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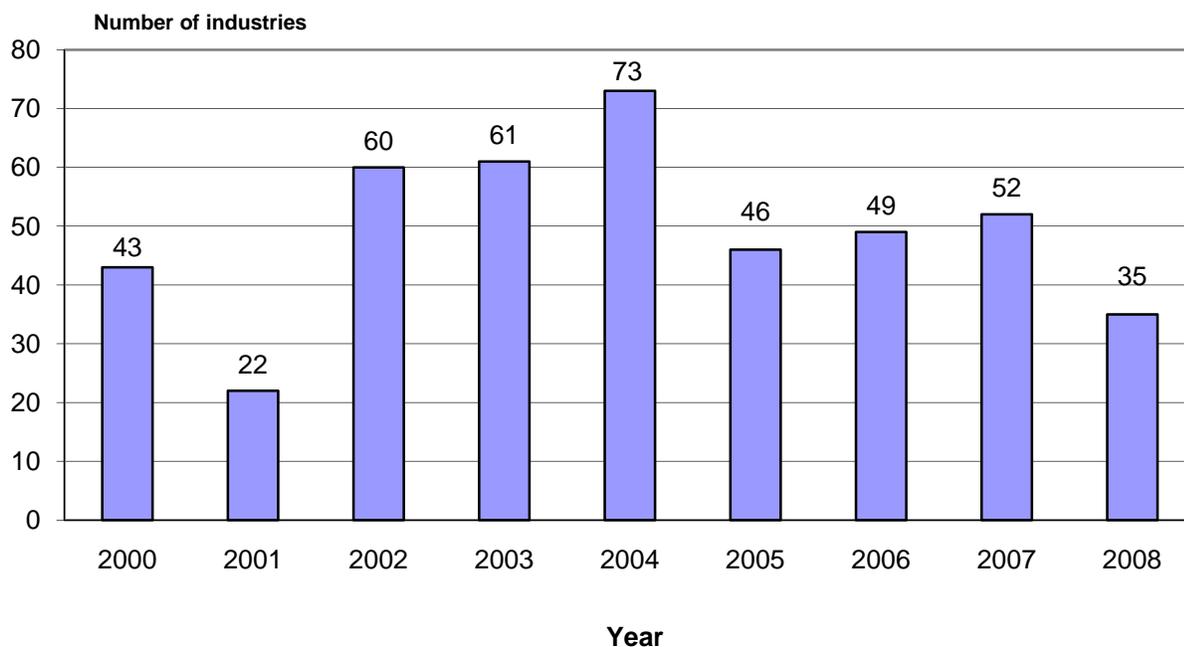
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MULTIFACTOR PRODUCTIVITY TRENDS FOR DETAILED INDUSTRIES, 2008

Multifactor productivity – defined as output per unit of combined inputs – increased in about 40 percent of the 86 four-digit NAICS manufacturing industries in 2008, the U.S. Bureau of Labor Statistics reported today. (See table 1.) This was down from 2007, when multifactor productivity increased in about 60 percent of those industries. Fewer manufacturing industries recorded multifactor productivity increases in 2008 than in any year since 2001. (See chart 1 below.)

Chart 1. Number of manufacturing industries with multifactor productivity growth, 2000-2008



Within the transportation sector in 2008, multifactor productivity rose 0.6 percent in air transportation and declined 1.9 percent in line-haul railroads.

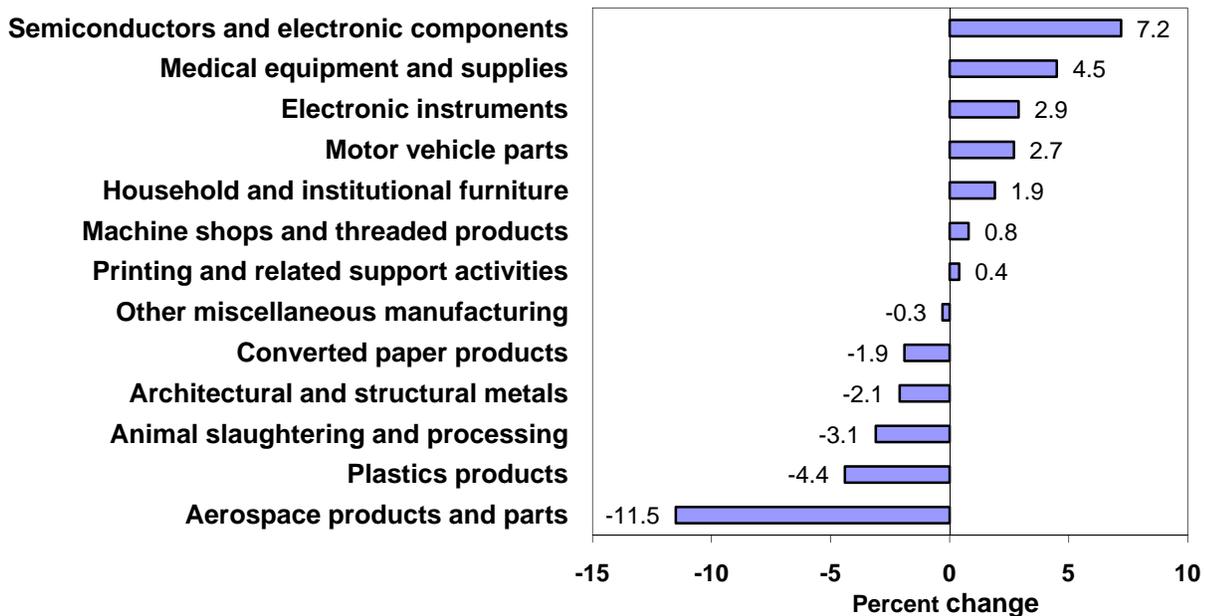
Multifactor productivity indexes relate the change in output to the change in the combined inputs of labor, capital, and intermediate purchases consumed in producing that output. Multifactor productivity measures the joint influences on economic growth of a variety of factors, including technological change, returns to scale, enhancements in managerial and staff skills, changes in the organization of production, and other efficiency improvements.

Manufacturing industries

Output rose in fewer manufacturing industries in 2008 than in 2007. Output rose in only 17 of 86 manufacturing industries in 2008, compared to 39 in 2007. Combined inputs fell in more industries, 65 in 2008 compared to 54 in 2007. Labor hours fell in 67 manufacturing industries in 2008, while intermediate inputs fell in 65 industries and capital services fell in 43 industries.

Chart 2 shows the percent change in multifactor productivity in the largest manufacturing industries (those with employment over 300,000). Of those industries, multifactor productivity rose most in the semiconductors and electronics components industry followed by the medical equipment and supplies industry. Multifactor productivity rose modestly in the largest manufacturing industry, printing and related support activities. Aerospace products and parts posted the largest multifactor productivity decline in 2008 among the largest industries.

Chart 2. Percent change in multifactor productivity in the largest (by employment) manufacturing industries, 2007-2008



Multifactor productivity increased in fewer manufacturing industries in 2008 than over the longer-term period from 1987 to 2008. Between 1987 and 2008, multifactor productivity increased in 45 of 86 manufacturing industries (52 percent). (See table 2.) Output increased in 60 industries while combined inputs increased in 59 industries over the period.

Chart 3 shows a broader and more negative distribution of multifactor productivity growth rates in the most recent year compared to the longer-term period from 1987 to 2008.

Chart 3. Distribution of annual percent change in multifactor productivity for manufacturing industries, 1987-2008 and 2007-2008

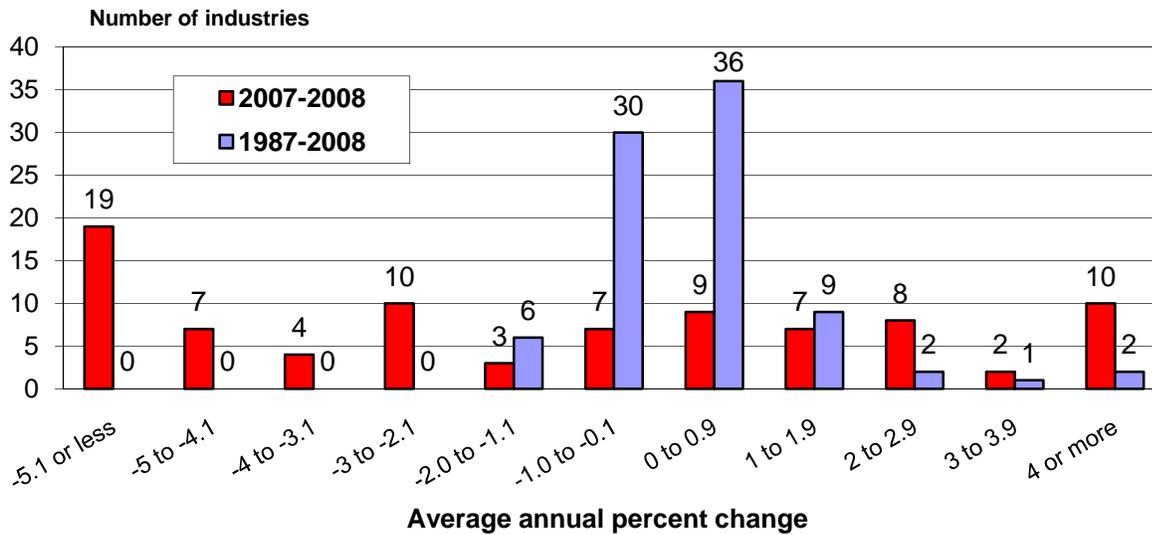
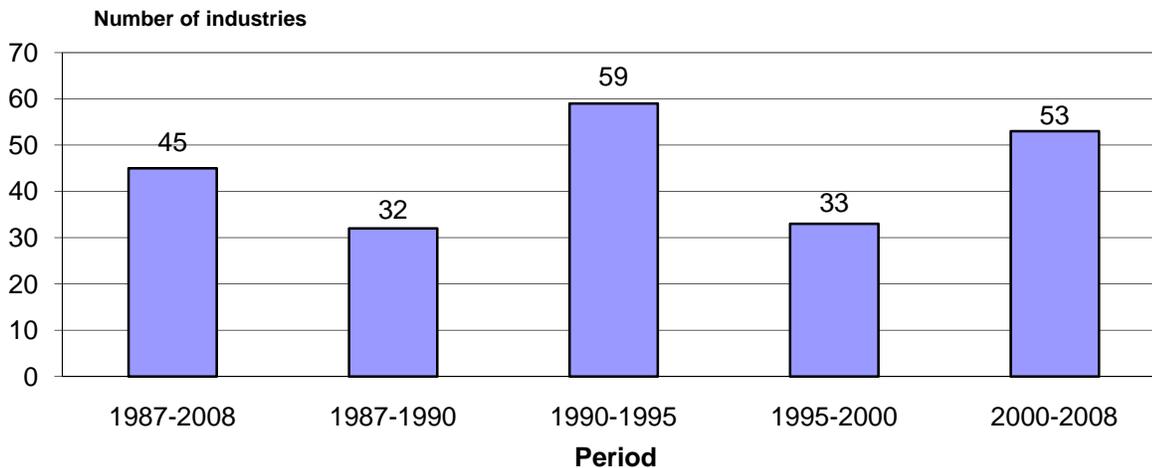


Table 3 presents average annual multifactor productivity growth by industry for 1987 to 2008 and various subperiods. From 2000 to 2008, multifactor productivity grew in 53 of the 86 manufacturing industries, more than in any of the other periods shown except 1990-1995. (See Chart 4.)

Chart 4. Number of manufacturing industries with multifactor productivity growth, 1987-2008 and selected subperiods



Transportation industries

In 2008 multifactor productivity rose in air transportation, as output declined 3.1 percent and combined inputs, led by reductions in intermediate inputs, dropped 3.7 percent. Multifactor productivity in line-haul railroads fell, as output declined 1.0 percent and combined inputs increased 0.9 percent.

Productivity performance was worse in 2008 than over the 1987-2008 period for both industries. Multifactor productivity in air transportation rose at an average annual rate of 1.0 percent over the period, as output rose 3.1 percent annually and combined inputs rose 2.1 percent per year. Multifactor productivity in line-haul railroads grew 2.2 percent per year on average from 1987 to 2008, as output rose 2.2 percent per year and combined inputs showed no change.

Technical Note

Multifactor Productivity: Multifactor productivity measures for detailed industries are derived by dividing an index of industry output by an index of the combined inputs of labor, capital, and intermediate purchases. Multifactor productivity growth measures the extent to which output has grown faster than measured inputs, and reflects the joint influences on economic growth of a number of factors, including technological change, returns to scale, improved skills of the workforce, better management techniques, or other efficiency improvements.

Year-to-year movements in industry multifactor productivity measures may be erratic, particularly in smaller industries. The annual measure based on sample data may differ from measures generated by a census of establishments in the industry. Annual changes in an industry's output, labor, capital, and intermediate purchases may reflect cyclical changes in the economy as well as long-term trends. As a result, long-term multifactor productivity changes tend to be more reliable indicators of industry performance than year-to-year changes.

Output: Manufacturing industry output is measured as annual sectoral output, the total value, in real terms, of goods and services produced for sale outside the industry. Industry value of production is derived by adjusting industry shipments for changes in inventories and subtracting intra-industry transfers and resales. For most manufacturing industries, real output is measured by deflating nominal value of production, but for a few industries physical quantities of output are measured. Output measures for manufacturing industries are constructed using data primarily from the economic censuses and annual surveys of the Bureau of the Census, U.S. Department of Commerce, together with information on price changes chiefly from the Bureau of Labor Statistics (BLS).

For air transportation and line-haul railroads, annual real output is measured by aggregating freight ton-miles and passenger-miles. For air transportation, data on passenger-miles and freight ton-miles from the Bureau of Transportation Statistics (BTS), U.S. Department of Transportation (DOT), are combined using revenue weights from that source. For line-haul railroads, data on freight ton-miles and passenger-miles from the Surface Transportation Board (STB) of DOT, the Association of American Railroads (AAR), and AMTRAK are aggregated using operating expenses from those sources as weights.

Wherever possible, the indexes of industry output are calculated with a Törnqvist formula. This formula aggregates the growth rates of the various industry outputs between two periods, using their relative shares in industry value of production, averaged over the two periods, as weights.

Combined Inputs: The index of combined inputs is a Törnqvist index of separate quantity indexes of capital, labor, and intermediate purchases. The annual growth rates of the various inputs are aggregated using their relative cost shares in total industry value of production as weights. The labor weight is based on labor compensation including fringe benefits. The weight for intermediate purchases is based on the total cost of materials, fuels, electricity, and purchased services. The capital weight is based on the value of sectoral production minus the values of labor compensation and intermediate purchases.

Capital Input: Capital input reflects the flow of services derived from the stock of physical assets. Capital services are estimated by calculating capital stocks; changes in the stocks are assumed to be proportional to changes in capital services for each asset. For the manufacturing industries, physical capital is composed of 26 categories of equipment, 2 categories of structures, 3 categories of inventories, and land.

Capital stocks are calculated using the perpetual inventory method, which takes into account the continual additions to and subtractions from the stock of capital as new investment and retirement of old

capital occur. The perpetual inventory method measures stocks at the end of a year equal to a weighted sum of all past investments, where the weights are each asset's efficiency relative to a new asset. A hyperbolic age-efficiency function is assumed for calculating the relative efficiency of an asset at different ages.

For manufacturing industries, estimates of investment by asset type for each industry are derived using annual capital expenditures for detailed industries from the economic censuses and annual surveys of the Bureau of the Census in combination with benchmark capital flow tables and annual detailed asset investment by industry from the Bureau of Economic Analysis (BEA). Price changes are removed from the annual investment data before calculating stocks. Price deflators for each asset category are constructed by combining detailed price indexes (mostly PPIs) with weights from the BEA capital flow tables that reflect each industry's use of individual asset commodities.

For air transportation, a weighted index of 44 types of airframes and 34 types of engines is derived from quantities and purchase prices from BTS. For assets other than airframes and engines, current dollar capital stocks are calculated with the perpetual inventory method. Inventories of parts and supplies are also included; the current dollar series is deflated with a weighted cost index based on data from the Air Transport Association (ATA) and BTS. Indexes for aircraft and engines, non-aircraft assets, and parts and supplies inventories are aggregated using cost share weights to derive an overall measure of capital input.

For line-haul railroads, current dollar investment for 10 categories of equipment and 13 categories of structures, obtained from STB and AMTRAK, were deflated with BLS producer price indexes and deflators based on BEA data. The perpetual inventory method was used to calculate capital stocks for each of the items. Inventories of materials and supplies are also included. Estimates of investments in land from STB and AMTRAK were deflated with price indexes from BEA.

The index of aggregate capital input for each manufacturing and transportation industry is calculated as an annually-chained Törnqvist quantity index. To construct the index, the growth rates of the stocks of each type of asset are aggregated using weights that are the average of each asset type's cost share in successive years. The asset costs are estimated by multiplying the asset stocks by implicit rental prices.

Labor Input: For manufacturing industries, the primary source of industry employment and hours data is the BLS Current Employment Statistics (CES) survey. The CES provides monthly data on the number of total and production worker jobs held by wage and salary workers in nonfarm establishments, as well as data on the average weekly hours of production workers in those establishments. Data from the Current Population Survey (CPS) are also used to supplement the CES data. CPS data are used to estimate employment and hours of self-employed and unpaid family workers in each industry. Data from the CPS, together with the CES data, are also used to estimate the historical average weekly hours of nonproduction workers for each industry. Hours of all persons in an industry are treated as homogeneous and are directly aggregated.

For air transportation and line-haul railroads, labor input measures are derived primarily from DOT data. For air transportation, annual estimates are based on monthly data from BTS. For line-haul railroads, total labor hours for supervisory and nonsupervisory workers are derived from STB data and supplemented with data from AAR. For the railroad industry, the labor input measures include an adjustment to remove capitalized labor hours in order to avoid double-counting, because some capitalized labor costs are embedded in the railroad investment data.

Intermediate Purchases Input: The index of intermediate purchases is constructed as a Törnqvist index of separate quantities of materials, services, fuels, and electricity consumed by each industry. Except for electricity consumed by manufacturing industries, for which direct quantity data are available, quantities are derived by deflating current-dollar values with appropriate price deflators.

For manufacturing industries, nominal values of materials, fuels and electricity, and quantities of electricity consumed by each industry are obtained from economic censuses and annual surveys of the Bureau of the Census. To avoid double counting, an adjustment is made to the materials estimates to exclude the value of intra-industry commodity transfers. Purchased business services are estimated using annual industry data and benchmark input-output tables from BEA.

Constant-dollar materials consumed are derived by dividing annual current-dollar industry purchases by a weighted price deflator for each industry. Materials deflators are constructed for each industry by combining detailed producer price indexes and import price indexes from BLS using weights based on detailed commodity data from the BEA benchmark input-output tables. Aggregate price indexes to deflate purchased business services are constructed in a similar manner. Annual total fuels consumed by each industry are also deflated with weighted price deflators. Producer price indexes for individual fuel categories are weighted together with weights reflecting detailed fuels expenditures by industry from the Energy Information Administration (EIA), U.S. Department of Energy.

For air transportation, detailed cost of materials, services, fuels, and electricity from the BTS were deflated using cost indexes from ATA. For line-haul railroads, intermediate purchases data from STB were supplemented with data from other sources including AAR, AMTRAK, EIA, and the Edison Electric Institute. The nominal values were deflated with producer price indexes from BLS and implicit price deflators calculated from BEA investment data.

Revisions: This news release incorporates annual Census Bureau data from the 2007 Economic Census and the 2008 Annual Survey of Manufactures, and annual data and benchmark revisions from the BLS Current Employment Statistics survey published in February, 2010. The multifactor productivity measures included in this release also reflect several other changes since the last release of data for multifactor productivity on August 29, 2008. The measures now reflect data classified according to the 2007 NAICS definitions. In addition, the multifactor productivity measures for manufacturing industries have been revised to include the output and combined capital, labor and intermediate inputs of nonemployer firms, including the hours and labor compensation of self-employed and unpaid family workers. In addition, the index series have been rebased from 1997=100 to 2002=100.

Additional Information: Industry multifactor productivity and related measures are available online on the BLS Multifactor Productivity and Costs website at <http://www.bls.gov/mfp>. Additional data are available upon request by sending an e-mail to dipsweb@bls.gov or by calling the Division of Industry Productivity Studies at 202-691-5618. Information in this report will be made available to sensory-impaired individuals upon request. Voice phone: 202-691-5618; TDD message referral phone number: 1-800-877-8339.

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Table 1. Multifactor productivity and related data for 88 industries, percent change, 2007-2008

NAICS code	Industry	2008 Employment (thousands)	Percent change, 2007-2008					
			Multifactor productivity	Output	Combined inputs	Labor Hours	Capital	Intermediate purchases
Manufacturing								
3111	Animal food	53	-3.0	-0.6	2.5	5.8	0.9	2.8
3112	Grain and oilseed milling	62	-2.7	1.4	4.2	5.3	-2.2	6.7
3113	Sugar and confectionery products	74	-7.4	-8.2	-0.9	-0.6	-1.4	-0.6
3114	Fruit and vegetable preserving and specialty	173	-3.4	-2.5	1.0	-0.1	0.0	1.6
3115	Dairy products	132	-2.4	2.3	4.8	-5.2	1.5	7.0
3116	Animal slaughtering and processing	514	-3.1	1.6	4.9	-0.9	3.7	6.1
3117	Seafood product preparation and packaging	39	-11.6	-13.6	-2.3	-1.0	5.9	-3.9
3118	Bakeries and tortilla manufacturing	300	-5.9	-5.1	0.8	2.6	-0.2	0.4
3119	Other food products	164	0.3	-0.1	-0.4	-1.5	0.5	-0.8
3121	Beverages	179	-2.6	-5.3	-2.7	-5.4	0.8	-4.4
3122	Tobacco and tobacco products	22	-7.8	-10.6	-3.0	2.7	-5.2	11.5
3131	Fiber, yarn, and thread mills	37	-4.4	-13.4	-9.5	-14.5	-4.5	-8.9
3132	Fabric mills	72	-4.4	-13.5	-9.5	-17.8	-3.9	-7.9
3133	Textile and fabric finishing mills	52	-13.1	-22.2	-10.5	-8.8	-4.4	-11.5
3141	Textile furnishings mills	82	-6.2	-12.6	-6.9	-10.2	-2.4	-7.7
3149	Other textile product mills	81	-4.4	-1.1	3.4	-0.6	2.5	6.0
3151	Apparel knitting mills	32	-0.6	-15.0	-14.5	-12.0	-6.1	-16.0
3152	Cut and sew apparel	172	2.0	-13.2	-14.9	-11.9	-4.9	-18.6
3159	Accessories and other apparel	17	0.3	-14.6	-14.9	-14.6	-3.7	-15.4
3161	Leather and hide tanning and finishing	5	5.0	-12.3	-16.5	-9.9	-3.5	-18.4
3162	Footwear	17	12.0	11.6	-0.3	-5.5	-3.2	2.6
3169	Other leather products	15	-10.1	-16.5	-7.1	-12.2	1.0	-6.1
3211	Sawmills and wood preservation	106	2.6	-9.4	-11.7	-12.5	-3.1	-12.1
3212	Plywood and engineered wood products	90	-5.5	-18.3	-13.5	-14.9	-0.9	-13.6
3219	Other wood products	290	-3.0	-14.6	-12.0	-11.6	0.4	-13.8
3221	Pulp, paper, and paperboard mills	127	-2.1	-4.1	-2.0	-4.6	-3.1	-0.8
3222	Converted paper products	319	-1.9	-4.5	-2.7	-3.4	-0.1	-3.1
3231	Printing and related support activities	623	0.4	-6.0	-6.4	-7.3	0.4	-7.3
3241	Petroleum and coal products	118	-0.4	0.6	1.1	3.7	4.6	0.5
3251	Basic chemicals	153	-10.9	-12.3	-1.5	3.4	0.9	-2.8
3252	Resin, rubber, and artificial fibers	104	-7.5	-13.2	-6.2	-5.2	-1.0	-7.1
3253	Agricultural chemicals	37	-12.1	-8.6	4.1	-7.6	0.3	8.6
3254	Pharmaceuticals and medicines	292	-5.0	-4.2	0.8	-2.9	0.7	2.9
3255	Paints, coatings, and adhesives	62	-3.3	-9.1	-6.0	-5.3	-0.8	-7.2
3256	Soaps, cleaning compounds, and toiletries	112	-10.4	-9.6	0.8	-4.3	1.2	1.5
3259	Other chemical products and preparations	96	-2.8	-6.0	-3.2	-6.7	-1.9	-2.6
3261	Plastics products	589	-4.4	-8.8	-4.5	-4.2	0.3	-5.9
3262	Rubber products	145	-5.1	-11.4	-6.6	-4.2	0.3	-8.3
3271	Clay products and refractories	57	-4.5	-9.4	-5.1	-8.1	-0.3	-4.5
3272	Glass and glass products	104	2.1	-3.5	-5.5	0.5	-1.8	-9.3
3273	Cement and concrete products	223	-9.6	-17.6	-8.8	-11.3	3.9	-13.0
3274	Lime and gypsum products	18	4.1	-7.2	-10.8	-5.6	4.3	-16.8
3279	Other nonmetallic mineral products	79	1.1	-6.1	-7.1	-7.2	1.4	-11.3
3311	Iron and steel mills and ferroalloy production	100	-3.5	6.7	10.6	-1.7	0.1	15.5
3312	Steel products from purchased steel	62	-8.7	-7.9	0.8	-3.5	-3.8	3.3
3313	Alumina and aluminum production	66	-0.7	-9.4	-8.8	-8.0	0.0	-10.2
3314	Other nonferrous metal production	67	5.9	2.1	-3.6	-2.4	2.3	-5.9
3315	Foundries	148	-4.2	-13.4	-9.6	-6.8	2.1	-11.9

Table 1. Multifactor productivity and related data for 88 industries, percent change, 2007-2008-Continued

NAICS code	Industry	2008	Percent change, 2007-2008					
		Employment (thousands)	Multifactor productivity	Output	Combined inputs	Labor Hours	Capital	Intermediate purchases
3321	Forging and stamping	107	1.0	-3.6	-4.5	-3.7	0.8	-6.0
3322	Cutlery and hand tools	49	-1.7	-11.8	-10.3	-8.8	-0.8	-13.1
3323	Architectural and structural metals	412	-2.1	-4.5	-2.5	-3.7	1.1	-2.8
3324	Boilers, tanks, and shipping containers	98	0.5	-2.4	-2.9	-0.3	1.4	-4.9
3325	Hardware	30	-0.2	-13.8	-13.6	-19.9	-1.8	-12.8
3326	Spring and wire products	53	1.0	-6.6	-7.5	-10.4	0.5	-7.4
3327	Machine shops and threaded products	370	0.8	-0.9	-1.7	-4.4	3.1	-1.4
3328	Coating, engraving, and heat treating metals	145	3.6	-0.1	-3.5	-1.3	1.4	-6.4
3329	Other fabricated metal products	286	1.3	-2.0	-3.2	-5.8	1.4	-4.1
3331	Agriculture, construction, and mining machinery	244	2.4	4.0	1.5	1.7	4.2	0.7
3332	Industrial machinery	124	-5.4	-13.6	-8.7	-4.4	-1.4	-11.2
3333	Commercial and service industry machinery	105	3.2	-0.4	-3.5	-6.2	-1.6	-2.6
3334	HVAC and commercial refrigeration equipment	151	1.2	-2.9	-4.0	-2.4	-1.0	-5.4
3335	Metalworking machinery	195	2.2	0.5	-1.6	0.4	-0.9	-3.2
3336	Turbine and power transmission equipment	106	0.5	-0.1	-0.7	2.7	1.6	-1.9
3339	Other general purpose machinery	277	-1.0	-3.9	-3.0	0.4	-0.1	-5.0
3341	Computer and peripheral equipment	185	41.9	35.8	-4.3	2.2	0.4	-7.4
3342	Communications equipment	130	5.8	-2.4	-7.8	2.4	-1.0	-13.6
3343	Audio and video equipment	28	-9.0	-20.2	-12.2	-5.3	-6.2	-14.4
3344	Semiconductors and electronic components	434	7.2	3.1	-3.9	-1.3	6.8	-13.0
3345	Electronic instruments	444	2.9	4.3	1.3	2.0	0.6	1.1
3346	Magnetic media manufacturing and reproduction	35	12.0	3.7	-7.4	-13.1	-2.3	-5.4
3351	Electric lighting equipment	59	0.5	-3.1	-3.5	-5.0	-0.2	-3.9
3352	Household appliances	71	-1.5	-10.9	-9.5	-7.3	-1.7	-12.0
3353	Electrical equipment	161	-0.1	-0.1	0.0	4.2	-0.8	-1.4
3359	Other electrical equipment and components	138	0.3	-2.6	-2.9	-0.3	0.0	-4.5
3361	Motor vehicles	192	-5.3	-19.9	-15.5	-11.7	-3.8	-17.8
3362	Motor vehicle bodies and trailers	142	-2.3	-21.9	-20.0	-17.1	-2.8	-21.7
3363	Motor vehicle parts	550	2.7	-17.1	-19.4	-13.0	-3.3	-21.7
3364	Aerospace products and parts	508	-11.5	-6.9	5.2	2.4	0.9	8.4
3365	Railroad rolling stock	29	6.1	18.0	11.2	1.1	2.0	15.0
3366	Ship and boat building	157	1.1	2.9	1.8	-8.9	3.1	7.0
3369	Other transportation equipment	44	2.7	9.0	6.1	5.0	6.7	6.1
3371	Household and institutional furniture	335	1.9	-10.1	-11.7	-14.2	-2.6	-11.7
3372	Office furniture and fixtures	133	0.0	-5.1	-5.1	-5.9	-1.7	-6.0
3379	Other furniture-related products	45	-2.4	-13.6	-11.5	-15.7	-1.5	-12.9
3391	Medical equipment and supplies	324	4.5	6.2	1.6	3.4	3.1	-1.1
3399	Other miscellaneous manufacturing	375	-0.3	-4.3	-4.1	-3.7	-0.6	-5.3
	Transportation							
481	Air Transportation	427	0.6	-3.1	-3.7	-1.8	0.0	-4.8
482111	Line-Haul Railroads	184	-1.9	-1.0	0.9	0.1	1.3	1.2

Table 2. Multifactor productivity and related data for 88 industries, average annual percent change, 1987-2008

NAICS code	Industry	Average annual percent change, 1987-2008					
		Multifactor productivity	Output	Combined inputs	Labor Hours	Capital	Intermediate purchases
Manufacturing							
3111	Animal food	0.4	2.0	1.7	-0.7	2.2	1.8
3112	Grain and oilseed milling	0.0	1.3	1.2	-0.8	1.1	1.5
3113	Sugar and confectionery products	0.1	-0.1	-0.2	-0.9	1.3	-0.9
3114	Fruit and vegetable preserving and specialty	0.3	1.3	1.0	-0.3	1.7	1.1
3115	Dairy products	-0.4	1.0	1.4	-0.6	1.9	1.6
3116	Animal slaughtering and processing	0.6	2.3	1.7	1.4	2.8	1.6
3117	Seafood product preparation and packaging	-0.4	0.1	0.5	-0.8	1.6	0.6
3118	Bakeries and tortilla manufacturing	-1.1	0.3	1.4	-0.2	1.9	2.1
3119	Other food products	0.5	2.0	1.5	1.6	1.5	1.5
3121	Beverages	0.7	1.5	0.8	-0.4	0.9	0.9
3122	Tobacco and tobacco products	-1.0	-3.1	-2.1	-3.6	-2.1	-3.4
3131	Fiber, yarn, and thread mills	0.6	-1.5	-2.0	-5.4	-0.9	-1.2
3132	Fabric mills	0.9	-2.6	-3.4	-7.1	-1.4	-2.4
3133	Textile and fabric finishing mills	-0.3	-3.6	-3.3	-4.2	-1.3	-3.4
3141	Textile furnishings mills	-0.2	-1.5	-1.3	-2.2	-0.2	-1.5
3149	Other textile product mills	0.1	-0.2	-0.3	-1.5	1.7	-0.2
3151	Apparel knitting mills	-1.3	-6.8	-5.6	-6.2	-2.0	-5.9
3152	Cut and sew apparel	-1.0	-8.5	-7.5	-7.2	-1.9	-8.9
3159	Accessories and other apparel	-1.8	-6.9	-5.3	-4.4	-1.3	-6.0
3161	Leather and hide tanning and finishing	-1.1	-4.8	-3.8	-5.4	-1.7	-3.9
3162	Footwear	0.2	-5.6	-5.7	-7.9	-3.0	-5.1
3169	Other leather products	-0.2	-3.5	-3.3	-4.9	-0.7	-3.3
3211	Sawmills and wood preservation	-0.1	0.1	0.2	-2.3	0.1	1.5
3212	Plywood and engineered wood products	-0.5	-0.1	0.4	-0.8	2.0	0.8
3219	Other wood products	-0.5	0.1	0.6	-1.0	2.0	1.2
3221	Pulp, paper, and paperboard mills	-0.3	-0.2	0.1	-3.1	-0.1	1.4
3222	Converted paper products	-0.1	0.5	0.5	-1.0	1.6	0.7
3231	Printing and related support activities	-0.2	0.1	0.3	-1.3	2.4	0.8
3241	Petroleum and coal products	0.3	1.2	0.9	-1.3	1.5	1.0
3251	Basic chemicals	-0.9	0.5	1.5	-2.1	0.9	2.4
3252	Resin, rubber, and artificial fibers	0.0	0.5	0.5	-1.6	1.1	0.7
3253	Agricultural chemicals	0.6	0.5	-0.2	-2.1	-1.0	0.7
3254	Pharmaceuticals and medicines	-1.2	3.0	4.3	2.4	5.2	4.0
3255	Paints, coatings, and adhesives	-1.0	-0.3	0.7	-1.4	0.7	1.3
3256	Soaps, cleaning compounds, and toiletries	0.2	2.3	2.1	-0.7	2.3	2.5
3259	Other chemical products and preparations	-0.8	0.0	0.9	-2.3	0.5	2.1
3261	Plastics products	0.0	2.0	2.0	0.1	3.6	2.3
3262	Rubber products	0.4	0.4	0.0	-1.7	0.8	0.8
3271	Clay products and refractories	-0.2	-1.1	-1.0	-2.4	-0.2	-0.3
3272	Glass and glass products	0.8	0.5	-0.3	-1.5	0.8	-0.1
3273	Cement and concrete products	-0.4	1.1	1.4	0.6	1.6	1.6
3274	Lime and gypsum products	-0.4	0.0	0.4	-1.0	1.6	0.2
3279	Other nonmetallic mineral products	1.0	1.5	0.5	-0.2	0.6	0.8
3311	Iron and steel mills and ferroalloy production	0.7	2.5	1.7	-2.6	-1.7	4.1
3312	Steel products from purchased steel	-0.6	-1.6	-1.0	-0.7	-1.6	-0.8
3313	Alumina and aluminum production	-0.4	-0.1	0.4	-2.5	-0.1	1.3
3314	Other nonferrous metal production	-1.2	-0.9	0.3	-2.3	-0.3	1.1
3315	Foundries	-0.1	0.1	0.2	-1.9	0.3	1.8

Table 2. Multifactor productivity and related data for 88 industries, average annual percent change, 1987-2008-Continued

NAICS code	Industry	Average annual percent change, 1987-2008					
		Multifactor productivity	Output	Combined inputs	Labor Hours	Capital	Intermediate purchases
3321	Forging and stamping	1.0	1.8	0.8	-1.0	2.0	1.5
3322	Cutlery and hand tools	-0.4	-0.9	-0.5	-2.3	0.3	0.4
3323	Architectural and structural metals	-0.2	1.8	2.0	0.7	1.5	2.8
3324	Boilers, tanks, and shipping containers	0.5	0.3	-0.2	-0.5	0.0	-0.1
3325	Hardware	-0.9	-2.6	-1.7	-3.8	-0.1	-1.0
3326	Spring and wire products	0.9	0.7	-0.1	-2.0	1.3	0.5
3327	Machine shops and threaded products	1.2	3.3	2.1	0.8	2.9	3.1
3328	Coating, engraving, and heat treating metals	1.4	3.4	1.9	0.3	2.4	2.7
3329	Other fabricated metal products	0.0	0.9	0.9	-0.8	0.9	2.0
3331	Agriculture, construction, and mining machinery	0.9	3.6	2.8	0.6	0.4	4.0
3332	Industrial machinery	0.3	1.6	1.3	-0.9	2.2	2.4
3333	Commercial and service industry machinery	-0.6	-0.2	0.4	-1.7	0.4	1.6
3334	HVAC and commercial refrigeration equipment	0.7	1.7	1.0	-0.4	1.4	1.5
3335	Metalworking machinery	0.9	0.6	-0.3	-1.5	0.9	0.6
3336	Turbine and power transmission equipment	-0.1	1.8	1.9	-0.2	1.1	3.0
3339	Other general purpose machinery	0.5	1.9	1.4	-0.7	0.8	2.8
3341	Computer and peripheral equipment	17.5	20.1	2.2	-3.8	1.3	3.8
3342	Communications equipment	2.8	4.5	1.6	-2.7	3.0	3.7
3343	Audio and video equipment	1.7	0.3	-1.4	-3.5	0.6	-1.2
3344	Semiconductors and electronic components	14.0	15.2	1.0	-1.4	6.5	-0.8
3345	Electronic instruments	0.4	2.5	2.0	-1.8	1.0	5.0
3346	Magnetic media manufacturing and reproduction	3.7	2.0	-1.7	-1.5	1.5	-2.1
3351	Electric lighting equipment	0.5	0.3	-0.2	-1.8	0.5	0.3
3352	Household appliances	1.7	0.9	-0.8	-3.0	0.0	-0.2
3353	Electrical equipment	0.3	0.6	0.4	-2.1	-0.4	2.2
3359	Other electrical equipment and components	0.0	0.2	0.2	-1.8	0.6	0.9
3361	Motor vehicles	0.4	1.2	0.8	-2.2	1.0	1.0
3362	Motor vehicle bodies and trailers	-0.3	1.2	1.6	0.0	1.9	2.0
3363	Motor vehicle parts	1.0	2.0	1.0	-0.8	1.3	1.8
3364	Aerospace products and parts	-0.9	-0.5	0.4	-2.1	0.1	2.1
3365	Railroad rolling stock	1.1	5.9	4.8	0.7	-0.2	6.7
3366	Ship and boat building	-0.4	1.3	1.7	-0.9	0.0	3.4
3369	Other transportation equipment	2.3	7.2	4.8	0.4	3.7	6.2
3371	Household and institutional furniture	0.1	0.3	0.2	-1.5	1.4	1.0
3372	Office furniture and fixtures	0.3	0.9	0.6	-0.9	1.6	1.0
3379	Other furniture-related products	0.7	1.8	1.1	-0.5	0.6	1.7
3391	Medical equipment and supplies	1.7	5.0	3.2	1.3	5.1	3.3
3399	Other miscellaneous manufacturing	0.5	1.3	0.7	-0.9	1.7	1.4
	Transportation						
481	Air Transportation	1.0	3.1	2.1	0.2	4.9	3.0
482111	Line-Haul Railroads	2.2	2.2	0.0	-1.9	-0.3	2.2

Table 3. Multifactor productivity trends, 1987-2008 and selected subperiods

NAICS code	Industry	Average annual percent change					
		1987-2008	1987-1990	1990-1995	1995-2000	2000-2008	2007-2008
Manufacturing							
3111	Animal food	0.4	0.6	0.3	-0.8	1.1	-3.0
3112	Grain and oilseed milling	0.0	0.0	0.5	0.3	-0.4	-2.7
3113	Sugar and confectionery products	0.1	-0.3	0.4	1.9	-1.0	-7.4
3114	Fruit and vegetable preserving and specialty	0.3	-2.6	1.3	0.9	0.4	-3.4
3115	Dairy products	-0.4	-0.3	-0.6	-0.7	0.0	-2.4
3116	Animal slaughtering and processing	0.6	-0.8	1.0	1.3	0.5	-3.1
3117	Seafood product preparation and packaging	-0.4	-1.2	0.0	-0.4	-0.3	-11.6
3118	Bakeries and tortilla manufacturing	-1.1	-4.4	0.4	-0.8	-1.0	-5.9
3119	Other food products	0.5	-0.1	0.6	-0.2	1.2	0.3
3121	Beverages	0.7	0.3	1.0	-1.1	1.7	-2.6
3122	Tobacco and tobacco products	-1.0	-1.2	-0.7	0.6	-2.1	-7.8
3131	Fiber, yarn, and thread mills	0.6	0.1	0.3	-0.1	1.3	-4.4
3132	Fabric mills	0.9	-0.1	1.3	-0.2	1.7	-4.4
3133	Textile and fabric finishing mills	-0.3	-0.2	-0.1	1.0	-1.3	-13.1
3141	Textile furnishings mills	-0.2	-0.6	1.2	-1.0	-0.5	-6.2
3149	Other textile product mills	0.1	-0.9	-0.2	0.4	0.6	-4.4
3151	Apparel knitting mills	-1.3	0.8	1.9	-2.7	-3.1	-0.6
3152	Cut and sew apparel	-1.0	-1.2	0.4	-1.2	-1.7	2.0
3159	Accessories and other apparel	-1.8	0.9	0.4	-4.8	-2.2	0.3
3161	Leather and hide tanning and finishing	-1.1	-3.2	-2.2	3.5	-2.3	5.0
3162	Footwear	0.2	-1.9	0.2	-0.9	1.6	12.0
3169	Other leather products	-0.2	0.0	-2.3	1.6	0.0	-10.1
3211	Sawmills and wood preservation	-0.1	1.5	-1.4	-2.1	1.3	2.6
3212	Plywood and engineered wood products	-0.5	-0.7	-0.4	-0.9	-0.1	-5.5
3219	Other wood products	-0.5	-0.8	-1.0	-0.8	0.1	-3.0
3221	Pulp, paper, and paperboard mills	-0.3	-1.8	-1.1	-0.4	0.9	-2.1
3222	Converted paper products	-0.1	-0.6	-0.2	-0.3	0.4	-1.9
3231	Printing and related support activities	-0.2	-0.4	-0.4	-1.4	0.8	0.4
3241	Petroleum and coal products	0.3	-1.9	2.1	1.9	-1.0	-0.4
3251	Basic chemicals	-0.9	-1.0	-3.2	-1.2	0.7	-10.9
3252	Resin, rubber, and artificial fibers	0.0	-0.8	1.1	-0.8	0.2	-7.5
3253	Agricultural chemicals	0.6	2.1	1.0	-1.1	1.0	-12.1
3254	Pharmaceuticals and medicines	-1.2	-1.8	-2.4	-2.1	0.3	-5.0
3255	Paints, coatings, and adhesives	-1.0	-2.0	-0.8	-2.1	-0.2	-3.3
3256	Soaps, cleaning compounds, and toiletries	0.2	-1.4	0.2	-1.9	2.2	-10.4
3259	Other chemical products and preparations	-0.8	-1.6	0.1	-1.0	-0.9	-2.8
3261	Plastics products	0.0	-0.8	1.0	0.4	-0.4	-4.4
3262	Rubber products	0.4	1.2	1.1	0.9	-0.8	-5.1
3271	Clay products and refractories	-0.2	0.7	1.1	0.8	-1.8	-4.5
3272	Glass and glass products	0.8	-0.3	1.7	1.7	0.1	2.1
3273	Cement and concrete products	-0.4	0.6	0.3	0.0	-1.4	-9.6
3274	Lime and gypsum products	-0.4	-1.4	-2.5	0.6	0.7	4.1
3279	Other nonmetallic mineral products	1.0	-1.4	2.0	-0.5	2.3	1.1
3311	Iron and steel mills and ferroalloy production	0.7	1.3	1.9	1.9	-1.0	-3.5
3312	Steel products from purchased steel	-0.6	1.1	2.3	-0.2	-3.2	-8.7
3313	Alumina and aluminum production	-0.4	-0.2	-0.7	-0.3	-0.4	-0.7
3314	Other nonferrous metal production	-1.2	-1.6	1.5	0.0	-3.5	5.9
3315	Foundries	-0.1	-0.2	1.5	0.0	-1.3	-4.2

Table 3. Multifactor productivity trends, 1987-2008 and selected subperiods -Continued

NAICS code	Industry	Average annual percent change					
		1987-2008	1987-1990	1990-1995	1995-2000	2000-2008	2007-2008
3321	Forging and stamping	1.0	-0.6	0.9	0.8	1.7	1.0
3322	Cutlery and hand tools	-0.4	-1.5	0.9	-0.5	-0.8	-1.7
3323	Architectural and structural metals	-0.2	-1.2	0.8	-0.7	0.0	-2.1
3324	Boilers, tanks, and shipping containers	0.5	0.6	1.2	0.1	0.2	0.5
3325	Hardware	-0.9	-2.2	0.6	-0.2	-1.8	-0.2
3326	Spring and wire products	0.9	0.4	1.5	0.4	1.0	1.0
3327	Machine shops and threaded products	1.2	1.0	3.2	0.0	0.7	0.8
3328	Coating, engraving, and heat treating metals	1.4	0.8	2.0	-0.7	2.7	3.6
3329	Other fabricated metal products	0.0	-1.8	0.2	-0.9	1.2	1.3
3331	Agriculture, construction, and mining machinery	0.9	2.5	-0.2	-1.0	2.1	2.4
3332	Industrial machinery	0.3	0.2	1.5	-0.5	0.0	-5.4
3333	Commercial and service industry machinery	-0.6	0.8	-0.8	-1.6	-0.3	3.2
3334	HVAC and commercial refrigeration equipment	0.7	-0.2	0.7	0.6	1.0	1.2
3335	Metalworking machinery	0.9	0.1	1.2	-0.7	2.0	2.2
3336	Turbine and power transmission equipment	-0.1	-0.6	-0.1	0.8	-0.4	0.5
3339	Other general purpose machinery	0.5	0.4	0.0	-0.1	1.1	-1.0
3341	Computer and peripheral equipment	17.5	5.4	11.7	21.8	23.5	41.9
3342	Communications equipment	2.8	3.6	3.7	1.3	2.8	5.8
3343	Audio and video equipment	1.7	3.7	1.8	0.2	1.7	-9.0
3344	Semiconductors and electronic components	14.0	7.2	18.2	22.8	8.9	7.2
3345	Electronic instruments	0.4	1.6	-0.3	-4.3	3.6	2.9
3346	Magnetic media manufacturing and reproduction	3.7	1.1	5.8	0.1	5.8	12.0
3351	Electric lighting equipment	0.5	-1.8	0.1	0.2	1.7	0.5
3352	Household appliances	1.7	-0.1	2.4	0.9	2.5	-1.5
3353	Electrical equipment	0.3	0.4	1.7	-2.4	1.0	-0.1
3359	Other electrical equipment and components	0.0	-1.8	0.9	0.3	-0.1	0.3
3361	Motor vehicles	0.4	0.2	-1.4	0.3	1.8	-5.3
3362	Motor vehicle bodies and trailers	-0.3	-3.0	2.0	-2.0	0.2	-2.3
3363	Motor vehicle parts	1.0	-0.8	1.9	-0.3	1.9	2.7
3364	Aerospace products and parts	-0.9	-2.8	-1.7	-1.8	0.9	-11.5
3365	Railroad rolling stock	1.1	2.2	-1.3	4.0	0.5	6.1
3366	Ship and boat building	-0.4	-0.1	-2.0	-0.3	0.4	1.1
3369	Other transportation equipment	2.3	-1.8	4.1	-0.9	4.9	2.7
3371	Household and institutional furniture	0.1	-0.6	0.6	-0.6	0.5	1.9
3372	Office furniture and fixtures	0.3	-2.6	0.2	1.7	0.6	0.0
3379	Other furniture-related products	0.7	0.0	0.6	-0.3	1.6	-2.4
3391	Medical equipment and supplies	1.7	2.6	0.3	2.1	2.1	4.5
3399	Other miscellaneous manufacturing	0.5	1.2	0.6	-0.2	0.6	-0.3
	Transportation						
481	Air Transportation	1.0	-1.2	0.5	0.1	2.9	0.6
482111	Line-Haul Railroads	2.2	4.4	4.1	1.2	0.9	-1.9