FEDERAL RESERVE BANK OF ST. LOUIS

JUNE 1978

REVIEW

CONTENTS

Imports and Jobs — The Observed and the Unobserved 2

Benchmark Revisions of the Money Stock and Ranges of Money Stock Growth 11

Vol. 60, No. 6

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 competition 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

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

[2]The 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.

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

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

[5]Baldwin, "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 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.

---

[6]U.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.

[8]See 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.

[9]This column is calculated as follows:

$$\left[\frac{E}{1\text{-}P_{1975\text{-}76}}\right] \times [1\text{-}P_{1964\text{-}65}]$$

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) Value (million dollars)	1964-65 Percent of Domestic Purchases*	1975-76 (annual average) Value (million dollars)	1975-76 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

(thousands)

Industry Group	(1) Actual Number 1964-65 (annual average)	(2) Number Required for 1975-76 Purchases Assuming No Change in Percentage Imported	(3) Actual Number 1975-76 (annual average)	(4) 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

[1]Assumes 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.

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

[3]Total apparel and other textile products.

[4]Includes 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 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.

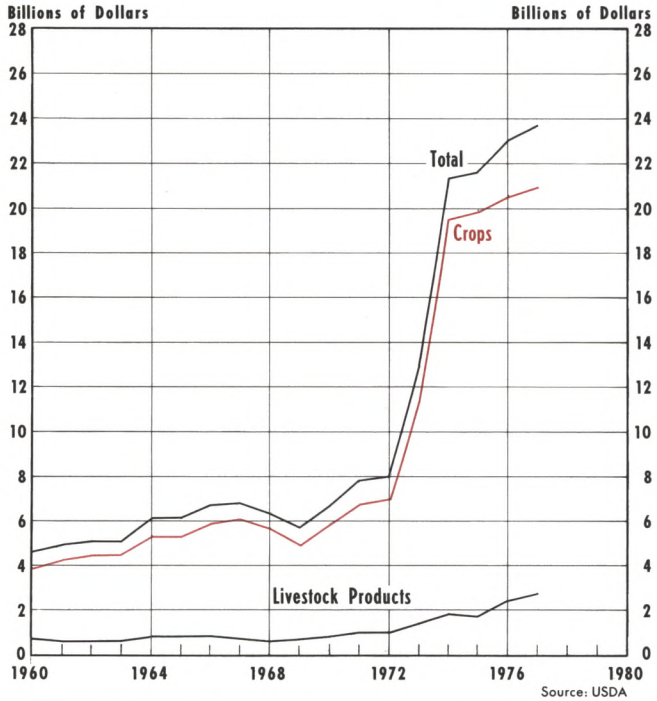
Unobserved Employment Gains Offset Observed Losses

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

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

Chart I

Exports of Farm Commodities



those industries with a rising proportion of total sales abroad are transport equipment other than automobiles, 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 II

Farm Exports As Percent of Farm Commodity Sales

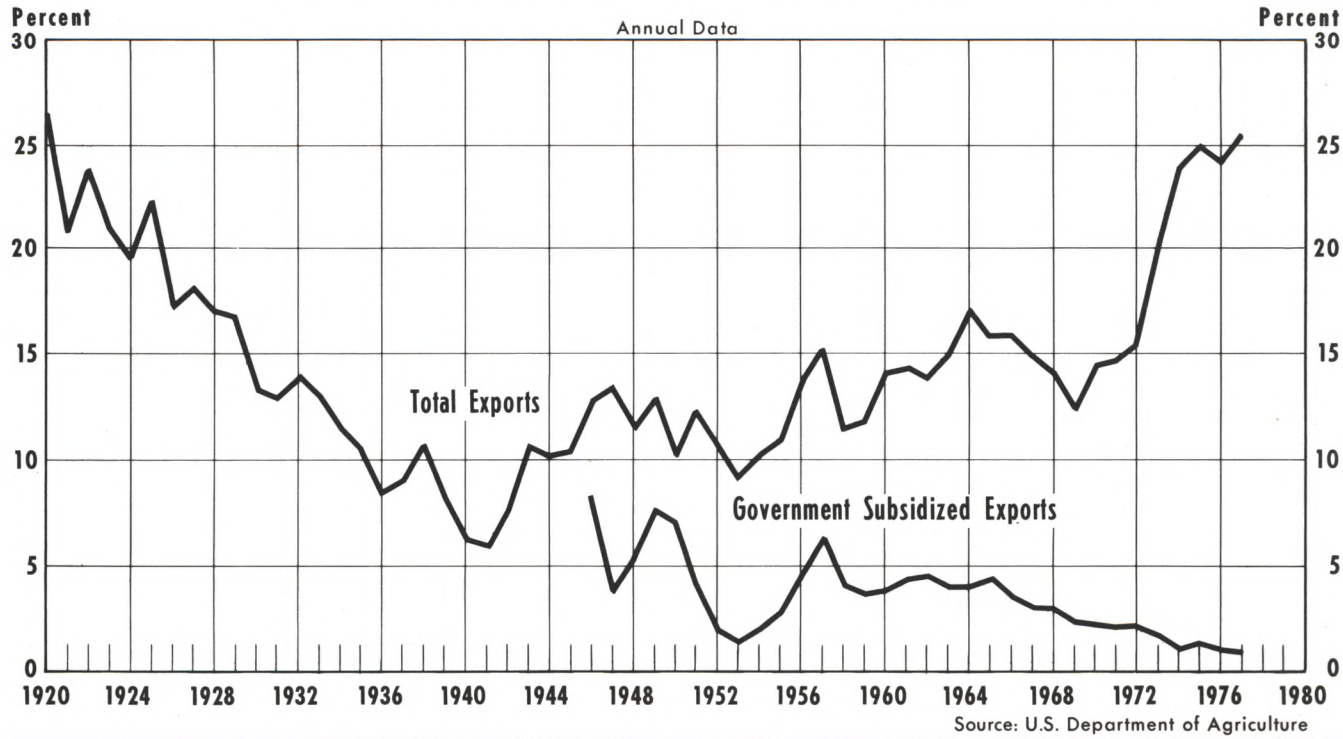
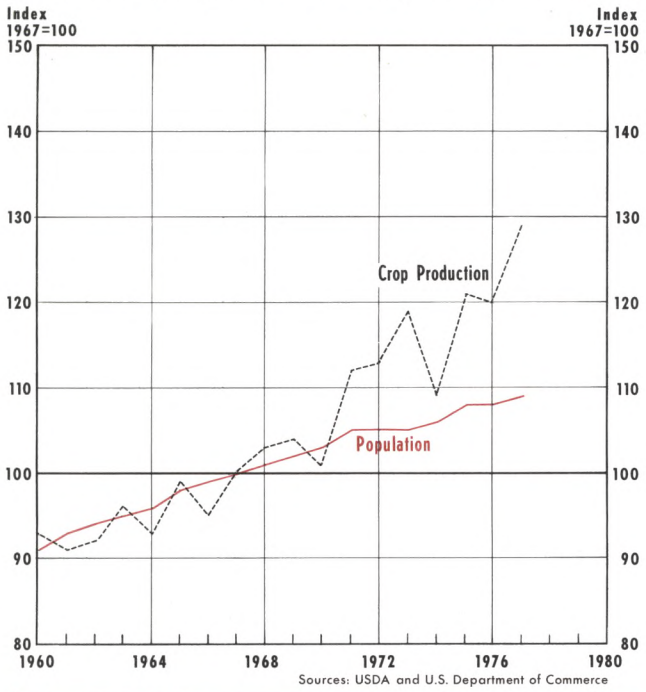


Chart III

United States Population and Crop Production Trends



Sources: USDA and U.S. Department of Commerce

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-

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

[12] *Hearings; 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

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

[2]Total 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

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

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:

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

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:

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

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^*.

Benchmark Revisions of the Money Stock and Ranges of Money Stock Growth

RICHARD W. LANG

WEEKLY data on the monetary aggregates since 1973 have been revised usually three or four times each year by the Board of Governors of the Federal Reserve System. These frequent revisions are made to incorporate "benchmark" adjustments to the components of the weekly monetary aggregates that are estimated for banks which are not members of the Federal Reserve System.

Data on deposits and vault cash for these nonmember banks are available only for a few dates each year and weekly data between these dates must be estimated. Initial estimates of nonmember bank deposits and vault cash are subsequently revised as more information becomes available, in order to "benchmark" the estimated weekly data to the few weeks of actual nonmember bank data.[1]

The most recent benchmark revision of the monetary aggregates was made on March 23, 1978.* Due to longer than usual delays in processing reports from nonmember banks, this revision incorporated nonmember bank data from four, rather than from one or two, reporting periods. This revision resulted in a $1.3 billion increase in the narrowly-defined money stock (M1) at the end of 1977 — a figure which appears to be quite large. The change in the level of the money stock resulted, however, in less than a one-half percentage point change in the growth rate of M1 during 1977.

This article explains how benchmark revisions of money stock data are made and examines their effects on rates of money growth relative to the Federal Reserve's ranges. Benchmark revisions generally have resulted in relatively small changes in either short- or long-run rates of money growth compared with the ranges set by Federal Reserve policymakers. Whether or not benchmark revisions would have a more significant effect on money growth rates in the event that bank membership in the Federal Reserve System continues to decline remains an open question.

NONMEMBER BANKS AND MONEY STOCK DATA

Although the basic definition of the narrowly-defined money stock (M1) seems quite straightforward — M1 is the sum of private demand deposits at all commercial banks plus currency and coin held by the nonbank public — the actual construction of weekly M1 data is more complicated. As shown in Table I, not only are a number of adjustments made to obtain the currency and demand deposit components of M1, but a number of these items must be estimated as well. Two of the estimated items important to the construction of M1 are demand deposits and vault cash of nonmember banks. These items must be estimated to obtain a weekly series on M1 since actual nonmember bank data on deposits and vault cash are only available for, at most, four weeks each year.

Banks which are members of the Federal Reserve System make weekly reports of selected assets and liabilities to the Federal Reserve Bank in their district in order for the Federal Reserve to verify their holdings of required reserves. These balance sheet data are used to construct the member bank items which are included in the money stock (Table I). Although member banks make up less than half of the about 14,700 commercial banks in the United States (Table II), they hold about 73 percent of the total deposits in the banking system (Table III). Consequently, member bank data comprise the largest portion of the weekly M1 numbers.

Banks which do not belong to the Federal Reserve System must meet reserve requirements of the various

---

[1]Since monthly data is constructed from weekly data, these revisions affect monthly data as well. Weekly deposit data for nonmember banks around call report dates have been available only since March 1976. Prior to that date, single-day call report data was used.

*As this article was going into print, another benchmark revision was announced on June 22, 1978.

Table I

Construction of M1

Amounts in millions of dollars; monthly averages, not seasonally adjusted

Line, item	Contribution to M1, December 1974	Source of data
1. Currency in circulation	78,933	Daily data reported by F.R. Banks and Treasury Dept.
2. Less: Member bank vault cash	7,488	Daily data reported by all member banks.
3. Nonmember bank vault cash	2,399	Estimated, based on member banks and call report data.
4. Equals: Currency component of M1	69,046	
5. Demand deposits at member banks[1]	151,315	Daily data reported by all member banks.
6. Less: F.R. float	2,732	Daily data reported by F.R. Banks.
Plus:		
7. Demand deposits at nonmember banks[1]	57,954	Estimated, based on daily data reported by small member banks and call report data.
8. CIPC associated with foreign agency and branch transfers	3,519	Daily data reported by foreign-related institutions in New York City.
9. Demand deposits due to foreign commercial banks	6,004	Estimated, based on single-day (Wednesday) data for large banks and call report data for other banks.
10. Demand deposits due to mutual savings banks	1,124	Estimated, based on single-day (Wednesday) data for large banks and call report data for other banks.
11. Demand deposits due to banks in territories and possessions	116	Estimated, based on call report data.
12. M1-type balances at foreign-related institutions in New York City	4,356	Estimated, based on last-Wednesday-of-month reports.
13. Deposits due to foreign official institutions at F.R. Banks	568	Daily data reported by F.R. Banks.
14. Equals: Demand deposits component of M1	222,224	
15. Money stock (M1) — currency plus demand deposits adjusted	291,270	

[1]Gross demand deposits less demand deposits due to the U.S. Govt., interbank deposits, and CIPC (cash items in process of collection).

Source: *Improving the Monetary Aggregates: Report of the Advisory Committee on Monetary Statistics* (Bach Committee), Board of Governors of the Federal Reserve System (June 1976), p. 22.

state banking authorities, and generally file extensive reports on their assets and liabilities only on a few dates each year.[2] For example, nonmember banks insured by the Federal Deposit Insurance Corporation (FDIC) are required to file Reports of Condition (call reports) with the FDIC four times each year. Call reports are filed at the end of March, June, September, and December. Balance sheet data from these call reports are forwarded to the Federal Reserve by the FDIC, usually after a delay, and are then used in the construction of M1.[3]

Nonmember banks which are not insured by the FDIC (noninsured nonmember banks) file Reports of

Table II

Number of Commercial Banks

End of Period December 31	Member Banks	Nonmember Banks		
		Total	FDIC Insured	Non-insured
1960	6174	7300	6948	352
1965	6221	7583	7320	263
1970	5767	7919	7735	184
1975	5787	8846	8585	261
1976	5758	8914	8639	275
1977[1]	5720	8998	8705	293

[1]Call report of June 30, 1977

Source: Federal Reserve *Bulletin*

[2]For a listing of state reserve requirements and their reporting periods, see R. Alton Gilbert and Jean M. Lovati, "Bank Reserve Requirements and Their Enforcement: A Comparison Across States," this *Review* (March 1978), pp. 22-32. The reports discussed by Gilbert and Lovati are not generally "Reports of Condition" such as are filed by insured banks with the FDIC.

[3]"Improving the Monetary Aggregates: Report of the Advisory Committee on Monetary Statistics" (Bach Committee), Board of Governors of the Federal Reserve System (June 1976), p. 29. Prior to 1973, only the June and December call reports were sufficiently detailed to be used to revise nonmember bank data. See Darwin Beck and Joseph Sedransk, "Revision of the Money Stock Measures and Member Bank Reserves and Deposits," Federal Reserve *Bulletin* (February 1974), p. 84.

Table III

Distribution of Commercial Bank Deposits

End of Period December 31	Total Deposits[1]	Percent of Total Deposits Held By: Member Banks	Nonmember Banks	FDIC Insured Nonmember Banks	Noninsured Nonmember Banks
1960	$229,843	84.0%	16.0%	15.4%	0.6%
1965	332,436	82.9	17.1	16.5	0.6
1970	481,745	80.0	20.0	19.5	0.5
1975	786,532	75.1	24.9	23.5	1.4
1976	838,335	73.8	26.2	24.6	1.6
1977[2]	862,031	73.0	27.0	25.3	1.7

[1]Millions of dollars

[2]Call report of June 30, 1977

Source: Federal Reserve *Bulletin*

Condition with their respective state banking authorities in accordance with individual state requirements. In general, such call reports are filed twice a year — at the end of June and December. Balance sheet data on these noninsured nonmember banks are also collected by the Federal Reserve for use in constructing M1.[4]

FDIC-insured nonmember banks comprise the majority of nonmember banks, both in terms of numbers and in terms of deposits (Tables II and III). There were only 293 noninsured nonmember banks as of June 30, 1977, which accounted for less than 2 percent of the total deposits in the banking system. Thus, the four call reports filed by nonmember banks insured by the FDIC provide the majority of the nonmember bank data used in the construction of M1.

However, since these call reports cover selected balance sheet data only for the one-week period surrounding each call report date, insured nonmember bank data are known only four weeks out of each year.[5] Noninsured nonmember bank data are known even less often — only twice each year. Consequently, weekly data on nonmember bank demand deposits and vault cash must be estimated between call report dates in order to obtain weekly M1 numbers.

ESTIMATION OF NONMEMBER BANK ITEMS

Deposits

Between call report dates, weekly data on nonmember bank demand deposits are estimated using a subset of generally smaller member banks which prior to November 1972 were classified as "country banks."[6] Deposit data are available with a one- to two-week delay for these smaller member banks. Weekly estimates of nonmember bank demand deposits are obtained by multiplying the smaller member bank demand deposits for a particular week by the estimated ratio of nonmember bank demand deposits to smaller member bank demand deposits.[7] These estimated ratios are based on the actual ratio of nonmember bank demand deposits to smaller member bank demand deposits as of the call report dates. However, due to the delays in the processing of call report data, there are generally at least three estimates of the same set of weekly nonmember bank deposit data.

For example, consider the estimation of nonmember bank demand deposits for the last week of July.[8] The estimated ratio of nonmember bank demand deposits to smaller member bank demand deposits for the last week in July is based on a linear interpolation between the ratios of these deposits for the two call report dates surrounding the last week of July (see Figure I). These two call reports are the end-of-June and the end-of-September call reports.

At the time that the July data for member banks become available, however, the September call report has yet to be collected while the data from the

[4]"Improving the Monetary Aggregates," pp. 28-29.

[5]Prior to March 1976 the call reports filed with the FDIC required balance sheet data for only one day — the date of the call report — rather than for the week surrounding the call report date.

[6]Prior to November 1972, member banks were classified as either "reserve city" or "country" banks. The "reserve city" category included primarily large banks in financial centers which were subject to higher required reserve ratios on demand deposits than were "country" banks. The "country bank" category included all other banks, whether they were in urban or rural areas, regardless of size. See "Recent Regulatory Changes in Reserve Requirements and Check Collection," Federal Reserve *Bulletin* (July 1972), p. 628.

[7]That is:

$$\text{Estimated weekly nonmember bank demand deposits} = (\text{Weekly smaller member bank demand deposits}) \times (\text{Estimated weekly ratio})$$

where the

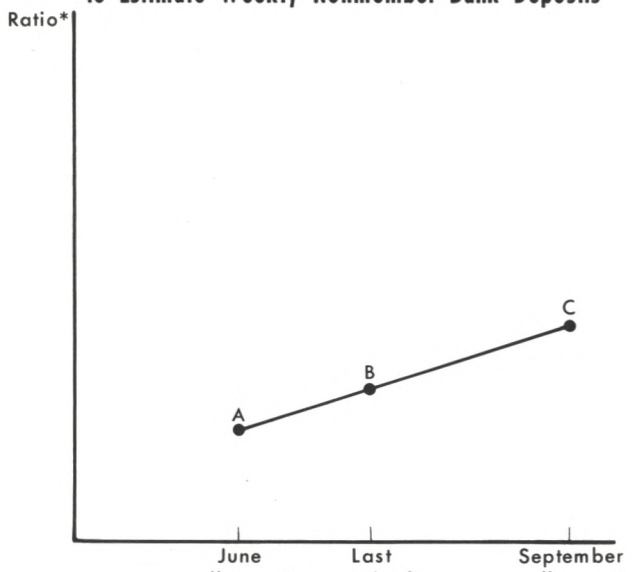
$$\text{ratio} = \frac{(\text{Nonmember bank demand deposits})}{(\text{Smaller member bank demand deposits})}$$

is estimated from the actual ratios as of call report dates. "Improving the Monetary Aggregates," p. 29.

[8]Weekly time deposit data for nonmember banks, which are used in constructing M2, are estimated in the same way as nonmember bank demand deposits.

Figure I

Illustration of Linear Interpolation of Ratio Used to Estimate Weekly Nonmember Bank Deposits



*Nonmember Bank Demand Deposits divided by Smaller Member Bank Demand Deposits.

June call report have not been processed.[9] The delay between the call report date and the release of money stock revisions has generally been four to seven months during the past few years (see Table IV). Consequently, for the June and September call report dates, the ratio of nonmember bank demand deposits to smaller member bank demand deposits is initially estimated by using a regression equation.[10] The ratio for the last week of July is a linear interpolation between the estimated June and September ratios (see Figure I). This ratio is multiplied by smaller member bank demand deposits for the last week of July to obtain the first estimate of nonmember bank demand deposits for that week.

[9]Processing the call report data takes a long time for a number of reasons. First, the FDIC usually forwards the data to the Federal Reserve with a two-month delay. Second, the data must be edited to check for incorrect filing of reports and omissions of data. Third, the data must be used to re-estimate the ratios used in estimating the weekly data.

[10]The regression equation makes the ratio a function of linear and quadratic time trends and the 3-month Treasury bill rate.

$$\text{Ratio} = a_0 + a_1 t + a_2 t^2 + a_3 \text{TBR} + e$$

where

t = time
TBR = 3-month Treasury bill rate
e = error term

Predicted values of the ratio for future call report dates based on this regression equation may be judgmentally adjusted as well. See Beck and Sedransk, "Revision of the Money Stock Measures," pp. 85-86; and "Improving the Monetary Aggregates," p. 29.

Table IV

Benchmark Revisions
1971 - Present

Date of Revision	Source of Revision
March 23, 1978	Call reports of December 1976, March, June, and September 1977. Change of seasonal factors.
June 23, 1977	Call report of December 31, 1976.
April 21, 1977	Call report of September 30, 1976.
February 17, 1977	Call report of June 1976. Change of seasonal factors.
October 21, 1976	Call report of March 31, 1976.
May 20, 1976	Call report of December 31, 1975.
January 22, 1976	Call reports of June and September 1975. Change of seasonal factors.
September 18, 1975	Call report of April 16, 1975.
May 22, 1975	Call report of December 31, 1974.
February 20, 1975	Call report of October 15, 1974.
November 21, 1974	Call report of June 1974. Change of seasonal factors.
August 22, 1974	Call report of April 24, 1974.
May 23, 1974	Call report of December 31, 1973.
January 31, 1974	Call reports of December 1972, March, June, and October 1973. Change of seasonal factors.
February 1, 1973	Call reports of December 1971 and June 1972. Change of seasonal factors.
November 18, 1971	Call reports of June 30, 1971 and December 31, 1970. Change of seasonal factors.

After the June call report data are processed, the actual June ratio replaces the estimated June ratio — that is, the data are "benchmarked" to the actual June ratio. In addition, the September ratio is re-estimated to incorporate the effect of the actual June ratio. The ratio for the last week of July is then revised by linearly interpolating between the (new) June and September ratios. This revised ratio is multiplied by the smaller member bank demand deposits for the last week of July to obtain a second estimate of nonmember bank demand deposits.

After the September call report data become available, the actual September ratio is then known and another benchmark revision is made. The ratio for the last week in July is again estimated by linear interpolation between the June and September ratios, from which a third estimate of nonmember bank demand deposits is calculated for the last week of July.

Vault Cash

Weekly data on nonmember bank vault cash are also estimated between call report dates. In this case, the ratio of nonmember bank vault cash to *all* mem-

ber bank vault cash is used to compute weekly estimates of nonmember bank vault cash — by multiplying the vault cash of all member banks for a particular week by this ratio.

Nonmember bank vault cash for the last week of July is also likely to have at least three estimates, although in this case June and September ratios of nonmember bank vault cash to member bank vault cash are not estimated, such as is done for demand deposits. Instead, the actual ratio, as of the latest available call date, is used until the ratios for the surrounding call report dates are known, at which time the ratio for the last week of July is estimated by linear interpolation between the June and September ratios.

In the above example, nonmember bank vault cash for the last week of July would initially be estimated using the ratio of nonmember bank vault cash to member bank vault cash based on the latest available call report. At the time member bank data for the last week of July are available, the latest available call report could be the end-of-March report, although it is more likely to be the end-of-December call report. If the latest available report is the December call report, then the initial estimate of nonmember bank vault cash for the last week of July will be based on the December ratio.

When the March call report becomes available, the March ratio replaces the December ratio, and a second estimate is obtained. The same substitution occurs when the June ratio becomes available. When both the June and September ratios are known, the ratio for the last week of July is estimated by linear interpolation between the two. Consequently, three or four estimates of weekly nonmember bank vault cash could be made.

Difficulties With Revisions

Given the four- to seven-month delays between the call report dates and the publication of benchmark revisions, the M1 number for the last week of July may be revised even under "normal" reporting conditions as late as eight or nine months after the first estimate is made. In general, the "final" estimate of weekly M1 data is made between four and nine months after the week occurs (see Table IV). The delay may be even longer if there are problems in collecting or processing the call reports, such as occurred with the revision announced in March 1978.[11]

Another source of revisions in the estimates of weekly nonmember bank data involves changes in bank structure between call report dates. Such changes include the formation of new nonmember banks, the liquidation of existing nonmember banks, mergers of nonmember banks, or the conversion of member banks to nonmember status. Adjustments are made to the weekly estimates of nonmember bank data as these changes in bank structure occur.[12]

The size of benchmark revisions depends on how close the earlier estimates of the nonmember bank components of the money stock are to the later estimates of these data. During the 1970s there has been considerable concern over the size of these benchmark revisions. The level of M1 changed by more than $1 billion as a result of a number of the revisions since 1970, including an increase of $2.8 billion in June 1973.[13]

A special group (the Bach Committee) studied the problems of benchmark revisions as part of a larger study of the construction of the monetary aggregates, and recommended in 1976 that changes be made to improve the estimates of nonmember bank data.[14]

> To reduce large errors in preliminary estimates of deposits at nonmember banks, we recommend prompt establishment of a weekly reporting sample of large and small nonmember banks and collection of weekly-average-of-daily-deposits data from nonmember banks four times annually in connection with call reports.[15]

As the Bach Committee report was being completed, one of their recommendations — that weekly-average-of-daily-deposits, rather than one-day data, be collected around call report dates — was being implemented by the FDIC starting with the March 1976 call report. Their recommendation that a sample of nonmember banks be established to estimate nonmember bank deposits and vault cash, rather than using member banks, was begun by the FDIC in 1977. The results of this sample are being evaluated by the Board of Governors but have not yet been implemented.

---

[11]The delay could also be longer if there are substantial changes in the behavior of deposits or vault cash at noninsured nonmember banks. However, these noninsured nonmember banks represent only a very small proportion of deposits (Table III). In addition, separate reports for branches of foreign banks in New York City are available for spring and fall call report dates. Since such branches account for the bulk of noninsured nonmember bank deposits, a good estimate of such deposits is generally available.

[12]Beck and Sedransk, "Revision of the Money Stock Measures," p. 85.

[13]Ibid., pp. 83-86; "Improving the Monetary Aggregates," pp. 28-29.

[14]"Improving the Monetary Aggregates."

[15]Ibid., p. 3.

BENCHMARK REVISIONS AND MONETARY GROWTH

An important issue raised by the benchmark revisions of the money stock involves the extent to which these revisions affect monetary growth. With regard to the ranges of monetary growth set by the Federal Open Market Committee (FOMC), the Federal Reserve's principal policymaking body, the issue is whether the revised data substantially change rates of money growth relative to the FOMC's ranges.

Some information concerning this issue can be obtained by examining the impact of the March 1978 benchmark revision on the levels and rates of growth of M1 and M2. In so doing, it is useful to distinguish between the short-run and long-run ranges of M1 and M2 growth which are set by the FOMC. Each quarter the FOMC sets ranges of growth for M1 and M2 over the next four quarters, taking into consideration such factors as the growth of the economy, the rate of unemployment, and inflation. These one-year ranges are based on the quarterly average of M1 or M2 for the most recent quarter to the quarterly average for M1 or M2 one year in the future.[16]

In addition, at each of its monthly meetings the FOMC sets two-month ranges for M1 and M2 growth which are expected to be consistent with the one-year ranges. For example, at its June meeting the FOMC specifies an M1 growth range for the two-month June-July period. Then at its July meeting the Committee sets a new range for the July-August period. Although longer-term fluctuations in money growth are more important than short-term fluctuations in terms of effects on output, employment, and prices, these two-month ranges are guides in the implementation of policy.

When deciding the long- and short-run growth ranges for M1 and M2, the FOMC examines past M1 and M2 growth and projections of future M1 and M2 growth. Significant deviations of M1 or M2 growth from their short-run ranges (if the FOMC's domestic policy directive is a "money market conditions" directive), or from the mid-points of their ranges (if the FOMC's domestic policy directive is a "monetary aggregates" directive), can lead to a change in the FOMC's Federal funds rate objective.[17] Thus, the issue is whether the benchmark revisions significantly alter the two-month or one-year growth rates of M1 or M2 relative to the FOMC's ranges.

Table V

One-Year Growth Rates of M1 and M2 Before and After Benchmark Revision of March 23, 1978

(not seasonally adjusted)[1]

	M1		M2	
	Revised	Old	Revised	Old
I/76-I/77	6.3%	5.9%	10.9%	10.9%
II/76-II/77	6.6	6.0	10.7	10.6
III/76-III/77	7.8	7.3	11.0	10.9
IV/76-IV/77	7.8	7.4	9.7	9.6

[1]One-year growth rates using seasonally adjusted data are essentially the same as the growth rates shown here.

One-Year Growth Rates

For the one-year growth rate of M1 to change by more than one percent, M1 would have to increase (or decrease) relative to the current level of M1 by about $3.5 billion. Although such a large benchmark revision is possible, even the March 1978 revision (which incorporated four call reports instead of the usual one or two) changed the level of M1 at the end of 1977 by only $1.3 billion. Since 1970, only the benchmark revisions for 1973, which were the largest in the history of the series, were large enough to change the growth rate of M1 by one percent.[18] The most recent benchmark revisions increased the growth rate of M1 from fourth quarter 1976 to fourth quarter 1977 by about four-tenths of one percent, from 7.4 to 7.8 percent (see Table V).

Since the difference between the upper and lower limits of the one-year ranges for M1 growth has generally been at least 2 percentage points, the probability that a benchmark revision would significantly alter the one-year rate of M1 growth relative to the FOMC's longer-run range is quite small, unless M1 growth were already at the upper or lower limit of its range before the revision.

Two-Month Growth Rates

Since money growth has often been more volatile over time periods shorter than one year, it is also necessary to examine the effect of benchmark revisions on M1 growth for shorter time periods. Table VI gives

[16]For a discussion of the FOMC's ranges, see Richard W. Lang, "The Federal Open Market Committee in 1977," this *Review* (March 1978), pp. 2-9.

[17]Ibid., pp. 7-9.

[18]Beck and Sedransk, "Revisions of the Money Stock Measures," p. 81.

the two-month rates of M1 growth for 1977 using old data and old seasonal factors, revised data and old seasonal factors, and revised data and revised seasonal factors. Calculating growth rates for revised data using old seasonal factors is necessary to separate out the effects of the revision of the seasonal factors for 1977 from the revisions due to benchmark adjustments alone. As can be seen from Table VI, the two-month growth rates of M1 changed by more than one percentage point during the first quarter of 1977. However, in the January-February and February-March periods, neither of the revised growth rates (using old seasonal factors) are outside of the FOMC's short-run range(which was 3 to 7 percent in both periods). In the March-April period, both the old and revised (using old seasonal factors) growth rates are outside of the FOMC's 4½ to 8½ percent range. So even though the benchmark revision results in about a 1.5 percentage point increase in the March-April growth rate, the old growth rate was already substantially outside the short-run range.

Table VI

M1
Two-Month Simple Annual Rates of Change
(seasonally adjusted)

	FOMC Short-Run Ranges	Old Data	Revised Data as of March 23, 1978	
		Old Seasonals	Old Seasonals	New Seasonals
1977				
Jan.-Feb.	3-7 %	3.1%	4.4%	7.1%
Feb.-Mar.	3-7	3.1	4.6	6.5
Mar.-Apr.	4½-8½	12.4	13.9	10.8
Apr.-May	6-10	10.1	10.6	7.7
May-June	0-4	2.6	2.8	4.3
June-July	2½-6½	11.4	11.5	9.5
July-Aug.	3½-7½	12.1	11.7	9.1
Aug.-Sept.	0-5	6.6	6.0	7.5
Sept.-Oct.	2-7	9.7	9.1	9.8
Oct.-Nov.	3-8	5.3	4.9	5.6
Nov.-Dec.	1-7	3.1	3.0	3.8

A comparison of the remaining two-month growth rates for old data (old seasonals) and revised data (old seasonals) for 1977 indicates that in no case did the rate of M1 growth substantially change, nor did the revised growth rate fall inside the FOMC's short-run range if the old growth rate did not (and vice versa). Thus, although shorter-term M1 growth rates may change by larger amounts than one-year growth rates as a result of benchmark revisions, it is still not very likely that such changes will substantially alter these growth rates relative to the FOMC's ranges. This is particularly true since the spread between the upper and lower limits of the short-run ranges is generally four or more percentage points — much wider than the spread for the longer-run ranges.

One-year and two-month growth rates for M2 in 1977 were also little changed by the recent benchmark revisions (Tables V and VII). Relative to the FOMC's short- or long-run ranges for M2, changes in M2 growth rates due to benchmark revisions are also not likely to be very significant.

Table VII

M2
Two-Month Simple Annual Rates of Change
(seasonally adjusted)

	FOMC Short-Run Ranges	Old Data	Revised Data as of March 23, 1978	
		Old Seasonals	Old Seasonals	New Seasonals
1977				
Jan.-Feb.	7-11 %	8.4%	8.9%	10.1%
Feb.-Mar.	6½-10½	7.9	8.4	9.4
Mar.-Apr.	7-11	11.1	11.6	10.2
Apr.-May	8-12	9.1	9.3	8.2
May-June	3½-7½	6.4	6.7	7.3
June-July	6-10	12.4	12.8	11.3
July-Aug.	6½-10½	11.6	11.7	10.6
Aug.-Sept.	3-8	7.2	7.3	8.4
Sept.-Oct.	4-8	9.1	9.1	9.4
Oct.-Nov.	5½-9½	7.4	7.4	7.6
Nov.-Dec.	5-9	5.2	5.2	5.5

Benchmark revisions seem particularly minor in comparison to revisions of money stock data due to the revision of seasonal adjustment factors (see Tables VI and VII).[19] For the two-month growth rates of M1, the revisions based on the new seasonal factors for 1977 result in much larger changes in rates of M1 growth compared to the changes due to the benchmark revisions alone.

BENCHMARK REVISIONS AND FEDERAL RESERVE MEMBERSHIP

Nonmember bank deposits have comprised an increasing proportion of the monetary aggregates since 1960 (Table III). This has been the result of a num-

[19]Also see the Bach Committee's discussion of revisions of preliminary estimates of the money stock; "Improving the Monetary Aggregates," pp. 25-26.

ber of factors, including more rapid growth of deposits at nonmember banks than at member banks, and the recent decline in membership in the Federal Reserve System (Table II).[20] Consequently, estimates of the weekly deposits of nonmember banks have become a larger item in the construction of M1. If Federal Reserve membership continues to decline, will benchmark revisions become larger? Would these revisions become large enough to affect significantly rates of money growth relative to the FOMC's ranges?

Answers to these questions are not clear-cut, as scenarios can be drawn which give opposite conclusions on the matter. Some of the possible effects of declining Federal Reserve membership can be described, although additional research is necessary to provide conclusive evidence on these questions.

For example, since the size of nonmember bank deposits would increase as Federal Reserve membership declined, the same percentage errors in estimating nonmember deposits as have occurred in the past would result in an increase in the size of the benchmark revisions relative to the level of the money stock. Larger revisions would result in larger changes in short- and long-run growth rates of the monetary aggregates relative to the FOMC's ranges.

However, it is possible that the percentage errors in estimating nonmember deposits could either increase or decrease as Federal Reserve membership declines. The present estimates of weekly nonmember deposits depend upon the ratio (as of the call report dates) of nonmember bank deposits to smaller member bank deposits. The present approach implicitly assumes that the relationship between smaller member deposits and nonmember deposits does not change much over time. The larger the changes in this relationship from one call report date to the next, the more likely it is that the initial estimates of this ratio will be off the mark, resulting in larger benchmark revisions. Thus, whether or not the relationship between smaller member deposits and nonmember deposits is changed as membership declines becomes an important factor in assessing whether the size of benchmark revisions will increase or decrease.

If the characteristics of banks which drop membership are similar to other nonmember banks' characteristics, then the estimates of the ratio would have errors similar to those that have occurred in the past. Alternatively, if the former member banks' characteristics remain the same after they are nonmembers, the estimates of the ratio could, over time, become less subject to errors. The nonmembers' characteristics would become more similar to the members' characteristics in this case, and (after an adjustment period) the ratio of nonmember deposits to member deposits would become more, rather than less, stable.

Alternatively, if the characteristics of former member banks change significantly once they are nonmembers, and if they are not similar to the other nonmembers' characteristics, then the estimates of nonmember data could have even larger errors than the present errors.

The possibility that benchmark revisions will become larger as Federal Reserve membership declines would be reduced by a number of proposals. Suggestions have been made to reduce the incentives for member banks to withdraw from the System, or to actually increase the incentives for nonmember banks to join the System.[21] These include the payment of interest on reserves held at Federal Reserve Banks. Of course, if all nonmember banks joined the Federal Reserve System or if all nonmember banks reported weekly as member banks do now, the problem of estimating nonmember deposits would disappear.

Other proposals have centered on improving the estimates of nonmember bank data in order to reduce the size of benchmark revisions. As mentioned earlier, the Bach Committee concluded that errors in estimates of nonmember components of M1 could be significantly reduced if a sample of nonmember banks would report weekly. This recommendation was based upon an experiment in which the FDIC requested that 573 insured nonmember banks report daily balance sheet data on a weekly basis. This sample of banks included all "large" nonmember banks (177 banks having total deposits in excess of $100 million) and groups of smaller nonmember banks in various size classes based on their total deposits.[22]

During the period from summer 1974 to spring 1975, this sample was used to estimate nonmember bank deposits and vault cash. In principle, large nonmember deposits and vault cash were available for each week and did not have to be estimated.[23] The weekly deposits and vault cash for smaller nonmember banks

[20]For a discussion of the factors affecting the growth of nonmember bank deposits, see John T. Rose, "An Analysis of Federal Reserve System Attrition Since 1960," Staff Economic Studies No. 93, Board of Governors of the Federal Reserve System, 1977.

[21]Ibid., p. 41.

[22]"Improving the Monetary Aggregates," pp. 29-30.

[23]In fact, not all banks reported on a regular basis.

were estimated using the same technique as illustrated in Figure I.

Thus, instead of estimating weekly data for *all* nonmember banks between call report dates, weekly data for large nonmember banks would be known and only data for small nonmember banks would be estimated. After experimenting with a number of other estimation and sampling techniques, the Bach Committee concluded that the technique described above would significantly improve the construction of the monetary aggregates, and that the costs of increased reporting by nonmember banks compared favorably to the benefits.

> After reviewing current procedures, the sample explorations, and various alternative proposals, the Committee concluded that the inaccuracies in the estimate of demand deposits of nonmember banks represent a major defect in up-to-date monetary statistics and a significant defect in historical statistics of M1 and that marked improvements are feasible at reasonable costs for both reporting nonmember banks and the Federal agencies involved.[24]

The Bach Committee's proposal would reduce errors in estimating nonmember deposits and vault cash so that growth rates of M1 and M2 would be less affected by benchmark revisions. If declining Federal Reserve membership tends to increase the size of benchmark revisions, then such reductions in estimation errors will become more important.

SUMMARY

Benchmark revisions of the money stock are made usually three or four times each year to incorporate new information on nonmember bank deposits and vault cash. Although these revisions have at times changed the level of the money stock by more than $2 billion as of a call report date, only during 1973 have these changes represented as much as a one percent change in the money stock.

The changes in one-year growth rates of M1 and M2 as a result of these benchmark revisions have been quite small, generally changing the growth rates by a few tenths of one percentage point or less. Compared with the two or more percentage point spread in the one-year ranges of M1 and M2 growth set by the FOMC, such changes in M1 and M2 growth rates appear to have little effect on monetary growth relative to the FOMC's ranges.

The changes in two-month growth rates of M1 and M2 as a result of benchmark revisions have been larger, at times changing these short-run growth rates by more than one percentage point. However, the two-month ranges of M1 and M2 growth set by the FOMC are much wider than the one-year ranges — four percentage points or more. Changes in short-run M1 and M2 growth rates also are likely to have little effect on monetary growth relative to the FOMC's ranges.

Whether or not a continuing decline in Federal Reserve membership will increase the size of benchmark revisions remains an open question. In the event that declining membership does increase the errors in estimating nonmember bank components of the money stock, the proposals to reduce the size of the revisions by alternative sampling and estimation techniques, or to encourage increased Federal Reserve membership, will become more important issues.

[24] "Improving the Monetary Aggregates," p. 30.