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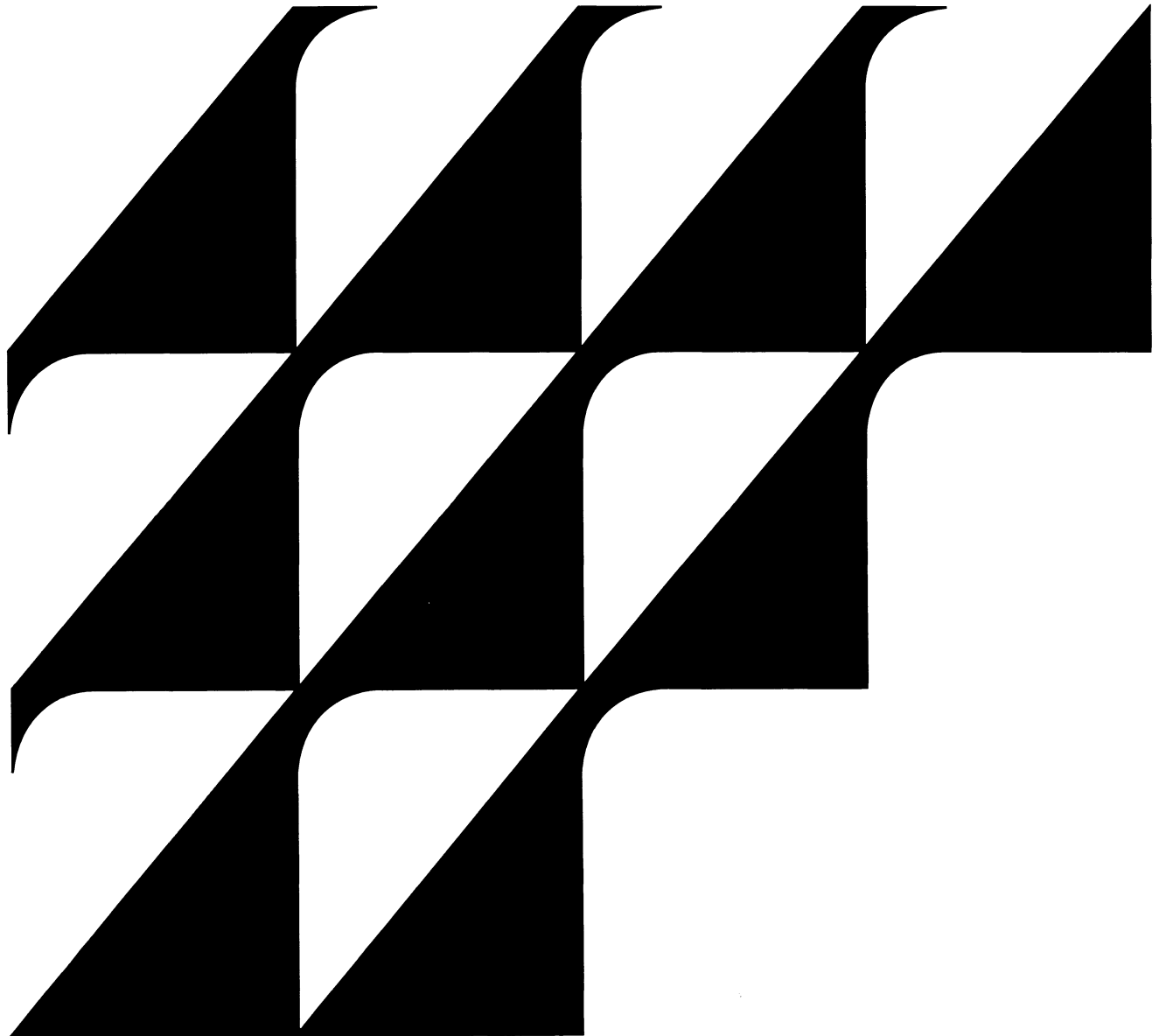
An Economic Research Service Report

Measuring the Economywide Effect of the Farm Sector

Two Methods

William Edmondson
Mindy Petrusis
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Measuring the Economywide Effect of the Farm Sector: Two Methods. By William Edmondson, Mindy Petrulis, and Agapi Somwaru. Rural Economy Division, Economic Research Service, U.S. Department of Agriculture. Technical Bulletin No. 1843.

Abstract

ERS produces two series that estimate the impact of agriculture on the domestic economy. The Food and Fiber System (FFS) series identifies the total economic activity (value-added, employment, and output) associated with providing food, clothing, tobacco, flowers, and other agricultural products to the final consumer. The Farm and Farm-Related Employment (FRE) series estimates the number of jobs in farming and in industries directly and indirectly related to agriculture. In terms of relative employment shares (percent of the domestic economy), the FFS declined 2 percent and the FRE 1.9 percent from 1982 to 1990.

Keywords: Food and fiber system, farm and farm-related employment.

Contents

Summary	iii
Introduction	1
Overview	2
How Is Supporting Activity Estimated?	3
Food and Fiber Share of Industry Output	3
FFS vs. FRE Employment Estimates: The Paths Part	5
Annual Estimates of the Size of the Food and Fiber System	5
Modifying Equation (1) to Provide Yearly FFS Estimates	6
Farm and Farm-Related Employment	7
Developing Local Estimates	9
Comparing the Local With the National Estimates	10
Conclusion	11
References	12
Appendix I	13
Appendix II	14

Summary

ERS produces two series that estimate the impact of agriculture on the domestic economy in terms of employment and value-added. The first, the Food and Fiber System (FFS) series, identifies the total economic activity associated with providing food, clothing, tobacco, flowers, and other agricultural products to consumers and governments. The FFS series has many advantages: it is national in scope; it is additive to a set of controls, the National Income and Product Accounts published by the Department of Commerce; and it includes all economic activity related to agriculture.

The second series, the Farm and Farm-Related Employment (FRE) series, includes (1) farming and all other industries in which 50 percent or more of their national output is used to satisfy agricultural final demands, and (2) other sectors (indirect agribusiness) in which 32-50 percent of output is associated with consumption of food, clothing, tobacco and other agricultural products. For users interested in the regional or local impact of agriculture, this series' employment data can be determined for geographic areas as small as a county.

Both series have a common foundation, the U.S. Input-Output tables. The estimation procedure for going from the Input-Output tables to the FFS estimates differs from the methodology used to derive the FRE estimates. The FFS estimates also differ from the FRE estimates both in the number of sectors included and in the share of output and employment generated by those sectors.

Given the differences in methodology, the FFS and FRE estimates came out relatively close in the base year for the Input-Output tables, 1982. Total employment differences in the two series narrowed from 3.6 million in 1982 to 2.5 million in 1990. In terms of relative employment shares (percent of the domestic economy), the FFS declined 2 percent and FRE fell 1.9 percent from 1982 to 1990. Both series show similar trends: employment losses in the farm sector and manufacturing, little change in food processing, and growth in transportation and in wholesale/retail trade. Both series show total farm and farm-related employment growing more slowly than the domestic economy.

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Agapi Somwaru

Introduction

As an economy grows and develops, sectors become more interrelated. While dominance of core sectors may appear to erode, their influence may be strong though less apparent. In their 1957 classic book, *A Concept of Agribusiness*, Davis and Goldberg used input-output analysis to measure this indirect influence for agriculture. Ever since, sectoral analysts have navigated the shoals of limited data availability in order to measure the overall importance of selected sectors in an economy. The paper explores several recent attempts at identifying agriculturally related activities in an economy and explores the economic logic underlying alternative measures. The Economic Research Service (ERS) publishes two series that measure the number of jobs associated with producing, processing, and marketing food and natural textile commodities to U.S. and foreign consumers.

Data in the first series, the Food and Fiber System (FFS), identify the total economic activity associated with providing the food, clothing, tobacco, flowers, and other agricultural products that consumers and governments purchase. The FFS series has many advantages: it is national in scope; it is additive to a set of controls, the National Income and Product Accounts published by the Department of Commerce; and it includes all economic activity related to agriculture.

The second series, the Farm and Farm-Related Employment (FRE) series, includes (1) farming and all other industries in which 50 percent or more of their national output is used to satisfy agricultural final demands and (2) other sectors (indirect agribusiness), in which 32-50 percent of output is associated with consumption of food, clothing,

tobacco, and other agricultural products. For users interested in the regional or local impact of agriculture, this series' employment data can be determined for geographic areas as small as a county.

This paper is an updated and expanded look at an accounting system that identifies the value, in terms of output, income, and employment, of agricultural production. While the original foundation for such a system was published in 1957 (Davis and Goldberg), this paper is more closely related to *Measuring the Size of the U. S. Food and Fiber System* (Lee and others), which ERS published in March 1987. This paper updates that publication and presents a separate approach that ERS uses to measure farm and farm-related employment. Differences in the economic underpinnings of both processes are presented and the results of applying both sets of procedures are compared in table 5.

One of the tools available to researchers and analysts is input/output analysis. *The 1982 Benchmark Input-Output Accounts of the United States* (U.S. Dept. Commerce, 1991) provides national I/O data. Researchers use input-output (I/O) analysis to estimate the size of the agricultural economy, the contribution of the farm sector to the total domestic economy, the interaction of the farm sector with the nonfarm sector, and many other important issues. Both the FFS employment estimates and the FRE employment estimates presented here are based on the U.S. Department of Commerce's 1982-based input-output model. This paper aims to enable analysts to understand the differences in the two approaches so they can use the series that best serves their needs.

Overview

Both the FFS and the FRE rely conceptually upon the fact that most farm production is absorbed directly by domestic consumption of food, clothing, and tobacco, or by the export market. Also included in both measures, at much smaller relative values, are net inventory change, consumption of flowers and potted plants, government purchases of farm commodities, farmers' capital expenditures, and imported food and fiber products. By tracing the Nation's final demand for domestic and imported agricultural commodities, national income and employment associated with agricultural commodities that originate in the farm sector are estimated (table 1).

The first step in estimating the size of an economic system, independent of the procedures used, is to define the products (final demands) of the system. The final demands of the agricultural system are defined as (1) domestic consumers' expenditures for food; (2) domestic consumers' expenditures for tobacco products, shoes, clothing, flowers, seeds, and potted plants; (3) net agricultural and textile exports; and (4) the value of farm inventory change, the value of changes in off-farm private inventories, the value of Commodity Credit Corporation (CCC) stocks of farm commodities, and "other final demands" (table 1).^{1,2}

One of the purposes of defining a consistent set of final demands is to isolate domestic income and employment related to agriculture. Our primary interindustry data source, the U.S. Department of Commerce (USDC), Bureau of Economic Analysis (BEA), input-output accounts, commingle domestic and imported flows in the economy. We had two viable alternatives for removing the income and employment effects of imported economic activity.

¹ For a complete description of all activities included in "other final demands," consult Appendix I.

² The CCC adjustment, table 1, is a necessary but unique step employed because this analysis is based on a "full blown," or most highly disaggregated input-output model, 534 sectors, possible. For a completely disaggregated input-output model to "balance," CCC transactions that are originally part of the intermediate transactions must be made part of the final demand columns when running the model. For our Food and Fiber System results to be consistent with and reflect the accuracy of the 1982 benchmark I/O accounts, we must carry this adjustment along in our nonbase year final demands. For more information on the CCC adjustment procedure consult the unpublished 1967 input-output computer tape documentation or call the Bureau of Economic Analysis, Interindustry Branch, 202-606-5587.

Table 1—Components of final demand, 1992

Category	Subcategory	Expenditures
		<i>\$ billion (1987)</i>
Personal consumption expenditures (food)	Off premise consumption (food)	302.9
	Off premise consumption (alcohol)	40.1
	Purchased meals and beverages	167.3
	Food furnished to employees	9.8
	Food produced and consumed on farms	.4
	Subtotal	520.5
Other personal consumption expenditures	Tobacco	30.9
	Shoes	27.2
	Clothing	166.3
	Flowers	9.2
	Subtotal	233.6
Net exports	Raw agricultural exports	18.7
	Processed agricultural exports	18.3
	Raw agricultural imports	-5.0
	Processed agricultural imports	-12.1
	Apparel exports	4.2
	Apparel imports	-35.1
Subtotal	-11.0	
Other food and fiber demands	Livestock inventory change	3.0
	Crop inventory change	.8
	Other final demands	1.3
	Farm capital expenditures	10.1
	CCC adjustment	1.3
	Subtotal	16.5
Total		759.6

We could attempt to estimate an import flow table and subtract it from the published USDC-BEA table prior to using it in the formula described in equation (1) below. Or we could treat imports as a negative final demand. We chose the second alternative. Direct data on import intersectoral flows do not exist. Treating imports as a negative final demand makes our total estimates net of the effects of imports, but overstates the income and employment effects of individual demand elements because they include the imports' effects.

How is Supporting Activity Estimated?

Once we identify the final demands of the FFS, we use this information in an input-output model. Professors John Davis and Raymond Goldberg of the Harvard Business School first used input-output analysis in 1957 to measure the total contribution of the farm sector to the economy. They coined the term "agribusiness" to convey all the businesses that support the delivery of food, clothing and shoes, tobacco, flowers, and agricultural exports to their final consumers. Since then, this generic measure has been expanded and refined to better capture all farm-related activity, including the effects of imported food and fiber products, farm capital expenditures, and apparel exports. The values of these items are significant today but were negligible in 1957. We include activities that support farm capital expenditures as part of the business activity that supports the FFS. Maintaining the capacity to produce farm products requires periodic replacement of and additions to the farm capital stock of machinery, equipment, and structures.

The input-output model identifies the levels of economic activity in the various sectors of the economy required to support the final demands of the FFS. This supporting output can be categorized in three ways: (1) output of raw farm commodities, (2) nonfarm output used to support the production of farm commodities (called backward linkages), and (3) nonfarm output generated in the processing and distribution of raw farm commodities (forward linkages). Most nonfarm industries produce some outputs that support farm production, some that support processing and distribution, and some not used by the FFS at all. For example, the FFS uses nearly 70 percent of the output of the metal containers industry. About 87 percent of the total FFS outputs are associated with forward linkages, about 6.5 percent with raw farm commodities, and about 6.5 percent with backward linkages.

Using the identified sales of the various industries that contribute to the final output of the FFS, I/O analysis estimates the level of supporting economic activity required from each sector of the economy to produce this final output of the FFS.

Specifically we calculate:

$$X = (I-A)^{-1}Y \quad (1)$$

where X is an $n * m$ matrix of outputs generated by a corresponding level of final demands; $(I-A)^{-1}$ is an $n * n$ total requirements matrix; Y is an $n * m$ matrix of

final demands of the FFS disaggregated and bridged to the sector of origin; m is the number of final demand categories, 20 for this analysis; and n is the number of economic sectors, 534 for this analysis.

When FFS income and employment are estimated, ideally, only those values associated with personal consumption expenditures (PCE) and exports of clothing and shoes from natural materials should be considered. However, manmade and natural fibers often get blended in textile and clothing manufacturing, leather and manmade materials often get blended in footwear manufacturing, and even the unblended products often get grouped in consumption statistics. Thus, a clear separation between the use of manmade and natural materials is not likely, nor is there a simple cost-effective way of making the desired adjustment. Appendix II describes our adjustment procedure. The estimated results from applying equation 1 and the subroutine described in Appendix II are presented in appendix table 2.

Food and Fiber Share of Industry Output

Appendix table 2 presents our estimates of how important output supporting the FFS is to the total output of individual sectors. The first column of appendix table 2 contains the Bureau of Economic Analysis (BEA) input-output sectoral identification codes. Many publications map these codes to the more prevalent Standard Industrial Classification (SIC) codes. The second column is a brief sector description. The third column is the supporting output needed from the 534 input-output sectors to meet the base-year FFS final demands. Column four, the share estimate, indicates the relative importance of the FFS to that sector, and the fifth column is total U.S. output by industry sector in 1982.

In 1982, industry 010100—dairy farm products—produced a total output of \$19.1 billion. The sector purchased an equivalent amount of intermediate inputs, those goods and services needed by the dairy sector from all other sectors of the economy, and value-added payments—wages and salaries, indirect business taxes, and profit-type incomes. Total industry output equals intermediate inputs plus value-added.

An estimated 82 percent of dairy output supports economic activity within the FFS. The additional 18 percent could support other (non-FFS) uses of dairy products such as adhesives, drugs, and paints. While

one may expect that all farm dairy production would be used in the FFS, the input-output estimation procedure links production in a particular sector to all final demands in the economy. FFS production is very important to "dairy," as it is to all of the first 17 I/O sectors (production agriculture) except for miscellaneous livestock (010302) and forest products (020701).

The reasons for the relatively small FFS shares of input-output sectors 010302 (animal specialties and miscellaneous livestock) and 020701 (forest products) are straightforward. The miscellaneous livestock sector is dominated by horse production, the output of which ties chiefly to the recreation industry. The forest products (020701) sectors' output is most closely associated with the forest services (040001) and forestry products (030001) industries. While horses and forest products are farm or farm-related products, they are not products that primarily support the Nation's consumption of food and fiber products.

In general, the farther away one gets from the production agriculture sectors of the input-output table, the smaller the FFS output share. There are a few notable exceptions. Sector 410202, crowns and closures, has a corresponding FFS output share of 72 percent. Sector 410202 includes establishments primarily engaged in the manufacturing of bottle caps and tops, jar caps and tops, and stamped metal closures. Thus, a strong FFS linkage is evident in the link between bottle caps and beverages and between jar tops and condiments. The *Standard Industrial Classification Manual* provides much of the input-output sectors' industry composition detail.

Other packaging industries with strong FFS linkages include wood containers (210000), with a 71-percent share; glass containers (350200), with a 77-percent share; and metal cans (390100), at 81 percent. Ninety-one percent of total industry output of the buttons (640701) sector and 76 percent of the needles, pins, and fasteners (640702) sector is generated by FFS demands, specifically for clothing and shoes.

The total output generated by wholesale trade (690100) in the 1982 input-output tables was close to \$300 billion. The FFS generated over 42 percent of that output, or \$125 billion. The FFS also accounted for 30 percent of advertising (730200) output, or \$4.2 billion.

Seven input-output sectors (030002, 110502, 141600, 143000, 150102, 180101, and 180102) have FFS shares greater than one. Within the FFS, output

levels depend upon the size of the final demand associated with that category. FFS inventory change is one part of FFS final demand and is only valued within the first 17 sectors of the input-output table. These sectors represent livestock and crop production or raw agriculture. If an industry's output level is tied almost exclusively to FFS final demands, such as personal consumption expenditures (PCE) for food, clothing, or tobacco, and if the effect of total inventory change, not just FFS inventory change, is negative, it is possible for an industry to have a higher level of output due to FFS final demand than for total economywide final demand. Some FFS final demand is being satisfied by a drawdown of inventory stocks outside the 17 production agriculture input-output sectors. When this situation occurs, the industry will have a FFS/total ratio greater than one. This situation occurs in rice milling (I/O sector 141600); cigars (150102); women's hosiery, except socks (180101); and hosiery not elsewhere classified (n.e.c.) (180102).

Commercial fishing's (030002) FFS share of total output is greater than one because this sector's output is associated with the final demand categories of personal consumption expenditures for food, one of the FFS final demands, but most of its total demand is satisfied by fish imports. Because FFS income and employment is domestic, we adjust our estimates to remove income and employment associated with the consumption of imported products. For fisheries, however, this adjustment is not made because fish exports and imports are not classified as in the usual definition of an "agricultural" export and import. They are classified in the input-output table outside of the 17 production agriculture sectors. Therefore, any negative effects of fish imports are reflected in the total output column, not in FFS output. The same relationship causes the FFS share of manufactured ice (143000) output to be greater than one. Ice is used extensively in packing and preparing fish.

In new farm service facilities (110502), the FFS share is larger than expected because of data revisions. Data from ERS' *Economic Indicators of The Farm Sector* (1993) series indicate that revisions in the farm capital expenditures accounts, an FFS final demand, are larger than those included in the 1982 BEA input-output accounts. We chose to use the most recent information available in this analysis. Incorporating the revised data raises the FFS share of output above the total output of this sector in the BEA accounts.

Table 2—Employment within eight sectors of the Food and Fiber System, satisfying four categories of final demand, 1992¹

Sector	Personal consumption expenditures for food	Other personal consumption expenditures	Net exports	Other final demands	Total
<i>1,000 workers</i>					
Farming	1,709	176	112	11	2,009
Food processing	1,465	12	-17	0	1,460
Textiles	20	2,256	-808	1	1,470
Other manufacturing	1,005	833	-424	95	1,509
Services and other	2,422	955	-74	99	3,401
Trade	3,378	3,598	55	62	7,094
Transportation	5,57	119	31	11	719
Eating places	5,035	143	-15	4	5,167
Total	15,591	8,092	-1,141	285	22,828

¹Totals may not add due to rounding.

FFS vs. FRE Employment Estimates: The Paths Part

Up to this point, the estimation procedure for the FFS and FRE employment estimates is essentially the same. Both use the information in appendix table 2. FFS estimates use the information in column 3 (FFS output) as the core estimates to be transformed to employment and income estimates and to be annually updated. FRE estimates use the information in column 4 (FFS output share) to identify which sectors are agriculturally related and base further estimates on this distinction.

Annual Estimates of the Size of the Food and Fiber System

The FFS estimates are demand-driven. The series reflects supporting income and employment generated to meet a set of real (quantity-based) demands. The direct output of the farm sector in the FFS includes grains, livestock, livestock products, fruits, vegetables, tobacco, cotton, greenhouse and nursery products, and so on. But, production has no value unless there is a use for it.

Consider for a moment the unsold inventory of a farm machinery manufacturer. Its role in the economy is very similar to that of FFS products. Its manufacture has provided jobs and markets for machinery parts and other manufacturing inputs. But now that it is sitting on the manufacturer's lot, it has no further role in the economy until purchased and put to use.

We can view the farm sector that same way. For a vigorously operating economy, production is not a goal, consumption is. Production replaces goods and services consumed by individuals and collectively by private and public institutions. And we must ask, where do farm products fit in this view of an economic system that emphasizes the use or the consumption of output?

The first role might be domestic food consumption. For example, Iowa farmers produce corn not for its own sake but as a feed for hogs. But not only does Iowa corn fatten Iowa hogs, it will also fatten hogs in Russia (the export market). Some farm production also ends up in government and private storage.

We use the 534-sector U.S. input-output table to make our estimates of FFS output. For ease of presentation, these 534 sectors are aggregated into 8 main categories (table 2). The aggregate categories consist of direct farm production of raw agricultural commodities (farming); farm product manufacturing (food processing and textiles); supporting manufacturing inputs; service industries and all sectors not included in the other seven categories; wholesale and retail trade; transportation; and direct distribution of processed products to consumers (eating places).

These eight categories encompass the entire domestic economy. The FFS output, income, and employment related to this output can be aggregated to these categories for ease of presentation. Jobs within these

categories range from grain elevator operators and barge captains to waiters and supermarket checkers. Almost all the output from these job categories satisfies food and fiber final demand. This analysis does not include government workers and household workers (maids, butlers, nannies, etc.).

The negative values in the third column of table 2 represent jobs that would have been required to support 1992's level of FFS final demand if that year's competitive imports were produced domestically. They do not represent an actual loss of jobs to the economy. Some imported food and fiber products (for example, bananas, coffee, and tea) cannot be produced in the United States; therefore, their value and the economic activity that they represent is not considered in this analysis of the Food and Fiber System.

The Food and Fiber System includes all economic activity that supports farm production and the conversion of raw farm products to consumable goods: machinery repair, fertilizer production, farming itself, food processing and manufacturing, transportation, wholesale and retail trade, distribution of food and apparel, eating establishments, and others. When an input-output table is available, these estimates can be made using the procedure for generating appendix table 2.

Modifying Equation (1) to Provide Yearly FFS Estimates

FFS estimates are often needed subsequent to a base-year input-output table. The only new pertinent information that is likely to be available are annual real (constant dollar) estimates of the final output of the FFS, some broad indices of labor productivity, and broad indices of sectoral price changes.

To estimate FFS employment in a year other than that in which a benchmark input-output table has been published and to accommodate for the unavailability of all pertinent information, equation (1) can be modified:

$$E = pL(I-A)^{-1} Be \quad (2)$$

where E is an $n * 1$ vector of sector employment needs for meeting the outputs of the FFS; p is an n element diagonal matrix of current-year sector labor productivity relative to the base year; L is an n element diagonal matrix of base-year employment needs per dollar of sector output; $(I-A)^{-1}$ is as

previously defined; B is an $n * m$ matrix of sectoral shares of food and fiber system demand category j ; $j = 1, \dots, m$; $\sum_{i=1}^n b_{ij}=1$; b_{ij} is an element of matrix B ; and e is an $m * 1$ vector of real expenditures of m categories of FFS demands.

National employment measures of the Food and Fiber System start with household survey data provided by the Bureau of Labor Statistics (BLS), which includes hired full-time and part-time workers, the self-employed, and unpaid family workers. The data are collected and maintained by BLS from at least four different source surveys. BLS analysts aggregate the data to the appropriate sectors of a BLS-maintained input-output model. We map nonfarm employment from this model to the BEA input-output model (the model used for generating FFS estimates) by disaggregating it according to the input-output sectoring plan provided in the benchmark input-output publication (U.S. Dept. Commerce, 1991). Farm employment is disaggregated from the two BLS (crop and livestock) estimates to the 17 BEA agriculture sectors by pro-rating according to man-hours required for production in those sectors. The resulting vector of farm and nonfarm employment is column three of appendix table 3.

Appendix table 3 shows total employment and FFS job requirements for 534 sectors in 1982. The BLS employment data are for the civilian labor force and exclude government employment (except for government enterprises) and the military. ERS annual estimates of FFS system employment are based on 1982 interindustry linkages (U.S. input-output tables, described above), adjusted by an ERS index of farm labor productivity (U.S. Dept. Agr., 1992), and BLS productivity indices of output per hour of all persons employed in manufacturing and nonfarm business (U.S. Dept. Labor, various).

If between the base year and the current year the underlying assumptions of input-output analysis (constant relative prices, fixed input coefficients, etc.) are violated sufficiently to bias our estimate, a gross adjustment for nonfarm sector employment should be made. To make this adjustment we compute:

$$GDP = v(I-A)^{-1} C gdp \quad (3)$$

where GDP is an $n * 1$ vector of estimated gross domestic product originating by sector; v is an n element diagonal matrix of sector gross domestic product per dollar of output in the base year; $(I-A)^{-1}$ is as defined before; C is an $n * k$ share matrix like B but inclusive of all categories of the national income

and products accounts, not just FFS; k is the number of categories, 23 for this analysis; and gdp is a $k \times 1$ vector of constant dollar expenditures by national income and product account categories (Edmondson and Schluter, 1986).

The sum of the nonfarm elements of GDP are compared with gross domestic product less gross farm product to compute the adjustment coefficient for nonfarm employment in the product of equation (2).

The U.S. Department of Commerce publishes annually the tables of the National Income and Products Accounts (NIPA). These tables allow researchers to determine base-year values—that is, data for the same year as the published benchmark input-output table, for most categories of final demand, and for years later than the published input-output table. All values of nonbase-year personal consumption expenditures for food and fiber products are determined by using the NIPA data. Data for net exports of food and food products, crop and livestock inventory change, farm capital expenditures, and other final demands are derived from ERS sources. Data for net exports of clothing and shoes are from the Bureau of the Census.

Applying the methods described above, equations (2) and (3) enable us to measure the size of the Food and Fiber System for years other than the base year, 1982. Table 3 presents estimates of employment and value-added in the FFS for 1982-92. These data are aggregated from the 534-sector input-output tables into 6 broad categories, which represent the entire economy.

The 1982 estimate of FFS employment differs in table 3 from appendix table 3. The estimates of FFS final demand needed to compute the annual updates in table 3 are revised backwards 3 years every year in the NIPA tables by the USDC. This means that, at a minimum, the level of final demand for 1982 food and fiber was changed three times since 1982, most likely even more. Labor productivity indices are also subject to revisions. Appendix table 3 is a snapshot of the FFS as it looked in the base year, without the benefit of later revisions. And, table 3 contains government and household workers.

While the nominal value of food and fiber GDP or value-added has increased during 1982-92, the share of FFS value-added has declined relative to the total domestic economy. Job requirements within the FFS have varied between 23.5 million workers in 1990 and 22.3 million in 1985. The FFS share of total

civilian jobs has steadily declined. This suggests that the economy outside the FFS is growing at a faster rate than within the FFS.

One explanation for the faster growth rate is that final demands for food and fiber products are relatively income-inelastic. Food demands typically grow at or near the rate of the increase in population. As consumers' income increases, their propensity to consume food products remains the same. Most consumers, as their disposable income increases, spend more income on products other than food; a person can consume only a finite amount of food and there is limited substitutability. For example, one may substitute steak for hot dogs within personal expenditures for food, but within total expenditures, consumers are more likely to exchange an apartment and rent for a house and mortgage when raising their standard of living.

Growth in FFS employment is affected not only by the sluggish increase of FFS final demands but also by the rising rate of labor productivity. The labor productivity indices we use to adjust FFS employment increased by nearly 50 percent from 1982 to 1992 in the farm, food processing, and textile categories in table 3. Adjusting for labor productivity increases causes decreases in the FFS employment levels and labor hours required to produce the level of output to meet FFS final demands. While 800,000 workers may not have actually left the farm sector from 1983 to 1992 (table 3), the jobs required in the farm sector to produce 1992's output of food and fiber products, given the changes in labor productivity and the shifting composition of food and fiber final demands since 1983, have declined by that amount. BEA survey data indicate that about 600,000 workers actually left the farm sector in 1983-92.

Farm and Farm-Related Employment

The Food and Fiber System includes farming activity and all businesses that support the production and delivery of food, clothing, shoes, tobacco, and other agricultural products to domestic and foreign consumers. The identification of the sectors involved is based on the national interindustry requirements (input-output) tables, which identify industries that must provide goods and services in order to satisfy the economy's final demands for agricultural products. FFS-type estimates at the regional or local level encounter data problems because of the lack of regional or local FFS demand data and the difficulty of identifying FFS-related regional or local

Table 3—The Food and Fiber System (FFS) and the domestic economy, 1982-92¹

Item	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Employment:	<i>Millions</i>										
Total food and fiber	22.9	23.0	22.6	22.3	22.4	22.4	22.7	23.4	23.5	23.2	22.8
	<i>Percent</i>										
Percent of domestic economy	20.8	20.6	19.9	19.3	19.0	18.7	18.6	18.9	18.8	18.5	18.0
	<i>Millions</i>										
Farm sector	2.4	2.8	2.3	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0
Nonfarm sectors	20.5	20.2	20.3	20.2	20.3	20.5	20.6	21.4	21.4	21.2	20.8
Food processing	1.7	1.6	1.6	1.6	1.6	1.6	1.5	1.5	1.5	1.5	1.5
Manufacturing	3.6	3.5	3.4	3.3	3.2	3.1	3.0	3.2	3.1	3.1	3.0
Transportation, trade and retailing	7.2	7.2	7.3	7.4	7.5	7.5	7.6	7.9	8.0	7.9	7.8
Eating	4.6	4.7	4.7	4.7	4.8	5.0	5.2	5.3	5.4	5.3	5.2
All other	3.4	3.2	3.2	3.2	3.2	3.2	3.3	3.5	3.5	3.5	3.4
Total domestic economy	110.2	111.6	113.5	115.5	117.8	119.9	121.7	123.9	124.8	125.3	127.0
	<i>Percent</i>										
Farm sector	2.1	2.5	2.0	1.8	1.7	1.6	1.7	1.6	1.7	1.6	1.6
Nonfarm sectors	17.5	16.7	16.5	17.5	17.3	17.1	17.0	17.3	17.2	16.9	16.4
Total domestic economy	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Value added by activity:	<i>Billion \$</i>										
Total food and fiber	622.6	630.5	672.1	697.8	716.6	744.7	784.5	850.3	889.8	913.8	950.2
	<i>Percent</i>										
Percent of domestic economy	19.8	18.5	17.8	17.3	16.8	16.4	16.0	16.2	16.0	16.0	15.7
	<i>Billion \$</i>										
Farm sector	58.7	40.9	55.5	58.5	52.6	53.0	49.7	65.2	68.1	63.4	67.0
Nonfarm sectors	563.9	589.6	616.6	639.3	664.0	691.7	734.9	785.0	821.7	850.4	883.2
Food processing	72.6	76.9	80.5	82.3	87.4	86.2	91.8	96.1	99.8	103.4	106.2
Manufacturing	105.0	108.3	109.9	109.8	113.2	111.5	115.2	124.5	125.6	130.8	135.7
Transportation, trade and retailing	187.2	193.2	201.2	208.9	212.0	222.5	235.7	247.2	257.4	265.6	277.5
Eating	57.4	60.5	62.9	64.5	66.0	73.0	78.5	80.7	85.6	88.3	90.9
All other	141.8	150.7	162.1	173.8	185.3	198.4	213.8	236.6	253.2	262.3	272.9
Total domestic economy	3,149.6	3,405.0	3,777.2	4,038.7	4,268.6	4,539.9	4,900.4	5,250.8	5,546.1	5,722.9	6,038.5
	<i>Percent</i>										
Farm sector	1.9	1.2	1.5	1.4	1.2	1.2	1.0	1.2	1.2	1.1	1.1
Nonfarm sectors	17.9	17.3	16.3	15.8	15.6	15.2	15.0	15.0	14.8	14.9	14.6
Total domestic economy	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

¹Total FFS employment in 1982 in appendix table 3 and table 5 is different from table 3 because a revised set of FFS final demands (the latest revised data is incorporated) has been used here. Appendix table 3 and table 5 represent FFS employment in terms of the base year 1982. The difference between total FFS employment in table 3 and appendix table 3/table 5 is due mostly to Government and household workers being included in the former.

inshipments and outshipments. In the farm and farm-related employment estimates, we avoid these data problems by including only farm production and industries that have at least 32 percent of their national workforce employed in the Food and Fiber System.

Developing Local Estimates

Measures of the agriculturally related economic system at the regional or local level are also based on 1982 interindustry linkages. However, these measures entail some definitional changes due to data limitations (availability) at the local level. We use one of the few comprehensive sources of detailed employment data at the county level—the annual County Business Patterns (CBP), released by the Bureau of the Census, U.S. Department of Commerce. This series provides county-level employment by four-digit levels of the SIC system. The employment data consist of full-time and part-time employees who were on the establishment's payroll in the pay period including March 12. The data do not include information on self-employed persons, domestic service workers, most government employees, railroad employees, and agricultural production workers.

In compiling a data series for measuring local farm and farm-related employment, we started with establishment-based employment data from CBP. This data series was enhanced to account for confidential data not published by the Bureau of the Census. The nondisclosure adjustment used midpoints of the number-of-establishments by employee size class, in conjunction with a Vector RA procedure, to estimate missing data elements. The Vector RA procedure adds up all related SIC codes, starting with the four-digit data, and moving to the three, two, and one-digit data, respectively. This procedure compares the group total with the actual total, and then makes adjustments only to the elements that were nondisclosed to ensure that the SIC groups add to the totals. To complete the array of industrial detail, the CBP data are supplemented with employment data from the Bureau of Economic Analysis (BEA), U.S. Department of Commerce. The BEA data provide information on farm proprietors and wage and salary jobs in farm production, as well as nonfarm proprietors, government employees, and railroad workers. These data are primarily from establishment payroll records and farm proprietor numbers are equivalent to the actual number of farms. Employment data on nonfarm proprietors, available only for major industrial divisions (one-digit SIC level), are prorated among farm-related industries (two-, three-, and four-digit SIC levels) based on the

proprietor share of total employment in the category in which the farm-related industry is classified. The percentage of proprietor employment in every industrial category was determined for each county. These percentages were applied to wage and salary employment in farm-related industries in the county to estimate the county's total employment.

When compiling a data set for regional analysis, we chose to exclude industries whose workforce comprises only a relatively small proportion of agriculturally related employment rather than use national FFS output shares to estimate regional (local) agriculturally related employment. Since local employment participation rates in the Food and Fiber System may not equal the national averages in the FFS, we made several simplifying assumptions.

Generally, we have defined farming and closely related industries as those industries that have 50 percent or more of their national workforce employed in providing goods and services necessary to satisfy domestic final demands for agricultural products. Industries that employ 32-50 percent of their national workforce in such endeavors are classified as indirect agribusinesses.

The only major exceptions to these criteria are some of the warehousing, retail trade, and wholesale trade sectors. In the national input-output tables, these sectors are highly aggregated and contain both agriculture-related trade services and trade services that have very few linkages with farm-related industries. Since the input/output-based procedure does not provide sufficient detail to determine how much each of these trade service sectors contributed to farm and farm-related employment, we relied on SIC definitions. That is, if the SIC definition indicated that a particular trade service sector is clearly engaged in farm or farm-related activities (for example, farm product warehousing and storage; retail sale of hay, grain, and feed; wholesale distribution of tobacco and its products; etc.), then it is assumed that this trade's service sector is part of the farm-related industries.

All of these agriculture-related sectors are then classified by location in metro and nonmetro counties as defined by the Office of Management and Budget's Metropolitan Statistical Area designation in 1984.

Table 4 shows how these industries are aggregated into related groups, classified as: (1) farming; (2) closely related industries (agriculture services, forestry, fishing; agricultural input industries;

Table 4—Classification of farm and farm-related industries

Industry groups and components	1987 Standard Industrial Classification (SIC) ¹
<i>Farming:</i>	
Farm production (farm proprietors, and wage and salary farmworkers)	01-02 ²
<i>Closely related industries:</i>	
Agricultural services, forestry, and fishing	071-2, 074-6, 08-09
<i>Agricultural input industries--</i>	
Agricultural chemicals	287
Farm machinery and equipment	3523
Farm supply and machinery (wholesale trade)	5083, 5191
Commodity contract brokers and dealers	622
<i>Agricultural processing and marketing--</i>	
Meat products	201
Dairy products	202
Canned, frozen, and preserved fruits and vegetables	203
Grain mill products	204
Bakery products	205
Sugar and confectionery products	206
Fats and oils products	207
Beverages	208
Miscellaneous food preparations and kindred products	209
Tobacco products	21
Apparel and textiles	221-4, 2251-4, 2257-8, 226, 228, 231-8, 2397, 3965
Leather products and footwear	302, 31
Packaging	2441, 2449, 3221, 3411, 3466
Farm-related raw materials (wholesale trade)	515
Warehousing	4221, 4222
<i>Peripherally related industries:</i>	
<i>Wholesale and retail trade of agricultural products--</i>	
Wholesale trade	513-4, 518, 5194
Retail trade	54, 56, 58, 592, 5948-9, 5993
<i>Indirect agribusiness--</i>	
Chemical and fertilizer mining	147
Miscellaneous textile products	2259, 2298-9, 2393, 2395
Containers, paper products, and pulpwood products	263, 265, 2671-4, 2679
Food products machinery	3556
Miscellaneous manufacturing	2448, 3497

¹The Standard Industrial Classification (SIC) was revised in 1987. The revision resulted in mergers of some industries and creation of others through subdividing or restructuring existing industries.

²Data were obtained from the Bureau of Economic Analysis, U.S. Department of Commerce, because County Business Patterns data do not include information about the employment of farmers or wage and salary jobs in agricultural production (SIC 01-02).

agricultural processing and marketing industries); and (3) peripherally related industries (wholesale and retail trade of agricultural products, indirect agribusiness).

Comparing the Local With the National Estimates

Table 5 compares 1982 national employment estimates for the Food and Fiber System with employment in the farm and farm-related industries. There was a 6.4-percent discrepancy between the two measures—20,634,000 jobs in the FFS compared with 19,322,000 jobs in the farm and farm-related industries.

However, the employment differential was as high as 53 percent for production agriculture (farming).

Nearly half of the national employment differential can be attributed to such definitional differences as the use of household occupation survey data for estimating farm employment in the FFS and establishment data for estimating the number of farm operators in the farm and farm-related industries. Most of the remaining difference can be attributed to the way employment is allocated in industries where part of the workforce is engaged in activities that have little to do (directly or indirectly) with the farm and farm-related industries. In the FFS definition, employment includes only the labor force that is actually used to produce goods and services to satisfy the final demand for agricultural products. Thus, in 1982, the FFS accounted for 24 percent of the employed civilian labor force (table 5). The employment shares average 86.2 percent for farming, 85.8 percent for closely related industries, and 17.8 percent for the peripherally related industries. As mentioned previously, this is not the case with the definition of the farm and farm-related industries. In the latter case, we are defining industries as farm or farm-related if 32 percent or more of their national workforce is linked to the Food and Fiber System; and, if that is true, then all of their employment is considered as part of the farm and farm-related industries.

These assumptions appear to produce reasonable measures for farm production and the closely related industries. In the case of peripherally related industries, the overall discrepancy between the two measures widens somewhat with the inclusion of total employment from industries that engage in the wholesale and retail trade activity of farm-related

Table 5—Food and Fiber System and farm and farm-related employment, 1982

Industry group	Food and fiber system			Employment differences
	Employment share ¹	Job requirements	Farm and farm-related industries	
	<i>Percent</i>	<i>Thousand jobs</i>		<i>Percent</i>
Farming	86.2	2,368	3,621	52.9
Closely related industries	85.8	4,882	4,679	-4.2
Agricultural services, forestry, fishing	86.0	355	346	-2.5
Agricultural input industries	58.5	597	524	-12.2
Agricultural processing and marketing	87.0	3,930	3,809	-3.1
Food and kindred products	90.5	1,499	1,491	-0.5
Tobacco	98.0	67	60	-10.4
Apparel and textiles	84.5	1,417	1,701	20.0
Leather	83.5	201	230	14.4
Packaging, farm raw materials, wholesale trade, warehousing	77.6	746	327	-56.2
Peripherally related industries	17.8	13,384	11,022	-17.6
Wholesale and retail trade of agricultural products, indirect agribusiness ²	37.9	5,288	11,022	108.4
Other ³	17.6	8,096	--	--
Total	24.0	20,634	19,322	-6.4

¹FFS wholesale and retail, warehousing, and commodity contract brokers and dealers are not included in the employment share category percentages. They are included in the total employment share and in the job requirements column.

²Indirect agribusiness includes industries that employ between 32 and 50 percent of their national workforce in providing goods and services necessary to satisfy domestic U.S. final demand for agricultural products.

³Industries that employ only some (less than 32 percent) of their workforce to produce goods and services to satisfy domestic final demands for agricultural products. Examples are government enterprises, advertising, motor freight transportation, etc.

products. The inclusion of total employment from such industries overestimates the farm and farm-related employment. This overestimate, however, appears to have been offset by the exclusion of employment from industries that employ less than 32 percent of their national workforce in the FFS.

Conclusion

Given the differences in methodology, the Food and Fiber System and farm and farm-related employment estimates came out relatively close in 1982. They came even closer during the ensuing 1982-90 period (tables 3 and 6). Total employment differences narrowed from 3.6 million in 1982 to 2.5 million in 1990. In terms of relative employment shares (percent of the domestic economy), the Food and Fiber System declined 2 percent and farm and farm-related employment 1.9 percent from 1982 to 1990. There are of course some differences among

subsectors but both series show similar trends: job decreases in the farm sector and manufacturing, little change in food processing, and growth in transportation and in wholesale/retail trade.

When making some of the comparisons, such as computing relative employment shares, different employment bases are used for measuring total domestic economic activity. Because FFS measures incorporate BLS employment data that are not easily disaggregated to small geographic areas, it seemed more appropriate to use the CBP/BEA (County Business Patterns and Bureau of Economic Analysis) data for the FRE. The latter series can provide county-level employment estimates and is used by ERS to address many local issues. Both series show total farm and farm-related employment growing more slowly than the domestic economy.

Appendix II—Procedure for Estimating Manmade Fiber Content of Domestic and Imported Textiles

Step 1. Using equation 1 (p. 3), we estimate total output required from all sectors to support PCE for clothing and shoes plus textile exports and imports (shoes, clothing, apparel exports/imports in table 1.) Sum this 534 x 4 matrix to a 534 by 1 vector of sector outputs.

Step 2. From this 534 x 1 vector of sector outputs we select four sums, the output of sectors (280100) plastics materials and resins, (280200) synthetic rubber, (280300) cellulosic man-made fibers, and (280400) organic fibers-noncellulosic. These sectors account for most of the man-made materials used in

domestic clothing and shoes, and textile exports and imports.

Step 3. Our man-made fiber adjustment is the output of the four sectors selected in step 2 and all direct inputs used in making this output. We estimated these inputs by multiplying the direct requirement coefficients (inputs per dollar of output from the input-output accounts) of the four man-made fiber sectors times the output estimates.

Step 4. We sum the 534 x 4 matrix of step 3 to a 534 x 1 vector and subtract the vector from total FFS output by sector.

Appendix table 2--Output supporting the U.S. Food and Fiber System, industry output, and Food and Fiber System share by sector, 1982

Industry input-output code and title	Total FFS output	FFS output share	Total output ¹
	\$ million	Percent	\$ million
1. Agriculture, Forestry, and Fisheries			
010100 Dairy farm products	15723.5	0.824327	19074.4
010200 Poultry and eggs	8987.0	0.917355	9796.7
010301 Meat animals	43338.1	0.879757	49261.4
010302 Animal specialties and miscellaneous livestock	852.7	0.387552	2200.2
020100 Cotton	2655.3	0.763108	3479.6
020201 Food grains	11138.3	0.959978	11602.7
020202 Feed grains	34527.3	0.876096	39410.4
020203 Grass seeds	255.4	0.762361	335
020300 Tobacco	3196.8	0.918249	3481.4
020401 Fruits	5867.7	0.948719	6184.9
020402 Tree nuts	797.3	0.968827	823
020501 Vegetables	8114.7	0.943882	8597.2
020502 Sugar crops	1457.1	0.887738	1641.4
020503 Miscellaneous crops	534.2	0.791126	675.2
020600 Oil bearing crops	13121.7	0.946759	13859.6
020701 Forest products	211.1	0.177469	1189.4
020702 Greenhouse and nursery products	3514.7	0.791649	4439.7
030001 Forestry products	679.5	0.183575	3701.5
030002 Commercial fishing	3399.9	1.421347	2392
040001 Agricultural, forestry, and fishery services	6119.1	0.797946	7668.6
040002 Landscape and horticultural services	295.4	0.052985	5576
2. Mining			
050000 Iron and ferroalloy ores mining	232.9	0.136326	1708.3
060100 Copper ore mining	128.2	0.085121	1505.9
060200 Nonferrous metal ores mining, except copper	298.5	0.148221	2014.2
070000 Coal mining	3372.7	0.117755	28641.7
080000 Crude petroleum and natural gas	27023.8	0.180641	149599.3
090001 Dimension, crushed and broken stone mining and quarrying	272.0	0.098123	2771.7
090002 Sand and gravel mining	162.4	0.085821	1892.3
090003 Clay, ceramic, and refractory minerals mining	133.8	0.151589	882.5
090004 Nonmetallic mineral services and miscellaneous minerals	70.7	0.138879	509.3
100000 Chemical and fertilizer mineral mining	981.2	0.317612	3089.3
3. Construction			
110101 New residential 1-unit structure	0.0	0	40073.3
110102 New residential 2-4 unit structure	0.0	0	2875.7
110103 New residential garden apartments	0.0	0	8406.7
110104 New residential high-rise apartments	0.0	0	2349.3
110105 New residential additions and alterations, nonfarm	0.0	0	23601.8
110106 New hotels and motels	0.0	0	3895.1
110107 New dormitories and other group housing	0.0	0	722
110201 New industrial buildings	0.0	0	36654.1
110202 New office buildings	0.0	0	33368.5
110203 New warehouses	0.0	0	5249.9
110204 New garages and service stations	0.0	0	952.8
110205 New stores and restaurants	0.0	0	10402.8
110206 New religious buildings	0.0	0	1621
110207 New educational buildings	0.0	0	7609.4
110231 New hospitals	0.0	0	8580.7
110232 New residential institutions and health related facilities	0.0	0	1993.6
110241 New amusement and recreation buildings	0.0	0	2040.7
110250 Other new nonfarm buildings	0.0	0	3122.6
110301 New telephone and telegraph facilities	0.0	0	6874.8
110302 New railroads	0.0	0	1255
110303 New electric utility facilities	0.0	0	24641.3
110304 New gas utility facilities	0.0	0	3763.8
110305 New petroleum pipelines	0.0	0	357.9

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Appendix table 2—Output supporting the U.S. Food and Fiber System, industry output, and Food and Fiber System share by sector, 1982—continued

Industry input-output code and title	Total FFS output	FFS output share	Total output ¹
	\$ million	Percent	\$ million
110306 New water supply facilities	0.0	0	4370.3
110307 New sewer system facilities	0.0	0	8524.7
110308 New local transit facilities	0.0	0	1452.5
110400 New highways and streets	0.0	0	17430.3
110501 New farm housing units and additions and alterations	0.0	0	1095
110502 New farm service facilities	3757.0	1.017606	3692
110601 New petroleum and natural gas well drilling	0.0	0	38620.2
110602 New petroleum, natural gas, and solid mineral exploration	0.0	0	4858.9
110603 New access structures for solid mineral development	0.0	0	1428
110701 New military facilities	0.0	0	16.7
110702 New dams and reservoirs	0.0	0	800.9
110703 Other new conservation and development facilities	0.0	0	2581.3
110704 Other new nonbuilding facilities	0.0	0	3846.1
120100 Residential construction repair and maintenance (R & M)	916.6	0.032176	28488.2
120201 Nonresidential nonfarm building construction R & M	4811.1	0.11128	43234.3
120202 Farm residential building construction R & M	8.2	0.011973	686
120203 Farm service facility construction R & M	1395.3	0.753063	1852.8
120204 Telephone and telegraph facility construction R & M	301.8	0.085678	3523
120205 Railroad construction R & M	1069.6	0.199648	5357.2
120206 Electric utility facility construction R & M	967.0	0.142183	6801
120207 Gas utility facility construction R & M	77.6	0.141771	547.6
120208 Petroleum pipeline construction R & M	44.3	0.128522	345
120209 Water supply facility construction R & M	291.5	0.094982	3068.5
120210 Sewer facility construction R & M	303.4	0.098244	3088.1
120211 Local transit facility construction R & M	38.8	0.056839	682.4
120212 Military facility construction R & M	0.0	0	910.4
120213 Conservation and development facility construction R & M	0.0	0	889
120214 Highway and street construction R & M	224.1	0.016293	13753
120215 Petroleum and natural gas well construction R & M	742.8	0.180692	4110.6
120216 Other nonbuilding facility construction R & M	243.6	0.104811	2324.3
4. Manufacturing			
130100 Guided missiles and space vehicles	6.2	0.00061	10169.4
130200 Ammunition, no small arms, not elsewhere classified (n.e.c.)	8.3	0.004717	1753.1
130300 Tanks and tank components	4.8	0.00188	2564.8
130500 Small arms	16.1	0.014602	1104.2
130600 Small arms ammunition	16.3	0.019834	823
130700 Other ordnance and accessories	5.1	0.003662	1393.3
140101 Meat packing plants	37637.7	0.885654	42497.1
140102 Sausages and other prepared meats	10758.1	0.926181	11615.6
140103 Poultry dressing plants	8479.6	0.928494	9132.6
140104 Poultry and egg processing	1260.9	0.954539	1321
140200 Creamery butter	1269.2	0.771528	1645.1
140300 Cheese, natural and processed	7920.2	0.794348	9970.7
140400 Condensed and evaporated milk	3640.7	0.818869	4446
140500 Ice cream and frozen desserts	2094.3	0.822051	2547.7
140600 Fluid milk	14235.3	0.834408	17060.3
140700 Canned and cured sea foods	1223.6	0.893834	1368.9
140800 Canned specialties	3809.7	0.947782	4019.6
140900 Canned fruits and vegetables	8065.4	0.882958	9134.5
141000 Dehydrated food products	1616.7	0.91777	1761.6
141100 Pickles, sauces, and salad dressings	3617.6	0.90324	4005.1
141200 Fresh or frozen packaged fish	2894.8	0.771962	3749.9
141301 Frozen fruits, fruit juices and vegetables	4648.6	0.898765	5172.2
141302 Frozen specialties	4262.1	0.976513	4364.6
141401 Flour and other grain mill products	4369.1	0.925942	4718.6
141402 Cereal breakfast foods	3685.0	0.960004	3838.5
141403 Blended and prepared flour	1262.6	0.951467	1327
141501 Dog, cat, and other pet food	4042.1	0.953656	4238.5
141502 Prepared feeds, n.e.c.	11779.7	0.870859	13526.5

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Appendix table 2--Output supporting the U.S. Food and Fiber System, industry output, and Food and Fiber System share by sector, 1982--continued

Industry input-output code and title	Total FFS output	FFS output share	Total output ¹
	\$ million	Percent	\$ million
141600 Rice milling	1789.4	1.003423	1783.3
141700 Wet corn milling	2725.6	0.847325	3216.7
141801 Bread, cake, and related products	15091.8	0.905137	16673.5
141802 Cookies and crackers	4168.2	0.942514	4422.4
141900 Sugar	4938.6	0.883337	5590.9
142001 Confectionery products	6177.8	0.952779	6484
142002 Chocolate and cocoa products	2081.7	0.939386	2216
142003 Chewing gum	796.1	0.881133	903.5
142101 Malt beverages	12107.0	0.951113	12729.3
142102 Malt	627.4	0.963465	651.2
142103 Wines, brandy, and brandy spirits	2814.7	0.863021	3261.5
142104 Distilled liquor, except brandy	5077.2	0.828697	6126.7
142200 Bottled and canned soft drinks	14307.7	0.969027	14765
142300 Flavoring extracts and syrups, n.e.c.	3804.4	0.903004	4213.1
142400 Cottonseed oil mills	664.7	0.811756	818.9
142500 Soybean oil mills	7066.2	0.900097	7850.5
142600 Vegetable oil mills, n.e.c.	268.7	0.591754	454
142700 Animal and marine fats and oils	1330.4	0.803848	1655.1
142800 Roasted coffee	4651.5	0.865658	5373.4
142900 Shortening and cooking oils	4209.9	0.875735	4807.3
143000 Manufactured ice	239.7	1.048981	228.5
143100 Macaroni and spaghetti	979.1	0.960194	1019.7
143200 Food preparations, n.e.c.	9868.7	0.923194	10689.7
150101 Cigarettes	14239.7	0.999238	14250.6
150102 Cigars	287.5	1.000333	287.4
150103 Chewing and smoking tobacco	619.8	0.980581	632.1
150200 Tobacco stemming and redrying	4082.9	0.910385	4484.8
160100 Broadwoven fabric mills and fabric finishing plants	11802.2	0.551561	21397.9
160200 Narrow fabric mills	435.5	0.512613	849.6
160300 Yarn mills and finishing of textiles, n.e.c.	4068.9	0.550048	7397.4
160400 Thread mills	456.8	0.793531	575.7
170100 Floor coverings	262.1	0.044854	5843
170200 Felt goods, n.e.c.	38.2	0.153648	248.3
170300 Lace goods	55.8	0.776752	71.9
170400 Padding and upholstery filling	32.4	0.116905	277.1
170500 Processed textile waste	30.8	0.143707	214.5
170600 Coated fabrics, not rubberized	274.2	0.253949	1079.7
170700 Tire cord and fabric	221.8	0.226628	978.7
170900 Cordage and twine	128.3	0.384056	334.1
171001 Nonwoven fabrics	237.6	0.186629	1273.1
171002 Textile goods, n.e.c.	117.1	0.389156	301
180101 Women's hosiery, except socks	1400.1	1.008666	1388.1
180102 Hosiery, n.e.c.	1431.6	1.026501	1394.6
180201 Knit outerwear mills	2935.2	0.947698	3097.2
180202 Knit underwear mills	754.7	0.933911	808.1
180203 Knitting mills, n.e.c.	36.8	0.334173	110
180300 Knit fabric mills	3767.4	0.953463	3951.3
180400 Apparel made from purchased materials and dressed furs	41062.6	0.948721	43282.1
190100 Curtains and draperies	13.1	0.011687	1123.2
190200 Housefurnishings, n.e.c.	76.4	0.024129	3166.1
190301 Textile bags	149.3	0.385826	387
190302 Canvas and related products	142.0	0.202736	700.2
190303 Pleating and stitching	377.5	0.435134	867.5
190304 Automotive and apparel trimmings	392.5	0.185973	2110.3
190305 Schiffli machine embroideries	185.4	0.611226	303.4
190306 Fabricated textile products, n.e.c.	227.6	0.157356	1446.6
200100 Logging camps and logging contractors	1597.8	0.147253	10850.6
200200 Sawmills and planing mills, general	1190.2	0.122423	9722.3
200300 Hardwood dimension and flooring mills	28.1	0.031463	893.3
200400 Special product sawmills, n.e.c.	24.3	0.165813	146.4
200501 Millwork	91.8	0.022333	4110.7

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Appendix table 2—Output supporting the U.S. Food and Fiber System, industry output, and Food and Fiber System share by sector, 1982--continued

Industry input-output code and title	Total FFS output	FFS output share	Total output ¹
	\$ million	Percent	\$ million
200502 Wood kitchen cabinets	7.2	0.003528	2027.6
200600 Veneer and plywood	307.7	0.069326	4438.6
200701 Structural wood members, n.e.c.	7.6	0.009477	799.4
200702 Prefabricated wood buildings	2.9	0.00215	1325.9
200800 Wood preserving	77.0	0.058315	1320.4
200901 Wood pallets and skids	360.1	0.3644	988.3
200902 Particleboard	11.7	0.021787	538.2
200903 Wood products, n.e.c.	270.9	0.082832	3270.7
210000 Wood containers	424.1	0.708885	598.3
220101 Wood household furniture	7.7	0.001555	4982.2
220102 Household furniture, n.e.c.	5.7	0.015054	379.5
220103 Wood TV and radio cabinets	3.8	0.012602	304
220200 Upholstered household furniture	0.8	0.000217	3547.3
220300 Metal household furniture	7.0	0.004474	1555.8
220400 Mattresses and bedsprings	2.7	0.001406	1902.8
230100 Wood office furniture	0.3	0.000275	1040.3
230200 Metal office furniture	6.2	0.002073	3006.2
230300 Public building furniture	8.3	0.007738	1075.1
230400 Wood partitions and fixtures	8.6	0.004884	1758.7
230500 Metal partitions and fixtures	9.4	0.004994	1874.2
230600 Drapery hardware and blinds and shades	4.5	0.004426	1013.1
230700 Furniture and fixtures, n.e.c.	4.1	0.003385	1223.2
240100 Pulp mills	746.2	0.242333	3079.3
240200 Paper mills, except building paper	5040.0	0.239553	21039
240300 Paperboard mills	3503.4	0.366531	9558.2
240400 Envelopes	202.6	0.117844	1719.3
240500 Sanitary paper products	2606.7	0.298885	8721.3
240602 Building paper and board mills	18.5	0.052214	353.5
240701 Paper coating and glazing	1821.0	0.343171	5306.3
240702 Bags, except textile	1828.5	0.369916	4942.9
240703 Die-cut paper and board	225.1	0.137599	1636.2
240704 Pressed and molded pulp goods	105.9	0.440537	240.3
240705 Stationery products	65.9	0.073859	892.6
240706 Converted paper products, n.e.c.	322.0	0.140815	2286.6
250000 Paperboard containers and boxes	8989.3	0.477975	18807.1
260100 Newspapers	4658.9	0.216372	21531.9
260200 Periodicals	1843.1	0.159488	11556.4
260301 Book publishing	159.1	0.02077	7662
260302 Book printing	210.9	0.088932	2371.7
260400 Miscellaneous publishing	678.8	0.241022	2816.4
260501 Commercial printing	7232.3	0.257622	28073.4
260502 Lithographic platemaking and services	298.6	0.257806	1158.4
260601 Manifold business forms	487.3	0.099536	4895.3
260602 Blankbooks and looseleaf binders	194.6	0.096607	2013.9
260700 Greeting card publishing	72.3	0.038913	1856.9
260801 Engraving and plate printing	99.8	0.173242	576.3
260802 Bookbinding and related work	34.4	0.044872	767.2
260803 Typesetting	324.7	0.237114	1369.4
260804 Photoengraving, electrotyping, and stereotyping	42.6	0.276062	154.2
270101 Alkalies and chlorine	356.7	0.228663	1560.1
270102 Industrial gases	287.7	0.149847	1919.9
270103 Inorganic pigments	262.6	0.164882	1592.4
270104 Industrial inorganic chemicals, n.e.c. excluding alumina	1800.5	0.179697	10019.7
270105 Industrial organic chemicals except gum and wood chemicals	6638.9	0.180788	36722
270201 Nitrogenous and phosphatic fertilizers	4063.7	0.605331	6713.2
270202 Fertilizers, mixing only	921.2	0.634787	1451.2
270300 Agricultural chemicals, n.e.c.	3037.7	0.58801	5166.1
270401 Gum and wood chemicals	85.8	0.139708	614.3
270402 Adhesives and sealants	377.0	0.137343	2744.6
270403 Explosives	69.3	0.079047	876.4
270404 Printing ink	430.6	0.280762	1533.8

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Appendix table 2--Output supporting the U.S. Food and Fiber System, industry output, and Food and Fiber System share by sector, 1982--continued

Industry input-output code and title	Total FFS output	FFS output share	Total output ¹
	\$ million	Percent	\$ million
270405 Carbon black	79.4	0.127036	625.1
270406 Chemical preparations, n.e.c.	965.8	0.155518	6210
280100 Plastics materials and resins	2000.0	0.12888	15518.6
280200 Synthetic rubber	321.6	0.103991	3092.2
280300 Cellulosic man-made fibers	45.3	0.036687	1234.3
280400 Organic fibers, noncellulosic	278.6	0.033652	8277.4
290100 Drugs	1668.8	0.070748	23588.2
290201 Soap and other detergents	545.3	0.063902	8532.9
290202 Polishes and sanitation goods	356.7	0.082773	4309.5
290203 Surface active agents	485.2	0.242051	2004.5
290300 Toilet preparations	56.6	0.005822	9714.7
300000 Paints and allied products	725.8	0.085066	8532
310101 Petroleum refining	27226.6	0.138117	197127.4
310102 Lubricating oils and greases	504.6	0.176581	2857.7
310103 Products of petroleum and coal, n.e.c.	108.5	0.156361	694.2
310200 Paving mixtures and blocks	83.5	0.02494	3349.4
310300 Asphalt felts and coatings	150.2	0.056098	2677.1
320100 Tires and inner tubes	1127.1	0.117892	9560.8
320200 Rubber and plastics footwear	620.2	0.963316	643.8
320301 Reclaimed rubber	7.5	0.126267	59.5
320302 Fabricated rubber products, n.e.c.	662.4	0.107539	6159.3
320400 Miscellaneous plastics products	7400.8	0.202952	36465.7
320500 Rubber and plastics hose and belting	317.8	0.174795	1818.2
330001 Leather tanning and finishing	1316.3	0.76004	1731.9
340100 Boot and shoe cut stock and findings	96.8	0.272717	355.1
340201 Shoes, except rubber	4543.1	0.96509	4707.4
340202 House slippers	255.4	0.937682	272.4
340301 Leather gloves and mittens	129.3	0.962017	134.4
340302 Luggage	96.8	0.145612	665
340303 Women's handbags and purses	555.1	0.988496	561.6
340304 Personal leather goods	252.8	0.702453	359.9
340305 Leather goods, n.e.c.	50.2	0.161054	311.4
350100 Glass and glass products, except containers	693.0	0.096375	7191
350200 Glass containers	4012.2	0.766274	5236
360100 Cement, hydraulic	120.9	0.034259	3530.3
360200 Brick and structural clay tile	7.6	0.012583	607.1
360300 Ceramic wall and floor tile	8.8	0.022646	386.6
360400 Clay refractories	23.3	0.036572	637.4
360500 Structural clay products, n.e.c.	0.9	0.007597	121.7
360600 Vitreous plumbing fixtures	14.9	0.032368	459
360701 Vitreous china food utensils	30.1	0.12422	242
360702 Fine earthenware food utensils	4.7	0.05536	84.6
360800 Porcelain electrical supplies	13.2	0.024949	531
360900 Pottery products, n.e.c.	21.1	0.052853	399.5
361000 Concrete block and brick	26.2	0.023929	1094.9
361100 Concrete products, n.e.c.	119.0	0.032453	3666.6
361200 Ready-mixed concrete	282.4	0.032959	8569.5
361300 Lime	96.9	0.179165	540.8
361400 Gypsum products	29.7	0.023555	1260.8
361500 Cut stone and stone products	2.9	0.005324	541.2
361600 Abrasive products	243.9	0.099846	2442.8
361700 Asbestos products	44.1	0.053928	817.1
361800 Gaskets, packing and sealing devices	164.4	0.10281	1599.2
361900 Minerals, ground or treated	100.9	0.081301	1240.9
362000 Mineral wool	78.9	0.035033	2251
362100 Nonclay refractories	27.7	0.040643	681.5
362200 Nonmetallic mineral products, n.e.c.	32.1	0.07774	413.1
370101 Blast furnaces and steel mills	4508.6	0.128015	35219.6
370102 Electrometallurgical products	121.5	0.182016	667.6
370103 Steel wire and related products	260.3	0.11248	2314.4
370104 Cold finishing of steel shapes	382.4	0.129257	2958.2

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Appendix table 2--Output supporting the U.S. Food and Fiber System, industry output, and Food and Fiber System share by sector, 1982--continued

Industry input-output code and title		Total FFS output	FFS output share	Total output ¹
		\$ million	Percent	\$ million
370105	Steel pipe and tubes	454.0	0.125712	3611.4
370200	Iron and steel foundries	670.7	0.071781	9343.9
370300	Iron and steel forging	177.4	0.062112	2856.6
370401	Metal heat treating	102.1	0.095238	1072.1
370402	Primary metal products, n.e.c.	82.6	0.083462	989.5
380100	Primary copper	245.0	0.079935	3064.7
380200	Primary lead	64.6	0.114068	566.4
380300	Primary zinc	58.9	0.200185	294.1
380400	Primary aluminum and alumina	1659.1	0.27623	6006.4
380500	Primary nonferrous metals, n.e.c.	188.5	0.080295	2348.0
380600	Secondary nonferrous metals	691.2	0.156757	4409.6
380700	Copper rolling and drawing	205.0	0.063677	3220
380800	Aluminum rolling and drawing	2424.1	0.236892	10233
380900	Nonferrous rolling and drawing, n.e.c.	149.1	0.044801	3328.2
381000	Nonferrous wire drawing and insulating	356.3	0.044363	8032.6
381100	Aluminum castings	173.9	0.058554	2969.5
381200	Brass, bronze, and copper castings	40.6	0.059	687.3
381300	Nonferrous castings, n.e.c.	41.0	0.045632	899.4
381400	Nonferrous forging	32.0	0.03077	1039.3
390100	Metal cans	8902.4	0.811446	10971.1
390200	Metal barrels, drums, and pails	265.2	0.256276	1034.9
400100	Metal sanitary ware	17.4	0.031594	550.6
400200	Plumbing fixture fittings and trim	40.6	0.032089	1266.3
400300	Heating equipment, except electric	29.3	0.015302	1915.5
400400	Fabricated structural metal	275.9	0.034066	8099.4
400500	Metal doors, sash, and trim	163.2	0.035949	4539.5
400600	Fabricated plate work (boiler shops)	210.2	0.026538	7921
400700	Sheet metal work	305.6	0.045509	6715.1
400800	Architectural metal work	39.5	0.028424	1389.4
400901	Prefabricated metal buildings	192.9	0.087469	2205.2
400902	Miscellaneous metal work	51.7	0.021568	2394.8
410100	Screw machine products and bolts, nuts, rivets, and washers	397.8	0.071176	5589
410201	Automotive stampings	334.7	0.038255	8749.6
410202	Crowns and closures	585.8	0.722798	810.4
410203	Metal stampings, n.e.c.	331.5	0.052415	6324.6
420100	Cutlery	40.6	0.044806	906
420201	Hand and edge tools, n.e.c.	456.3	0.172712	2641.8
420202	Hand saws and saw blades	43.5	0.095163	456.6
420300	Hardware, n.e.c.	217.0	0.038945	5572.7
420401	Plating and polishing	119.2	0.043119	2763.9
420402	Metal coating and allied services	306.1	0.127418	2402.3
420500	Miscellaneous fabricated wire products	350.3	0.105167	3330.6
420700	Steel springs, except wire	45.7	0.121459	376.2
420800	Pipe, valves, and pipe fittings	906.4	0.077934	11630.9
421000	Metal foil and leaf	852.4	0.476356	1789.5
421100	Fabricated metal products, n.e.c.	392.9	0.091914	4274.4
430100	Turbines and turbine generator sets	155.5	0.043006	3614.6
430200	Internal combustion engines, n.e.c.	773.6	0.089937	8601.9
440001	Farm machinery and equipment	5921.6	0.572404	10345.1
440002	Lawn and garden equipment	341.8	0.151728	2252.8
450100	Construction machinery and equipment	640.1	0.05766	11101.9
450200	Mining machinery, except oil field	101.0	0.051042	1978.5
450300	Oil field machinery	202.6	0.019009	10655.9
460100	Elevators and moving stairways	22.8	0.02143	1065.7
460200	Conveyors and conveying equipment	77.8	0.028795	2701.9
460300	Hoists, cranes, and monorails	22.2	0.021949	1010.1
460400	Industrial trucks and tractors	78.7	0.043629	1803
470100	Machine tools, metal cutting types	75.7	0.018573	4075.4
470200	Machine tools, metal forming types	24.5	0.018431	1327.2
470300	Special dies and tools and machine tool accessories	481.7	0.05751	8375.6
470401	Power driven hand tools	188.6	0.117701	1602.3

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Appendix table 2--Output supporting the U.S. Food and Fiber System, industry output, and Food and Fiber System share by sector, 1982--continued

Industry input-output code and title	Total FFS output	FFS output share	Total output ¹
	\$ million	Percent	\$ million
470402 Rolling mill machinery	4.5	0.009278	482.3
470403 Metalworking machinery, n.e.c.	23.7	0.017118	1384
480100 Food products machinery	299.8	0.134524	2228.5
480200 Textile machinery	260.9	0.253817	1027.8
480300 Woodworking machinery	9.2	0.013269	691.5
480400 Paper industries machinery	60.4	0.046053	1311.3
480500 Printing trades machinery	90.3	0.043145	2093.4
480600 Special industry machinery, n.e.c.	122.1	0.023868	5117.5
490100 Pumps and compressors	472.0	0.053503	8822.7
490200 Ball and roller bearings	350.8	0.117035	2997.4
490300 Blowers and fans	123.0	0.058569	2100.1
490400 Industrial patterns	43.7	0.098279	444.3
490500 Power transmission equipment	337.8	0.099931	3380
490600 Industrial furnaces and ovens	6.2	0.005618	1100.1
490700 General industrial machinery, n.e.c.	167.9	0.038176	4398.3
500001 Carburetors, pistons, rings, valves	281.0	0.12942	2171.4
500002 Machinery, except electrical, n.e.c.	1720.5	0.134645	12778.3
510101 Electronic computing equipment	237.0	0.006817	34768.5
510102 Calculating and accounting machines	24.0	0.016141	1484.4
510300 Scales and balances	12.1	0.025099	480.5
510400 Typewriters and office machines, n.e.c.	205.0	0.051723	3963.2
520100 Automatic merchandising machines	17.0	0.036212	469.6
520200 Commercial laundry equipment	6.2	0.020155	305.6
520300 Refrigeration and heating equipment	353.8	0.030384	11643.8
520400 Measuring and dispensing pumps	4.8	0.007691	626.3
520500 Service industry machines, n.e.c.	74.7	0.03067	2434.6
530100 Instruments to measure electricity	18.5	0.003271	5654.4
530200 Transformers	50.6	0.017802	2844.8
530300 Switchgear and switchboard apparatus	145.9	0.03017	4836.6
530400 Motors and generators	270.6	0.0458	5908.9
530500 Industrial controls	182.8	0.044401	4117.7
530600 Welding apparatus, electric	46.3	0.035206	1316
530700 Carbon and graphite products	100.3	0.101933	984.4
530800 Electrical industrial apparatus, n.e.c.	9.7	0.009095	1069.8
540100 Household cooking equipment	19.5	0.008853	2197.9
540200 Household refrigerators and freezers	17.7	0.007285	2435.4
540300 Household laundry equipment	22.3	0.010628	2097.9
540400 Electric housewares and fans	56.8	0.019217	2953.4
540500 Household vacuum cleaners	8.0	0.010583	751.9
540600 Sewing machines	20.7	0.072194	286.4
540700 Household appliances, n.e.c.	33.7	0.024121	1397
550100 Electric lamps	118.4	0.058128	2036.5
550200 Lighting fixtures and equipment	218.0	0.043121	5056
550300 Wiring devices	218.3	0.046195	4725.9
560100 Radio and TV receiving sets	81.4	0.014202	5728.2
560200 Phonograph records and tapes	15.7	0.008979	1750.9
560300 Telephone and telegraph apparatus	274.8	0.021327	12886.5
560400 Radio and TV communication equipment	129.7	0.003935	32967
570100 Electron tubes, all types	112.9	0.050094	2253.2
570200 Semiconductors and related devices	599.1	0.050646	11830
570300 Other electronic components	413.4	0.022094	18709.3
580100 Storage batteries	112.0	0.046598	2404.6
580200 Primary batteries, dry and wet	18.9	0.017524	1077.6
580300 X-ray apparatus and tubes	3.4	0.000868	3971
580400 Engine electrical equipment	265.1	0.083425	3177.4
580500 Electrical equipment and supplies, n.e.c.	38.9	0.031129	1249.7
590100 Truck and bus bodies	164.7	0.065238	2524.6
590200 Truck trailers	141.4	0.076604	1846.3
590301 Motor vehicles and car bodies	1598.6	0.022507	71023.9
590302 Motor vehicle parts and accessories	2051.8	0.05724	35846
600100 Aircraft	18.8	0.000613	30735.1

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Appendix table 2--Output supporting the U.S. Food and Fiber System, industry output, and Food and Fiber System share by sector, 1982--continued

Industry input-output code and title	Total FFS output	FFS output share	Total output ¹
	\$ million	Percent	\$ million
600200 Aircraft and missile engines and parts	167.4	0.010714	15627.1
600400 Aircraft and missile equipment, n.e.c.	59.9	0.004959	12076.9
610100 Ship building and repairing	515.8	0.048033	10737.8
610200 Boat building and repairing	150.6	0.034185	4405.6
610300 Railroad equipment	151.5	0.043077	3518
610500 Motorcycles, bicycles, and parts	75.9	0.059476	1276.5
610601 Travel trailers and campers	3.2	0.002582	1229.7
610602 Mobile homes	0.8	0.000223	3585.5
610603 Motor homes (made from purchased materials)	0.6	0.000654	956.2
610700 Transportation equipment, n.e.c.	41.0	0.047955	855.5
620100 Engineering and scientific instruments	19.2	0.006395	2994.7
620200 Mechanical measuring devices	253.0	0.038062	6647.2
620300 Environmental controls	39.7	0.026506	1498.5
620400 Surgical and medical instruments	16.6	0.004168	3970.5
620500 Surgical appliances and supplies	169.0	0.031322	5395.3
620600 Dental equipment and supplies	10.6	0.010403	1019.7
620700 Watches, clocks, and parts	8.8	0.007949	1111.9
630100 Optical instruments and lenses	17.0	0.004574	3726.8
630200 Ophthalmic goods	13.5	0.011493	1173.8
630300 Photographic equipment and supplies	799.0	0.048858	16352.7
640101 Jewelry, precious metal	11.7	0.00346	3381.3
640102 Jewelers' materials and lapidary work	3.4	0.002055	1670.3
640104 Silverware and plated ware	83.6	0.16146	517.6
640105 Costume jewelry	8.8	0.00959	914.5
640200 Musical instruments	16.3	0.018565	879.5
640301 Games, toys, and children's vehicles	19.7	0.00484	4068.9
640302 Dolls	0.5	0.001186	387.7
640400 Sporting and athletic goods, n.e.c.	37.9	0.01106	3424.9
640501 Pens and mechanical pencils	30.5	0.040954	744
640502 Lead pencils and art goods	29.7	0.074561	398.5
640503 Marking devices	30.5	0.095949	318.2
640504 Carbon paper and inked ribbons	62.0	0.087621	707.8
640600 Artificial trees and flowers	89.3	0.380624	234.6
640701 Buttons	110.1	0.905987	121.5
640702 Needles, pins, and fasteners	502.8	0.76182	660
640800 Brooms and brushes	46.4	0.062232	745.1
640900 Hard surface floor coverings	7.2	0.012775	562
641000 Burial caskets and vaults	0.9	0.001347	673.3
641100 Signs and advertising displays	514.6	0.161643	3183.8
641200 Manufacturing industries, n.e.c. excluding fur dressing	449.9	0.102261	4399.7
5. Transportation, Communications, and Utilities			
650100 Railroads and related services	8702.6	0.284607	30577.4
650200 Private local and interurban passenger transit	585.7	0.061154	9578
650300 Motor freight transportation and warehousing	21149.4	0.28507	74190.4
650400 Water transportation	2994.3	0.130466	22950.6
650500 Transportation by air	3629.1	0.085627	42383
650600 Pipe lines, except natural gas	1025.2	0.128457	7980.8
650701 Freight forwarding and miscellaneous transportation service	845.0	0.188251	4488.8
650702 Arrangement of passenger transportation	241.9	0.056663	4269.9
660000 Communications, except radio and TV	8216.9	0.085494	96111
670000 Radio and television broadcasting	4579.3	0.291404	15714.6
680100 Private electric services (utilities)	14668.1	0.140806	104172.3
680200 Private gas production and distribution (utilities)	15840.8	0.143134	110671.2
680301 Private water supply and sewerage systems	124.2	0.065861	1885.3
680302 Sanitary services, steam supply, and irrigation systems	894.5	0.191948	4659.9
6. Wholesale and Retail Trade			
690100 Wholesale trade	124936.3	0.423487	295017.7
690200 Retail trade	82189.3	0.29144	282011.4

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Appendix table 2--Output supporting the U.S. Food and Fiber System, industry output, and Food and Fiber System share by sector, 1982--continued

Industry input-output code and title	Total FFS output	FFS output share	Total output ¹
	\$ million	Percent	\$ million
7. Finance, Insurance, and Real Estate			
700100 Banking	10541.6	0.110783	95155.7
700200 Credit agencies other than banks	2212.2	0.116762	18946
700300 Security and commodity brokers	1424.9	0.054789	26007.7
700400 Insurance carriers	2405.4	0.033327	72175.9
700500 Insurance agents, brokers, and services	988.5	0.033258	29722.2
710100 Owner-occupied dwellings	0.0	0	229067.7
710201 Real estate	23145.3	0.110493	209473.6
710202 Royalties	5640.5	0.159871	35281.8
8. Services			
720100 Hotels and lodging places	1989.9	0.077136	25797.4
720201 Laundry, cleaning, garment services and shoe repair	1026.9	0.09675	10613.9
720202 Funeral service and crematories	0.0	0	3860.3
720203 Portrait photographic studios and misc. personal services	61.6	0.007039	8749.5
720204 Electrical repair shops	1515.3	0.153377	9879.5
720205 Watch, clock, jewelry, and furniture repair	0.0	0	2139.7
720300 Beauty and barber shops	0.0	0	9062.4
730101 Miscellaneous repair shops	3137.1	0.184629	16991.5
730102 Services to dwellings and other buildings	886.6	0.104572	8478.2
730103 Personnel supply services	1274.6	0.135137	9431.8
730104 Computer and data processing services	3494.0	0.107759	32423.7
730105 Management consulting services, testing and research labs	3446.7	0.119749	28782.8
730106 Detective and protective services	804.6	0.135861	5921.9
730107 Equipment rental and leasing	3370.7	0.177236	19018.3
730108 Photofinishing labs, photocopy, and commercial photography	1031.4	0.152876	6746.7
730109 Other business services	4941.5	0.221865	22272.4
730200 Advertising	4155.3	0.304926	13627.1
730301 Legal services	4426.7	0.112294	39421
730302 Engineering, architectural, and surveying services	1209.8	0.030293	39936.4
730303 Accounting, auditing, bookkeeping, and services, n.e.c.	3777.1	0.150093	25165.4
740000 Eating and drinking places	114182.3	0.797313	143208.8
750001 Automotive rental and leasing, without drivers	2096.7	0.195233	10739.7
750002 Automotive repair shops and services	3603.1	0.07589	47478.3
750003 Automobile parking and car washes	125.5	0.043857	2860.6
760100 Motion pictures	3268.9	0.211587	15449.5
760201 Theatrical producers, orchestras, and entertainers	1383.3	0.24378	5674.4
760202 Bowling alleys, billiard, and pool establishments	0.0	0	1633
760203 Professional sports clubs and promoters	71.3	0.059425	1200.1
760204 Racing, including track operation	215.9	0.063463	3402.4
760205 Membership sports and recreation clubs	66.8	0.02209	3022.2
760206 Other amusement and recreation services	793.9	0.060443	13135.3
770100 Doctors and dentists	0.0	0	74999.8
770200 Private hospitals	0.0	0	93830
770301 Private nursing and personal care facilities	0.0	0	18217.9
770302 Other medical and health services, excluding nursing homes	561.2	0.025878	21686.8
770401 Private elementary and secondary schools	0.0	0	9394.6
770402 Private colleges, universities, and professional schools	155.0	0.00835	18567.2
770403 Private libraries, vocational schools, educational service	19.2	0.003763	5111.9
770501 Business assoc. and professional membership organizations	1153.9	0.164478	7015.6
770502 Labor organizations and civic and social associations	0.0	0	9998.3
770503 Religious organizations	0.0	0	17139
770504 Other membership organizations	102.3	0.012928	7910.6
770600 Job training and related services	139.8	0.051865	2695
770700 Child day care services	0.0	0	6350
770800 Residential care	0.0	0	4540.5
770900 Social services, n.e.c.	0.0	0	10196.3

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Appendix table 2--Output supporting the U.S. Food and Fiber System, industry output, and Food and Fiber System share by sector, 1982--continued

Industry input-output code and title	Total FFS output	FFS output share	Total output ¹
	\$ million	Percent	\$ million
9. Government Enterprises			
780100 U.S. Postal Service	3085.8	0.134724	22904.4
780200 Federal electric utilities	713.2	0.14204	5021.4
780300 Commodity Credit Corporation	0.0	0	0.0
780400 Other Federal Government enterprises	2120.0	0.394292	5376.7
790100 State and local government passenger transit	203.5	0.056833	3581
790200 State and local electric utilities	1734.2	0.142146	12200
790300 Other state and local government enterprises	2805.5	0.09821	28566.1
Total	1246944.4	0.224391	5557018.1

¹ In millions of dollars at producer prices. Total output of a sector equals that sector's value-added (wages, salaries, profit-type income, indirect business taxes, etc.) plus all intermediate inputs purchased from other sectors.

Appendix table 3--Total civilian workforce, FFS output share and FFS job requirements, 1982

Industry input-output code and title	Total 1982	FFS output	1982 FFS job
	civilian workforce	share	requirements
	1,000 jobs	Percent	1,000 jobs
1. Agriculture, Forestry, and Fisheries			
010100 Dairy farm products	349.5	0.824327	288.1
010200 Poultry and eggs	206.7	0.917355	189.6
010301 Meat animals	508.3	0.879757	447.2
010302 Animal specialties and miscellaneous livestock	153.4	0.387552	59.5
020100 Cotton	38.1	0.763108	29.1
020201 Food grains	142.6	0.959978	136.9
020202 Feed grains	364.6	0.876096	319.4
020203 Grass seeds	3.2	0.762361	2.5
020300 Tobacco	134.2	0.918249	123.3
020401 Fruits	260.9	0.948719	247.6
020402 Tree nuts	36.1	0.968827	35.0
020501 Vegetables	213.0	0.943882	201.0
020502 Sugar crops	36.8	0.887738	32.7
020503 Miscellaneous crops	15.5	0.791126	12.3
020600 Oil bearing crops	154.2	0.946759	146.0
020701 Forest products	8.2	0.177469	1.5
020702 Greenhouse and nursery products	121.5	0.791649	96.2
030001 Forestry products	25.0	0.183575	4.6
030002 Commercial fishing	66.0	1.421347	93.8
040001 Agricultural, forestry, and fishery services	321.3	0.797946	256.4
040002 Landscape and horticultural services	313.7	0.052985	16.6
2. Mining			
050000 Iron and ferroalloy ores mining	18.2	0.136326	2.5
060100 Copper ore mining	23.6	0.085121	2.0
060200 Nonferrous metal ores mining, except copper	32.1	0.148221	4.8
070000 Coal mining	237.6	0.117755	28.0
080000 Crude petroleum and natural gas	287.8	0.180641	52.0
090001 Dimension, crushed and broken stone mining and quarrying	41.0	0.098123	4.0
090002 Sand and gravel mining	27.7	0.085821	2.4
090003 Clay, ceramic, and refractory minerals mining	9.2	0.151589	1.4
090004 Nonmetallic mineral services and misc. mineral mining	7.2	0.138879	1.0
100000 Chemical and fertilizer mineral mining	27.7	0.317612	8.8
3. Construction			
110101 New residential 1-unit structures	518.8	0	0.0
110102 New residential 2-4 unit structures	37.2	0	0.0
110103 New residential garden apartments	108.8	0	0.0
110104 New residential high-rise apartments	30.4	0	0.0
110105 New residential additions and alterations, nonfarm	305.6	0	0.0
110106 New hotels and motels	50.4	0	0.0
110107 New dormitories and other group housing	9.3	0	0.0
110201 New industrial buildings	474.6	0	0.0
110202 New office buildings	432.0	0	0.0
110203 New warehouses	68.0	0	0.0
110204 New garages and service stations	12.3	0	0.0
110205 New stores and restaurants	134.7	0	0.0
110206 New religious buildings	21.0	0	0.0
110207 New educational buildings	98.5	0	0.0
110231 New hospitals	111.1	0	0.0
110232 New residential institutions and health facilities	25.8	0	0.0
110241 New amusement and recreation buildings	26.4	0	0.0
110250 Other new nonfarm buildings	40.4	0	0.0
110301 New telephone and telegraph facilities	89.0	0	0.0
110302 New railroads	16.2	0	0.0
110303 New electric utility facilities	319.0	0	0.0
110304 New gas utility facilities	48.7	0	0.0

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Appendix table 3—Total civilian workforce, FFS output share and FFS job requirements, 1982—continued

Industry input-output code and title	Total 1982	FFS output	1982 FFS job
	civilian workforce	share	requirements
	1,000 jobs	Percent	1,000 jobs
110305 New petroleum pipelines	4.6	0	0.0
110306 New water supply facilities	56.6	0	0.0
110307 New sewer system facilities	110.4	0	0.0
110308 New local transit facilities	18.8	0	0.0
110400 New highways and streets	225.7	0	0.0
110501 New farm housing units and additions and alterations	14.2	0	0.0
110502 New farm service facilities	47.8	1.017606	48.6
110601 New petroleum and natural gas well drilling	366.4	0	0.0
110602 New petroleum, natural gas, and solid mineral exploration	46.1	0	0.0
110603 New access structures for solid mineral development	18.5	0	0.0
110701 New military facilities	0.2	0	0.0
110702 New dams and reservoirs	10.4	0	0.0
110703 Other new conservation and development facilities	33.4	0	0.0
110704 Other new nonbuilding facilities	49.8	0	0.0
120100 Residential construction repair and maintenance (R & M)	368.8	0.032176	11.9
120201 Nonresidential nonfarm building construction R & M	559.7	0.11128	62.3
120202 Farm residential building construction R & M	8.9	0.011973	0.1
120203 Farm service facility construction R & M	24.0	0.753063	18.1
120204 Telephone and telegraph facility construction R & M	45.6	0.085678	3.9
120205 Railroad construction R & M	69.4	0.199648	13.8
120206 Electric utility facility construction R & M	88.1	0.142183	12.5
120207 Gas utility facility construction R & M	7.1	0.141771	1.0
120208 Petroleum pipeline construction R & M	4.5	0.128522	0.6
120209 Water supply facility construction R & M	39.7	0.094982	3.8
120210 Sewer facility construction R & M	40.0	0.098244	3.9
120211 Local transit facility construction R & M	8.8	0.056839	0.5
120212 Military facility construction R & M	11.8	0	0.0
120213 Conservation and development facility construction R & M	11.5	0	0.0
120214 Highway and street construction R & M	178.1	0.016293	2.9
120215 Petroleum and natural gas well construction R & M	39.0	0.180692	7.0
120216 Other nonbuilding facility construction R & M	30.1	0.104811	3.2
4. Manufacturing			
130100 Guided missiles and space vehicles	103.3	0.00061	0.1
130200 Ammunition, no small arms, n.e.c.	16.5	0.004717	0.1
130300 Tanks and tank components	19.5	0.00188	0.0
130500 Small arms	18.5	0.014602	0.3
130600 Small arms ammunition	10.9	0.019834	0.2
130700 Other ordnance and accessories	19.2	0.003662	0.1
140101 Meat packing plants	148.9	0.885654	131.9
140102 Sausages and other prepared meats	72.6	0.926181	67.2
140103 Poultry dressing plants	115.7	0.928494	107.4
140104 Poultry and egg processing	14.7	0.954539	14.1
140200 Creamery butter	2.7	0.771528	2.1
140300 Cheese, natural and processed	36.0	0.794348	28.6
140400 Condensed and evaporated milk	14.8	0.818869	12.2
140500 Ice cream and frozen desserts	21.7	0.822051	17.8
140600 Fluid milk	95.2	0.834408	79.4
140700 Canned and cured sea foods	14.4	0.893834	12.9
140800 Canned specialties	24.5	0.947782	23.2
140900 Canned fruits and vegetables	73.9	0.882958	65.3
141000 Dehydrated food products	14.3	0.91777	13.1
141100 Pickles, sauces, and salad dressings	23.1	0.90324	20.8
141200 Fresh or frozen packaged fish	39.0	0.771962	30.1
141301 Frozen fruits, fruit juices, and vegetables	51.7	0.898765	46.5
141302 Frozen specialties	42.8	0.976513	41.7
141401 Flour and other grain mill products	18.7	0.925942	17.4
141402 Cereal breakfast foods	19.4	0.960004	18.6
141403 Blended and prepared flour	8.4	0.951467	8.0
141501 Dog, cat, and other pet food	21.6	0.953656	20.6

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Appendix table 3--Total civilian workforce, FFS output share and FFS job requirements, 1982--continued

Industry input-output code and title	Total 1982	FFS output	1982 FFS job
	civilian workforce	share	requirements
	1,000 jobs	Percent	1,000 jobs
141502 Prepared feeds, n.e.c.	46.5	0.870859	40.5
141600 Rice milling	6.9	1.003423	7.0
141700 Wet corn milling	11.8	0.847325	10.0
141801 Bread, cake, and related products	183.1	0.905137	165.8
141802 Cookies and crackers	48.9	0.942514	46.1
141900 Sugar	33.4	0.883337	29.5
142001 Confectionery products	53.5	0.952779	51.0
142002 Chocolate and cocoa products	10.0	0.939386	9.4
142003 Chewing gum	5.3	0.881133	4.7
142101 Malt beverages	51.5	0.951113	48.9
142102 Malt	2.0	0.963465	2.0
142103 Wines, brandy, and brandy spirits	14.1	0.863021	12.2
142104 Distilled liquor, except brandy	14.6	0.828697	12.1
142200 Bottled and canned soft drinks	136.2	0.969027	132.0
142300 Flavoring extracts and syrups, n.e.c.	13.9	0.903004	12.5
142400 Cottonseed oil mills	5.4	0.811756	4.4
142500 Soybean oil mills	9.3	0.900097	8.4
142600 Vegetable oil mills, n.e.c.	1.4	0.591754	0.8
142700 Animal and marine fats and oils	11.3	0.803848	9.1
142800 Roasted coffee	12.3	0.865658	10.6
142900 Shortening and cooking oils	13.0	0.875735	11.4
143000 Manufactured ice	5.2	1.048981	5.5
143100 Macaroni and spaghetti	8.7	0.960194	8.4
143200 Food preparations, n.e.c.	84.6	0.923194	78.1
150101 Cigarettes	47.0	0.999238	46.9
150102 Cigars	4.3	1.000333	4.3
150103 Chewing and smoking tobacco	3.5	0.980581	3.4
150200 Tobacco stemming and redrying	13.9	0.910385	12.7
160100 Broadwoven fabric mills and fabric finishing plants	294.3	0.551561	162.3
160200 Narrow fabric mills	19.5	0.512613	10.0
160300 Yarn mills and finishing of textiles, n.e.c.	117.9	0.550048	64.9
160400 Thread mills	10.3	0.793531	8.1
170100 Floor coverings	48.8	0.044854	2.2
170200 Felt goods, n.e.c.	3.9	0.153648	0.6
170300 Lace goods	2.0	0.776752	1.5
170400 Padding and upholstery filling	3.9	0.116905	0.5
170500 Processed textile waste	3.0	0.143707	0.4
170600 Coated fabrics, not rubberized	11.8	0.253949	3.0
170700 Tire cord and fabric	6.9	0.226628	1.6
170900 Cordage and twine	5.9	0.384056	2.3
171001 Nonwoven fabrics	12.8	0.186629	2.4
171002 Textile goods, n.e.c.	5.9	0.389156	2.3
180101 Women's hosiery, except socks	30.7	1.008666	31.0
180102 Hosiery, n.e.c.	34.6	1.026501	35.5
180201 Knit outerwear mills	69.1	0.947698	65.5
180202 Knit underwear mills	22.1	0.933911	20.6
180203 Knitting mills, n.e.c.	2.9	0.334173	1.0
180300 Knit fabric mills	48.0	0.953463	45.8
180400 Apparel made from purchased materials and dressed furs	1006.2	0.948721	954.6
190100 Curtains and draperies	24.7	0.011687	0.3
190200 Housefurnishings, n.e.c.	47.5	0.024129	1.1
190301 Textile bags	7.6	0.385826	2.9
190302 Canvas and related products	15.2	0.202736	3.1
190303 Pleating and stitching	19.0	0.435134	8.3
190304 Automotive and apparel trimmings	25.6	0.185973	4.8
190305 Schiffli machine embroideries	6.6	0.611226	4.1
190306 Fabricated textile products, n.e.c.	24.7	0.157356	3.9
200100 Logging camps and logging contractors	124.4	0.147253	18.3
200200 Sawmills and planing mills, general	163.3	0.122423	20.0
200300 Hardwood dimension and flooring mills	28.2	0.031463	0.9
200400 Special product sawmills, n.e.c.	3.5	0.165813	0.6

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Appendix table 3--Total civilian workforce, FFS output share and FFS job requirements, 1982--continued

Industry input-output code and title	Total 1982	FFS output	1982 FFS job
	civilian workforce	share	requirements
	1,000 jobs	Percent	1,000 jobs
200501 Millwork	63.0	0.022333	1.4
200502 Wood kitchen cabinets	52.9	0.003528	0.2
200600 Veneer and plywood	59.1	0.069326	4.1
200701 Structural wood members, n.e.c.	12.4	0.009477	0.1
200702 Prefabricated wood buildings	16.7	0.00215	0.0
200800 Wood preserving	11.5	0.058315	0.7
200901 Wood pallets and skids	23.1	0.3644	8.4
200902 Particleboard	6.3	0.021787	0.1
200903 Wood products, n.e.c.	65.0	0.082832	5.4
210000 Wood containers	13.6	0.708885	9.7
220101 Wood household furniture	134.3	0.001555	0.2
220102 Household furniture, n.e.c.	6.3	0.015054	0.1
220103 Wood TV and radio cabinets	7.4	0.012602	0.1
220200 Upholstered household furniture	76.1	0.000217	0.0
220300 Metal household furniture	27.5	0.004474	0.1
220400 Mattresses and bedsprings	27.5	0.001406	0.0
230100 Wood office furniture	20.7	0.000275	0.0
230200 Metal office furniture	35.7	0.002073	0.1
230300 Public building furniture	17.9	0.007738	0.1
230400 Wood partitions and fixtures	31.8	0.004884	0.2
230500 Metal partitions and fixtures	28.0	0.004994	0.1
230600 Drapery hardware and blinds and shades	16.0	0.004426	0.1
230700 Furniture and fixtures, n.e.c.	18.8	0.003385	0.1
240100 Pulp mills	21.9	0.242333	5.3
240200 Paper mills, except building paper	161.7	0.239553	38.7
240300 Paperboard mills	69.3	0.366531	25.4
240400 Envelopes	24.0	0.117844	2.8
240500 Sanitary paper products	37.5	0.298885	11.2
240602 Building paper and board mills	3.8	0.052214	0.2
240701 Paper coating and glazing	41.4	0.343171	14.2
240702 Bags, except textile	50.0	0.369916	18.5
240703 Die-cut paper and board	16.4	0.137599	2.3
240704 Pressed and molded pulp goods	2.9	0.440537	1.3
240705 Stationery products	12.5	0.073859	0.9
240706 Converted paper products, n.e.c.	26.0	0.140815	3.7
250000 Paperboard containers and boxes	190.0	0.477975	90.8
260100 Newspapers	445.2	0.216372	96.3
260200 Periodicals	102.7	0.159488	16.4
260301 Book publishing	66.7	0.02077	1.4
260302 Book printing	42.8	0.088932	3.8
260400 Miscellaneous publishing	53.6	0.241022	12.9
260501 Commercial printing	439.6	0.257622	113.3
260502 Lithographic platemaking and services	19.3	0.257806	5.0
260601 Manifold business forms	46.3	0.099536	4.6
260602 Blankbooks and looseleaf binders	38.7	0.096607	3.7
260700 Greeting card publishing	26.4	0.038913	1.0
260801 Engraving and plate printing	11.9	0.173242	2.1
260802 Bookbinding and related work	27.9	0.044872	1.3
260803 Typesetting	36.8	0.237114	8.7
260804 Photoengraving, electrotyping, and stereotyping	3.2	0.276062	0.9
270101 Alkalies and chlorine	11.7	0.228663	2.7
270102 Industrial gases	9.3	0.149847	1.4
270103 Inorganic pigments	17.5	0.164882	2.9
270104 Industrial inorganic chemicals, n.e.c., no aluminum	103.8	0.179697	18.7
270105 Industrial organic chemicals, no gum and wood chemicals	183.1	0.180788	33.1
270201 Nitrogenous and phosphatic fertilizers	30.5	0.605331	18.4
270202 Fertilizers, mixing only	13.1	0.634787	8.3
270300 Agricultural chemicals, n.e.c.	21.8	0.58801	12.8
270401 Gum and wood chemicals	8.2	0.139708	1.1
270402 Adhesives and sealants	19.3	0.137343	2.7
270403 Explosives	13.8	0.079047	1.1

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Appendix table 3—Total civilian workforce, FFS output share and FFS job requirements, 1982—continued

Industry input-output code and title	Total 1982	FFS output	1982 FFS job
	civilian workforce	share	requirements
	1,000 jobs	Percent	1,000 jobs
270404 Printing ink	11.0	0.280762	3.1
270405 Carbon black	1.8	0.127036	0.2
270406 Chemical preparations, n.e.c.	45.0	0.155518	7.0
280100 Plastics materials and resins	73.7	0.12888	9.5
280200 Synthetic rubber	16.6	0.103991	1.7
280300 Cellulosic man-made fibers	17.6	0.036687	0.6
280400 Organic fibers, noncellulosic	76.8	0.033652	2.6
290100 Drugs	198.8	0.070748	14.1
290201 Soap and other detergents	40.4	0.063902	2.6
290202 Polishes and sanitation goods	25.6	0.082773	2.1
290203 Surface active agents	10.8	0.242051	2.6
290300 Toilet preparations	68.0	0.005822	0.4
300000 Paints and allied products	60.9	0.085066	5.2
310101 Petroleum refining	164.2	0.138117	22.7
310102 Lubricating oils and greases	9.0	0.176581	1.6
310103 Products of petroleum and coal, n.e.c.	1.6	0.156361	0.2
310200 Paving mixtures and blocks	14.9	0.02494	0.4
310300 Asphalt felts and coatings	11.1	0.056098	0.6
320100 Tires and inner tubes	102.9	0.117892	12.1
320200 Rubber and plastics footwear	19.1	0.963316	18.4
320301 Reclaimed rubber	1.1	0.126267	0.1
320302 Fabricated rubber products, n.e.c.	95.7	0.107539	10.3
320400 Miscellaneous plastics products	456.1	0.202952	92.6
320500 Rubber and plastics hose and belting	25.5	0.174795	4.5
330001 Leather tanning and finishing	20.6	0.76004	15.7
340100 Boot and shoe cut stock and findings	7.7	0.272717	2.1
340201 Shoes, except rubber	130.2	0.96509	125.6
340202 House slippers	8.8	0.937682	8.2
340301 Leather gloves and mittens	4.1	0.962017	4.0
340302 Luggage	16.5	0.145612	2.4
340303 Women's handbags and purses	16.5	0.988496	16.3
340304 Personal leather goods	10.3	0.702453	7.2
340305 Leather goods, n.e.c.	7.2	0.161054	1.2
350100 Glass and glass products, except containers	108.9	0.096375	10.5
350200 Glass containers	64.5	0.766274	49.4
360100 Cement, hydraulic	24.8	0.034259	0.8
360200 Brick and structural clay tile	15.9	0.012583	0.2
360300 Ceramic wall and floor tile	9.5	0.022646	0.2
360400 Clay refractories	7.4	0.036572	0.3
360500 Structural clay products, n.e.c.	3.2	0.007597	0.0
360600 Vitreous plumbing fixtures	9.5	0.032368	0.3
360701 Vitreous china food utensils	6.4	0.12422	0.8
360702 Fine earthenware food utensils	3.2	0.05536	0.2
360800 Porcelain electrical supplies	10.6	0.024949	0.3
360900 Pottery products, n.e.c.	11.7	0.052853	0.6
361000 Concrete block and brick	16.2	0.023929	0.4
361100 Concrete products, n.e.c.	55.3	0.032453	1.8
361200 Ready-mixed concrete	96.4	0.032959	3.2
361300 Lime	5.7	0.179165	1.0
361400 Gypsum products	9.5	0.023555	0.2
361500 Cut stone and stone products	12.7	0.005324	0.1
361600 Abrasive products	26.5	0.099846	2.6
361700 Asbestos products	10.6	0.053928	0.6
361800 Gaskets, packing and sealing devices	32.9	0.10281	3.4
361900 Minerals, ground or treated	11.7	0.081301	0.9
362000 Mineral wool	22.3	0.035033	0.8
362100 Nonclay refractories	7.4	0.040643	0.3
362200 Nonmetallic mineral products, n.e.c.	7.4	0.07774	0.6
370101 Blast furnaces and steel mills	324.8	0.128015	41.6
370102 Electrometallurgical products	5.6	0.182016	1.0
370103 Steel wire and related products	22.3	0.11248	2.5

--Continued

Appendix table 3—Total civilian workforce, FFS output share and FFS job requirements, 1982—continued

Industry input-output code and title	Total 1982	FFS output	1982 FFS job
	civilian workforce	share	requirements
	1,000 jobs	Percent	1,000 jobs
370104 Cold finishing of steel shapes	17.9	0.129257	2.3
370105 Steel pipe and tubes	25.7	0.125712	3.2
370200 Iron and steel foundries	158.6	0.071781	11.4
370300 Iron and steel forgings	34.1	0.062112	2.1
370401 Metal heat treating	17.8	0.095238	1.7
370402 Primary metal products, n.e.c.	7.9	0.083462	0.7
380100 Primary copper	7.9	0.079935	0.6
380200 Primary lead	2.3	0.114068	0.3
380300 Primary zinc	2.3	0.200185	0.5
380400 Primary aluminum and alumina	32.7	0.27623	9.0
380500 Primary nonferrous metals, n.e.c.	12.4	0.080295	1.0
380600 Secondary nonferrous metals	17.8	0.156757	2.8
380700 Copper rolling and drawing	25.7	0.063677	1.6
380800 Aluminum rolling and drawing	64.8	0.236892	15.3
380900 Nonferrous rolling and drawing, n.e.c.	22.3	0.044801	1.0
381000 Nonferrous wire drawing and insulating	75.9	0.044363	3.4
381100 Aluminum castings	51.5	0.058554	3.0
381200 Brass, bronze, and copper castings	12.4	0.059	0.7
381300 Nonferrous castings, n.e.c.	15.4	0.045632	0.7
381400 Nonferrous forgings	9.8	0.03077	0.3
390100 Metal cans	53.3	0.811446	43.2
390200 Metal barrels, drums, and pails	10.7	0.256276	2.7
400100 Metal sanitary ware	7.9	0.031594	0.3
400200 Plumbing fixture fittings and trim	19.8	0.032089	0.6
400300 Heating equipment, except electric	34.4	0.015302	0.5
400400 Fabricated structural metal	104.5	0.034066	3.6
400500 Metal doors, sash, and trim	77.3	0.035949	2.8
400600 Fabricated plate work (boiler shops)	104.5	0.026538	2.8
400700 Sheet metal work	89.3	0.045509	4.1
400800 Architectural metal work	26.1	0.028424	0.7
400901 Prefabricated metal buildings	26.1	0.087469	2.3
400902 Miscellaneous metal work	25.0	0.021568	0.5
410100 Screw machine products, bolts, nuts, rivets, and washers	91.4	0.071176	6.5
410201 Automotive stampings	81.4	0.038255	3.1
410202 Crowns and closures	6.8	0.722798	4.9
410203 Metal stampings, n.e.c.	95.3	0.052415	5.0
420100 Cutlery	13.6	0.044806	0.6
420201 Hand and edge tools, n.e.c.	38.7	0.172712	6.7
420202 Hand saws and saw blades	8.4	0.095163	0.8
420300 Hardware, n.e.c.	81.7	0.038945	3.2
420401 Plating and polishing	61.3	0.043119	2.6
420402 Metal coating and allied services	35.6	0.127418	4.5
420500 Miscellaneous fabricated wire products	47.8	0.105167	5.0
420700 Steel springs, except wire	3.5	0.121459	0.4
420800 Pipe, valves, and pipe fittings	120.9	0.077934	9.4
421000 Metal foil and leaf	9.6	0.476356	4.6
421100 Fabricated metal products, n.e.c.	54.8	0.091914	5.0
430100 Turbines and turbine generator sets	33.5	0.043006	1.4
430200 Internal combustion engines, n.e.c.	81.1	0.089937	7.3
440001 Farm machinery and equipment	106.8	0.572404	61.2
440002 Lawn and garden equipment	18.9	0.151728	2.9
450100 Construction machinery and equipment	111.3	0.05766	6.4
450200 Mining machinery, except oil field	27.3	0.051042	1.4
450300 Oil field machinery	117.3	0.019009	2.2
460100 Elevators and moving stairways	12.3	0.02143	0.3
460200 Conveyors and conveying equipment	33.1	0.028795	1.0
460300 Hoists, cranes, and monorails	13.2	0.021949	0.3
460400 Industrial trucks and tractors	22.7	0.043629	1.0
470100 Machine tools, metal cutting types	61.6	0.018573	1.1
470200 Machine tools, metal forming types	21.3	0.018431	0.4
470300 Special dies and tools and machine tool accessories	179.1	0.05751	10.3

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Appendix table 3—Total civilian workforce, FFS output share and FFS job requirements, 1982—continued

Industry input-output code and title	Total 1982	FFS output	1982 FFS job
	civilian workforce	share	requirements
	1,000 jobs	Percent	1,000 jobs
470401 Power driven hand tools	22.4	0.117701	2.6
470402 Rolling mill machinery	5.6	0.009278	0.1
470403 Metalworking machinery, n.e.c.	23.5	0.017118	0.4
480100 Food products machinery	30.2	0.134524	4.1
480200 Textile machinery	17.4	0.253817	4.4
480300 Woodworking machinery	9.2	0.013269	0.1
480400 Paper industries machinery	16.5	0.046053	0.8
480500 Printing trades machinery	26.6	0.043145	1.1
480600 Special industry machinery, n.e.c.	70.5	0.023868	1.7
490100 Pumps and compressors	90.3	0.053503	4.8
490200 Ball and roller bearings	38.8	0.117035	4.5
490300 Blowers and fans	27.1	0.058569	1.6
490400 Industrial patterns	11.2	0.098279	1.1
490500 Power transmission equipment	45.2	0.099931	4.5
490600 Industrial furnaces and ovens	15.4	0.005618	0.1
490700 General industrial machinery, n.e.c.	58.7	0.038176	2.2
500001 Carburetors, pistons, rings, valves	30.9	0.12942	4.0
500002 Machinery, except electrical, n.e.c.	277.5	0.134645	37.4
510101 Electronic computing equipment	397.9	0.006817	2.7
510102 Calculating and accounting machines	16.7	0.016141	0.3
510300 Scales and balances	6.2	0.025099	0.2
510400 Typewriters and office machines, n.e.c.	45.8	0.051723	2.4
520100 Automatic merchandising machines	7.0	0.036212	0.3
520200 Commercial laundry equipment	5.0	0.020155	0.1
520300 Refrigeration and heating equipment	116.1	0.030384	3.5
520400 Measuring and dispensing pumps	7.0	0.007691	0.1
520500 Service industry machines, n.e.c.	30.0	0.03067	0.9
530100 Instruments to measure electricity	110.6	0.003271	0.4
530200 Transformers	40.9	0.017802	0.7
530300 Switchgear and switchboard apparatus	68.2	0.03017	2.1
530400 Motors and generators	97.6	0.0458	4.5
530500 Industrial controls	71.8	0.044401	3.2
530600 Welding apparatus, electric	15.7	0.035206	0.6
530700 Carbon and graphite products	12.9	0.101933	1.3
530800 Electrical industrial apparatus, n.e.c.	18.2	0.009095	0.2
540100 Household cooking equipment	24.2	0.008853	0.2
540200 Household refrigerators and freezers	23.3	0.007285	0.2
540300 Household laundry equipment	18.4	0.010628	0.2
540400 Electric housewares and fans	40.7	0.019217	0.8
540500 Household vacuum cleaners	9.7	0.010583	0.1
540600 Sewing machines	6.8	0.072194	0.5
540700 Household appliances, n.e.c.	15.5	0.024121	0.4
550100 Electric lamps	26.3	0.058128	1.5
550200 Lighting fixtures and equipment	80.2	0.043121	3.5
550300 Wiring devices	82.5	0.046195	3.8
560100 Radio and TV receiving sets	68.2	0.014202	1.0
560200 Phonograph records and tapes	24.1	0.008979	0.2
560300 Telephone and telegraph apparatus	162.8	0.021327	3.5
560400 Radio and TV communication equipment	139.2	0.003935	0.5
570100 Electron tubes, all types	34.3	0.050094	1.7
570200 Semiconductors and related devices	226.7	0.050646	11.5
570300 Other electronic components	284.0	0.022094	6.3
580100 Storage batteries	29.2	0.046598	1.4
580200 Primary batteries, dry and wet	26.8	0.017524	0.5
580300 X-ray apparatus and tubes	32.0	0.000868	0.0
580400 Engine electrical equipment	56.0	0.083425	4.7
580500 Electrical equipment and supplies, n.e.c.	53.6	0.031129	1.7
590100 Truck and bus bodies	30.3	0.065238	2.0
590200 Truck trailers	18.8	0.076604	1.4
590301 Motor vehicles and car bodies	317.5	0.022507	7.1
590302 Motor vehicle parts and accessories	325.3	0.05724	18.6

--Continued

Appendix table 3--Total civilian workforce, FFS output share and FFS job requirements, 1982--continued

Industry input-output code and title	Total 1982	FFS output	1982 FFS job
	civilian workforce	share	requirements
	1,000 jobs	Percent	1,000 jobs
600100 Aircraft	319.9	0.000613	0.2
600200 Aircraft and missile engines and parts	164.9	0.010714	1.8
600400 Aircraft and missile equipment, n.e.c.	128.2	0.004959	0.6
610100 Ship building and repairing	171.6	0.048033	8.2
610200 Boat building and repairing	48.0	0.034185	1.6
610300 Railroad equipment	37.1	0.043077	1.6
610500 Motorcycles, bicycles, and parts	11.7	0.059476	0.7
610601 Travel trailers and campers	15.6	0.002582	0.0
610602 Mobile homes	43.3	0.000223	0.0
610603 Motor homes (made from purchased materials)	9.4	0.000654	0.0
610700 Transportation equipment, n.e.c.	11.7	0.047955	0.6
620100 Engineering and scientific instruments	274.5	0.006395	1.8
620200 Mechanical measuring devices	132.8	0.038062	5.1
620300 Environmental controls	36.9	0.026506	1.0
620400 Surgical and medical instruments	66.5	0.004168	0.3
620500 Surgical appliances and supplies	80.9	0.031322	2.5
620600 Dental equipment and supplies	16.6	0.010403	0.2
620700 Watches, clocks, and parts	20.9	0.007949	0.2
630100 Optical instruments and lenses	66.4	0.004574	0.3
630200 Ophthalmic goods	40.4	0.011493	0.5
630300 Photographic equipment and supplies	140.2	0.048858	6.8
640101 Jewelry, precious metal	41.1	0.00346	0.1
640102 Jewelers' materials and lapidary work	10.0	0.002055	0.0
640104 Silverware and plated ware	8.9	0.16146	1.4
640105 Costume jewelry	22.2	0.00959	0.2
640200 Musical instruments	18.2	0.018565	0.3
640301 Games, toys, and children's vehicles	52.5	0.00484	0.3
640302 Dolls	8.8	0.001186	0.0
640400 Sporting and athletic goods, n.e.c.	58.8	0.01106	0.6
640501 Pens and mechanical pencils	11.1	0.040954	0.5
640502 Lead pencils and art goods	6.1	0.074561	0.5
640503 Marking devices	8.1	0.095949	0.8
640504 Carbon paper and inked ribbons	7.1	0.087621	0.6
640600 Artificial trees and flowers	6.1	0.380624	2.3
640701 Buttons	3.0	0.905987	2.7
640702 Needles, pins, and fasteners	13.1	0.76182	10.0
640800 Brooms and brushes	14.1	0.062232	0.9
640900 Hard surface floor coverings	5.0	0.012775	0.1
641000 Burial caskets and vaults	10.1	0.001347	0.0
641100 Signs and advertising displays	55.5	0.161643	9.0
641200 Manufacturing industries, n.e.c. excluding fur dressing	60.5	0.102261	6.2
5. Transportation, Communications, and Utilities			
650100 Railroads and related services	429.4	0.284607	122.2
650200 Private local and interurban passenger transit	311.3	0.061154	19.0
650300 Motor freight transportation and warehousing	1446.9	0.28507	412.5
650400 Water transportation	203.3	0.130466	26.5
650500 Transportation by air	448.6	0.085627	38.4
650600 Pipe lines, except natural gas	21.3	0.128457	2.7
650701 Freight forwarding and misc. transportation services	113.7	0.188251	21.4
650702 Arrangement of passenger transportation	116.1	0.056663	6.6
660000 Communications, except radio and TV	1128.2	0.085494	96.5
670000 Radio and television broadcasting	295.0	0.291404	86.0
680100 Private electric services (utilities)	548.0	0.140806	77.2
680200 Private gas production and distribution (utilities)	230.0	0.143134	32.9
680301 Private water supply and sewerage systems	26.0	0.065861	1.7
680302 Sanitary services, steam supply, and irrigation systems	81.4	0.191948	15.6

--Continued

Appendix table 3--Total civilian workforce, FFS output share and FFS job requirements, 1982--continued

Industry input-output code and title	Total 1982	FFS output	1982 FFS job
	civilian workforce	share	requirements
	1,000 jobs	Percent	1,000 jobs
6. Wholesale and Retail Trade			
690100 Wholesale trade	5595.2	0.423487	2369.5
690200 Retail trade	11753.7	0.29144	3425.5
7. Finance, Insurance, and Real Estate			
700100 Banking	2065.7	0.110783	228.8
700200 Credit agencies other than banks	310.6	0.116762	36.3
700300 Security and commodity brokers	320.9	0.054789	17.6
700400 Insurance carriers	1237.3	0.033327	41.2
700500 Insurance agents, brokers, and services	642.2	0.033258	21.4
710100 Owner-occupied dwellings	0.0	0	0.0
710201 Real estate	1273.6	0.110493	140.7
710202 Royalties	0.0	0.159871	0.0
8. Services			
720100 Hotels and lodging places	1449.9	0.077136	111.8
720201 Laundry, cleaning, garment services and shoe repair	470.1	0.09675	45.5
720202 Funeral service and crematories	78.1	0	0.0
720203 Portrait photographic studios and misc personal services	194.5	0.007039	1.4
720204 Electrical repair shops	135.4	0.153377	20.8
720205 Watch, clock, jewelry, and furniture repair	58.4	0	0.0
720300 Beauty and barber shops	616.8	0	0.0
730101 Miscellaneous repair shops	346.0	0.184629	63.9
730102 Services to dwellings and other buildings	605.7	0.104572	63.3
730103 Personnel supply services	552.6	0.135137	74.7
730104 Computer and data processing services	384.7	0.107759	41.5
730105 Management consulting services and testing and research	700.5	0.119749	83.9
730106 Detective and protective services	356.0	0.135861	48.4
730107 Equipment rental and leasing	119.5	0.177236	21.2
730108 Photofinishing labs, photocopy, commercial photography	155.4	0.152876	23.8
730109 Other business services	625.5	0.221865	138.8
730200 Advertising	185.7	0.304926	56.6
730301 Legal services	779.7	0.112294	87.6
730302 Engineering, architectural, and surveying services	636.3	0.030293	19.3
730303 Accounting, auditing and bookkeeping services, n.e.c.	683.8	0.150093	102.6
740000 Eating and drinking places	5164.4	0.797313	4117.6
750001 Automotive rental and leasing, without drivers	149.0	0.195233	29.1
750002 Automotive repair shops and services	686.2	0.07589	52.1
750003 Automobile parking and car washes	77.1	0.043857	3.4
760100 Motion pictures	356.0	0.211587	75.3
760201 Theatrical producers, orchestras, and entertainers	99.7	0.24378	24.3
760202 Bowling alleys, billiard, and pool establishments	101.5	0	0.0
760203 Professional sports clubs and promoters	30.9	0.059425	1.8
760204 Racing, including track operation	46.9	0.063463	3.0
760205 Membership sports and recreation clubs	153.9	0.02209	3.4
760206 Other amusement and recreation services	485.4	0.060443	29.3
770100 Doctors and dentists	1699.7	0	0.0
770200 Private hospitals	3016.5	0	0.0
770301 Private nursing and personal care facilities	1075.1	0	0.0
770302 Other medical and health services, excl. nursing homes	374.7	0.025878	9.7
770401 Private elementary and secondary schools	330.9	0	0.0
770402 Private colleges, universities, professional schools	754.2	0.00835	6.3
770403 Private libraries and vocational schools	240.0	0.003763	0.9
770501 Business assocs., professional membership organizations	120.4	0.164478	19.8
770502 Labor organizations and civic and social associations	449.1	0	0.0
770503 Religious organizations	914.2	0	0.0
770504 Other membership organizations	221.2	0.012928	2.9
770600 Job training and related services	186.9	0.051865	9.7
770700 Child day care services	344.3	0	0.0

--Continued

Appendix table 3--Total civilian workforce, FFS output share and FFS job requirements, 1982--continued

Industry input-output code and title	Total 1982	FFS output	1982 FFS job
	civilian workforce	share	requirements
	1,000 jobs	Percent	1,000 jobs
770800 Residential care	244.1	0	0.0
770900 Social services, n.e.c.	450.4	0	0.0
9. Government Enterprises			
780100 U.S. Postal Service	662.3	0.134724	89.2
780200 Federal electric utilities	49.0	0.14204	7.0
780300 Commodity Credit Corporation	0.0	0	0.0
780400 Other Federal Government enterprises	181.0	0.394292	71.4
790100 State and local government passenger transit	174.0	0.056833	9.9
790200 State and local electric utilities	70.0	0.142146	10.0
790300 Other state and local government enterprises	511.0	0.09821	50.2
Total	86036.9	0.23982	20634.0

SUMMARY OF REPORT AER-716

The 1995 Farm Bill

GATT and Budget Constraints Are Crucial Issues for Export Programs

 June 1995

Contact: Karen Z. Ackerman, (202) 720-6829

Export programs assisted about 20 percent of U.S. agricultural exports in 1989-93—and their role for certain commodities was much higher. A central policy issue related to these programs is how best to support farm exports, and thereby farm income, in a time of lower price subsidies under the Uruguay Round Agreement of the General Agreement on Tariffs and Trade (GATT) and with the current U.S. budget restraints. These and other policy questions and options are described in ***Agricultural Export Programs: Background for 1995 Farm Legislation***, a new report from USDA's Economic Research Service.

Exports play an important role in the health of the U.S. farm sector and related activities. For example, more than half the U.S. wheat crop is shipped overseas, as well as nearly half the rice and cotton crops. The agricultural sector generated an \$18 billion trade surplus in 1993, helping to offset deficits in other areas.

After the U.S. share of world agricultural trade fell from a peak of almost 20 percent in 1981 to about 12 percent in 1986, the United States revised domestic support policies and increased export assistance. The tools used to boost farm exports include programs to help exporters compete in pricing, to help importers obtain credit needed to purchase U.S. commodities, to influence consumer tastes and preferences, and to provide U.S. farm products as food aid.

A number of program-specific issues are likely to have prominent positions in this year's debate in Congress over omnibus farm legislation. One such question is how best to implement the Export Enhancement Program (EEP), which was successful in bringing the European Union (EU) to negotiate reductions in export subsidies, now that such subsidies are capped. And with the recent increase in exports of high-value products (HVP's), policymakers will be studying the role of export programs in HVP markets.

Another issue is how credit guarantees will operate in an environment where a growing number of foreign private entities (rather than state monopolies) import goods. The effectiveness of market promotion and an appropriate government role in such assistance can be contentious. With lower surplus stocks in exporting countries and higher commodity prices, future food aid availabilities for needy countries are uncertain.

In the aftermath of the GATT Uruguay Round, a key question is how to change the means and targets of export assistance. How funds are spent depends on the time horizon in which benefits are to be realized. In the short run, price subsidies are the quickest way to bring about greater sales, especially in the face of continuing EU subsidies and other competitors' pricing practices. However, the GATT agreement limits the commodities eligible for export price subsidies and subsidy volumes and values. Similarly, credit guarantees may help importers with foreign exchange constraints.

To Order This Report...

The information presented here is excerpted from ***Agricultural Export Programs: Background for 1995 Farm Legislation***, AER-716, by Karen Z. Ackerman, Mark E. Smith, and Nydia R. Suarez. The cost is \$9.00.

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Individually owned farms most common, control most land and sales

June 1995

Contact: Judith Kalbacher, 202-219-0592

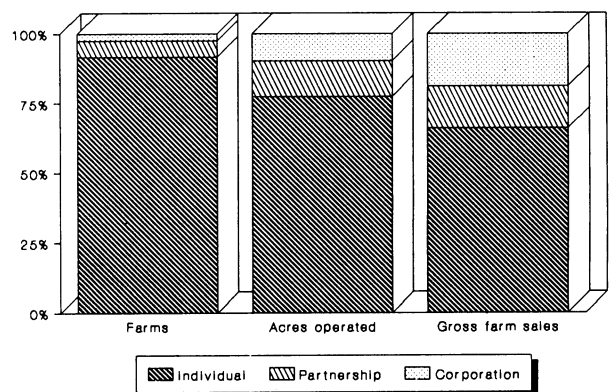
About 2.1 million farms operated 854 million acres of land in the contiguous United States during 1991. The average land operated was 407 acres per reporting farm. The value of gross farm sales, a measure of what the farm has produced during the year, was estimated at \$145.5 billion, or \$69,298 per farm. Gross cash farm income, a measure of cash actually received by the farm business during the year, totaled \$130.7 billion, with 44 percent from crop sales, 42 percent from livestock sales, 9 percent from other farm-related income, and 5 percent from government payments.

These data are reported in *Structural and Financial Characteristics of U.S. Farms, 1991: 16th Annual Family Farm Report to Congress*, the second in a series of reports designed to provide annual data on the major structural and financial characteristics of the farm sector as portrayed by the U.S. Department of Agriculture's 1991 Farm Costs and Returns Survey (FCRS).

The report shows how the Nation's farm sector is organized to use and control its resources and the financial and economic results of its activities. Information is presented on five basic categories: characteristics of farm operations, farmland ownership and use, financial and economic well-being, characteristics of farm operators, and farm operator households' dependence on farming. The 1991 FCRS data provide the following information:

- Individual operations were the most common type of organization, accounting for the majority of farms (92 percent), total acres operated (77 percent), and gross farm sales (66 percent). However, in terms of mean acres operated and mean farm sales, individual operations were smaller than farms operated as partnerships or corporations.
- The most common types of farms were beef, hog, or sheep farms (43 percent of all farms) followed by cash grain farms (19 percent). These two farm types also accounted for the most total acres operated and most farm sales.

Farms, acres operated, and gross farm sales, by type of farm organization, 1991



Source: Farm Costs and Returns Survey, U.S. Department of Agriculture.

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The information presented here is excerpted from *Structural and Financial Characteristics of U.S. Farms, 1991: 16th Annual Family Farm Report to Congress*, AIB-712, by Judith Z. Kalbacher, Victor J. Oliveira, and Susan E. Bentley. The cost is \$12.00.

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