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U.S. Trade in Competitive World Markets

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International trade links countries to the global economy. But trade patterns and production locations shift as countries advance their technology. For example, in the early decades following Japan's first foray into the global market in 1858, raw silk was its staple export. As Japan's economy advanced, manufactured textiles became the top export item. In turn, these were replaced by exports of cars and high-tech items. Today, Japan is a net importer of textiles.

Similar advances in economic development are happening in Taiwan and South Korea. These countries, like Japan, used manufactured textile exports to expand their economies. Now they export more electronics and electrical equipment than textiles.

Economic development shapes the patterns of world trade. Education, technical skills, income, and natural resources, such as land, water, and climate, determine what countries will produce and trade. Low-income countries often specialize in industries that use large numbers of unskilled workers. High-income countries concentrate production in areas that take advantage of their abundance of highly skilled labor. Differences in per capita incomes also influence the types of goods demanded and traded.

A recent study by USDA's Economic Research Service found that the trading patterns between the United States and 12 nations of Bangladesh, Egypt, Indonesia, India, Jordan, Morocco, Nepal, the Philippines, Pakistan, Sri Lanka, Thailand, and Tunisia are largely complementary. (For the rest of the article these 12 countries will be referred to as Asia, the Near East, and North Africa.)

The United States' abundance of land resources, capital endowments, and highly trained labor has assured a comparative advantage *(see box)* in agriculture and in the finished capital (automobiles, aircraft, etc.) and high-tech

Comparative Advantage: Explaining Trade

The concept of comparative advantage shows how all countries, including the ones with the highest production costs, can engage in trade to the benefit of their citizens and those of their trading partners. Under comparative advantage, what matters is relative or opportunity costs, not absolute or actual costs. Opportunity cost is the value of products relinquished in order to produce other goods. For example, a Midwestern farmer's opportunity cost of growing corn is the quantity of soybeans he could have produced. Even very efficient, low-cost producing countries will have high opportunity costs for certain products. Thus, countries will specialize in those products in which they have the lowest opportunity costs and trade for others.

Consider this example. Two countries, Hightechia and Lowtechia, use their labor to produce just two goods, TV's and microwave ovens. In Hightechia, it takes 1 hour of labor to manufacture a TV and 2 hours for a microwave. In contrast, Lowtechians take 6 hours to manufacture a TV and 3 hours to assemble a micro wave. Thus, Hightechians have an absolute advantage in manufacturing both TV's and microwaves. However, the cost of producing microwave ovens is greater in Hightechia when measured by the quantity of TV's not produced. In Hightechia, the cost of a microwave oven is two TV's, but in Lowtechia the cost is only one-half of a TV. Thus, Lowtechia has a relative or comparative advantage in producing microwave ovens.

It is this comparative advantage that stimulates trade worldwide. Assuming Hightechians can trade one TV for one microwave oven, it is to their advantage to specialize in TV's and trade some of them for microwaves. By trading, Hightechians can have the same number of TV's with twice as many microwave ovens, or some combination of more TV's and microwaves. Lowtechia can also specialize in microwaves, trading the excess microwave ovens for TV's.

Comparative advantage works best when countries are willing to engage in unfettered trade. The advantage of free trade is not that it equalizes incomes, but rather that it increases the quantities of goods that consumers in both countries can buy.

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sectors. The United States has a comparative disadvantage in basic intermediates industries, such as iron and steel, electrical energy and fertilizer, that require moderately skilled labor and capital.

The Asian, Near Eastern, and North African nations have the natural resources and unskilled labor necessary to achieve a comparative advantage in mining, fishing and forestry, and agriculturally linked industries, such as textiles, clothing, leather, and footwear.

Trade Depends on Stages of Development

The ERS study measures trade of the United States and the developing nations of Asia, the Near East, and North Africa over the last two decades. The study divides the total trade into eight sectors: agriculture, fishing and forestry, mining, agriculturally linked industries, intermediate differentiated goods (office supplies, heating and lighting equipment, etc.), basic intermediates, finished capital goods, and high tech. The eight sectors underscore changing requirements of production processes as each nation moves up the ladder of development *(table 1)*.

Lowest on the ladder are agriculture, fishing and forestry, and mining, which typically use large amounts of relatively unskilled labor and natural resources. (But agriculture can re-emerge on a higher rung when it is characterized by capital-intensive technology.) The sector, agriculturally linked industries, is the next step in the general development pattern because it uses substantial quantities of unskilled labor relative to other inputs. Above these sectors come intermediate manufactures and basic intermediates. These two sectors depend upon moderately skilled labor. The top two rungs—finished capital and high-tech sectors—require highly skilled and very highly skilled labor. After World War II, Japan climbed this ladder of development. During the past two decades, the newly industrializing countries of Taiwan and South Korea have been rapidly scaling it as well.

Table 1. From Farming to High Tech: Countries Move Up the Ladder of Development

Economic Sector	Needed Inputs	Low Income Countries	Upper-Low Income Countries	Middle Income Countries	Upper-Middle Income Countries	High Income Countries
				Typical Industries		
High Tech	highly skilled labor				telecommunications, chemical & medical products, medical instruments, etc.	
Finished Capital Goods	skilled labor and capital				automobiles, aircraft, machinery, war firearms, etc.	
Basic Intermediates	moderately skilled labor and capital			iron & steel, processed petroleum and coal, paper, plastic, etc.		
Intermediate Differentiated Goods	moderately skilled labor			maps, office supplies, heating & lighting equipment, watches, etc.		
Agriculturally Linked Industries	semi-skilled labor		textiles, yarn, fabrics, leather, footwear, furniture, clothing, etc.			
Mining	unskilled labor & natural resources	unprocessed coal, crude oil, ores, natural gas, crude fertilizers, etc.				
Fish and Forestry	unskilled labor & natural resources	fish, wood, lumber pulp wood, cork, waste paper, etc.				
Agriculture	unskilled-to-moderately skilled labor, capital, and natural resources	grains, livestock, vegetables, tobacco, beverages, cooking oils, etc.				

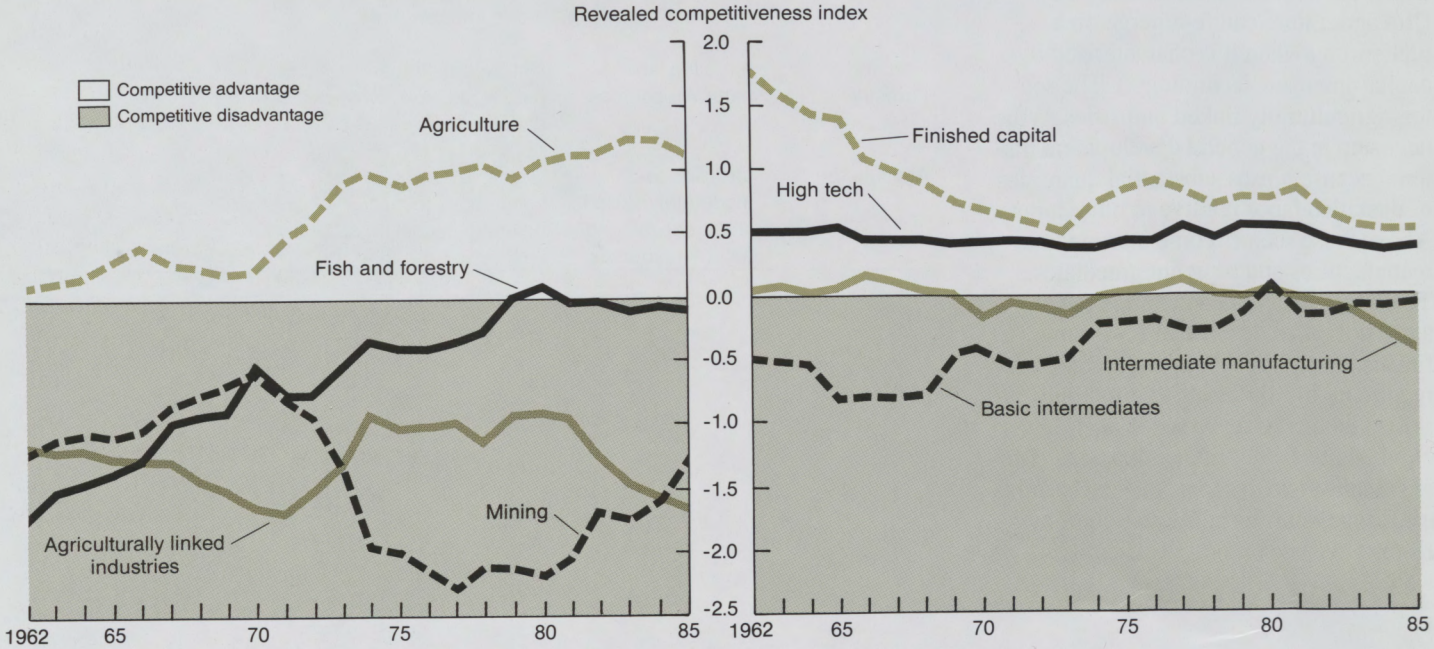
Sector Competitiveness

Agriculture is a capital-intensive sector in which the United States' competitive edge has been increasing *(figure 1)*. *(For information on how global and bilateral competitiveness are determined, see box on Measuring Trade Competitiveness.)* At the same time, the Asian, Near Eastern, and North African nations are losing their competitive edge in this sector, compared with nonagriculture *(figure 2)*. All 12 countries exhibited declining competitiveness in agriculture, with the exception of India, a country that has sharply shifted its trade policies in pursuit of agricultural self-sufficiency.

There are considerable variations in competitiveness among countries. Between 1962 and 1985, Thailand, Sri Lanka, and the Philippines consistently displayed stronger competitive advantages in agriculture than the United States. By contrast, Bangladesh, Morocco, Tunisia, and Indonesia not only had lower agricultural competitive advan-

U.S. agriculture is competitive in world markets.

Figure 1. The United States' Greatest Competitive Advantage Is in Agriculture



Source: Vollrath, Thomas. *The Links Between Development and World Trade*, Technical Bulletin Number, 1774. ERS, USDA, February 1990.

Measuring Trade Competitiveness

A nation's "revealed competitiveness" indexes summarize its global competitive advantages and disadvantages of various economic sectors. A single revealed competitiveness measure shows how well a country's particular economic sector, such as agriculture, competes with other sectors at home and all sectors abroad. The measure, based on trade records, incorporates factors influencing competition: demand, supply, and government policy. It also includes exports and imports. A positive revealed competitiveness value indicates that a country's industry has a relative competitive advantage, while a negative revealed competitive value reveals a relative competitive disadvantage.

Another trade statistic is "overall bilateral competitiveness" which measures the correlation of revealed competitiveness values between two countries. Complementarity occurs when one country has competitive advantages in sectors where the other country has competitive disadvantages. The overall bilateral competitiveness statistic is negative when this happens. Two countries become competitive with each other when they specialize their economies in the same few industries. Strong bilateral competitiveness occurs when the correlation value of revealed competitiveness is positive and approaches 1.

U.S. trade in food grains and jute provides an example of how bilateral complementarity is established. The United States has competitive advantage in food grain production, and Bangladesh, has competitive advantage in jute production. By trading food grain and jute on the world market, each country's trade complements the other. But it is important to recognize that overall bilateral competitiveness (complementarity) encompasses trade across many commodities. More goes into this measure of U.S.-Bangladesh trade than food grains and jute.

For additional information about revealed competitiveness see:

Thomas L. Vollrath. *Competitiveness and Protection in World Agriculture*, Agricultural Information Bulletin Number 567. ERS, USDA, July 1989.

For additional information about overall bilateral competitiveness see:

Thomas L. Vollrath. *The Links Between Development and World Trade*, Technical Bulletin Number 1774. ERS, USDA, February 1990.

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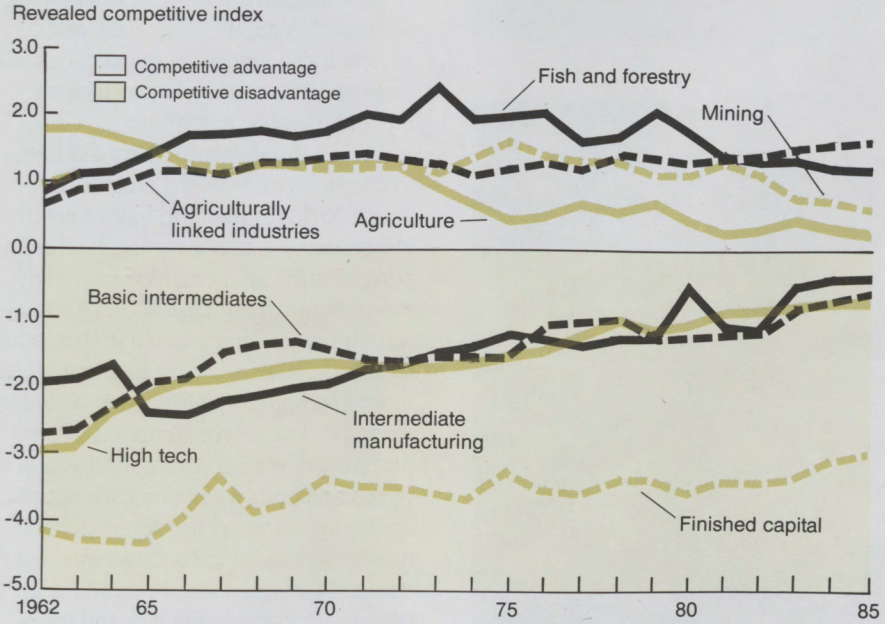
Figure 2. Asian, Near Eastern, and North African Countries Have Their Greatest Competitive Advantage in Agriculturally Linked Industries



Source: Vollrath, Thomas. *The Links Between Development and World Trade*, Technical Bulletin Number, 1774. ERS, USDA, February 1990.

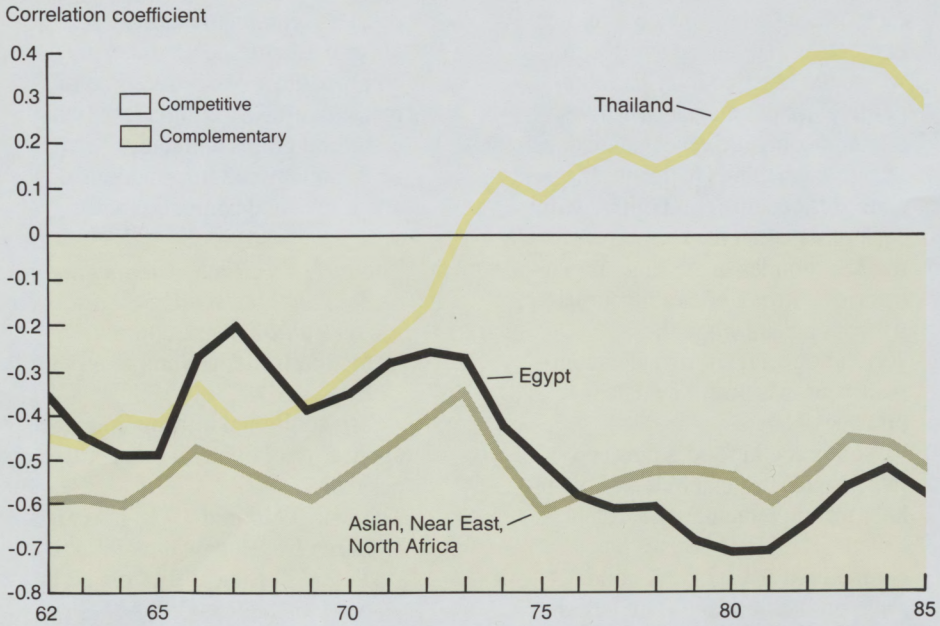
tages than the United States—a trend which started in the early to mid-1970's—but actually showed agricultural competitive disadvantages during the 1980's.

The United States' competitive position in basic intermediates and fish and forestry showed steady improvement. Fish and forestry improved because of rising relative supply, and basic intermediates improved due to declining relative demand. The competitive position for mining rebounded from its large decline during the 1970's. The competitive disadvantage of agriculturally linked industries worsened during the farm crisis of the 1980's.

Overall Competitiveness

Trade between the United States and Asia, the Near East, and North Africa is largely complementary *(figure 3)* because of specialized production across the eight economic sectors. Overall, increasing complementarity is due to emerging trade relations of the United

Figure 3. Thailand Among Selected Developing Countries, Is Most Competitive with the United States



Source: Vollrath, Thomas. *The Links Between Development and World Trade,* Technical Bulletin Number 1774, ERS, USDA, February 1990.

Countries with developing economies specialize in industries that use large numbers of unskilled labor.

States and Indonesia, Egypt, Tunisia, and Bangladesh. The other Asian, Near Eastern, and North African countries increased their bilateral competitiveness with the United States. However, these competitiveness levels remain low. Of the 12 developing countries examined in this study, Thailand's economy most closely resembles that of the United States.

Development Aid Can Benefit U.S. Trade

The conflict between promoting agricultural development in developing countries and championing U.S. economic and agricultural interests is a perennial problem facing policy officials. The ERS analysis of changing agricultural competitive trade patterns between the United States and the Asian, Near Eastern, and North African nations, however, suggests little cause for alarm.

If Asia, the Near East, and North Africa are to buy more U.S. goods, they must generate additional foreign exchange. The most efficient way to do that is to specialize in economic activities where a natural competitive advantage exists. U.S. development aid programs should encourage production in these industries. For the developing nations of Asia, the Near East, and North Africa, these industries include agriculture, agriculturally linked industries, fishing and forestry, and mining.

Agricultural development aid targeted to countries in Asia, the Near East, or North Africa is likely to have a positive effect on those countries' agricultural imports. Farms are generally small, with lower-than-average incomes. As small-farm incomes increase, a high percentage of additional earnings is spent purchasing more and higher quality food. This often means increased consumption of imported agricultural commodities such as wheat and corn when domestic supplies are being outpaced by increases in domestic demands. ERS data show that the demand for agricultural imports is increasing relative to the demand for nonagricultural imports in Asia, the Near East, and North Africa. ■