

# **The Productivity Renaissance in the U.S. Service Sector**

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## The Productivity Renaissance in the U.S. Service Sector

Since 1995 productivity growth has accelerated in the United States. According to the most widely used aggregate productivity measure, the series on non-farm business sector output per hour produced by the Bureau of Labor Statistics (BLS), productivity advanced at a 2.9 per cent average annual rate from 1995 to 1999 and at a 4.3 per cent annual rate in the first half of 2000.

The majority of computers that are produced are used in the service sector, where they are employed by industries such as finance, insurance, real estate, retail and wholesale trade, transportation and public utilities, government and other service industries. To the proponents of the new economy, it is no accident that the improved productivity performance and the healthy degree of non-inflationary growth has coincided with an explosion in the application of computing technologies by many businesses. If there is to be an acceleration in technological progress there should be a broadening of productivity gains to these IT-using service sectors.

Unfortunately, the BLS does not provide data on productivity growth by industry so it is not possible to identify from this source which sectors are fueling the productivity revival. Such data can, however, be constructed from the real output and labor input series compiled by the Bureau of Economic Analysis (BEA) and publicly available on the BEA website (although this data series has only recently been updated to 1998). This article uses the BEA data to provide estimates of labour productivity growth on an industry basis in the post-1995 period, the period when the new economy appears to have flowered (See Tables A1, A2 and A3 in the appendix).

This article's key message is that after many decades of stagnant growth, there now appears to be a renaissance in service sector productivity. Real (1996\$) value added per person employed in the broadly defined service sector (transportation and public utilities, wholesale trade, retail trade, finance, insurance and real estate, services, and government) advanced at a 2.4 per cent average annual pace in the 1995-98 period, up nearly five-fold from the 0.5 per cent rate of the 1981-89 and 1989-95 periods (see Table 1). Real value added per hour worked in industries where data on hours are available, exhibits similar productivity growth patterns as those of real value added per worker (Table 2, and Tables A4 and A5 in appendix). It now appears that the service sector productivity drought is over, at least for the second half of the 1990s, and possibly into the future.

This development may come as a surprise. Economists have long deplored lagging productivity growth in the service sector, and have advanced numerous explanations, including measurement problems, and an intrinsic lack of dynamism in many service industries.<sup>1</sup>

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<sup>1</sup> See, for example, the April 1999 special issue of the *Canadian Journal of Economics* edited by Erwin Diewert, Alice Nakamura, and Andrew Sharpe on service sector productivity and the productivity paradox. The papers are posted at [www.csls.ca](http://www.csls.ca) under publications.

**Table 1: Value Added per Worker Employed – Growth Rates, U.S.**

Industry Title	% Average compound growth rates			
	1981-89	1989-95	1995-98	(1995-98)- (1989-95)
<b>Total Economy</b>	<b>1.38</b>	<b>1.11</b>	<b>1.85</b>	<b>0.74</b>
<b>Goods Sector</b>	<b>3.18</b>	<b>2.20</b>	<b>2.79</b>	<b>0.59</b>
Agriculture, forestry, and fishing	3.60	0.01	5.53	5.52
Mining	8.02	4.71	3.23	-1.48
Construction	0.64	-0.13	0.03	0.16
Manufacturing	3.74	3.14	3.50	0.36
<b>Service Sector</b>	<b>0.48</b>	<b>0.54</b>	<b>2.41</b>	<b>1.88</b>
Transportation and public utilities	2.21	2.59	2.03	-0.56
Wholesale trade	3.37	2.85	9.20	6.35
Retail trade	1.61	0.91	5.74	4.83
Finance, insurance, and real estate	-0.12	1.64	2.89	1.26
Services	-0.16	-0.79	0.19	0.99
Government	0.33	0.28	0.58	0.30

Source: Calculated from table A3 in appendix.

**Note:** Because of the use of non-additive chain indices for real output, industries total GDPs do not sum to the total economy total. As a result, the total economy productivity growth rate in the 1995-98 period is less than both the goods sector and service sector productivity growth rates.

**Table 2: Value Added per Person Hour- Growth Rates, U.S.**

Industry Title	% Average compound growth rates			
	1981-89	1989-95	1995-98	(1995-98)- (1989-95)
<b>Total Economy</b>	1.65	1.16	1.67	0.51
<b>Goods Sector</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>
Agriculture, forestry, and fishing	n/a	n/a	n/a	n/a
Mining	8.28	4.01	3.79	-0.22
Construction	0.41	-0.53	-0.32	0.21
Manufacturing	3.39	2.86	3.35	0.48
<b>Service Sector</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>
Transportation and public utilities	2.60	2.09	1.90	-0.19
Wholesale trade	3.53	2.75	9.11	6.36
Retail trade	2.12	1.00	5.39	4.39
Finance, insurance, and real estate	n/a	n/a	n/a	n/a
Services	n/a	-0.72	-0.07	0.65
Government	n/a	n/a	n/a	n/a

Source: Calculated from Table A5 in appendix

## Service Sector Productivity Growth by Industry

The productivity renaissance in the service sector is broadly based, with four of the six basic service sector industries showing at least a one percentage point increase in labour productivity growth between the 1989-95 and 1995-98 periods. The growth rate of output per worker in wholesale trade accelerated 6.4 points, in retail trade 4.8 points, in finance, insurance and real estate 1.3 points and in services (personal, business and other services) 1.0 points (Table 1). Even government enjoyed improved productivity growth, up 0.3 points, although the estimates of real output for government are not appropriate for productivity calculations as they are largely estimated on the basis of inputs. The only service sector industry that did not enjoy faster productivity growth after 1995 was transportation and public utilities, experiencing a 0.6 point fall-off.

A more disaggregated analysis of productivity growth in the service sector is provided by Table 3 (Also see Table A6, A7 and A8 in appendix). For finance, insurance and real estate, productivity growth acceleration was distinctively strong in credit agencies other than banks which was up 25.0 points from the 1989-95 period to the 1995-98 period. Productivity growth acceleration was also particularly strong in security and commodity brokers and holding and other investment offices.

The services industry is the largest industry in the service sector and accounts for 30 per cent of total employment. A disaggregated analysis of this industry (Table 3) shows that the productivity growth acceleration was particularly strong in other services (up 2.9 points), personal services (2.0 points), amusement and recreation services (1.6 points), and motion pictures (1.5 points).

**Table 3: Value Added Per Employed Worker by Detailed Industry – Growth Rates: Service Sector, U.S.**

Industry Title	% Average compound growth rates			
	1981-89	1989-95	1995-98	(1995-98)- (1989-95)
<b>Transportation and public utilities</b>	<b>2.21</b>	<b>2.59</b>	<b>2.03</b>	<b>-0.56</b>
Transportation	1.91	2.43	1.95	-0.49
Communications	4.31	4.86	4.29	-0.57
Electric, gas, and sanitary services	1.67	2.36	2.43	0.07
<b>Wholesale trade</b>	<b>3.37</b>	<b>2.85</b>	<b>9.20</b>	<b>6.35</b>
<b>Retail trade</b>	<b>1.61</b>	<b>0.91</b>	<b>5.74</b>	<b>4.83</b>
<b>Finance, insurance, and real estate</b>	<b>-0.12</b>	<b>1.64</b>	<b>2.89</b>	<b>1.26</b>
Banking	Na	2.65	2.18	-0.47
Credit agencies other than banks	Na	-1.20	23.84	25.04
Security and commodity brokers	2.93	5.11	14.72	9.61
Insurance carriers	-4.25	1.64	-1.23	-2.87
Insurance agents, brokers, and service	0.31	-4.43	-1.44	2.99
Real estate	0.25	1.52	1.74	0.21
Holding and other investment offices	-25.31	7.35	18.54	11.20
<b>Services</b>	<b>-0.16</b>	<b>-0.79</b>	<b>0.19</b>	<b>0.99</b>
Hotels and other lodging places	0.60	1.68	-1.89	-3.57
Personal services	0.81	-1.40	0.62	2.02
Business services	Na	0.81	1.91	1.10
Auto repair, services, and parking	-0.74	0.25	-0.75	-1.00
Miscellaneous repair services	0.39	-2.55	-1.37	1.18
Motion pictures	1.51	-3.09	-1.58	1.51
Amusement and recreation services	0.95	-0.17	1.40	1.56
Health services	-1.15	-2.13	-0.51	1.62
Legal services	-1.83	-0.76	-1.08	-0.32
Educational services	0.14	-0.35	-1.63	-1.28
Social services and membership organisations	-3.80	-0.57	-2.85	-2.28
Other Services	Na	1.21	4.12	2.90
<b>Government</b>	<b>0.33</b>	<b>0.28</b>	<b>0.58</b>	<b>0.30</b>
Federal	0.88	1.75	1.97	0.22
State and local	0.14	0.05	0.44	0.39

Source: GDP and Employment Data are obtained from the Bureau of Economic Analysis. Release date: June 2000.  
[http://www.bea.doc.gov/bea/uguide.htm#\\_1\\_14](http://www.bea.doc.gov/bea/uguide.htm#_1_14)

Not all services industries have experienced better productivity growth since 1995 (Table 3). Indeed, between the 1989-95 and 1995-98 periods, productivity growth actually fell 3.6 points in hotels and other lodging places, 2.8 points in social services and membership organizations, 1.3 points in educational services, and 1.0 points in auto repair, services and parking. Moreover, productivity growth rates continue to be negative

in the 1995-98 period in the four industries mentioned above as well as for insurance carriers; insurance agents, brokers and service; miscellaneous repair services; motion pictures; health services; and legal services. This suggests they may be still room for significant productivity improvement in a number of service industries.

The service sector productivity renaissance refers to the post-1995 acceleration of labour productivity growth, not the overall pace of this growth in the service sector. Indeed, productivity growth in the goods sector continues to outperform that in the service sector at 2.8 per cent versus 2.4 per cent per year in the 1995-98 period (Table 1). But the pick-up in goods sector productivity was much less than the service sector productivity after 1995 (0.6 points versus 1.9 points). This reflected the robust pace of goods-sector productivity growth in the 1989-95 period, due to strong productivity growth in manufacturing and mining during the first half of the 1990s.

#### Estimates of Service Sector Productivity for 1999 and 2000

Because the available GDP and employment data for the various industries provided by the BEA only go to 1998, we have constructed estimates for productivity growth rates for the non-manufacturing business sector (NMBS) which is primarily the service-producing industries (88% of total NMBS employment was in services in 1998), using the productivity data compiled by the BLS for the manufacturing and the business sectors for 1999 and first half of 2000. Since the manufacturing sector's share of business sector employment is about 17 percent, a simple formula is used to calculate estimates for productivity growth for the non-manufacturing business sector (see Table 4). From 1995-98 to 1998-2000, productivity growth in NMBS picked up from 2.1 to 3.0 percent average annual rate. Service sector productivity growth has thus accelerated even more since 1998.

**Table 4: Estimates of Output per Hour in the Non-Manufacturing Business Sector - Growth Rates, U.S.**

Year	Average annual rates of growth		
	Business Sector	Manufacturing Sector	Non-Manufacturing Business Sector
<b>1995-98</b>	2.50	4.24	2.14
<b>1998-2000*</b>	3.69	6.98	3.02
<b>1999</b>	3.17	6.21	2.55
<b>2000*</b>	4.21	7.75	3.48
<b>1995-2000*</b>	2.98	5.33	2.50

Source: Data for output per hour are obtained from the BLS. Business sector data are obtained from <http://www.bls.gov/news.release/prod2.t01.htm>, and manufacturing sector data are obtained from <http://www.bls.gov/news.release/prod2.t03.htm>, data revised on Sep 6 2000.

\* Based on continuation of trends for the first half of 2000.

## Service Sector Productivity Estimates Based on Gross Output

To check the robustness of the results, real gross output instead of real GDP data are employed as the output measure. The data on gross output provided by the BEA are only available in current dollars. These are transformed to real gross output by using the price deflators also provided by the BEA (see Tables A9, A10 and A11 in appendix).

By constructing labour productivity figures in terms of real gross output per worker, it can be seen that the growth rates exhibit similar patterns as those for real value added per worker (Table 5 below and Table A12 in appendix). Between the 1989-95 and 1995-98 periods, gross output per worker in the service sector accelerated 1.28 points, as compared with the 1.88 percentage point acceleration when value added rather than gross output is employed. Between the two periods, three of the six basic service sector industries show at least a one percentage point increase in gross output per worker.

From 1989-95 to 1995-98 period, the growth rate of gross output per worker in wholesale trade accelerated 0.7 points and in retail trade 1.8 points, considerably lower than the 6.4 and 4.8 percentage point acceleration in real value added per worker for each respective industry. Gross output per worker growth in transportation and public utilities, like the other service sector industries, increased after 1995, which is in contrast to the 0.6 percentage point fall-off in value added per worker for this industry.

**Table 5: Gross Output per Employed Worker, Growth Rates, U.S.**

Industry Title	% Average compound growth rates			
	1981-89	1989-95	1995-98	(1995-98)- (1989-95)
<b>Total Economy</b>	N/a	<b>1.42</b>	<b>2.82</b>	<b>1.40</b>
<b>Goods Sector</b>	<b>2.41</b>	<b>2.34</b>	<b>3.76</b>	<b>1.42</b>
Agriculture, forestry, and fishing	2.94	0.58	3.93	3.35
Mining	5.22	3.63	1.17	-2.45
Construction	-0.73	-0.34	0.14	0.47
Manufacturing	3.16	3.19	4.98	1.79
<b>Service Sector</b>	<b>n/a</b>	<b>1.23</b>	<b>2.50</b>	<b>1.28</b>
Transportation and public utilities	n/a	1.99	2.55	0.56
Wholesale trade	1.98	3.76	4.47	0.71
Retail trade	0.82	1.44	3.23	1.80
Finance, insurance, and real estate	n/a	2.31	3.66	1.35
Services	n/a	0.28	1.47	1.19
Government	n/a	0.50	0.62	0.12

Source: Based on Table A12.

A more disaggregated view of the service industry shows that the acceleration in gross output per worker was especially strong in miscellaneous professional services, which was up 6.1 points in the 1995-98 period, as compared with the 4.1 point increase in value added per worker (Table 6). Between the 1989-95 and 1995-98 period, half of the



service industries experienced at least a one percentage point increase in gross output per worker, namely in personal services, business services, miscellaneous repair services, health and legal services and miscellaneous professional services. However, motion pictures, amusement and recreation services, auto repair and services and parking, and hotels and other lodging places experienced over a percentage point fall-off in gross output per worker between the two periods. It should be noted that because of contacting out, value added is a more relevant concept to relate to industry employment for productivity calculation.

**Table 6: Real Gross Output per Employed Worker by Detailed Industry – Growth Rates, Service Sector, U.S.**

Industry Title	% Average compound growth rates			
	1981-89	1989-95	1995-98	(1995-98)- (1989-95)
<b>Transportation and public utilities</b>	<b>n/a</b>	<b>1.99</b>	<b>2.55</b>	<b>0.56</b>
Transportation	n/a	1.73	1.88	0.15
Communications	5.86	4.33	5.88	1.55
Electric, gas, and sanitary services	-1.57	1.76	2.53	0.77
<b>Wholesale trade</b>	<b>1.98</b>	<b>3.76</b>	<b>4.47</b>	<b>0.71</b>
<b>Retail trade</b>	<b>0.82</b>	<b>1.44</b>	<b>3.23</b>	<b>1.80</b>
<b>Finance, insurance, and real estate</b>	<b>n/a</b>	<b>2.31</b>	<b>3.66</b>	<b>1.35</b>
Banking	n/a	3.19	3.66	0.47
Credit agencies other than banks	n/a	4.13	4.78	0.65
Security and commodity brokers	4.30	7.80	18.87	11.07
Insurance carriers	1.38	-0.23	-1.35	-1.11
Insurance agents, brokers, and service	-0.48	-2.36	1.64	4.00
Real estate	n/a	2.06	2.59	0.53
Holding and other investment offices	n/a	3.16	13.89	10.74
<b>Services</b>	<b>n/a</b>	<b>0.28</b>	<b>1.47</b>	<b>1.19</b>
Hotels and other lodging places	1.50	1.76	-1.39	-3.15
Personal services	1.16	0.30	2.24	1.94
Business services	n/a	2.18	3.74	1.56
Auto repair, services, and parking	0.53	0.94	-0.61	-1.55
Miscellaneous repair services	1.12	2.07	3.06	0.99
Motion pictures	0.33	-0.18	-2.71	-2.53
Amusement and recreation services	0.54	1.98	0.65	-1.32
Health services	0.25	-0.82	0.27	1.09
Legal services	-1.16	-0.42	1.42	1.84
Educational services	0.85	-0.05	-0.55	-0.50
Social services and membership organizations	n/a	-0.72	-0.72	0.00
Other services	n/a	1.83	6.08	4.25
<b>Government</b>	<b>n/a</b>	<b>1.07</b>	<b>-0.51</b>	<b>-1.58</b>
Federal	n/a	2.13	1.08	-1.06
State and local	n/a	1.00	-0.80	-1.81

Source: Real gross output is calculated by using gross output in current dollars and the price deflator for gross output obtained from the BEA.

The employment data are obtained from the BEA.

[http://www.bea.doc.gov/bea/uguide.htm#\\_1\\_14](http://www.bea.doc.gov/bea/uguide.htm#_1_14)

### What Explains the Renaissance?

A full explanation of what appears to be a productivity renaissance in the U.S. service sector is well beyond the scope of this article. One explanation is that better output measures are now capturing real output gains that eluded government statisticians in the past. And output gains translate on a one-for-one basis into productivity gains.

A second explanation is that the massive investment in information technology (IT) made in the service sector throughout 1990s is finally paying off in terms of increasing output. The Solow productivity paradox seems to be resolved as we are now seeing the impact of computers in the productivity statistics. The lags between IT investment and productivity appear to have ended as firms and workers have now learned to use these new technologies in an effective manner. The large IT investment in wholesale and retail trade and the very strong increases in productivity in these two industries support the IT story.

Of course, the two explanations outlined above are not mutually exclusive and both have probably contributed to the improvement in service sector productivity growth.

### Implications for the New Economy Debate

It is now widely recognized that trend labour productivity growth has experienced a significant upward shift since 1995, and that this shift appears to be more than just a cyclical development as it reflects the impact of the massive IT investment in the 1990s. Until recently, it was believed that most of the productivity gains were taking place in the IT-producing sector and that the productivity-enhancing impact of IT was not spreading to the IT-using sectors. With the renaissance of productivity growth in IT-using service industries such as wholesale and retail trade, it now appears that the acceleration of productivity growth is more broadly based.

The jury is still out on whether the silicon chip represents a general purpose technology (GPT) of the importance of past GPTs such as the steam engine, the internal combustion engine, and electricity. It is unclear whether productivity gains of the second half of the 1990s represent a transitory phenomenon or whether they will have some legs and continue for two or more decades. Certainly, such long-term productivity gains are within the realm of possibility and the broadening of productivity gains to the IT-using service sector since 1995 augurs well for this view.

## Appendix Tables

**Table A1: Real Gross Domestic Product by industry (SIC basis) in United States, (millions of chained 1996 dollars)**

Industry Title	1981	1989	1995	1998
<b>Total Economy</b>	<b>5020993</b>	<b>6591815</b>	<b>7543772</b>	<b>8495650</b>
<b>Goods Sector</b>	<b>1266010</b>	<b>1622059</b>	<b>1820459</b>	<b>2060931</b>
Agriculture, forestry, and fishing	89442	111370	123138	142934
Mining	90984	102844	112972	126369
Construction	226025	296286	299608	342902
Manufacturing	859560	1111559	1284741	1448726
<b>Service Sector</b>	<b>3826686</b>	<b>4994625</b>	<b>5679515</b>	<b>6547498</b>
Transportation and public utilities	387319	500392	634518	725964
Wholesale trade	264340	399259	483047	663954
Retail trade	388804	562486	641425	795714
Finance, insurance, and real estate	994647	1234317	1392967	1606738
Services	932477	1313831	1510438	1708091
Government	859099	984340	1017120	1047037

Industry Title	% Average compound growth rates			
	1981-89	1989-95	1995-98	(1995-98)- (1989-95)
<b>Total Economy</b>	<b>3.46</b>	<b>2.27</b>	<b>4.04</b>	<b>1.77</b>
<b>Goods Sector</b>	<b>3.15</b>	<b>1.94</b>	<b>4.22</b>	<b>2.28</b>
Agriculture, forestry, and fishing	2.78	1.69	5.09	3.41
Mining	1.54	1.58	3.81	2.23
Construction	3.44	0.19	4.60	4.42
Manufacturing	3.27	2.44	4.09	1.64
<b>Service Sector</b>	<b>3.39</b>	<b>2.16</b>	<b>4.85</b>	<b>2.69</b>
Transportation and public utilities	3.25	4.04	4.59	0.55
Wholesale trade	5.29	3.23	11.19	7.96
Retail trade	4.72	2.21	7.45	5.24
Finance, insurance, and real estate	2.74	2.04	4.87	2.84
Services	4.38	2.35	4.18	1.83
Government	1.72	0.55	0.97	0.42

Source: Data for GDP are obtained from the Bureau of Economic Analysis, 2000. Release date: June 2000.

[http://www.bea.doc.gov/bea/uguide.htm#\\_1\\_14](http://www.bea.doc.gov/bea/uguide.htm#_1_14)

Note: Because of the use of non-additive chain indices for real output, industries total GDPs do not sum to the total economy total. As a result, the total economy productivity growth rate in the 1995-98 period is less than both the goods sector and service sector productivity growth rates.

**Table A2: Persons Engaged in Production by industry, (1972 SIC basis)in United States, (thousands)**

Industry Title	1981	1989	1995	1998
<b>Total Economy</b>	<b>96809</b>	<b>113907</b>	<b>121982</b>	<b>130011</b>
<b>Goods Sector</b>	<b>29777</b>	<b>29691</b>	<b>29247</b>	<b>30486</b>
Agriculture, forestry, and fishing	3260	3059	3380	3338
Mining	1163	709	591	601
Construction	5240	6526	6650	7603
Manufacturing	20114	19397	18626	18944
<b>Service Sector</b>	<b>67032</b>	<b>84216</b>	<b>92735</b>	<b>99525</b>
Transportation and public utilities	5230	5674	6172	6648
Wholesale trade	5534	6413	6555	6919
Retail trade	14153	18020	19462	20419
Finance, insurance, and real estate	5619	7043	7211	7636
Services	20331	29021	35000	39353
Government	16165	18045	18335	18550

Industry Title	% Average compound growth rates			
	1981-89	1989-95	1995-98	(1995-98)- (1989-95)
<b>Total Economy</b>	<b>2.05</b>	<b>1.15</b>	<b>2.15</b>	<b>1.00</b>
<b>Goods Sector</b>	<b>-0.04</b>	<b>-0.25</b>	<b>1.39</b>	<b>1.64</b>
Agriculture, forestry, and fishing	-0.79	1.68	-0.42	-2.09
Mining	-6.00	-2.99	0.56	3.55
Construction	2.78	0.31	4.57	4.25
Manufacturing	-0.45	-0.67	0.57	1.24
<b>Service Sector</b>	<b>2.89</b>	<b>1.62</b>	<b>2.38</b>	<b>0.76</b>
Transportation and public utilities	1.02	1.41	2.51	1.10
Wholesale trade	1.86	0.37	1.82	1.45
Retail trade	3.07	1.29	1.61	0.32
Finance, insurance, and real estate	2.86	0.39	1.93	1.53
Services	4.55	3.17	3.98	0.81
Government	1.38	0.27	0.39	0.12

Source: Data for employment are obtained from the Bureau of Economic Analysis, 2000. Release date: June 2000.

[http://www.bea.doc.gov/bea/uguide.htm#\\_1\\_14](http://www.bea.doc.gov/bea/uguide.htm#_1_14)

**Table A3: Value Added per Worker Employed, U.S.**

Estimates of GDP per employed worker in constant 1996 dollars

Industry Title	1981	1989	1995	1998
<b>Total Economy</b>	<b>51865</b>	<b>57870</b>	<b>61843</b>	<b>65346</b>
<b>Goods Sector</b>	<b>42516</b>	<b>54631</b>	<b>62244</b>	<b>67603</b>
Agriculture, forestry, and fishing	27436	36407	36431	42820
Mining	78232	145055	191154	210265
Construction	43135	45401	45054	45101
Manufacturing	42734	57306	68976	76474
<b>Service Sector</b>	<b>57087</b>	<b>59307</b>	<b>61245</b>	<b>65787</b>
Transportation and public utilities	74057	88190	102806	109200
Wholesale trade	47767	62258	73691	95961
Retail trade	27472	31215	32958	38969
Finance, insurance, and real estate	177015	175254	193173	210416
Services	45865	45272	43155	43404
Government	53146	54549	55474	56444

Source: Calculated from tables A1 and A2

**Table A4: Total Hours worked per Year by Industry, U.S.**

(millions)

Industry Title	1981	1989	1995	1998
<b>Total Economy</b>	<b>177535</b>	<b>204497</b>	<b>218413</b>	<b>234028</b>
<b>Goods Sector</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>
Agriculture, forestry, and fishing	n/a	n/a	n/a	n/a
Mining	2645	1582	1372	1373
Construction	10093	12802	13365	15445
Manufacturing	41689	41287	40284	41152
<b>Service Sector</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>
Transportation and public utilities	10720	11276	12632	13661
Wholesale trade	11081	12678	13035	13792
Retail trade	22146	27088	29096	30836
Finance, insurance, and real estate	n/a	n/a	n/a	n/a
Services	n/a	49108	58953	66814
Government	n/a	n/a	n/a	n/a

**Table A4 (cont'd)**

Industry Title	% Average compound growth rates			
	1981-89	1989-95	1995-98	(1995-98)- (1989-95)
<b>Total Economy</b>	1.78	1.10	2.33	1.23
<b>Goods Sector</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>
Agriculture, forestry, and fishing	n/a	n/a	n/a	n/a
Mining	-6.22	-2.34	0.01	2.36
Construction	3.02	0.72	4.94	4.22
Manufacturing	-0.12	-0.41	0.71	1.12
<b>Service Sector</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>
Transportation and public utilities	0.63	1.91	2.64	0.73
Wholesale trade	1.70	0.46	1.90	1.43
Retail trade	2.55	1.20	1.96	0.76
Finance, insurance, and real estate	n/a	n/a	n/a	n/a
Services	n/a	3.09	4.26	1.17
Government	n/a	n/a	n/a	n/a

Source: Data for total hours worked are calculated using average hours worked per week data from the BLS, and employment data from the BEA.

<http://www.bls.gov/cesb1b6.htm>

[http://www.bea.doc.gov/bea/uguide.htm#\\_1\\_14](http://www.bea.doc.gov/bea/uguide.htm#_1_14)

**Table A5: Value Added per Person Hour, U.S.**

Estimates of GDP per Hour in constant \$1996

Industry Title	1981	1989	1995	1998
<b>Total Economy</b>	<b>28.28</b>	<b>32.23</b>	<b>34.54</b>	<b>36.30</b>
<b>Goods Sector</b>	<b>N/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>
Agriculture, forestry, and fishing	N/a	n/a	n/a	n/a
Mining	34.40	65.00	82.31	92.04
Construction	22.39	23.14	22.42	22.20
Manufacturing	20.62	26.92	31.89	35.20
<b>Service Sector</b>	<b>N/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>
Transportation and public utilities	36.13	44.38	50.23	53.14
Wholesale trade	23.85	31.49	37.06	48.14
Retail trade	17.56	20.76	22.05	25.80
Finance, insurance, and real estate	n/a	n/a	n/a	n/a
Services	n/a	26.75	25.62	25.57
Government	n/a	n/a	n/a	n/a

**Table A6: Real Gross Domestic Product by Industry (SIC basis), Service Sector, U.S.**  
Millions of Chained 1996 Dollars

Industry Title	1981	1989	1995	1998	% Average compound growth rates		
					1981-89	1989-95	1995-98
<b>Transportation and public utilities</b>	<b>387319</b>	<b>500392</b>	<b>634518</b>	<b>725964</b>	<b>3.25</b>	<b>4.04</b>	<b>4.59</b>
Transportation	128417	172602	225070	261610	3.77	4.52	5.14
Communications	114449	146145	202379	256597	3.10	5.58	8.23
Electric, gas, and sanitary services	146532	182525	207208	208007	2.78	2.14	0.13
<b>Wholesale trade</b>	<b>264340</b>	<b>399259</b>	<b>483047</b>	<b>663954</b>	<b>5.29</b>	<b>3.23</b>	<b>11.19</b>
<b>Retail trade</b>	<b>388804</b>	<b>562486</b>	<b>641425</b>	<b>795714</b>	<b>4.72</b>	<b>2.21</b>	<b>7.45</b>
<b>Finance, insurance, and real estate</b>	<b>994647</b>	<b>1234317</b>	<b>1392967</b>	<b>1606738</b>	<b>2.74</b>	<b>2.04</b>	<b>4.87</b>
Banking	na	230876	242394	257900	Na	0.81	2.09
Credit agencies other than banks	na	27532	33403	87616	Na	3.27	37.91
Security and commodity brokers	21269	45171	76473	136329	9.87	9.17	21.25
Insurance carriers	140479	114672	129905	129638	-2.51	2.10	-0.07
Insurance agents, brokers, and service	44908	61551	49936	49258	4.02	-3.43	-0.45
Real estate	588115	754623	852754	932430	3.17	2.06	3.02
Holding and other investment offices	33879	6126	9872	16376	-19.25	8.28	18.38
<b>Services</b>	<b>932477</b>	<b>1313831</b>	<b>1510438</b>	<b>1708091</b>	<b>4.38</b>	<b>2.35</b>	<b>4.18</b>
Hotels and other lodging places	45016	54515	62710	63707	2.42	2.36	0.53
Personal services	37514	47396	48053	49914	2.97	0.23	1.27
Business services	na	226025	313940	421456	Na	5.63	10.32
Auto repair, services, and parking	44282	59746	65914	71958	3.81	1.65	2.97
Miscellaneous repair services	22660	25334	22429	21704	1.40	-2.01	-1.09
Motion pictures	12223	22678	23638	26145	8.03	0.69	3.42
Amusement and recreation services	27804	41547	55550	66134	5.15	4.96	5.99
Health services	342140	408279	444258	467004	2.23	1.42	1.68
Legal services	81190	108424	105130	107076	3.68	-0.51	0.61
Educational services	38622	50023	58463	60861	3.29	2.63	1.35
Social services and membership organisations	55104	76436	98237	100980	4.18	4.27	0.92
Other Services	na	183718	199918	238338	Na	1.42	6.03
<b>Government</b>	<b>859099</b>	<b>984340</b>	<b>1017120</b>	<b>1047037</b>	<b>1.72</b>	<b>0.55</b>	<b>0.97</b>
Federal	337416	377348	354311	349783	1.41	-1.04	-0.43
State and local	522368	607702	662850	697183	1.91	1.46	1.70

Source: Bureau of Economic Analysis, 2000. Release date: June 2000.

[http://www.bea.doc.gov/bea/uguide.htm#\\_1\\_14](http://www.bea.doc.gov/bea/uguide.htm#_1_14)

**Table A7: Persons Engaged in Employment, Service Sector, U.S.**  
Thousands

Industry Title	1981	1989	1995	1998	% Average compound growth rates		
					1981-89	1989-95	1995-98
<b>Transportation and public utilities</b>	<b>5230</b>	<b>5674</b>	<b>6172</b>	<b>6648</b>	<b>1.02</b>	<b>1.41</b>	<b>2.51</b>
Transportation	3099	3580	4041	4433	1.82	2.04	3.13
Communications	1286	1172	1221	1365	-1.15	0.68	3.79
Electric, gas, and sanitary services	845	922	910	850	1.10	-0.22	-2.25
<b>Wholesale trade</b>	<b>5534</b>	<b>6413</b>	<b>6555</b>	<b>6919</b>	<b>1.86</b>	<b>0.37</b>	<b>1.82</b>
<b>Retail trade</b>	<b>14153</b>	<b>18020</b>	<b>19462</b>	<b>20419</b>	<b>3.07</b>	<b>1.29</b>	<b>1.61</b>
<b>Finance, insurance, and real estate</b>	<b>5619</b>	<b>7043</b>	<b>7211</b>	<b>7636</b>	<b>2.86</b>	<b>0.39</b>	<b>1.93</b>
Banking	1554	2159	1938	1933	4.20	-1.78	-0.09
Credit agencies other than banks	563	358	467	645	-5.50	4.53	11.36
Security and commodity brokers	293	494	620	732	6.75	3.86	5.69
Insurance carriers	1222	1412	1451	1503	1.82	0.46	1.18
Insurance agents, brokers, and service	600	802	854	880	3.69	1.05	1.00
Real estate	1266	1592	1643	1706	2.91	0.53	1.26
Holding and other investment offices	121	226	238	237	8.12	0.87	-0.14
<b>Services</b>	<b>20331</b>	<b>29021</b>	<b>35000</b>	<b>39353</b>	<b>4.55</b>	<b>3.17</b>	<b>3.98</b>
Hotels and other lodging places	1318	1521	1583	1703	1.81	0.67	2.47
Personal services	1353	1603	1769	1804	2.14	1.66	0.66
Business services	3262	5363	7096	9000	6.41	4.78	8.25
Auto repair, services, and parking	876	1254	1363	1522	4.59	1.40	3.75
Miscellaneous repair services	523	567	586	591	1.01	0.55	0.28
Motion pictures	268	441	555	644	6.42	3.91	5.08
Amusement and recreation services	700	970	1310	1496	4.16	5.14	4.52
Health services	5493	7190	8902	9503	3.42	3.62	2.20
Legal services	745	1153	1170	1231	5.61	0.24	1.71
Educational services	1252	1603	1913	2092	3.14	2.99	3.03
Social services and membership organisations	1061	2007	2669	2992	8.29	4.87	3.88
Other Services	740	825	835	882	1.37	0.20	1.84
<b>Government</b>	<b>16165</b>	<b>18045</b>	<b>18335</b>	<b>18550</b>	<b>1.38</b>	<b>0.27</b>	<b>0.39</b>
Federal	5135	5354	4530	4218	0.52	-2.75	-2.35
State and local	11030	12691	13805	14332	1.77	1.41	1.26

Source: Bureau of Economic Analysis, 2000. Release date: June 2000.

[http://www.bea.doc.gov/bea/uguide.htm#\\_1\\_14](http://www.bea.doc.gov/bea/uguide.htm#_1_14)



**Table A8: Value Added per Employed Worker, Service Sector, U.S.**

<b>Industry Title</b>	<b>1981</b>	<b>1989</b>	<b>1995</b>	<b>1998</b>
<b>Transportation and public utilities</b>	<b>74057</b>	<b>88190</b>	<b>102806</b>	<b>109200</b>
Transportation	41438	48213	55697	59014
Communications	88996	124697	165749	187983
Electric, gas, and sanitary services	173410	197966	227701	244714
<b>Wholesale trade</b>	<b>47767</b>	<b>62258</b>	<b>73691</b>	<b>95961</b>
<b>Retail trade</b>	<b>27472</b>	<b>31215</b>	<b>32958</b>	<b>38969</b>
<b>Finance, insurance, and real estate</b>	<b>177015</b>	<b>175254</b>	<b>193173</b>	<b>210416</b>
Banking	na	106937	125074	133420
Credit agencies other than banks	na	76905	71527	135839
Security and commodity brokers	72589	91439	123344	186242
Insurance carriers	114958	81212	89528	86253
Insurance agents, brokers, and service	74847	76747	58473	55975
Real estate	464546	474009	519023	546559
Holding and other investment offices	279995	27106	41479	69097
<b>Services</b>	<b>45865</b>	<b>45272</b>	<b>43155</b>	<b>43404</b>
Hotels and other lodging places	34155	35842	39615	37409
Personal services	27727	29567	27164	27669
Business services	na	42145	44242	46828
Auto repair, services, and parking	50550	47644	48360	47279
Miscellaneous repair services	43326	44681	38275	36724
Motion pictures	45610	51424	42591	40598
Amusement and recreation services	39720	42832	42405	44207
Health services	62287	56784	49905	49143
Legal services	108980	94036	89855	86983
Educational services	30848	31206	30561	29092
Social services and membership organisations	51936	38085	36807	33750
Other Services	na	222688	239423	270224
<b>Government</b>	<b>53146</b>	<b>54549</b>	<b>55474</b>	<b>56444</b>
Federal	65709	70480	78214	82926
State and local	47359	47884	48015	48645

Source: Calculated from Tables A6 and A7

**Table A9: Gross Output by Industry, in millions of current dollars, U.S.**

<b>Industry Title</b>	<b>1981</b>	<b>1989</b>	<b>1995</b>	<b>1998</b>
<b>Total Economy</b>	<b>N/a</b>	<b>9491487</b>	<b>12815473</b>	<b>15212806</b>
<b>Goods Sector</b>	<b>2708574</b>	<b>3622652</b>	<b>4467933</b>	<b>5085448</b>
Agriculture, forestry, and fishing	174652	213733	250274	279862
Mining	253351	157007	156071	165917
Construction	285805	439446	514112	640672
Manufacturing	1994766	2812466	3547476	3998997
<b>Service Sector</b>	<b>N/a</b>	<b>5868836</b>	<b>8347540</b>	<b>10127358</b>
Transportation and public utilities	N/a	818046	1087579	1296755
Wholesale trade	336393	532953	768380	854265
Retail trade	431616	755351	1021674	1180342
Finance, insurance, and real estate	N/a	1427484	2075451	2660057
Services	N/a	1529312	2331205	2955468
Government	N/a	805690	1063251	1180471

<b>Industry Title</b>	<b>% Average compound growth rates</b>			
	<b>1981-89</b>	<b>1989-95</b>	<b>1995-98</b>	<b>(1995-98)- (1989-95)</b>
<b>Total Economy</b>	<b>n/a</b>	<b>5.13</b>	<b>5.88</b>	<b>0.75</b>
<b>Goods Sector</b>	<b>3.70</b>	<b>3.56</b>	<b>4.41</b>	<b>0.85</b>
Agriculture, forestry, and fishing	2.56	2.67	3.79	1.13
Mining	-5.81	-0.10	2.06	2.16
Construction	5.52	2.65	7.61	4.96
Manufacturing	4.39	3.95	4.07	0.13
<b>Service Sector</b>	<b>n/a</b>	<b>6.05</b>	<b>6.65</b>	<b>0.61</b>
Transportation and public utilities	n/a	4.86	6.04	1.18
Wholesale trade	5.92	6.29	3.60	-2.69
Retail trade	7.25	5.16	4.93	-0.23
Finance, insurance, and real estate	n/a	6.44	8.62	2.19
Services	n/a	7.28	8.23	0.95
Government	n/a	4.73	3.55	-1.18

Bureau of Economic Analysis. Release date, June 2000.

[http://www.bea.doc.gov/bea/uguide.htm#\\_1\\_14](http://www.bea.doc.gov/bea/uguide.htm#_1_14)

**Table A10: Implicit Price Deflator for Gross Output, 1996=100**

<b>Industry Title</b>	<b>1981</b>	<b>1989</b>	<b>1995</b>	<b>1998</b>
<b>Total Economy</b>	<b>n/a</b>	<b>84.9</b>	<b>98.4</b>	<b>100.8</b>
Agriculture, forestry, and fishing	86.9	89.9	92.0	92.8
Mining	132.2	89.4	86.1	86.9
Construction	63.6	83.3	97.6	106.0
Manufacturing	80.8	92.1	100.2	96.0
Transportation and public utilities	n/a	90.9	98.7	101.3
Wholesale trade	77.4	90.4	102.2	94.4
Retail trade	67.4	86.7	99.7	99.8
Finance, insurance, and real estate	n/a	78.2	96.9	105.3
Services	n/a	78.5	97.6	105.3
Government	n/a	77.1	97.2	104.7

<b>Industry Title</b>	<b>% Average compound growth rates</b>			
	<b>1981-89</b>	<b>1989-95</b>	<b>1995-98</b>	<b>(1995-98)- (1989-95)</b>
<b>Total Economy</b>	<b>n/a</b>	<b>2.48</b>	<b>0.81</b>	<b>-1.67</b>
Agriculture, forestry, and fishing	0.42	0.39	0.29	-0.11
Mining	-4.76	-0.63	0.31	0.94
Construction	3.43	2.67	2.77	0.10
Manufacturing	1.65	1.41	-1.42	-2.84
Transportation and public utilities	n/a	1.38	0.88	-0.51
Wholesale trade	1.97	2.06	-2.61	-4.67
Retail trade	3.21	2.35	0.03	-2.32
Finance, insurance, and real estate	n/a	3.63	2.81	-0.82
Services	n/a	3.69	2.57	-1.12
Government	n/a	3.94	2.51	-1.42

Bureau of Economic Analysis. Release date, June 2000.

[http://www.bea.doc.gov/bea/uguide.htm#\\_1\\_14](http://www.bea.doc.gov/bea/uguide.htm#_1_14)

**Table A11: Real Gross Output by industry (SIC basis) in millions of 1996 dollars -U.S.**

<b>Industry Title</b>	<b>1981</b>	<b>1989</b>	<b>1995</b>	<b>1998</b>
<b>Total Economy</b>	<b>n/a</b>	<b>11174475</b>	<b>13024252</b>	<b>15091171</b>
<b>Goods Sector</b>	<b>3311641</b>	<b>3994499</b>	<b>4520466</b>	<b>5263443</b>
Agriculture, forestry, and fishing	200902	237782	271963	301507
Mining	191697	175535	181206	190836
Construction	449202	527407	526689	604653
Manufacturing	2469840	3053775	3540607	4166446
<b>Service Sector</b>	<b>n/a</b>	<b>7178428</b>	<b>8504090</b>	<b>9829019</b>
Transportation and public utilities	n/a	900357	1102339	1280430
Wholesale trade	434734	589243	751626	904702
Retail trade	640713	870782	1024419	1182411
Finance, insurance, and real estate	n/a	1824564	2141959	2526506
Services	n/a	1948367	2389754	2807512
Government	n/a	1045116	1093992	1127458

<b>Industry Title</b>	<b>% Average compound growth rates</b>			
	<b>1981-89</b>	<b>1989-95</b>	<b>1995-98</b>	<b>(1995-98)- (1989-95)</b>
<b>Total Economy</b>	<b>n/a</b>	<b>2.59</b>	<b>5.03</b>	<b>2.45</b>
<b>Goods Sector</b>	<b>2.37</b>	<b>2.08</b>	<b>5.20</b>	<b>3.12</b>
Agriculture, forestry, and fishing	2.13	2.26	3.50	1.23
Mining	-1.09	0.53	1.74	1.21
Construction	2.03	-0.02	4.71	4.73
Manufacturing	2.69	2.50	5.58	3.08
<b>Service Sector</b>	<b>n/a</b>	<b>2.86</b>	<b>4.94</b>	<b>2.08</b>
Transportation and public utilities	n/a	3.43	5.12	1.69
Wholesale trade	3.87	4.14	6.37	2.23
Retail trade	3.91	2.75	4.90	2.15
Finance, insurance, and real estate	n/a	2.71	5.66	2.95
Services	n/a	3.46	5.52	2.06
Government	n/a	0.76	1.01	0.24

Source: Based on Tables A9 and A10.

**Table A12: Gross Output per Worker Employed, U.S.**

Estimates of gross output per employed worker in constant 1996 dollars

<b>Industry Title</b>	<b>1981</b>	<b>1989</b>	<b>1995</b>	<b>1998</b>
<b>Total Economy</b>	<b>n/a</b>	<b>98102</b>	<b>106772</b>	<b>116076</b>
<b>Goods Sector</b>	<b>111215</b>	<b>134536</b>	<b>154562</b>	<b>172651</b>
Agriculture, forestry, and fishing	61626	77732	80462	90326
Mining	164830	247581	306609	317531
Construction	85726	80816	79201	79528
Manufacturing	122792	157435	190090	219935
<b>Service Sector</b>	<b>n/a</b>	<b>85238</b>	<b>91703</b>	<b>98759</b>
Transportation and public utilities	n/a	158681	178603	192604
Wholesale trade	78557	91883	114665	130756
Retail trade	45270	48323	52637	57907
Finance, insurance, and real estate	n/a	259061	297040	330868
Services	n/a	67136	68279	71342
Government	n/a	57917	59667	60779

Source: Based on Tables A2 and A11