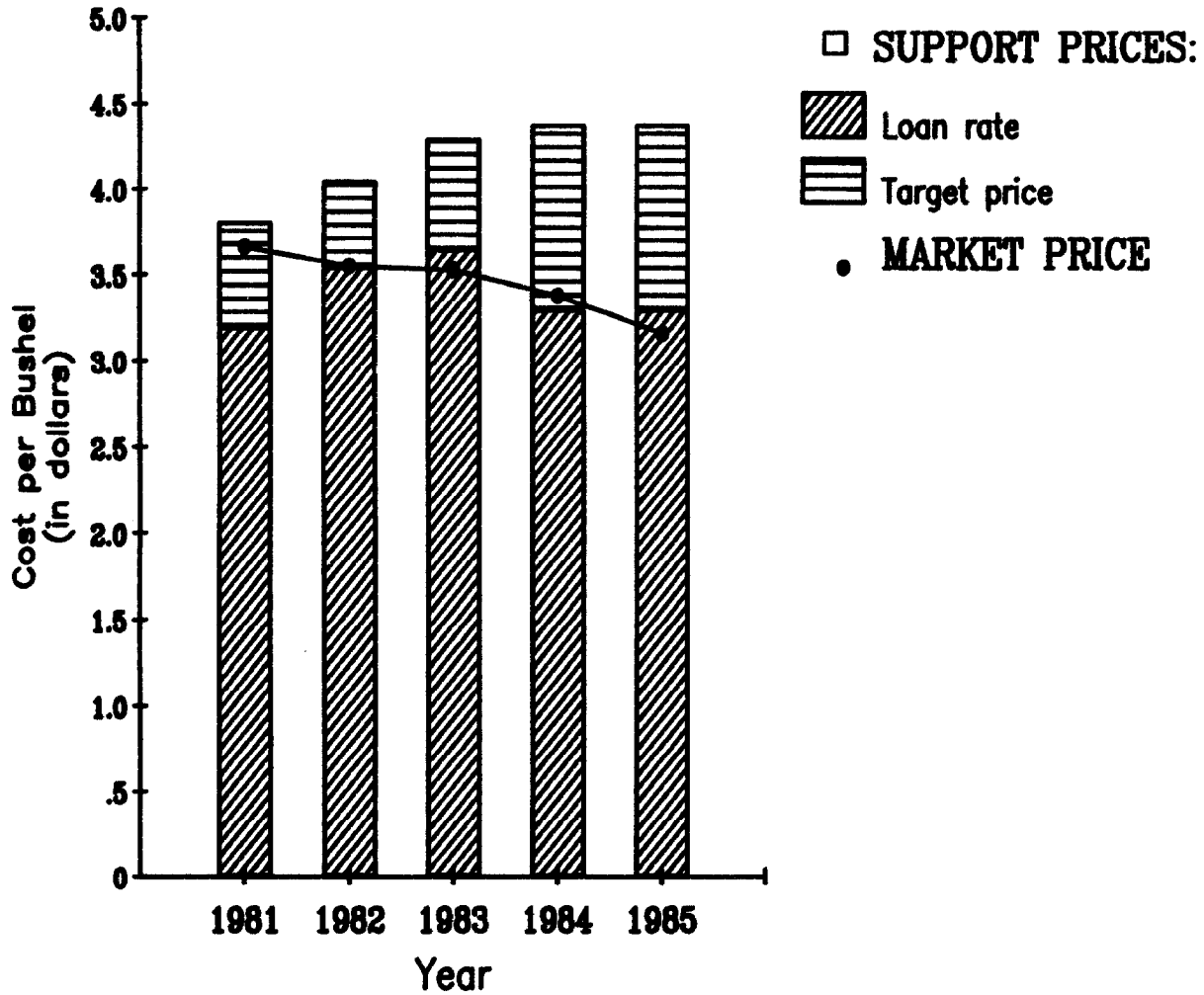
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<sup>2</sup>The loans are nonrecourse because if a farmer cannot profitably sell the commodity and repay the loan when it matures, the pledged or mortgaged collateral (the commodity on which the loan was advanced) can be forfeited to the government for settlement of the loans at the farmer's discretion.

An unintended side effect is that if the U.S. loan rate is above world market prices, the loan rate acts as a reference price for our competitors. They can price their commodities slightly below the U.S. loan rate and expand production where possible to capture market share. The higher price for U.S. wheat, for example, makes U.S. wheat less competitive in the international marketplace.

Figure 2.1

U.S. Support Prices and Market Prices for Wheat



Market prices are the average price received by farmers.

Source: Agricultural Stabilization and Conservation Service, USDA.

## Other Subsidies

Subsidies take different forms and produce various effects. Subsidies are intended to influence market behavior in reaction to problems in production, price, and farm income. U.S. subsidies include the Export Enhancement Program (EEP) and federal crop insurance. Other countries also have subsidies, such as the EEC's export subsidy program.

The EEP provides a "bonus-in-kind" payment for export sales to targeted foreign buyers in the international marketplace. Through this program, the government tries to improve U.S. competitiveness by encouraging and subsidizing the foreign consumption of U.S.-produced commodities. Subsidized federal crop insurance is available to farmers to help protect farm income from the perils of insect infestation and weather-related problems. To the extent this subsidy reduces the risk or cost of production, U.S. producers can be more cost-efficient compared with their foreign counterparts.

The EEC also subsidizes exports of domestic grain. In 1985, for example, the EEC's internal price for wheat was \$203.25 per mt, and the average price obtained from the export market was \$174.50 per mt. An export "restitution" payment of \$28.75 per mt was paid to wheat exporters, thereby allowing them to compete at lower price levels in the world marketplace.

## GOVERNMENT ORGANIZATIONAL STRUCTURE

Some government organizations exist to provide credit to foreign purchasers, stimulate foreign exports, purchase whatever imports the country may need, or support or subsidize the sale of products within the country's borders.

An example of how government organizations affect agricultural trade is state-owned or state-run trading agencies. As shown in table 2.2, most of the important countries in world grain trade have state trading organizations. These agencies can be responsible for all foreign purchases (imports) and/or all foreign sales (exports) of a country's agricultural commodities. Japan, for example, requires that all imports of wheat be licensed by the Japanese Food Agency and all imports be sold to the government at the port. Canada, on the other hand, requires that all exports of wheat, oats, barley, and rye be handled by the Canadian Wheat Board. The Board is also the major domestic marketing agency for grains. Since 95 percent of international grain trade is either bought or sold by state trading organizations, many of which transact their business in secrecy, they can have significant impact in the marketplace.

Government-established prices and purchasing criteria, and market secrecy, act to suppress competitiveness in the

marketplace. State trading organizations are frequently permitted to "make a profit" on the purchase and sale of agricultural commodities or pay subsidies to exporters of agricultural commodities. Although lower prices generally stimulate greater consumption, this may not happen if the lower prices are not passed on to consumers by the state trading agency. Hence, lower world prices may not result in increased consumption in these countries that purchase products at world prices and pass them on to consumers at higher prices.

The U.S. Commodity Credit Corporation (CCC) is an example of a government organization that, as one of its functions, provides credit at below market rates to purchasers of U.S. agricultural exports. It also administers the Export Enhancement Program. Part of the reason the CCC, state trading agencies, and others interact with the world commodity market is to enhance the salability (improve the competitive position) of their respective countries' products in the marketplace. This marketplace intervention may obscure cost-of-production advantages of other countries, and the price competitiveness of one country's product versus the same product from another country may be altered.



Table 2.2

State Trading Agencies of Major Importance in World Grain Trade

<u>Country</u>	<u>State trading agency</u>	<u>Grains traded</u>
<u>Industrial</u>		
United States	None	
European Community	None	
Canada	Canadian Wheat Board	Wheat, coarse grains
Australia	Australian Wheat Board	Wheat, coarse grains
Japan	Food Agency	Wheat, rice, barley
South Africa	South African Maize Board	Corn
<u>Less developed</u>		
Brazil	Brazilian Wheat Board	Wheat
Egypt	Ministry of Supply	Grains
India	Food Corporation of India	Food grains
Indonesia	BULOG	Food grains
South Korea	Korean Flour Industry Association	Wheat
Mexico	National Public Supply Company (CONASUPO)	Corn and other coarse grains
Argentina	National Grain Board	Grains
<u>Centrally planned</u>		
USSR (Russia)	EXPORTKHEB	Grains
Peoples Republic of China	CERIOLFOOD	All grains and oilseeds
Poland	Rolimpex	Grains

Source: Economic Research Service, USDA.

## NONTARIFF TRADE BARRIERS

Many countries use nontariff trade barriers to influence agricultural trade. Often numerous and difficult to identify, these practices--import quotas; restrictive licensing; standards-testing, labeling, or certification requirements; restrictions on marketing techniques; and domestic content or service requirements--often create formidable barriers to entry into a country's domestic market. In so doing, nontariff barriers reduce the competitiveness of an exporter of agricultural products to that country.

An example of a nontariff barrier is Japan's treatment of beef and citrus imports. Japan has an import quota that restricts the level or quantity of beef and oranges that U.S. traders can export to Japan. By limiting U.S. exports into the Japanese marketplace, U.S. exporters are limited in their ability to compete in that market. The fresh orange market in Japan is estimated by industry representatives to have an additional \$50 million potential annually. A much greater potential market exists for beef, according to the U.S. Trade Representatives office. This is estimated at an additional \$100 million annually. This nontariff barrier prevents the United States from competing in these areas of the Japanese marketplace.

Although domestic trade barriers do not affect U.S. exports, the United States also applies nontariff barriers to imports of foreign-produced commodities. For example, the United States has for some years supported domestic sugar prices at levels above the world price, and imposed import quotas on sugar to prevent large-scale government purchases of domestic sugar. In addition, the United States has a quota on the amount of beef that can be imported.

Another example of a nontariff barrier is Brazil's treatment of certain types of imported seeds. Although Brazil has been a major market for U.S. seed exports, Brazil has traditionally restricted imports of certain types of seeds for many years on phytosanitary grounds.<sup>3</sup> The major phytosanitary concerns have now been resolved, but commercial import licenses have not been issued, because of a self-sufficiency policy for these types of seeds. Grain sorghum, corn (field and sweet), and beans (soybeans, dry edible beans, and garden beans) have been the most significantly affected. In 1983 U.S. seed exports to Brazil were valued at \$6.7 million. Seed exports declined to \$3.3 million in 1984, and there were no exports of grain sorghum or corn seed in that year. Brazilian regulations have excluded the U.S. seed industry from a potential market worth perhaps \$20 million to \$30 million, according to the U.S. Trade Representative.

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<sup>3</sup>Phytosanitary pertains to plant health and its effect on the environment. Defined by treaty agreement, it provides the basis for rejecting certain imports that might have an adverse effect on the environment.

Quality standards are another barrier to effective competition. Both the U.S. grain industry and government seem to be sensitive to the increasing concerns about the lack of quality of U.S. grain exports. A number of government- and/or industry-sponsored conferences and workshops have been or are being held to discuss grain quality problems and possible solutions.

Nontariff barriers are restrictive for U.S. agricultural producers as they seek to establish a competitive position in the world market. When restrictions and standards are not evenly applied to both imported and domestic products, the U.S. exporter is denied full and equal access to international markets.

## LEVIES

Another public policy tool used by some countries involves levies, such as taxes, tariffs, and duties, that are imposed on imports and can eliminate the U.S. cost advantage when it is competing for their markets. Often justified as efforts to stabilize market prices and maintain self-sufficiency in a certain commodity, these levies effectively exclude U.S. producers from some markets.

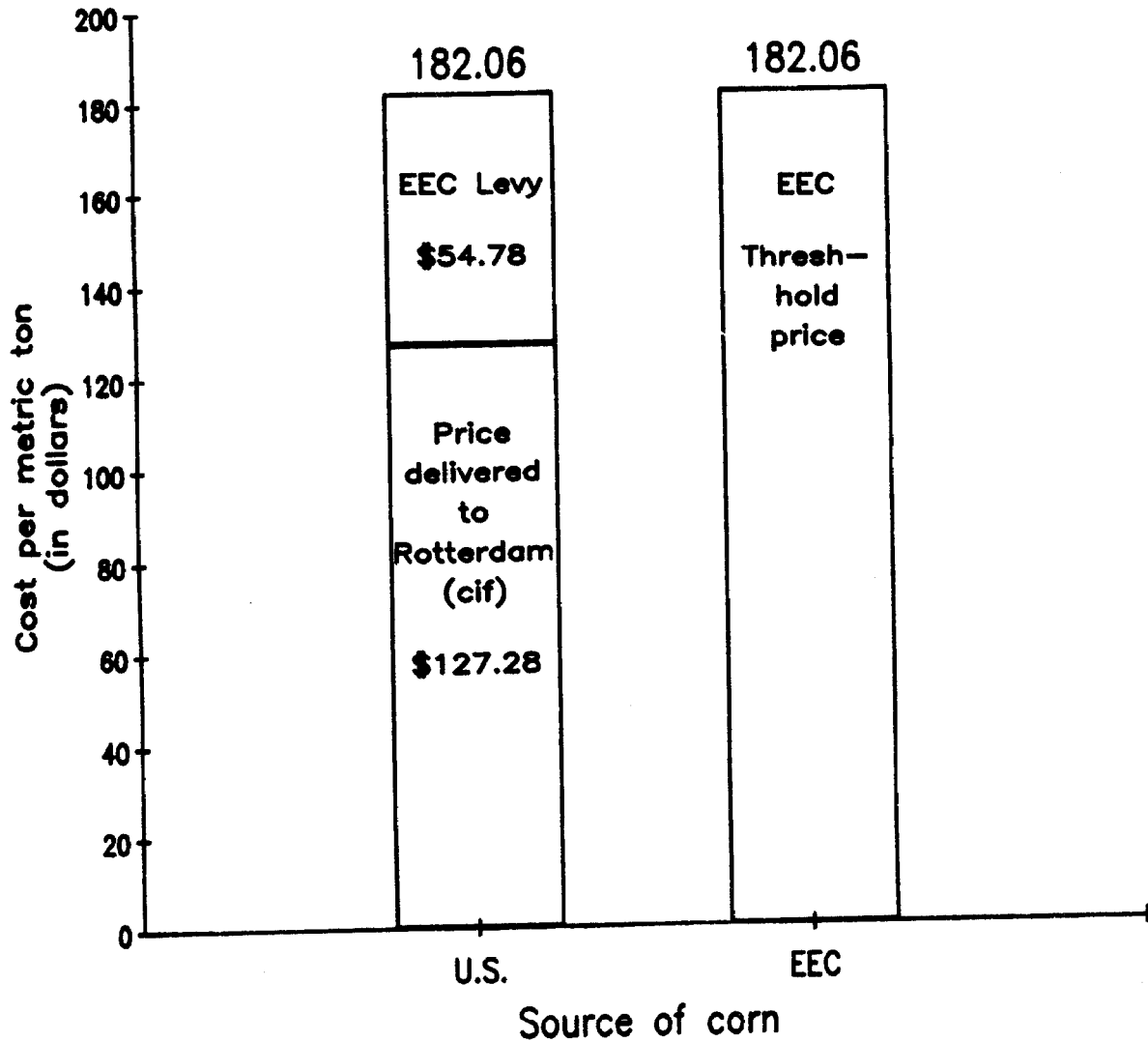
One example of a levy that distinguishes between imported and domestically produced commodities is the EEC's variable levy. Corn produced in the United States, for example, is exported to the EEC at a price at \$127.28 per metric ton (mt), which then imposes an import duty on the incoming corn of \$54.78 per mt. No commensurate fee is placed on domestically produced corn. The import duty in fact raises the price of the U.S. corn to \$182.06 per mt, at which price EEC corn can compete favorably. Referred to as the threshold price (see fig. 2.2), the ultimate effect of this fee is to reduce consumption of imported grain by making it less price-competitive in relation to domestically produced grain.

Such levies often reflect an attempt by a country or countries to provide preferential treatment to a domestic commodity in the face of stiff foreign competition. A case in point involves the EEC's preferential treatment of Mediterranean-grown citrus through a series of tariffs that work to the detriment of competing U.S. citrus products. The United States filed a petition with GATT officials in hope of reducing the tariffs imposed on U.S. exports of fresh oranges and lemons. In 1985 GATT recommended that the EEC "consider limiting the adverse effects" of these tariffs, but the tariffs have remained in effect. The United States likewise imposes levies on certain imported commodities, such as sugar, and honey, that it does not impose on domestically produced commodities.

Some countries defend levies on imports and the resulting protectionism as necessary measures to strengthen domestic industries. Nevertheless, by eliminating the element of foreign competition, these levies also tend to perpetuate the inefficiencies of domestic industries.

Figure 2.2

Effect of European Economic Community (EEC)  
Levies on Imported U.S. Corn



cif means that freight and insurance charges are included

Source: Resources For the Future.

## CREDIT POLICIES

Although U.S. agricultural producers would like to sell their exports for hard currency, not all foreign countries have the necessary capital to buy U.S. products outright. Thus, credit policies of the seller or international lender often have a significant impact on the buyer as well as on the type and volume of the product purchased. Furthermore, the lack of available credit for agricultural commodities in the international marketplace reduces the number of buyers and/or the volume of trade.

Without credit, some countries could not acquire needed commodities, U.S. exporters could lose sales to competitors who do provide credit assistance, and foreign exchange needed by developing countries would not be available for purchase of industrial supplies necessary for their economic growth. For this reason the United States provides government credit at below-market interest rates to certain foreign purchasers of agricultural products. In 1984 USDA's export credit and food aid programs helped move close to 16 percent of all U.S. agricultural exports.

In recent years, the credit policies of international lending institutions have had a significant impact on U.S. agricultural exports. In the face of worldwide recession in 1982-83 the export earning and debt servicing abilities of lesser developed countries (LDC) fell sharply. Consequently, the International Monetary Fund (IMF) and commercial banks holding LDC loans began to impose tough economic conditions--reduced imports, increased exports, currency devaluation, and reduced government spending (including reduced food purchase subsidies)--as a prerequisite for renegotiating loans.

IMF emphasis on LDC self-sufficiency thus adversely affected the ability of U.S. farmers as well as others to sell agricultural exports to the LDC markets. As LDC economies improve, however, U.S. agricultural exports are expected to rebound since these countries provide the greatest market potential for U.S. agricultural trade.

## SALES SUSPENSIONS, MORATORIUMS, AND EMBARGOES

Trade interruptions, including embargoes, moratoriums, and sales suspensions, have occurred with some frequency in recent years (see table 2.3). In the case of the United States, agricultural trade interruptions have taken place in response to conditions of short supply, national security, and as a tool of foreign policy. Notwithstanding the fact that all trade interruptions, whether general or agriculture-specific, limit U.S. participation on the world marketplace, we have addressed only those interruptions of agriculture trade exclusively.

In 1973 the United States imposed an embargo on soybeans, cottonseed, and related products in an effort to moderate escalating prices and maintain adequate domestic supplies. The federal government justified suspensions of grain sales to the Soviet Union in 1974 and Poland in 1975 on the need to ensure adequate domestic supplies. In 1980 the United States imposed an embargo on all agricultural sales to Russia (those sales not already provided for under the U.S.-Soviet grain agreement) in response to that country's invasion of Afghanistan.

In spite of government justifications on the basis of short supply or foreign policy, some analysts in both government and private sectors have criticized these interruptions because of their overall effect on U.S. agricultural trade. While the government claims to have acted in some cases to protect farm income, analysts have argued that these trade interruptions (1) made the United States an unreliable supplier, (2) encouraged trading partners to look elsewhere for more stable supply arrangements, (3) reduced U.S. market share in subsequent years, (4) in the case of the 1980 embargo, resulted in loan rates being raised administratively, which in turn made the United States less competitive in the world marketplace, (5) encouraged other exporters to increase production and exports and (6) may ultimately translate into lower market prices for U.S. produced commodities. In 1981 the President terminated the 1980 embargo on agricultural trade with the Soviet Union, citing this restriction as ineffective and damaging to the U.S. farm sector.

As we indicated, trade interruptions can influence U.S. farmers' ability to participate and/or compete in the international marketplace. Future trade interruptions remain difficult to predict because of (1) the uncertain nature of factors that have historically provoked these interruptions and (2) the prevailing political and public policy considerations concerning the effectiveness of these measures.

Table 2.3

Chronology of U.S. Agricultural Trade  
Suspensions, Moratoriums, and Embargoes

<u>YEAR</u>	<u>PRODUCT</u>	<u>AFFECTED AREA</u>
1973	Soybeans, cotton- seeds and their products	World
1974	Grain	USSR
1975	Grain	USSR
1975	Grain	Poland
1980-81	All agriculture commodities	USSR

### SECTION 3 ECONOMIC FACTORS

The competitiveness of U.S. agricultural exports is affected by both the production and consumption sides of the international market: on the one hand, by the degree to which the U.S. farm sector is able and willing to supply its products at competitive prices; and on the other hand, by the extent of importer demand for those products at the prices offered. The decline in market share that several U.S. agricultural exports have experienced since 1981 is the result of a combination of changes in both supply and demand factors.

In this section, we discuss the economic factors determining the competitiveness of U.S. agricultural exports under the following broad categories:

- o Costs of production
- o Productivity and technological change
- o Product quality and differentiation
- o Distribution costs
- o World economic recession/expansion
- o Exchange rate fluctuations
- o Population

On the supply side, the economic factors include those that determine the cost of delivering the product to the importing customer. These factors include the comparative costs of production; developments in productivity and technological change, which determine the changes in production costs over time; as well as distribution or infrastructure costs such as transportation, storage, and marketing. When viewed in comparison with data for other countries, these factors can provide a picture of the cost advantages or disadvantages held by U.S. agriculture in the world market. Although policy factors heavily influence the prices and quantities of agricultural exports, these cost advantages/disadvantages form the underlying relationships that are then affected by policy measures.

The demand-side factors include those that determine the need for, and the ability to purchase, U.S. exports. These factors include population change, per capita income, and food preferences of importing countries as well as the purchasing power of these countries with regard to U.S. exports. This purchasing power is influenced by currency exchange rate fluctuations, the importing country's debt position, and its access to foreign exchange. Changes in some factors, for example--exchange rates--can influence



the competitiveness of U.S. exports directly by changing the effective price paid by importers. Changes in other factors, such as general shifts in world demand for agricultural exports, resulting, for example, from a worldwide recession, can alter the competitive position of U.S. exports in a more indirect way. The United States tends to be the residual supplier of some agricultural products on the world market; as a result, the level of U.S. exports tends to fluctuate more than that of other exporting countries in response to world price changes.

## COSTS OF PRODUCTION

Agricultural costs of production consist of variable expenses, such as seed, fertilizer, fuel, and repairs; fixed expenses, such as general farm overhead, taxes, insurance, and interest; capital replacement costs; and land rent. Production costs do not include all costs incurred in delivering the product to its foreign purchaser. The additional costs of transporting and marketing the product on the world market are discussed in the section on "distribution costs."

The dominant cost factors in U.S. agricultural production have been interest, capital replacement, fertilizer, and fuel. In 1977 these factors comprised 63 percent of the total cash expenses involved in producing a planted acre of wheat. In 1985 these were still the dominant cost factors, still accounting for 63 percent of total expenses. The U.S. agricultural sector is currently very sensitive to interest rate changes because of the capital-intensive nature of the industry and the large amount of farm debt. Land cost is also a very important factor; however, it is generally treated separately. It is difficult to determine with consistency since it must be imputed.

There is no clear consensus on the degree to which the price competitiveness of U.S. agricultural exports is influenced by production costs. Some agricultural experts emphasize the importance of productivity trends, which influence the underlying relative costs of production. Others stress the dominance of policy measures in determining world trade flows. There is some agreement, however, that while costs of production are overridden by policy factors in the near term, they do become a relevant factor in the long term.

The assumption that the United States has been and still is the world's most efficient, or least-cost, producer of agricultural products is being increasingly challenged as U.S. farm exports lose market share and as evidence of rapidly rising foreign productivity mounts.

To determine whether or not U.S. production costs have played an important role in the declining competitiveness of U.S. agricultural products, it is necessary to compare production costs of U.S. farms with those of their foreign competitors. Unfortunately, the data available for such inter-country comparisons are severely limited. Even within the United States, cost of production estimates are subject to certain weaknesses, such as incomplete farmer records, and conceptual problems concerning the pricing of family labor and the allocation of farm overhead. Data limitations such as these are compounded in inter-country comparisons, especially where there are differences in production systems.

The Economic Research Service of the Department of Agriculture has compiled some preliminary data comparing average 1984 wheat production costs for the United States, Canada, France, Australia, and Argentina. Of the different categories of production costs, the least compatible for inter-country comparisons, according to USDA officials, are fixed costs. Different countries use different accounting procedures in the calculation of fixed expenses, such as interest on fixed assets. Table 3.1 compares total 1984 cash expenses for wheat production in the United States and the other major competing countries.

Table 3.1

Total 1984 Cash Expenses for Wheat Production

	<u>United States</u>			<u>Canada</u>	<u>France</u>	<u>Australia</u>	<u>Argentina</u>
	(Hard red)	(Soft red)	(Soft white)				
Variable expenses							
U.S.\$/hectare	105	193	195	99	290	64	68
U.S.\$/mt	48	68	48	53	51	40	37
Fixed expenses							
U.S.\$/hectare	116	118	157	a	426	36	43
U.S.\$/mt	53	42	39	a	75	23	23
Total cash expenses							
U.S.\$/hectare	221	311	352	a	715	100	112
U.S.\$/mt	101	110	87	a	126	62	60
Yield (mt/hectare)	2.2	2.8	4.0	1.9	5.7	1.6	1.9

Source: Western Hemisphere Branch, Economic Research Service, USDA.

Note: The data in this table are preliminary. One hectare is the metric equivalent of 2.47 acres.

<sup>a</sup>Data are not shown due to questionable reliability.

These preliminary cost comparisons show that in 1984, France, for example, was the most resource-intensive producer of wheat, reporting the highest variable and fixed expenses per hectare (\$290 and \$426, respectively). This intensive farming produced the highest yield that year (5.7 metric tons per hectare). Nonetheless, the total cost of French wheat per metric ton was the highest (at \$126).

The cost figures shown in table 3.1 indicate that while Australia and Argentina had a production cost advantage over the United States in 1984, France had a disadvantage. However, France as a member of the EEC, is committed to agricultural export subsidization. Because of this, the cost disadvantage was not

reflected in the world market and therefore did not play an important role in determining France's competitiveness, or relative market share, in wheat. This example illustrates that, in today's market, production cost advantages can be overridden by public policy factors.

The cost data in table 3.1 involve several other limitations in addition to accounting inconsistencies. For example, according to USDA analysts, different data-collection methods were used in different countries. Surveys were used in most countries; however, the Australian data were imputed from aggregate data. The quality of the surveys also varies considerably from country to country. The French sample, for example, was very small and was biased toward the larger, more capital-intensive firms. Also foreign exchange fluctuations affect the cost computations in dollar terms.

### PRODUCTIVITY AND TECHNOLOGICAL CHANGE

Productivity in agriculture is usually measured by overall farm output per unit of input. The most common measures used are labor productivity (the ratio of output per unit of labor), or yield measurements (the ratio of output per unit of land). A more comprehensive measure is total factor productivity: the ratio of total output per unit of total input.

Technological change, and the improvements in productivity that it induces, influences the competitiveness of U.S. exports in two basic ways: it either reduces the production costs of an existing product, or it introduces a new or modified product.

During the past decade, the world has seen much progress in agricultural productivity in the developing as well as the developed countries. Although the United States has led in agricultural research and development for decades, technical innovations in developing countries over the past decade have produced higher rates of productivity growth in some commodities than have occurred in U.S. farming. This rise in productivity has, in turn, led to rates of growth in LDC farm output that have exceeded U.S. output growth rates. USDA data show that from 1976 to 1985, developing-country farm output rose 30 percent, while that of U.S. agriculture rose 20 percent. While the relative world market shares of U.S. and foreign agricultural exporters are determined by many interrelated factors, the increase in LDC productivity and output may have intensified competition among exporters by reducing world demand (need) for imports.

The principal technological improvements in agriculture in the 1980's have been in the area of plant genetics, where new, high-yield grain varieties have been developed and adopted. Improvements in irrigation engineering, animal nutrition, pest control, and transportation, as well as the development of an

international network of research institutions and communications systems, have also contributed greatly to the rapid change in productivity.

According to a recent study by the Office of Technology Assessment, the development and commercialization of plant genetics, or biotechnology, is becoming increasingly important to future competitiveness in agriculture.<sup>1</sup> At present, the United States is ahead of other countries in the development of the biotechnology industry. This has been due to several factors, including complementary efforts of the large, established (mostly pharmaceutical and chemical) companies and the new, small biotechnology firms; the availability of financing and tax incentives; a well-developed science base; government and private funding of research; and personnel availability. Germany, the United Kingdom, Switzerland, and France lag behind the United States in the race toward the commercialization of biotechnology. However, Japan is expected to provide serious competition for the United States in this area.

#### PRODUCT QUALITY AND DIFFERENTIATION

Product quality and product differentiation are additional economic factors that can affect the competitiveness of U.S. agricultural exports. Product differentiation refers to the ability of firms to distinguish their products from those of competing firms within the same industry. Product quality and other physical characteristics are one form of product differentiation. Products may also be differentiated through the quality of service provided, the convenience of location, and advertising. However, in our opinion the product differentiation most relevant to the determination of U.S. competitiveness in agricultural exports is product quality.

According to USDA's Federal Grain Inspection Service, there is a growing concern among foreign buyers about the quality of U.S. grain exports. Complaints about grain quality rose sharply, from 24 in fiscal year 1984 to 75 in fiscal year 1985. U.S. grain is viewed by some buyers as being of lower quality than Canadian or Argentine grain. Therefore, U.S. producers may have to accept lower prices to compete or else lose market share. The effect is to make U.S. exports less competitive on the world market.<sup>2</sup>

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<sup>1</sup>For a more detailed discussion of emerging technologies see Technology, Public Policy and the Changing Structure of American Agriculture (OTA-F-285; 3/86).

<sup>2</sup>For a more in-depth treatment of grain quality, see U.S. Grain Exports: Concerns About Quality (GAO/RCED-86-134; 5/19/86).

Marketing efforts to make exports more attractive to foreign purchasers by including technical support and other services is another form of product differentiation that may play an important role in determining international sales.

### DISTRIBUTION COSTS

Although adequate data are not available to conclusively determine the relative cost-efficiency of U.S. agricultural production as compared with foreign production, there appears to be general agreement that the U.S. transportation and marketing infrastructure, which supports farm production by facilitating efficient distribution, remains, and will remain, unsurpassed in the world. In fact, some analysts we interviewed believe that the superior cost efficiency of the U.S. agricultural infrastructure will ensure the future competitiveness of U.S. farm exports.

Transportation costs include the costs of moving commodities from farm to port as well as possible transoceanic shipment. The cost of moving the commodities from farm to port is significant, given the vast size of the U.S. landlocked production area. However, the transportation and storage system of the United States is more extensive and better developed than those of most other countries. The cost of shipping from the port to the customer's market varies from market to market depending on the shipping route and distance. For this reason it is difficult to conclude in general whether the United States has a systematic advantage or disadvantage with regard to transoceanic shipping costs.

The principal modes of transporting farm products within the United States are rail and barges for long hauls and trucks for short hauls. Grain transport costs typically run between 20 cents and \$1.50 per bushel, varying primarily with the distance hauled. Competition among types of carriers is another factor that, in addition to the actual costs involved, can influence shipping rates. A recent study by USDA's Economic Research Service concludes, for example, that in many parts of the Corn Belt barges provide significant competition and push rail rates down. According to the study, competition exists not only between the rail and barge modes but between the different railroads as well.

Marketing costs form an additional cost of agricultural exports, and they are likely to become more important in the future. As competition in the world agricultural marketplace intensifies, international purchasers increasingly require a complete package of goods and services, including credit programs and, in some cases, turnkey operations, such as processing and assembling facilities. According to the recent symposium sponsored by the Federal Reserve Bank of Kansas City, it is becoming more common to provide product differentiation in response to the specific market, product, and logistic needs of the purchaser.

## WORLD ECONOMIC RECESSION/EXPANSION

Worldwide recessions and expansions directly affect the level of demand for U.S. exports. When a recession in the industrialized countries spreads, affecting the rest of the non-Communist world economy, as happened in the 1982-83 recession, world demand for agricultural exports falls. The more widespread the recession is, the more it affects all exporters alike. However, because the United States often functions as the residual supplier in the world market for some commodities, a general drop in world demand for exports will tend to reduce the U.S. relative market share.

The recession of 1982-83 reversed the long-term upward trend in world trade. Still feeling the inflationary effects of the 1979 oil price shock, monetary authorities in several industrialized countries tightened money supplies to control inflation. According to the World Bank and the U.S. International Trade Commission, these policy measures, in combination with other economic occurrences, led to rising real interest rates, a higher value of the dollar, and lower commodity prices. As export earnings of developing countries fell, and their debt service obligations rose, these countries found it increasingly difficult to repay their loans. In response, the IMF and bankers holding the loans imposed conditions for the deferral of the interest payments. These conditions were designed to encourage the debtor countries to generate foreign exchange earnings through reduced imports, increased exports, reduced domestic government spending, lower budget deficits, and the devaluation of the debtor country's currency. Import demand was discouraged directly but declined further as these economies stagnated and per capita income declined.

A worldwide recession hurts agricultural (and other) trade for all countries involved. Therefore, a recession that produces a shrinking world export market pie does not necessarily change the relative competitive position (the size of the slice) of any one exporter. As summarized in figure 3.1, however, the United States has held the position of the residual supplier of some commodities in the world market. Because of this, the U.S. market share has been disproportionately affected by fluctuations in the world economy.

Figure 3.1

Effects of Worldwide Recession

World demand for  
agricultural exports  
falls because:

U.S. share of  
agricultural export  
market shrinks if:

- o Per capita income falls

And may fall further when

- o Debt position of importing countries worsens
- o Currency of importing countries devalues relative to currencies of exporting countries

- o The United States remains the "residual supplier" on the world market, i.e., the supplies of U.S. exports remain more responsive than those from other countries to a drop in world price

- o Currency of a competing exporter devalues relative to the dollar

World recessions (or expansions) influence the relative competitiveness of U.S. agricultural exports to the extent that the U.S. agricultural sector plays the role of the "residual supplier" in the world market. This means that the level of U.S. export sales of certain commodities is more responsive than that of other countries to changes in world price levels. If the price of wheat falls worldwide, for example in response to reduced demand during a world recession, then the United States would see its exports reduced by a greater percentage than other countries. One effect of this role is to stabilize the world price as well as the level of exports from other countries.

The U.S. role of residual supplier in certain world commodity markets is attributed by some industry observers to the combined effect of the domestic U.S. commodity support program and the export subsidization policies of competing countries. The farm set-aside program has created significant excess productive capacity in the form of idle land. This allows U.S. production to expand at less cost per additional unit of output. The program also has the effect of encouraging U.S. exports to drop off more quickly if the world price falls below the loan rate. Export policies of other countries, designed to undersell U.S. exports to preserve their market share, reinforce this role of U.S. production in the world market.



## EXCHANGE RATE FLUCTUATIONS

An increase in the exchange value of the dollar will generally make U.S. exports more costly to foreign purchasers (i.e., less price-competitive on the world market) than they would be otherwise, regardless of the level of costs involved in producing and delivering the product. Under the existing system of flexible exchange rates, the effective price of a U.S. export commodity to its foreign purchaser may change as a result of exchange rate fluctuations even though the underlying conditions of supply and demand for that commodity remain stable.

The rise in the exchange value of the dollar during the 1980's has had the effect of raising the price of U.S. agricultural commodities abroad. The recent general decline in the dollar, however, has not boosted farm exports because the dollar did not fall significantly against the currencies of countries competing with the United States for agricultural export markets, including Canada, Australia, Brazil, and Argentina. A shift in the exchange value of the dollar affects the competitiveness of U.S. exports to the extent that the dollar changes against the currency of a competing exporter. A change in the value of the dollar against the currency of an importing country affects the level of purchases for imported commodities on the world market.

The value of the dollar against foreign currencies is determined by a host of factors, including the U.S. balance of trade, domestic interest and inflation rates, and changing conditions in the international capital markets. With the development of well-integrated international capital markets, exchange rates have become increasingly responsive to factors that influence domestic interest rates, such as domestic monetary and fiscal stabilization policies, and the level of the national debt. A tight monetary policy, for example, causes domestic interest rates to rise, attracting financial capital from abroad and bidding up the value of the dollar in the capital markets.

In summary, changes in foreign exchange occur for many reasons and can have a significant impact on the effective price paid by importers for U.S. products. Because of this, changes in the ability of U.S. products to compete may, at times, have little to do with changes in the actual cost advantage or disadvantage held by U.S. producers.

## POPULATION

Population factors into the demand side of the agriculture equation; population increases are a source of increased consumption of agricultural products. According to USDA, although a gradually slowing rate of increase is likely in global population into the 1990's, annual increases of 80-90 million people are still expected. Population expansion will be

particularly significant in developing countries, where yearly gains of about 2 percent are likely, compared with less than 1 percent in developed countries. However, areas with the highest population growth rates, such as sub-Saharan Africa, have the greatest financial problems and lowest per capita income.

The United States, of all the major exporters, has sufficient flexibility, because of its own natural resources, distribution networks, skilled labor, and stored reserve, to respond to market fluctuations. During a period of market expansion in the 1970's, for example, U.S. producers demonstrated a high degree of competitiveness in capturing an increased market share. With anticipated population increases, expanding markets, and changes in consumer preferences in the 1990's, the success of the United States may again depend, in part, on its flexibility and competitiveness in a changing international marketplace.

SECTION 4  
NATURAL RESOURCE FACTORS

Natural resources comprise a third category of factors that influence U.S. agricultural competitiveness. A healthy endowment of these resources, coupled with proper care and maintenance, can contribute to efficient and effective crop production. Conversely, inadequate natural resources and/or improper maintenance of these resources can reduce crop yields and have a negative effect on a country's ability to compete in the world market. Natural resource factors discussed in this section include

- o Climate/weather
- o Geography/arable land and water

## CLIMATE/WEATHER

The climate of a particular region or country is critical to its ability to compete in domestic and world markets. Climatic conditions, such as temperature, humidity, precipitation, wind, and sunshine, determine crop variety, growing seasons, and crop yield. These conditions also translate readily to the strength of a particular country in international markets. However, the persistence of erratic weather conditions tends to decrease crop yields and profitability, and negatively affects the level of exports or imports a country requires.

According to USDA's World Agricultural Outlook Board, since the early 1970's, weather variability in many regions of the world has been greater than at any time since the 1930's. Although weather variability differs among global crops and regions, it has resulted in sharp changes in regional and global crop yields. Even U.S. crop yield variability is increasing. For example, the average variation in 1979-83 U.S. corn yields was 13 percent, up from 8 percent in 1964-68. Wheat yield variability rose from about 3 to 6 percent, while soybeans increased from 5 to 9 percent for the same time period. The yield variations are a direct result of changes in weather patterns.

The World Agricultural Outlook Board further reported that since 1980, several countries have experienced weather-related record or near-record reductions in yields, in some cases caused by drought, and in others, by too much rain. The most notable weather-related crop losses in the 1980's were in Australia in 1982; in South Africa in 1983 and 1984; in the United States in 1980 and 1983; in the USSR in 1981; and in Canada in 1984. In contrast, favorable weather helped produce record crop yields in the United States in 1981 and 1982 and in the EEC in 1984, and China has experienced favorable weather and growing conditions in recent years.

Weather and climate have important implications for farmers and policymakers competing in the world marketplace. Several years of good weather can result in large crops and help turn a major grain and cotton importer, such as China, into an exporter. Bad weather, on the other hand, can turn a major exporter into an importer, as was the case in South Africa in 1983 and 1984.

## GEOGRAPHY/LAND AND WATER

A country's geography and amount of arable land also influences its ability to provide agricultural commodities for domestic and international markets.<sup>1</sup> Arable land and water

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<sup>1</sup>Although geography is generally a factor in costs of production, we have treated it separately for presentation purposes.

supplies help determine the type and amount of crops to be produced and the method of farming to be employed. Countries such as Canada, Argentina, Australia, and the United States are endowed with sufficient land and water conditions to support their current positions in world wheat trade. Unfavorable geographic conditions, including extensive tracts of mountainous terrain or deserts, limit the amount of arable land and hinder the transportation infrastructure necessary to bring crops to the market.

Farming and other land-use industries can have adverse effects, such as erosion, high salinity, acid rain, and sedimentation of water supplies, on soil quality, draining the soil of its natural resources. Proper care and maintenance of the soil can preserve the productivity of arable land in a given country. Conversely, improper soil and water management can reduce crop yield and quality, thereby decreasing the ability of a country to provide sufficient agricultural produce domestic and international consumption. Thus, a healthy endowment of natural resources, combined with their proper care and maintenance, is an important factor for competing on the world market.

SECTION 5  
OBJECTIVES, SCOPE, AND METHODOLOGY

We conducted our study of the competitiveness of U.S. agricultural commodities in the international marketplace in August and September of 1986. We gathered and analyzed a large amount of information from both public and private sources. Our objectives were to describe the recent history and current position of the United States in world agricultural trade and to identify and describe those factors that have contributed to the decline of U.S. competitiveness in international agricultural trade. The information sources we used in this study included the United Nations' Food and Agriculture Organization; the International Trade Commission; USDA's Economic Research Service, World Agricultural Outlook Board, and Foreign Agricultural Service; Resources For the Future; the Congressional Research Service; the State Department; the Commerce Department; trade associations; academic institutions; and others.

In conducting this study we recognized that U.S. agricultural exports have declined for two main reasons. The first is a general worldwide decline in agricultural trade affecting all producers alike. The second is the loss of world markets by U.S. agricultural exporters to foreign competitors. In this study we focus principally on the latter issue.

We discussed and/or obtained the views of present and/or past Secretaries, Under Secretaries and Assistant Secretaries from the U.S. Department of Agriculture concerning various aspects of competitiveness with respect to the position of the United States in world agricultural trade. We also interviewed policy officials from a variety of offices including the Departments of Agriculture, Commerce, and State; the World Bank; Congressional Research Service; Congressional Budget Office; the Federal Reserve Bank; and various private organizations. We reviewed literature, legislation, and publications dealing with U.S. competitiveness as well as export trade. We discussed portions of this report with USDA officials, and their suggestions were incorporated where appropriate. However, because of its informational nature, we did not obtain formal agency comments on a draft of this report.

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