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### **MEASURING THE SERVICES ECONOMY**

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#### **SESSION 5**

##### **Abstract**

Most establishments whether primarily engaged in manufacturing, retail trade, transportation, or data processing also produce services of some type or the other. An automobile manufacturing company that provides its own data processing services or building maintenance services is a producer not only of automobiles, but also of data processing services or building maintenance services. Because, however, the company is consuming the service internally, we generally do not attempt to measure that data processing service. This paper outlines the program of the United States Census Bureau to measure the output of these "auxiliary" establishments and the services produced internally by U.S. manufacturing, retail trade, merchant wholesaler, and selected services establishments. Data are presented from the 1992 Economic Census and plans are outlined for data to be presented from the 1997 Economic Census. A brief sketch of future plans also is noted.

# MEASURING THE SERVICES ECONOMY

## Background

The Census Bureau has a long history of measuring the manufacturing economy of the United States. The first manufacturing census was taken as part of the 1810 Decennial Census and then again in 1820 and 1840 (when a series of questions on mineral industries was added). Manufacturers were queried every 10 years after 1840 until 1900 when Congress directed that in addition to the decennial census coverage there would be a shorter Census of Manufactures every five years.

While manufacturing statistics have been available in the U.S. for almost 200 years, it was not until 1930 that the first services data were collected (retail and wholesale trade and hotels). More industries were added over the years with the last expansion covering data year 1992 when finance, insurance, real estate, communications, and utilities industries were added, bringing the coverage of the economic census (including governments and agriculture) to 98 percent of the United States' Gross Domestic Product (GDP).

The census covering the services sector generally focuses on the production of services. Information is collected and published for employment, payroll, receipts, and receipts by type for each SIC code or beginning in 1997 each NAICS code. Additional information pertinent to each industry (number of hotel rooms, selling space, employment by occupation, etc.) also is requested. The 1997 Economic Census (including the Census of Agriculture) will provide data on the output of most of the 1170 NAICS United States industries, approximately 500 of which produce services.

## Producers of Services

It has long been recognized that all establishments whether primarily engaged in manufacturing, retail, transportation, or data processing also produce some types of services. An automobile manufacturing company that provides its own data processing services or building maintenance services is a producer not only of automobiles, but also of data processing services and building maintenance services. Because, however, the services that the company is producing are consumed internally, generally we do not attempt to measure that service. We may recognize separately the unit that is producing the service if it is a separate establishment and call it an auxiliary establishment, but in the U.S., these auxiliary establishments, in the past, were classified according to the activity of the unit they were serving. Thus employment and any receipts data recorded by the auxiliary unit were included in the automobile manufacturing industry.

Beginning in 1954, the Census Bureau as part of its Economic Census began trying to measure the economic characteristics of establishments of multi-establishment firms that provided services internally to the firm. The Auxiliary Establishment report covers establishments whose employees are primarily engaged in performing supporting services for other establishments of the same company, rather than for the general public or for other business firms. Such diverse activities as executive and general management; accounting services; advertising; legal services; data processing services; and research and development when provided to the company by a separate establishment of a multi-establishment company are covered by the auxiliary report. It should be noted that for an establishment to be considered an auxiliary, it had to be producing services for internal consumption. Manufacturing establishments producing products for internal consumption by the company were considered manufacturing (i.e., an automobile parts plant producing parts for use only by its own company in manufacturing automobiles was considered a manufacturer, not an auxiliary).

The Auxiliary Establishment Report for 1997 was mailed to about 48,000 establishments of multi-establishment companies. The report, a copy of which is available upon request, includes questions as follows:

- type of business activity in which engaged (i.e., management, data processing, etc.)
- type of employees (i.e., management, accounting, advertising, legal, etc.)
- source of receipts (i.e., sales outside the firm)
- principal business activity of operating establishment served
- value of any inventories held
- receipts for research and development activities
- selected purchased services and expenses (rental payments, repair and maintenance, software purchases, data processing services purchased; accounting services purchased; purchased advertising services; purchased communication services, etc.)

While the 1997 data are not yet available, following are some results from the 1992 Economic Census as compared to the 1987 Economic Census:

	1992	1987
<b>Total Number of Establishments</b>	47,250	37,851
<b>Total Employment</b>	3,229,693	2,787,551
<b>By Type:</b>		
Administrative	2,050,377	1,741,553
Research & Development	246,360	223,020
Warehouse	339,802	282,021
Trucking	34,185	(NA)
Communications	20,877	(NA)
Repair	45,267	(NA)
Data Processing	106,089	142,623
Sales	191,018	146,730
Other Employees	195,718	251,604

**Establishments reporting their primary activity as:**

	1992		1987	
	No. Estabs.	Employment	No. Estabs.	Employment
Centralized Administration	33,011	2,133,926	25,969	1,896,157
Research & Development	1,458	263,847	1,167	232,357
Warehousing	5,093	361,509	4,479	305,625
Other	7,688	470,411	6,236	353,412

**Sales outside the enterprise (by type of sales) - in thous. dollars**

	1992	1987
Mineral extraction, production, or exploration	3,890,374	2,126,755
Construction	534,446	516,568
Manufacturing	71,028,389	36,710,921
Transportation, communications, & utilities	2,652,069	756,762
Wholesale trade	26,437,392	13,532,768
Retail trade	23,306,556	7,462,320
Finance, insurance, & real estate	2,715,375	(NA)
Service industries	10,497,339	3,295,777
<b>TOTAL</b>	<b>141,061,940</b>	<b>64,401,871</b>

In 1992, the employment and value of auxiliary establishments were assigned to the industry which the auxiliary establishment served. In practice, the Census Bureau coded auxiliaries to a 2-digit SIC (major group) rather than a 4-digit industry (except for mining auxiliaries that were coded to a 4-digit SIC) because we found it impossible to accurately code the establishment to a 4-digit industry. Most of the auxiliary establishments of multi-establishment firms in the U.S. serve many establishments of the company, often crossing 4-digit industries, thus rendering a 4-digit code meaningless. In fact, we have found it increasingly difficult to code even to a 2-digit level.

Nevertheless, auxiliary employment accounted for a significant portion of employment for some SIC sectors. For 1992, 1.2 million of the 3.2 million auxiliary employees were included in manufacturing (total manufacturing employment was 18,204,900) while another 850,000 were coded to retail trade (total employment in retail trade was 18,407,453). The remaining employees were scattered across the other SIC divisions.

As noted above, the sales to or receipts from customers outside the company increased dramatically between 1987 and 1992, from \$64 billion to \$142 billion, a 220 percent increase. These dollar numbers were not included in the value of shipments of the industry that the auxiliary served which for 1992 meant that this \$142 billion was not included in any industry grouping. For 1997, we are identifying establishments with large receipts and contacting them individually to determine the source of receipts. We are finding that many of these auxiliaries are actually sales branches from which the company's own manufactured products are being sold. Others are head offices of merchant wholesalers from which large sales are being recorded and still others are head offices from which sales personnel operate. In the first two instances, we are recoding the auxiliary establishment to wholesale trade while in the last case, the establishment is coded to the new NAICS industry 551114, Corporate, Subsidiary, and Regional Managing Offices. These large increases in sales from auxiliaries, the increasing complexity of company organizations, and the differences in treatment of captive manufacturing operations (classified as operating establishments) and captive service establishments (classified according to the industry served) led the three North American countries to reconsider the classification of auxiliaries in its new North American Industry Classification System (NAICS).

NAICS classifies auxiliaries according to their primary activity. Therefore, the head office (if a separate establishment) of a large manufacturer will now be classified in the corporate, subsidiary, and regional managing offices industry rather than in manufacturing. If that head office is not only providing services internally, but also selling services outside the company, or if it maintains a sales force at the head office from which sales are recorded, the establishment's receipts will, for the first time, be captured in the head office industry. We will not, however, attempt to value the output of the services provided internally. Our experience indicates that companies generally do not attach a value to this service and in most cases do not assign costs back to the establishment(s) being served. Therefore, it is very difficult for either the company or the Census Bureau to assign a value to the service. For 1997, we will publish the data for auxiliaries separately, according to their primary activity. We expect to continue this treatment in the future.

Purchased services and other expense data are also collected on the auxiliary form. Data collected for expenses include:

Type of Expense	1992	1987
	(thousands of dollars)	(thousands of dollars)
Payroll expenses	137,084,011	90,529,544
Purchased services:		
Repair of buildings and structures	986,645	(NA)
Repair of machinery and equipment	1,944,268	(NA)
Communication services	3,480,268	3,396,772
Legal services	3,953,948	(NA)
Accounting and bookkeeping services	832,792	(NA)
Advertising services	(NA)	(NA)
Software and other data processing services	1,102,820	(NA)
Purchased electricity	2,022,112	1,464,908
Cost of fuels consumed	460,383	472,030
Refuse removal, including hazardous waste	223,236	(NA)

The Census Bureau has never attempted to collect information on services produced and consumed internally from single-establishment companies or from multi-establishment companies that do not have separate locations where services are produced. In fact, most census forms do not even request information on employment by function because of the reporting burden imposed on companies to report such data.

### **Purchased Services**

In 1977, the Census Bureau began collecting limited purchased services data from manufacturers. For 1977, 1982, and 1987, information is available on repair of buildings and equipment and communication services purchased by manufacturers. In January 1991 the Presidential Economic Statistics Initiatives (known in the U.S. as the Boskin Report) was issued. The focus of the initiative was on improving economic policy information and included the following areas of concern:

- The rapid service sector expansion
- The ever-increasing internationalization of our economy
- Improvements to the quality of principal economic indicators
- Sharing of statistical data

Included in the funding for the initiative was an expansion of purchased services data collected and published by the Census Bureau. Therefore, for the 1992 Economic Census, additional purchased services data were collected for legal services, accounting and bookkeeping services, advertising services, software and other data processing services, and refuse removal. A similar expansion was made to the auxiliary form, data for which is shown above. For the nonmanufacturing sectors of the economy, the Census Bureau does not collect these data from each establishment included in the Economic Census. Rather, it conducts every five years an assets and expenditure survey for retail trade, wholesale trade, and service industries covered by the Census Bureau's annual programs. The reporting panel for this report is the same group of

reporting units that are required to file reports for the Annual Retail Trade Survey, the Annual Wholesale Trade Survey, and the Services Annual Survey. These 1992 surveys also were expanded to include more detailed purchased services data. Shown below is information for purchased services of manufacturers, retailers, wholesalers, and selected service industries as defined by the 1987 SIC for data years 1992 and 1987.

<b>Manufacturers:</b>	<b>1992</b>	<b>1987</b>
	(millions of dollars)	(millions of dollars)
Total value of shipments	3,004,723	2,475,901
Total cost of materials	1,571,774	1,319,803
Payroll expenses	494,109	428,480
Purchased services: <sup>1</sup>		
Repair of buildings and structures	5,426	4,207
Repair of machinery	23,302	14,586
Communications services	4,761	3,925
Legal services	3,889	(NA)
Accounting and bookkeeping services	1,916	(NA)
Advertising services	11,920	(NA)
Software and other data processing services	3,777	(NA)
Purchased electricity	35,527	31,661
Purchased fuels	21,886	20,879
Refuse removal, including hazardous waste	4,405	(NA)

<b>Merchant Wholesalers:<sup>2</sup></b>	<b>1992</b>	<b>1987</b>
	(millions of dollars)	(millions of dollars)
Total sales	1,849,798	1,491,147
Total cost of goods sold	1,469,268	1,190,694
Payroll expenses	144,792	107,689
Purchased services:		
Repair of buildings and structures	1,524	1,199
Repair of machinery	3,983	3,067
Communications services	6,434	4,688
Legal services	2,434	(NA)
Accounting and bookkeeping services	2,414	(N/A)
Advertising services	10,881	8,154
Data processing services <sup>3</sup>	1,296	(NA)
Purchased utilities <sup>4</sup>	5,872	4,377

<sup>1</sup> The response rate for establishments for these items was approximately 80 percent. No imputation has been made for non-response.

<sup>2</sup> Purchased service data are available only for merchant wholesalers.

<sup>3</sup> Excludes purchased software.

<sup>4</sup> Includes purchased fuels and refuse removal.

<b>Retail Trade:</b>	<b>1992</b>	<b>1987</b>
	(millions of dollars)	(millions of dollars)
Total sales	1,951,589	1,494,112
Total cost of goods sold	1,322,312	1,011,964
Payroll expenses	245,176	191,764
Purchased services:		
Repair of buildings and structures	4,328	3,599
Repair of machinery	5,684	4,613
Communications services	5,837	5,033
Legal services	1,939	(NA)
Accounting and bookkeeping services	3,191	(NA)
Advertising services	31,433	26,391
Data processing services <sup>3</sup>	1,831	(NA)
Purchased utilities <sup>4</sup>	22,695	17,705

<b>Selected Service Industries:</b>	<b>1992</b>	<b>1987</b>
Total Receipts	1,734,814 <sup>5</sup>	937,901 <sup>6</sup>
Payroll expenses	644,888	360,381 <sup>7</sup>
Total purchased services:		
Repair of buildings and structures	6,321 <sup>8</sup>	3,481
Repair of machinery	11,435	7,312
Communications services	17,056 <sup>9</sup>	10,496
Legal services	7,143 <sup>10</sup>	(NA)

<sup>5</sup> Includes 1987 SIC's 70, Hotels and Other Lodging Places; 72, Personal Services; 73, Business Services; 75, Auto Repair, Services, and Parking; 76, Miscellaneous Repair Services; 78, Motion Pictures; 79, Amusement and Recreation Services; 80, Health Services; 81, Legal Services; 823, Libraries; 824, Vocational Schools; 83, Social Services; 84, Museums, Botanical, Zoological Gardens; 86, Membership Organizations; and 87, Engineering and Management Services.

<sup>6</sup> Includes all industries shown for 1992 except for 823, Libraries; 832, Individual and Family Services; and 839, Social Services, NEC.

<sup>7</sup> Excludes SIC's 832, 839, and 84.

<sup>8</sup> Excludes SIC 874.

<sup>9</sup> Excludes SIC 86.

<sup>10</sup> Excludes SIC's 823 and 871.



<b>Selected Service Industries: Con.</b>	<b>1992</b>	<b>1987</b>
Accounting and bookkeeping services	7,084 <sup>11</sup>	(NA)
Advertising services	15,837 <sup>12</sup>	9,504 <sup>13</sup>
Data processing services <sup>3</sup>	5,226 <sup>14</sup>	(NA)
Purchases utilities <sup>4</sup>	21,912 <sup>15</sup>	12,798

Purchased services data are difficult information for the Census Bureau to collect and difficult for businesses to report. In 1987, we conducted a record keeping practices survey and we specifically queried companies about their ability to report these data. An excerpt from that report is shown in the attachment. You will note that many companies find it difficult to report purchased services data at the establishment level and yet that is the unit from which we are collecting the data for manufacturers. Expenses such as advertising and legal services are often only captured at the corporate level and the costs are not assigned back to the individual establishment. For the services sector, these data are collected at a more aggregated level, generally the company or a subcompany level, but still reporting the data can be quite burdensome to the business.

Another problem with these data are the differences in information collected across sectors and the differences in the definitions. For example, the manufacturing data do not include water and sewer expenses while the purchased utility data in the retail, wholesale, and services sector do. Also for manufacturing, the cost of purchased repair services for machinery and equipment does not include repair of fleet vehicles, but only repair of industrial machinery. The data for retail, wholesale, and services sector includes these types of repairs. These same problems remain in the 1997 data to be published shortly. One of our goals for 2002 is to ensure that the data collected across all sectors is consistent.

## **Future Plans**

Over the past several years, the Census Bureau has made a concerted effort to update, expand, and upgrade its service sector statistics. The Economic Census was expanded to cover almost all service industries, additional purchased services data and exported services questions were added to all economic census forms, and a new annual survey covering communication services was developed. With the implementation of NAICS, this focus on services data only intensifies. We will be adding a new annual information survey that will provide annual estimates of the NAICS information sector; we will, for the first time, collect data annually on selected financial industries; the services sector annual program will be expanded to include statistics on about 150 new NAICS industries; data on the activity of auxiliary establishments based on their activity will be available from the 1997 Economic Census as will data for purchased services; and we will begin the development of a demand-based product classification system for service industries.

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<sup>11</sup> Excludes SIC 872.

<sup>12</sup> Excludes SIC's 823, 86, and 873.

<sup>13</sup> Excludes SIC 81.

<sup>14</sup> Excludes SIC's 84, 871, 873, and 874.

<sup>15</sup> Excludes SIC 871.

As we begin planning for the 2002 Economic Census, one area of concern is the data collection and publication program for both auxiliaries and purchased services. We recognize the importance of these data especially to our national accounts analysts, but are also mindful of the reporting burden imposed on businesses. We are beginning a careful review of the current collection and publication program to ensure it meets the needs of the data user. It is quite likely that we will redesign the entire data collection and publication procedures to provide more relevant, meaningful data while easing the reporting burden on American businesses.

Data available for-- (in percents)					
Item	Company	Establishment level	Other	Not available	Not applicable
Cost of purchased--					
Office supplies	13	69	11	7	-
Manufactures	1	80	9	10	-
Construction	40	28	25	7	-
Wholesale Trade	26	74	-	-	-
Retail Trade	17	68	-	12	3
Services	37	56	7	-	-
New Services <sup>1</sup>	25	46	25	4	-
Electricity	10	68	10	11	1
Manufactures	1	80	9	10	-
Construction	40	31	22	7	-
Wholesale Trade	-	100	-	-	-
Retail Trade	26	74	-	-	-
Services	15	52	7	26	-
New Services <sup>1</sup>	18	41	22	16	3
Fuels consumed for heat or power	10	68	10	11	1
Manufactures	1	80	9	10	-
Construction	43	28	22	7	-
Wholesale Trade	26	74	-	-	-
Retail Trade	6	66	13	15	-
Services	15	52	7	26	-
New Services <sup>1</sup>	18	38	22	17	5

Water, sewer, refuse removal, except hazardous waste	10	59	10	20	1
Manufactures	1	68	8	22	1
Construction	40	28	22	7	3
Wholesale Trade	26	74	-	-	-
Retail Trade	6	53	11	27	3
Services	19	41	7	33	-
New Services <sup>1</sup>	16	38	19	24	2
Hazardous waste removal	6	48	8	19	19
Manufactures	-	64	9	22	5
Construction	3	10	22	3	62
Wholesale Trade	26	54	-	-	20
Retail Trade	3	24	3	12	58
Services	15	27	2	37	19
New Services <sup>1</sup>	7	19	11	22	41
Repair of buildings and other structures	8	63	11	16	2
Manufactures	1	71	9	19	1
Construction	47	28	25	-	-
Wholesale Trade	26	72	-	-	2
Retail Trade	11	55	15	19	-
Services	2	70	5	23	-
New Services <sup>1</sup>	17	37	22	16	8

Repair of machinery	10	54	11	22	3
Manufactures	1	59	9	31	-
Construction	40	16	25	19	-
Wholesale Trade	26	72	-	-	2
Retail Trade	14	55	10	21	-
Services	17	45	5	12	21
New Services <sup>1</sup>	18	42	23	10	7
Communications services	13	71	12	4	-
Manufactures	1	84	10	5	-
Construction	43	32	25	-	-
Wholesale Trade	26	74	-	-	-
Retail Trade	9	68	12	11	-
Services	40	55	5	-	-
New Services <sup>1</sup>	25	46	24	5	-
Cost of purchased--Con.					
Transportation services	12	60	13	10	5
Manufactures	3	69	14	14	-
Construction	40	13	25	3	19
Wholesale Trade	28	72	-	-	-
Retail Trade	20	54	13	12	-
Services	21	47	6	2	24
New Services <sup>1</sup>	20	40	22	9	9

Software	20	56	14	9	1
Manufactures	6	69	17	8	-
Construction	13	13	37	37	-
Wholesale Trade	44	56	-	-	-
Retail Trade	54	20	-	16	9
Services	42	48	3	7	-
New Services <sup>1</sup>	32	42	18	8	-
Other data processing services	20	58	14	6	1
Manufactures	5	70	16	9	-
Construction	76	24	-	-	-
Wholesale Trade	42	58	-	-	-
Retail Trade	44	38	6	12	-
Services	42	52	3	-	3
New Services <sup>1</sup>	28	41	25	5	2
Advertising	25	56	14	3	2
Manufactures	10	72	12	5	1
Construction	40	16	3	3	37
Wholesale Trade	46	36	18	-	-
Retail Trade	28	54	15	3	-
Services	42	53	5	-	-
New Services <sup>1</sup>	49	26	25	-	-
Legal Services	38	47	14	1	1
Manufactures	28	60	12	-	-
Construction	44	31	25	-	-
Wholesale Trade	67	29	-	-	4
Retail Trade	78	14	6	3	-
Services	45	52	3	-	-
New Services <sup>1</sup>	39	26	35	-	-

Accounting and bookkeeping services	32	47	11	4	6
Manufactures	22	59	10	7	2
Construction	44	13	40	-	3
Wholesale Trade	52	33	-	-	15
Retail Trade	64	18	3	9	6
Services	22	50	3	-	25
New Services <sup>1</sup>	46	23	24	1	5
Highway fuel expense for trucks owned or leased	15	50	8	12	15
Manufactures	9	66	5	10	10
Construction	3	13	22	52	10
Wholesale Trade	26	60	12	-	2
Retail Trade	20	15	3	29	33
Services	21	29	3	3	43
New Services <sup>1</sup>	28	17	21	14	20
Interest expense	42	42	15	-	1
Manufactures	30	58	12	-	-
Construction	62	13	25	-	-
Wholesale Trade	65	25	10	-	-
Retail Trade	89	5	3	-	3
Services	51	48	1	-	-
New Services <sup>1</sup>	46	14	39	-	1

Rental payments

Land, buildings, etc.	18	59	15	8	1
Manufactures	10	66	10	13	1
Construction	43	32	25	-	-
Wholesale Trade	26	72	2	-	-
Retail Trade	14	49	29	8	-
Services	26	58	14	-	2
New Services <sup>1</sup>	29	32	36	3	-
Machinery, equipment, etc.	18	58	14	9	1
Manufactures	6	71	9	13	1
Construction	40	32	25	3	-
Wholesale Trade	26	72	2	-	-
Retail Trade	27	36	29	8	-
Services	42	41	14	-	3
New Services <sup>1</sup>	31	30	30	7	2

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<sup>1</sup> Finance, Insurance, Real Estate, Transportation, Communications, and Public Utilities.