

Imports and Jobs – The Observed and the Unobserved

CLIFTON B. LUTTRELL

PLEAS for liberal trade policies are applauded by the leaders of almost all commercial nations. Nevertheless, free trade among nations may be facing its most serious challenge since the adoption of the Hawley-Smoot Tariff Act of 1930. This Act authorized tariff rate increases on more than 800 items and led to numerous retaliations by other nations. Professor Melvin B. Krauss at New York University stated, "In a scenario all too reminiscent of the beggar-thy-neighbor policies of the 1930s, the United States is now threatening to exceed the recent protectionist measures of certain Western European countries . . . under the dubious theory that caving in to protectionist pressures today is necessary to prevent an even greater cave-in tomorrow."¹ The new "protectionism" has produced such nontariff barriers to trade as industrial and employment subsidies, discriminatory Government purchasing practices and safety standards, "voluntary" export quotas, and "orderly" marketing agreements.²

Job Protection — Important Objective of Recent Restrictions

An important factor in the move toward greater protection for American products from foreign compe-

¹Melvin B. Krauss, "Stagnation and the New Protectionism," *Challenge* (January/February 1978), p. 40.

²The United States Department of Agriculture in *National Food Review* (April 1978), p. 32, has, for example, just announced more stringent import rules for filberts and "voluntary" meat import restrictions.

tion has been the alleged job losses caused by such imports. The alleged job losses have led to a shift in attitude toward foreign trade by the major labor union leaders. Before the late 1960s the AFL-CIO had strongly supported relatively free trade policies.³ In 1961 Bert Seidman, economist with the AFL-CIO, contended that unless our country is prepared to pursue a vigorous policy of trade liberalization it may be confronted with three consequences: a decline in our export opportunities, diminished influence in world economic decisions, and a weakening of its political leadership in the free world.⁴

By the late 1960s the attitude of labor leaders on foreign trade policies had changed sharply. Instead of advocating free trade, they had begun to actively oppose tariff reductions, and push for import quotas and other trade restrictive measures. In 1967, for example, labor leaders in the steel industry joined with management in supporting import quotas on steel.⁵

At the hearings on the Trade Reform Act of 1973, labor union opposition to free trade policies was pursued vigorously. AFL-CIO President George Meany, in a lengthy statement before the Senate Committee

³Robert E. Baldwin, "The Political Economy of Postwar U.S. Trade Policy," *The Bulletin*, New York University (1976-4), p. 23.

⁴U.S., Congress, Joint Economic Committee, Subcommittee on Foreign Economic Policy, *Hearings*, Eighty-seventh Congress, First Session, December 4-14, 1961, p. 325.

⁵Baldwin, "The Political Economy of Postwar U.S. Trade Policy," p. 24.

on Finance, opposed both further imports of goods from abroad and exports of farm products, which, he felt, put the nations of the world in competition with the American consumer for food products.⁶ He argued, "The shutdown of manufacturing operations here and their relocation abroad, where low-cost operations are more profitable, depress the whole American economy by the loss of domestic jobs, payrolls, domestic corporate revenues, . . ." An AFL-CIO report, included with Meany's statement, argued that "A tide of imports has wiped out more than a million jobs as products and whole industries have been engulfed."⁷

Hence, labor unions have generally shifted from proponents of free trade policies to supporters of protectionist policies during the past two decades. Protectionist policies, they allege, will protect domestic employees from the loss of jobs resulting from rising imports.

Some industry witnesses at the hearings also used the loss-of-jobs argument in addition to the traditional arguments in support of protectionist policies. Representatives of the steel industry, for example, argued that unrestricted imports almost wiped out many product lines in the specialty steel industry in the 1960s and early 1970s and had an adverse impact on jobs.⁸

Employment Losses from Imports — Readily Observed

The alleged reductions in domestic employment resulting from rising imports are highly visible and readily observed by labor union leaders, workers, and managements of domestic firms which produce goods that are competitive with the imports. The move toward relatively free trade during the 1950s and early 1960s, after a period of protection, had caused some disruptions in the domestic market for

⁶U.S., Congress, Senate, Committee on Finance, *Hearings; The Trade Reform Act of 1973*, Ninety-third Congress, Second Session, March 26-April 3, 1974, pp. 1136-37 and 1144.

⁷*Ibid.*, pp. 1139 and 1168. Other labor leaders making statements in opposition to free trade during the hearings include: I. W. Abel, President of United Steelworkers of America; George Collins of the International Union of Electrical, Radio, and Machine Workers; Leonard Woodcock, President of United Automobile, Aerospace, and Agricultural Implement Workers; and the Communication Workers of America. See *Ibid.*, pp. 1329-70, 1686-93, 857-72, and 2919-23, respectively, for their statements.

⁸See statement by Roger S. Ahlbrandt with Allegheny Ludlum Industries, and by Mark Anthony with Kaiser Steel Corporation, *Hearings; The Trade Reform Act of 1973*, pp. 1055 and 1058, respectively.

a number of goods such as shoes, clothing, and steel mill and blast furnace products where imports are highly competitive with domestic production. Such disruptions caused unemployment for a time and loss of wealth in those industries.

The increases in some major types of goods imported, which are highly competitive with U.S. produced goods, and imports as a percent of total domestic sales are shown in Table I. Imports as a percent of sales of automobiles, footwear, and mineral fuels rose sharply from the average for the 1964-65 period to the average for the 1975-76 period. During the latter period average imports for each of the above goods exceeded nine percent of total domestic purchases.

Rough estimates of the direct impact of imports on employment in these industries with sharply rising imports are shown in Table II. Column 1 indicates the average number of employees in the industries during the two years 1964-65. Column 2 indicates the number of employees that would have been employed by these industries in 1975-76 had the ratio of imports to domestic purchases remained constant, and the level of expenditure on these goods remained unchanged.⁹ The third column contains the actual number of domestic employees in the industries in 1975-76, and the fourth column is the estimated loss of employment resulting from imports (Column 2 minus Column 3).

Actual employment in the automobile industry held constant over the eleven-year period 1964-65 to 1975-76, but the industry experienced a sizable loss of potential employment from rising imports, as the ratio of imports to domestic production rose sharply. On the basis of the calculations in Table II, the number employed by domestic automobile manufacturers in 1975-76 would have been about 67,000 higher had the ratio of imports to domestic purchases remained unchanged. The number of employees would have been about 85,000 higher in mining operations and about 40,000 higher in clothing manufacture had the proportionate rise in these imports not occurred.

⁹This column is calculated as follows:

$$\left[\frac{E}{1-P_{1975-76}} \right] \times [1-P_{1964-65}]$$
 where E is the average number of domestic employees engaged in the production of the good in 1975-76 and P is net imports as a percent of domestic purchases.

Since these calculations were designed to show only the order of magnitude, several simplifying assumptions were made. It was assumed that productivity of workers remained constant, that increased volume of international trade did not affect total consumption, and, in particular, that changes in relative prices had minimal effects on labor usage (see Appendix).

Table I

MAJOR INDUSTRIES WITH RISING COMPETITION FROM IMPORTS

Industry Group	Net Imports			
	1964-65 (annual average)		1975-76 (annual average)	
	Value (million dollars)	Percent of Domestic Purchases*	Value (million dollars)	Percent of Domestic Purchases*
Telecommunications apparatus	\$ -105	-2.3%	\$1,262	8.2%
Automobiles, non-military (new)	249	.9	4,988	9.1
Iron and Steel Mill Products	292	1.3	1,816	4.3
Clothing	355	1.3	2,663	4.3
Footwear	150	2.9	1,481	13.2
Mineral Fuels and Related Materials	2,351	7.6	25,888	16.9

*Percentages calculated as follows: telecommunications apparatus—personal consumption expenditures for radio and television receivers, records, and musical instruments; automobiles—final sales; iron and steel mill products—shipments by blast furnaces and steel mills; clothing—personal consumption expenditures for clothing and accessories, except footwear; and mineral fuels and related materials—one hundred percent less domestic production as a percent of domestic consumption of B.T.U.s of coal, crude petroleum, natural gas, and electricity.

Source: U.S. Department of Commerce, *Statistical Abstract of the United States, 1976 and 1970*; *Business Statistics, 1975*; *The National Income and Product Accounts of the United States 1929-74*; *Overseas Business Reports, "United States Foreign Trade Annual 1970-76," April 1977*; *Survey of Current Business, July 1977*; and *Monthly Energy Review, January 1978*.

These data are readily observable, and to one whose vision is restricted to the production process of these specific industries only, the conclusion follows that the American market must not be opened wide for foreign economic invasion. These data, however, present a highly biased view of the impact of international trade on total domestic employment, overstating the depressive impact. Employment actually declined in only a few industries which experienced rising competition from imports; namely, blast

furnace and basic steel, clothing, and footwear, but only a portion of the decline in these industries can be attributed to rising imports. In blast furnace and basic steel product industries, for example, total employment declined by 97,000 workers (Table II), but there was only a moderate increase in imports of the products by these industries (from 1.3% to 4.3% of domestic purchases). Hence, on the basis of these calculations, only about 17,000 of the decline can be attributed to rising imports. Most of the decline in

Table II

NUMBER OF EMPLOYEES IN DOMESTIC INDUSTRIES WITH RISING COMPETITION FROM IMPORTS AND JOBS LOST IN THESE INDUSTRIES FROM IMPORTS

Industry Group	(thousands)			
	(1)	(2)	(3)	(4)
	Actual Number 1964-65 (annual average)	Number Required for 1975-76 Purchases Assuming No Change in Percentage Imported	Actual Number 1975-76 (annual average)	Estimated Loss from Increased Imports ¹
Radio and TV receiving equipment	124	139.3	125	14.3
Automobiles ²	743	809.0	742	67.0
Blast furnaces and basic steel products	641	561.0	544	17.0
Iron and steel foundries	220	227.9	221	6.9
Clothing ³	1,332	1,306.7	1,267	39.7
Footwear, except rubber	236	185.7	166	19.7
Mining ⁴	634	849.5	764	85.5
Total	3,930	4,079.1	3,829	250.1

¹Assumes no change in 1964-65 ratio of imports to domestic purchases, and that the number of employees per dollar value of imports are the same as the number per dollar value of domestic production.

²Automobile to total transportation employees assumed to be in same ratio as value of automobile output to manufacturer's sales of all transportation equipment.

³Total apparel and other textile products.

⁴Includes oil and gas extraction plus metal, coal, and nonmetallic mining.

Source: U.S. Department of Commerce, *Statistical Abstract of the United States, 1976 and 1965*; *Employment and Earnings, United States, 1909-75*; *Employment and Earnings, March 1977 and March 1976*; *Survey of Current Business, July 1977*; and *Business Statistics, 1975*.

Table III

MAJOR INDUSTRIES WITH SIZABLE GAINS IN NET EXPORTS

	Net Exports			
	1964-65		1975-76	
	Annual Average (million dollars)	Percent of Domestic Production*	Annual Average (million dollars)	Percent of Domestic Production*
Transport equipment other than new automobiles	\$2,248	4.9%	\$ 8,981	10.0%
Nonelectrical machinery	4,052	10.9	14,693	14.1
Chemicals	1,648	4.6	5,091	5.3
Food and live animals	566	1.7	6,212	8.0
Soybeans and textile fibers	906	19.8	4,264	38.8
Professional, scientific, photo, and controlling instruments	240	3.4	1,019	4.3
Textiles other than clothing	-188	-1.1	371	1.1

*Basis for domestic production as follows: manufacturers' sales for transport equipment other than new automobiles, nonelectrical machinery, chemicals, professional, scientific, photo, and controlling instruments, and textiles other than clothing; cash receipts from farm marketings of livestock and products plus cash receipts from farm marketings of crops less cotton (lint and seed), oil-bearing crops, and tobacco for food and live animals; and cash receipts from farm marketing of cotton (lint and seed) and oil-bearing crops for soybeans and textile fibers.

Source: U.S. Department of Commerce, *Overseas Business Reports*, "United States Foreign Trade Annual 1970-76," April 1977; *Statistical Abstract of the United States, 1970*; *Survey of Current Business*, July 1977; *Business Statistics, 1975*; and *The National Income and Product Accounts of the United States, 1929-74*; U.S. Department of Agriculture, *Farm Income Statistics*, July 1977.

employment in this industry was the result of such factors as rising efficiency of production or declining domestic demand for iron and steel mill products. Similarly, only 20,000 of the total decline of 70,000 workers in footwear can be attributed to the competitive pressure of imports. Only in the clothing industry can a major portion of the actual decline in employment be attributed to rising imports, and the loss here was less than 5 percent of total employment in the industry.

General Effects of Foreign Trade on Employment Same as Domestic Trade

The general effect of foreign trade on employment is no different from that of domestic trade. For example, a reduction in the tariff barriers imposed on new automobiles from Japan will have about the same impact on total employment in the United States as would the emergence of a new, more efficient automobile manufacturing firm in the United States. Assuming no growth in demand for automobiles, suppose, for example, that imports from Japan rise from zero to ten percent of domestic automobile sales. Employment in automobile production in the United States will decline and such employment in Japan will rise. Imports into the United States, however, increase the dollar holdings in Japan which will eventually be spent in the United States. Total demand for U.S. goods and services will thus remain unchanged.¹⁰ Hence, the employment lost through

¹⁰Of course, this adjustment is not immediate and a sudden change in the international competitive situation would result

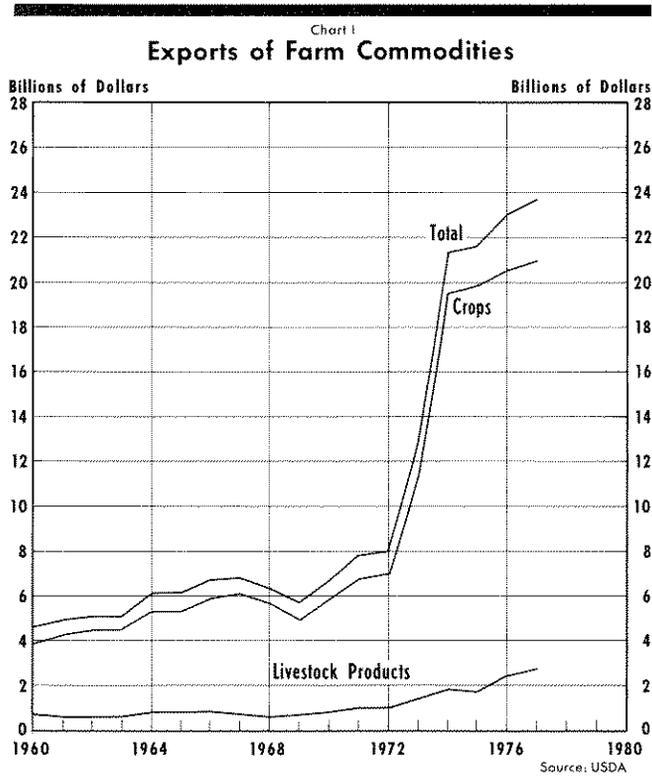
rising imports of automobiles will be gained through rising exports of other goods and services after all adjustments are made to the new demand patterns.

Similarly, if a new automobile manufacturing firm is established in Springfield, Missouri, with new plants in the vicinity manufacturing automobiles which account for ten percent of U.S. sales, the older automobile firms will lose a substantial number of workers as they would in the case of rising imports. The new firm will, in turn, employ new workers, they will spend their incomes, and total employment in the economy will not fall as much as the reported decline at the older automobile manufacturing firms.

Unobserved Employment Gains Offset Observed Losses

Offsetting the observed employment losses in some industries attributed to free trade are the sizable gains in sales and employment in other industries which can likewise be attributed to free trade. When foreigners sell us goods and services, they gain purchasing power which eventually leads to a rise in employment in our export industries. Major gains have occurred in employment since 1964-65 in a number of industries as a result of rising exports. Among

in substantial general unemployment which could last for some time. The experience in the United States since the oil embargo is a case in point. This is a problem of adjustment in the labor market which takes time, but is not reflective of a general decrease in demand for U.S. output. For a more comprehensive discussion of the impact of imports on unemployment, see Geoffrey E. Wood and Douglas R. Mudd, "The Recent U.S. Trade Deficit — No Cause for Panic," this *Review* (April 1978), pp. 2-7.



those industries with a rising proportion of total sales abroad are transport equipment other than automo-

biles, nonelectrical machinery, chemicals, scientific instruments, and farm products. Exports rose in these industries, both in absolute amounts and relative to domestic production. Net exports (exports less imports) in transport equipment other than automobiles, for example, rose from an average of 4.9 percent of domestic production in 1964-65 to 10 percent in 1975-76 (Table III).

Greatest gains relative to production during the period occurred in the agricultural sector. Total exports of farm products rose from a \$6.1 billion average per year for 1964-65 to \$22.3 billion for 1975-76 (Chart I). During the period exports of food and live animals rose from 1.7 to 8 percent of domestic sales, and exports of soybeans and textile fibers (largely cotton) rose from 20 to 39 percent. Exports of all farm products rose from an average of 16.4 percent of domestic sales (cash receipts) in 1964-65 to an average of 24.5 percent in 1975-76 (Chart II).

The impact of rising farm exports on farm production cannot be measured with precise accuracy since weather and other factors have a major influence on crop yields. However, the evidence indicates that rising exports have had a major impact on crop prices and production. As indicated in Chart I, crop exports rose moderately in 1971 and 1972 and increased

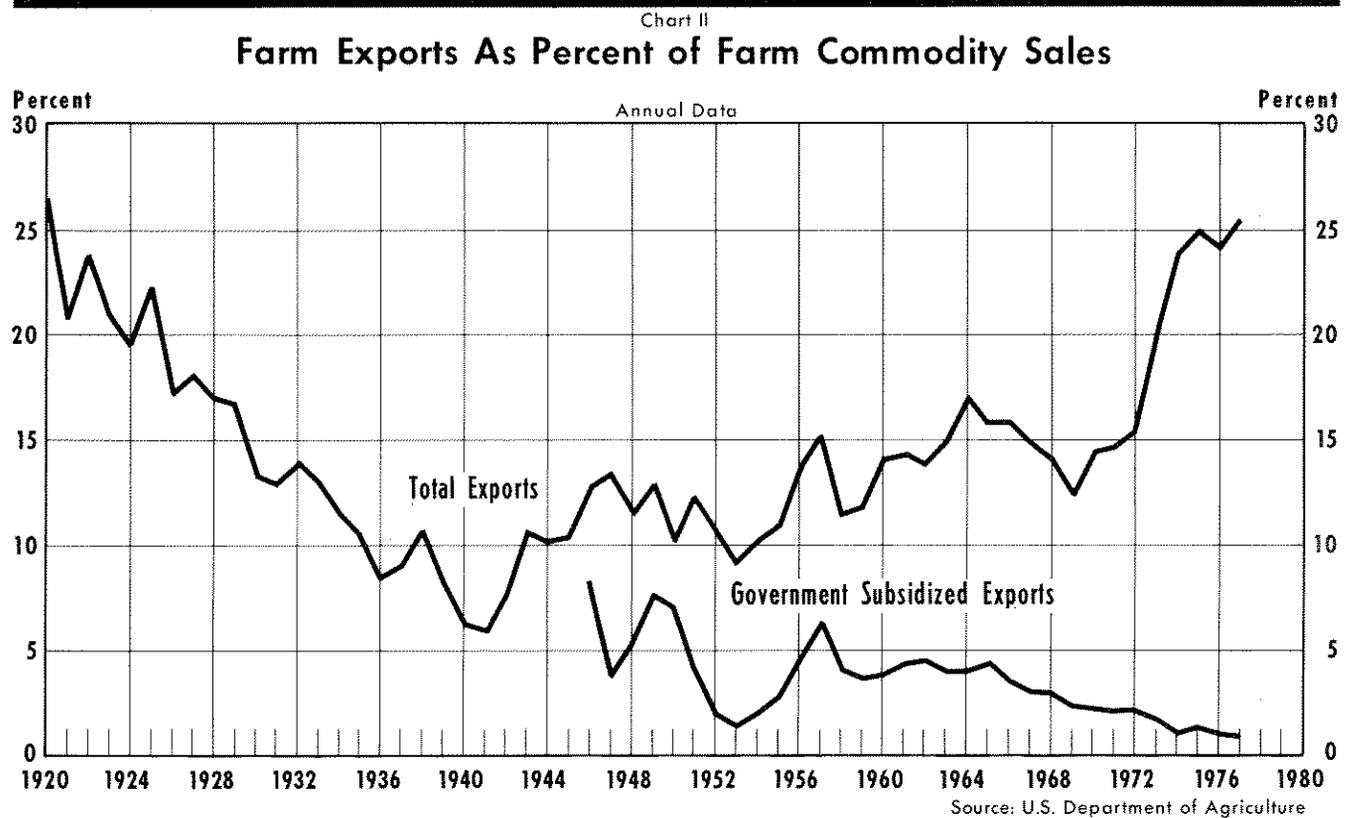
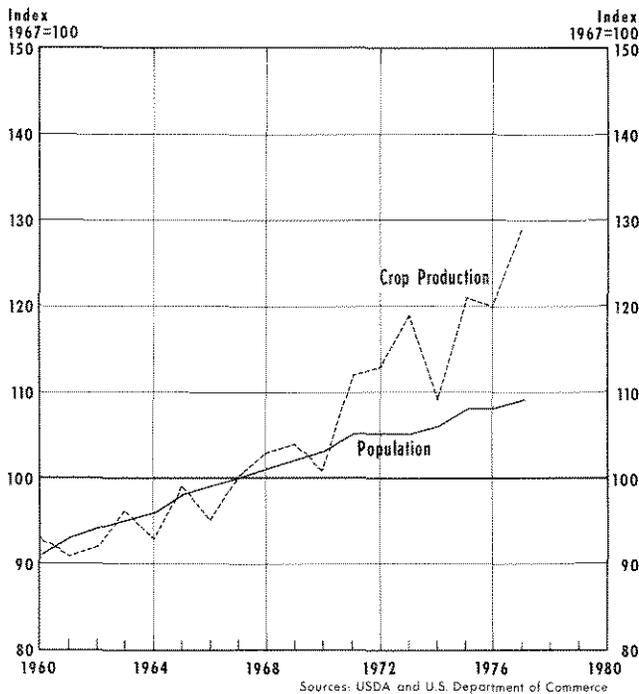


Chart III
United States Population and Crop Production Trends



sharply in 1973 and 1974. Crop production generally had been rising at about the same rate as population growth from 1960 through 1970. In 1971, however, the rate of crop production growth accelerated, consistent with the rising exports. Following a temporary decline in 1974 as a result of the worst crop growing weather in three decades, crop output continued up at a rate well above that of population growth (Chart III). During the seven-year period 1970-77 population rose at a compound annual rate of one percent per year while crop production rose four percent per year. By 1977 exports accounted for 60 percent of U.S. soybean production, 55 percent of rice production, 40 or more percent of wheat and cotton production, and about 30 percent of corn, grain sorghum, and tobacco production.¹¹

The estimated gain in direct employment resulting from the rise in exports of a selected group of commodities is shown in Table IV. Calculated in the same manner as its counterpart, Table II, this table shows the average actual employment in the respective industries for the years 1964-65 (column 1), the level of 1975-76 employment had exports remained the same percent of production as in the earlier period (column 2), the actual number of employees in

1975-76 (column 3), and the estimated gain in direct employment attributed to the rise in exports (column 4) (see Appendix).

While farm employment during the period actually declined from 4.4 million to 3.3 million, the number of farm employees would have been only 3.1 million in 1975-76 if farm commodity exports had not risen. Hence, about 236,000 workers in this sector can be attributed to the rise in exports.

This increased farm employment as a result of rising farm exports, however, was not observed by some of the nation's labor union leaders. The failure to appreciate the impact of rising farm exports on employment is indicated by the statement by I. W. Abel, President, United Steelworkers of America: "It is most frightening when the Secretary of the Treasury, Secretary of State, and the Administration's Executive Director of International Economic Policy agree before this Committee that our chief export five years from now will be agricultural products. Are we regressing to the status of a developing nation?"¹² This implication, that the highly sophisticated U.S. farm sector is at the same stage of development as the so-called developing nations, fails to comprehend the commercial nature of U.S. agriculture and its impact on the rest of the economy. Much of the farming sector of the developing economies is of the traditional self-sufficient type. Few farm resources are purchased from the nonfarm sector and few non-farm employees are engaged in the production of capital goods or current inputs used for farm production purposes.

In contrast to the self-sufficient type of agriculture in the developing economies, agriculture in the United States is composed of highly commercial firms. Cash expenditures for hired labor, capital, and operating goods used for farming totaled \$82 billion in 1976, more than four-fifths of total farm cash receipts. About \$42 billion of the above expenditures were for goods and services produced in the nonfarm sector. These expenditures were for such items as tractors, combines, other farm machinery, farm building materials, fertilizer, and other items the production of which requires nonfarm labor. These purchases resulted in part from the sharp increase in farm commodity exports. Such exports thus had a major indirect impact on nonfarm employment, another unobserved gain from free trade.

Employment increases attributed directly to rising exports, in just these selected industries with in-

¹¹U.S. Department of Agriculture, 1977 *Handbook of Agricultural Charts*, Agriculture Handbook No. 524, p. 65.

¹²Hearings; *The Trade Reform Act of 1973*, p. 1175.

Table IV

NUMBER OF EMPLOYEES IN INDUSTRIES WITH SIZABLE GAINS IN NET EXPORTS

(all employees, thousands)

Industry Group	(1) Actual Number of Employees, 1964-65 (annual average)	(2) Number of Employees in 1975-76 Assuming 1964-65 Levels of Exports	(3) Actual Number of Employees, 1975-76 (annual average)	(4) Estimated Gain in Direct Employment from Increased Exports
Transport equipment other than new automobiles ¹	939	905.0	949	44.0
Nonelectrical machinery	1,674	2,013.9	2,072	58.1
Chemicals	893	1,016.2	1,023	6.8
Food, live animals, soybeans, and textile fibers ²	4,442	3,103.1	3,339	235.9
Professional, scientific, photo, and controlling instruments	379	494.7	499	4.3
Textiles other than clothing	912	913.6	934	20.4
Total	9,239	8,446.5	8,816	369.5

¹Automobile to total transportation employees assumed to be in same ratio as value of automobile output to manufacturers' sales of transportation equipment.

²Total farm employment. Tobacco employment, a small percent of the total, is not excluded because of inavailability of data.

Source: U.S. Department of Commerce, *Statistical Abstract of the United States, 1976 and 1965*; *Employment and Earnings, March 1977*; *Survey of Current Business, July 1977*; and *Business Statistics, 1975*.

creases in net export sales during the period from 1964-65 to 1975-76, totaled 369,000 workers. These workers are the "unobserved gains" in employment resulting from the rise in foreign trade. Such unobserved gains in employment at least equaled the losses in other industries observed by the free trade opponents.

Unobserved Gains in Real Goods — The Only Real Benefit from Trade

Also important is the impact of foreign trade on the quantity and quality of goods available for consumers. Transactions among nations result in gains to both parties in the transactions. The gains occur as a result of the improvement in total output from the greater specialization of resources. The gains can be demonstrated with a simple example using two countries — the United States and Taiwan — and some hypothetical cost of production figures for traded commodities. In the United States the cost of resources used in producing a tractor is, say, \$20,000 and the cost of producing a pair of shoes is \$25, while in Taiwan the cost of producing a tractor is \$25,000 and the cost of producing a pair of shoes is \$20. If each nation attempts to produce both 20 tractors and 20,000 pairs of shoes, the tractors and shoes will cost \$900,000 in both countries in terms of resources foregone.

Costs of Production

	United States		Taiwan*	
	Cost Per Unit	Total Costs	Cost Per Unit	Total Costs
20 tractors	\$20,000	\$400,000	\$25,000	\$500,000
20,000 pairs of shoes	\$25	\$500,000	\$20	\$400,000
TOTAL		\$900,000		\$900,000

*Dollar costs at current exchange rates. These calculations assume a constant rate of exchange between U.S. and Taiwan money.

Through specialization and with the same quantity of resources used in production, more of both types of goods will be available in each nation. This is possible since each nation will be utilizing its resources for the production of the good where it has greatest relative advantage — tractors in the United States and shoes in Taiwan — and exchanging these goods.

Costs of Production

	United States	Taiwan
45 tractors	\$900,000	—
45,000 pairs of shoes	—	\$900,000
TOTAL	\$900,000	\$900,000

On this basis, U. S. producers of tractors can exchange 22 tractors (\$440,000 cost of resources expended) for 22,000 pairs of shoes (\$440,000 expended by Taiwan producers). Hence, for the \$900,000 in resources foregone U.S. producers will have 23 tractors plus 22,000 pairs of shoes. Taiwan will likewise gain, having available 22 tractors and 23,000 pairs of shoes. Hence, with specialization and trade each nation was able to realize a gain of more than ten percent in real goods available for its use. In other words, with greater specialization and free exchange through foreign trade, each country obtains more goods for a given cost.

The gains from trade may still occur even though one nation has an absolute advantage over another in the production of all goods. Trade between the nations will still be mutually advantageous if one has a greater relative advantage in the production of some particular goods. Both nations will gain by specializing in the production of the goods where they have the greatest relative advantage or least relative disadvantage and exchanging the goods with each other.

Summary

In summary, the job losses in some industries as a result of reduced trade barriers are highly visible. Many of the nation's businessmen and labor union leaders have reported job losses in their sectors from free trade, and concluded that such trade produces a decline in total domestic employment. As a consequence, such leaders have combined forces in the affected industries in opposition to free trade.

Free international trade, however, will not permanently reduce overall employment. Trade is not a unidirectional affair. Movement in the exchange rate

between the dollar and other currencies is the balancing mechanism in trade. If U.S. imports rise, we pay for them in dollars which must eventually be used to purchase our exports. Movement in the exchange rates will equalize such payments. If U.S. demand for foreign goods (imports) rises relative to foreign demand for U.S. goods (assuming no change in capital movements), the exchange value of the dollar will decline, making our goods less expensive to foreigners and their goods more expensive to us. Hence, any temporary tendency for industries facing increased foreign competition to reduce employment will likely be offset by the stimulative effects of a falling dollar exchange rate on industries with rising exports.

The data in this analysis illustrate the view that employment gains from freeing up trade have offset the employment losses. Sharp gains have occurred in direct employment in a number of industries having sizable gains in net exports. In other industries, such as agriculture, the number of employees is well above what it would have been without the rise in exports. The rise in farm commodity exports thus prevented a further decline in farm employment. These unobserved increases in employment resulting from freer trade in this analysis have offset the observed losses. Hence, international trade has not contributed to overall unemployment.

Such trade has contributed to major real gains in well-being which are also difficult to observe. The real gains occur through the greater specialization of resources and the larger volume of goods resulting from the use of a given quantity of resources. Through this process of specialized production and exchange, more goods are available to all nations and at less cost than would be available with trade restrictions.

APPENDIX

The calculations presented in Tables II and IV are rough estimates of the effect of international trade on domestic employment in several industries. These estimates are intended to show orders of magnitude.

The estimates presume that changes in spending reflect only changes in *quantity* of output and thus are biased to the extent the prices of domestically produced goods change relative to those of foreign goods. This bias works, however, to give underestimates of both job gains and

losses, and thus does not reduce the validity of the analysis.

The measure of loss or gain is given by

$$\begin{aligned} N^* - N > 0 & \quad (\text{job loss}) \\ N^* - N < 0 & \quad (\text{job gain}) \end{aligned}$$

where N is the actual employment in a particular industry in 1975-76, N^* is the employment that would result in that industry in 1975-76 if the proportion of imported output had remained at the ratio of 1964-65 (Column 2 in Tables II and IV).

The correct measure of N^* , given the assumptions used in the article, is given by:

$$(1) \quad N^* = N \cdot \frac{(1 - \rho_0)}{(1 - \rho_1)}$$

where ρ_0 is the proportion of domestic consumption (in *real* terms) accounted for by imports in 1964-65 and ρ_1 is the proportion for 1975-76. The form used in this study defines these proportions in terms of the ratio of imports to domestic consumption in *nominal* terms.

The bias that is introduced by using nominal variables can be seen by transforming equation (1) to logarithmic form:

$$\frac{\text{Real variables}}{\ln N^* = \ln N + \rho_0 (q^f - q^d)}$$

$$\frac{\text{Nominal variables}}{\ln N^* = \ln N + \rho_0 (q^f - q^d) + \rho_0' (p^f - p^d)}$$

where (q^f) is the rate of change of imported output, (q^d) is the rate change of domestic output, (p^f) is the rate of

change of import prices, (p^d) is the rate change of domestic prices, and (ρ_0') is the ratio of imports to domestic spending in *nominal* terms in 1964-65.

The two results differ only by the term $\rho_0' (p^f - p^d)$ which is the measure of relative rate of price change of imported *vs.* domestically produced goods, all in dollar terms.

In the case where domestic prices rise faster than import prices, imports are stimulated and domestic jobs are lost. The term $\rho_0' (p^f - p^d)$ would then be negative and lead to an underestimate of N^* and thus an understatement of the job loss ($N^* - N$).

In the case where foreign prices rise faster than domestic prices, exports are stimulated and domestic employment rises. Thus N will be greater than N^* , showing a gain of jobs. However, the term $\rho_0' (p^f - p^d)$ will be positive, biasing the measure of N^* upward and thus giving an underestimate of the difference between N and N^* .

