Between-Sector Earnings Inequality in the United States

By

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Abstract:

In this note we report on the evolution of between-sector wage inequality in the United States from 1969 – 2006. Our calculations take advantage of new NAICS sectoral classification, merging these with the earlier SIC scheme to achieve a single unified series. We compare this measure to the standard CPS-based Gini coefficient of household income inequality, showing that the evolution of the two series is very close. We show that between-sector variations dominate between-state variations in determining the evolution of inequality. The high importance of between-sector variations in driving overall U.S. pay inequality raises important questions about the standard invocation of education and training as a remedy for inequality, since the choice of specialization has become a speculative decision, whose income prospects depend heavily on the ebb and flow of sectoral economic fortunes.

Introduction

Eye-catching measures of economic inequality often lack context, and sometimes they are actually unreliable as indicators of larger trends. The ratio of chief executive officer pay to that of an average worker is highly provocative, but it is worth noting that there are only five hundred Fortune 500 CEOs in the United States at any given time. Except as part of a tale of greed, predatory behavior or grand larceny, does it matter whether a top CEO makes $150 million or $400 million in a particular year? A handful of huge incomes may make a large statistical difference to simple ratios, but impart variability of no compelling consequence. For example, the ratio of average-CEO-to-average-worker was 525 to 1 in 2000 before plunging to 281 to 1 in 2002 (United for a Fair Economy 2007). No underlying movement toward socialism lay behind this; it was the merely the effect of the Internet bust on the earnings of people like Bill Gates.

By the same token, inequality measures that speak directly to the condition of the American economy are often neglected in the professional literature, which is largely focused on income data from the Current Population Survey, with a data- and theory-driven predisposition to focus on household incomes and to relate changes in inequality to personal characteristics such as race, gender and years of schooling. This is equally problematic in many respects; it often leads to the view that gender, race and years of schooling are *determinants* of changing inequality, rather than mere indicators of one's likely place in the existing order. It is quite possible, for instance, for changes in inequality to be driven by events largely affecting male workers alone (Galbraith 1998), and for changes in relative wages across industries to be mistaken for changes in the "return to education" (Ferguson and Galbraith 1999).

Measures of the inequality of *household incomes* may be desirable for assessing inequality in relation to social welfare, because the shifting composition of households can mitigate or exacerbate the inequality of earnings *per se* (Burtless 2007). But for the same reason, they are an unsatisfactory proxy for measures of inequality in the underlying distribution of pay. The latter are of direct interest if one is examining the effects on inequality of technology, of trade, or of macroeconomic factors like the interest rate, the oil price, the rate of economic growth or the rate of unemployment on the earnings of the working population. These relationships, in turn, are often closely tied to the testing of key propositions in neoclassical theory – such as the hypothesis of "skill-biased technological change," or the effect of expanding trade on wage inequalities.

In this note, we examine a group-based measure of pay inequality, inequality measured between economic sectors in the United States. Such an approach captures major features of the rise in American pay inequality – especially in recent years – and allows us to distinguish clearly and in fine detail between winners and losers in this process. Data of this type open up new ways to investigate the determinants of economic change, and particularly the influence of changing power relationships and public policies on distribution.

The notion that between-sector changes help explain the movement of economic inequality is not new. Simon Kuznets (1955) based his famous inverted-U hypothesis on such changes, arguing that as economies transition from agriculture to industry they first endure rising inequality as scarce, high-wage jobs from budding industry draw workers from plentiful, low-paying farm

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jobs. As industry matures and the bulk of the population shifts to the cities, inequality later diminishes, in the first instance simply because the proportion of low-wage farm workers in the total population declines.

In Kuznets's simplified economy, there are two sources of wage inequality: the difference in average wages between farms and factories, and the distribution of the population across these sectors. Inequality is high when both sectors have high levels of employment and wide differences in average earnings. A shrinking of either sector or a diminution of the differential will decrease the inequality measured between sectors.

The modern economy is more complex, but the principle is the same. Overall inequality between sectors depends on the differentials between average wages and their comparative size. Moreover, as the work of Conceição, Galbraith and Bradford (2001) has shown, classification schemes that break the economy into a relatively small number of sectors are usually quite sufficient to capture the major dimensions of overall pay variability. This is partly because sectors are a particularly sensitive fault line; much of what changes in an economy reflects the changing fortunes of economic sectors. But it is also because a detailed category scheme of any type furnishes an instrument for measuring the changing shape of a distribution. With data of the kind we use, within-sector wage inequality is not captured, but we can argue with confidence that most of the movement of inequality is well-approximated by what can be observed between sectors.

In this paper, we provide a descriptive account of earnings inequality in the United States and show how decomposing the inequality data series among industrial sectors reveals the changing dynamics of the American economy. In particular, from 1990 to 2006, between-sector earnings inequality increased, but the sectors most responsible for this increase differed dramatically from the Clinton IT Boom to the Bush War Economy.

Method and Measurement

Since 1969, the Bureau of Economic Analysis (BEA) has published data series on earnings and employment across several dozen sectors annually for states and the nation as the whole. A list of the sectors is included in Appendix 1. From 1969 until 2000, the BEA organized the data according to the Standard Industrial Classification (SIC) coding system. The BEA began using the North American Industry Classification System (NAICS) in 2001, and they recently released recoded data for the 1990 to 2000 period using the NAICS categories. Thus, there are two annual datasets, one from 1969 to 2000 and the other from 1990 to 2006.

Given the total wage bill and the number of employees in a mutually exclusive and completely exhaustive set of industrial categories, Theil's T Statistic is an appropriate analytical tool to measure between-sector inequality.

Algebraically, Theil's T is:

$$T'_{Sectors} = \sum_{i=1}^{m} \frac{p_i}{P} * \frac{y_i}{\mu} * \ln\left(\frac{y_i}{\mu}\right)$$

where p_i is the number of jobs in sector i, P is the total number of jobs in the United States, y_i is the average earnings in sector i, and μ is the average earnings for all jobs. The terms within the summation sign, one for each category, are known as "Theil elements."

Inter-sectoral wage inequality is a function of the relative size of the sectors and their relative wages. Between-sector wage inequality decreases when average earnings in low-paying sectors rise, average earnings in high-paying sectors fall, or sectors that are far from the overall average in either direction lose employment. Likewise, between-sector wage inequality increases when high paying sectors make gains with respect to average wages, low paying sectors lose ground to the average, or there is increased employment in extreme low-paying or high-paying sectors.

In addition to describing the level of between-sector inequality, Theil's T Statistic allows us to identify those sectors most responsible for changes in inequality. By examining each sector's Theil element, we can isolate the contribution of each sector to total inequality between sectors. A sector's Theil element will be positive or negative, depending on whether the sector's average earnings are greater or less than the national average; sectors with exactly the average income make zero contribution to inequality. Sectors with low employment will have smaller Theil elements – in absolute terms – *ceteris paribus*. By construction, the sum of the positive elements must be greater than the sum of the negative elements.

The Evolution of Between-Sector Earnings Inequality

Income inequality in the United States has been on the rise for several decades. Earnings inequality shows this familiar pattern. Figure 1 displays between-state sector earnings inequality calculated with a SIC basis from 1969 to 2000 and a NAICS basis from 1990 to 2006 (authors' calculations from BEA 2007 data) and household income inequality Gini coefficients computed by the Census Bureau with the national sample of the Current Population Survey (U.S. Census Bureau; 2007).

Figure 1: Between-Sector Earnings Inequality and Household Income Inequality 1969 – 2006
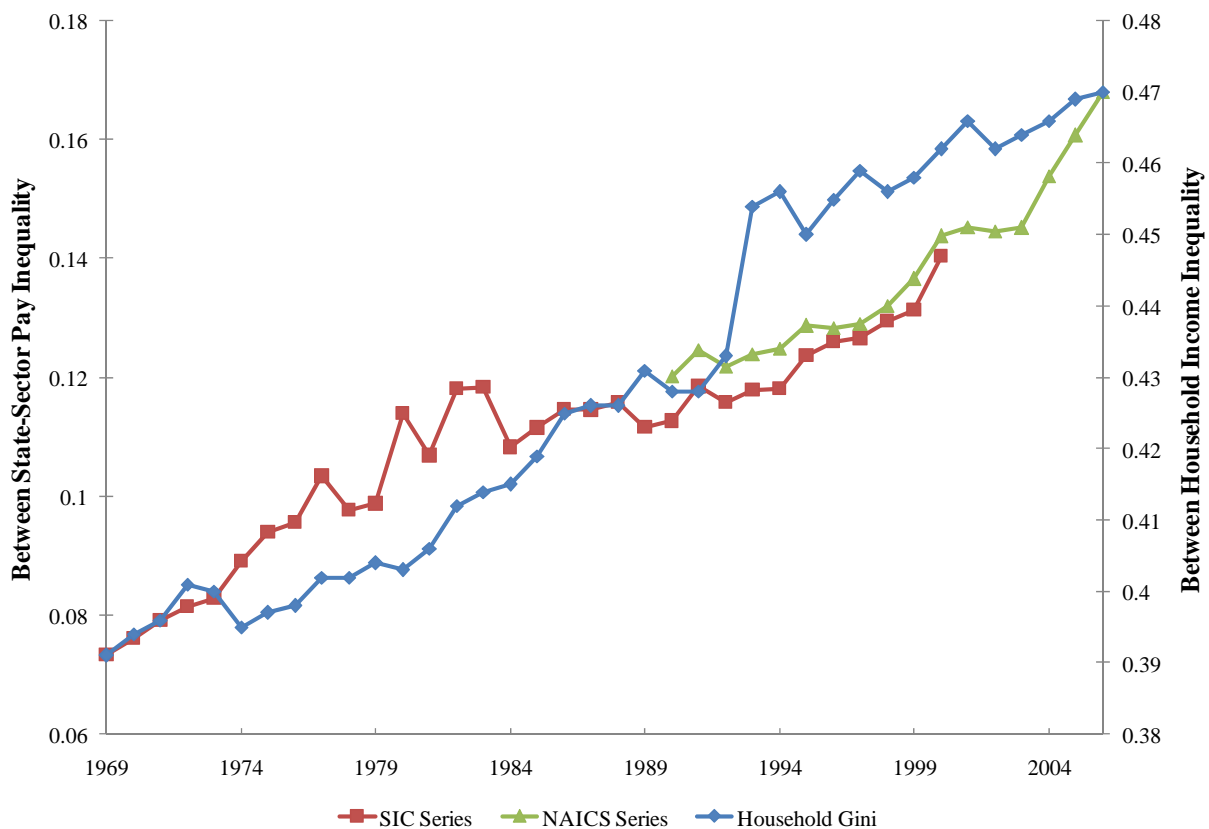
Earnings inequality rose substantially over the last four decades, but the rate of increase has varied over time. From 1969 to 1982, the between-sector measure of Theil's T increased 61%, but then earnings inequality remained flat until 1994 – a pattern identified in employment and earnings data by Galbraith (1998). A run-up from 1995 to 2006 was only interrupted by stability from 2000 to 2003.

The shift in coding regimes from SIC to NAICS has little effect on the pay inequality metric. Over the eleven data points where both coding schemes are available, the two series move in lock step. The correlation coefficient across the overlapping years of 1990 to 2000 is .98.

Despite brief periods of divergence, particularly during the inflationary years of the late 1970's and early 1980's when earnings inequality reversed course several times in rapid succession, earnings inequality and income inequality followed similar paths from 1969 to 2006. The correlation between the Gini coefficient of household income inequality and a homogenized earnings inequality measure – using the SIC values for 1969 to 2000, then adding the differences in the NAICS-based inequality measures to complete the series – is .9062. This value would be even higher if not for the break in the household income inequality series in 1993 that arose from a change in the income top-coding procedures.

Industry earnings at the national level are highly aggregated. Such aggregation could potentially wash out substantial variation existing within sectors. But, given that the underlying data is nested, we also have industrial sectors within states, and it is possible to decompose Theil's T statistic for the purpose of comparing the relative importance of industry and geography.

When members of a population can be classified into mutually exclusive and completely exhaustive groups, Theil's T statistic is made up of two components, the between group element (T'_g) and the within group element (T^w_g).

$$T = T'_g + T^w_g$$

In the current instance, between-sector earnings inequality measured between sectors within states– that is oil drilling in Texas compared to farming in Utah compared to retail in Rhode Island compared to all of the other combinations of states and sectors – can be expressed as the sum of inequality between the sectors at the national level and inequality within sectors but between the states. Alternatively, we could sum the inequality between the state average earnings and the inequality within the states but between the sectors. Either method leads to the same total.

$$T_{between\ state\text{-}sectors} = T'_{states} + T^w_{states} = T'_{sectors} + T^w_{sectors}$$

Figure 2 displays the results of parsing between-state sector earnings inequality from 1990 to 2006 into its components. In Figure 2A, we first measure inequality across national sectors, then measure inequality within the sectors but across the states. In Figure 2B, we first measure inequality across the states, then measure inequality with states across sectors. As mentioned above, either method leads to the same measure of total between state-sector earnings inequality.

States do vary in their average earnings; in 2000, they ranged from \$25,616 in Montana to \$64,730 in Washington D.C. Nonetheless, inter-sector variations account for most of the secular

trend. Figure 2 shows that between-industry inequality measured at the national level explains the bulk of between-state sector pay inequality and that the two series move together seamlessly – with a correlation greater than .99. Variation in state earnings holds less explanatory power and shows a decline in inequality since 2000 – which contradicts the trend in the between-state sector measure.

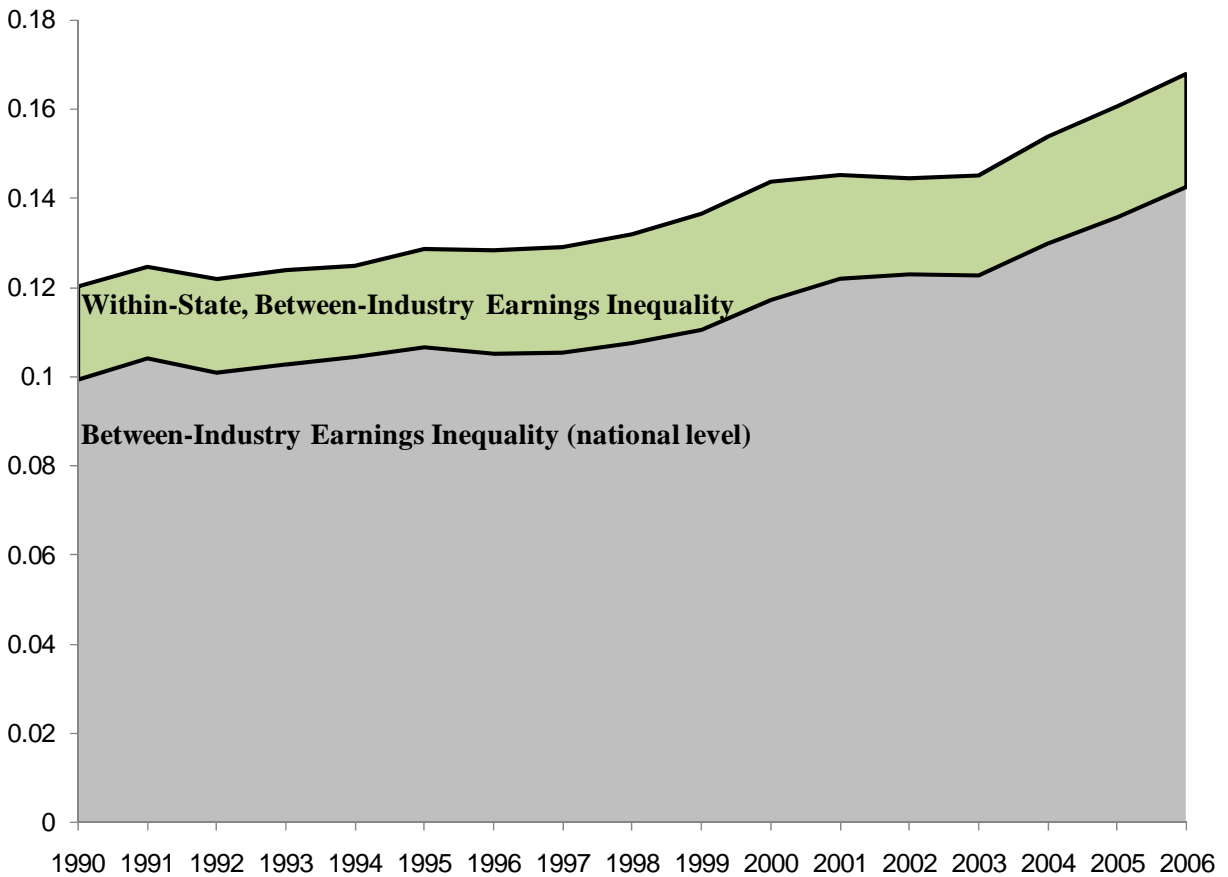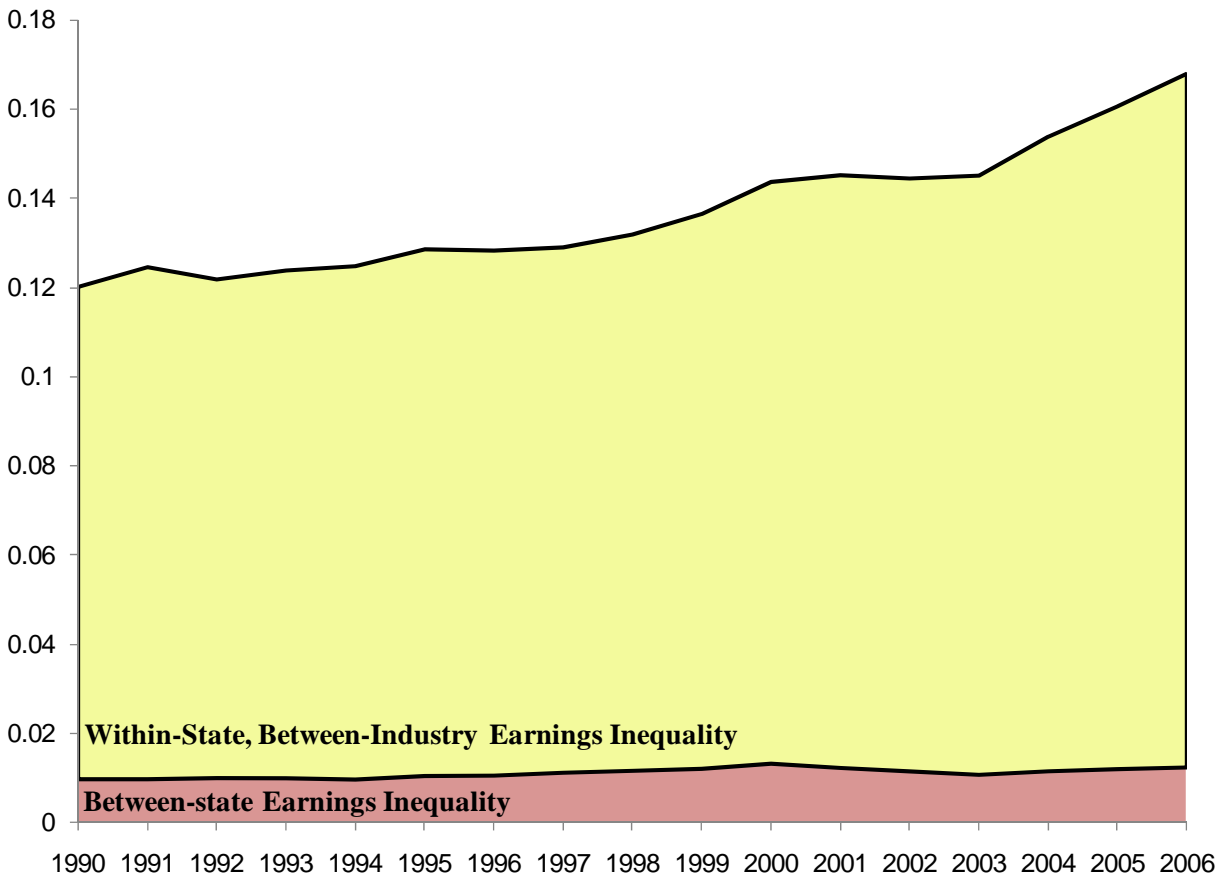Figure 2A – U.S. Earnings Inequality – Industry as First Basis

Figure 2B – U.S. Earnings Inequality – State as First Basis

Sectoral Analysis: Winners and Losers

The two hallmark economic phenomena of the last decade were the emergence of personal

computing and information technology as a major force in the late 1990's and the housing boom

of the early 2000's. From 1994 to 2000, average earnings per job in computer and electronic

product manufacturing rose from $52,731 to $83,848 nationwide, while employment grew from

1,654,265 to 1,815,622 jobs. Likewise, from 2001 to 2006, earnings per job for construction of

buildings grew robustly from $53,140 to $68,291, and the sector added 365,000 workers.

Indeed, computer manufacturing and construction were two significant contributors to the

increase in earnings inequality during these episodes. Nonetheless, many other sectors saw comparably wide swings in their fortunes.

Table 1 lists the ten sectors that saw the largest increases to their Theil elements from 1994 to 2000. Of these ten sectors, nine contributed to increasing inequality as their already high earnings outpaced average earnings growth. In all but one of these nine sectors, employment grew as well – with the sole exception of oil and gas extraction, where earnings skyrocketed but employment declined. Large gains in average earnings per job in real estate reduced between-sector earnings inequality as wages in real estate remained below the national average. Of the nine largest contributors to inequality growth from above, four were closely linked to the hi-tech boom: ISPs, search portals, and data processing; computer and electronic product manufacturing; professional and technical services; and securities, commodity contracts, investments.

Table 2 lists the ten sectors that saw the largest declines to their Theil elements from 1994 to 2000. Among these sectors, eight helped *reduce* inequality, with the exceptions being administrative and support services and specialty trade contractors, both of which experienced employment growth and below average earnings. Five of the sectors that contributed the most to inequality reduction in this period were governmental or closely associated with government service provision: ambulatory health care services; local government; federal, civilian government; state government; and hospitals. The other three sectors contributing the most to reducing earnings inequality were in heavy industry: motor vehicles, bodies and trailers, and parts manufacturing; other transportation equipment manufacturing; and fabricated metal product manufacturing.

Table 3 lists the biggest winners of the 2001 – 2006 period, the ten sectors that saw the largest increases in their Theil elements. All ten contributed to increasing earnings inequality, with large increases in average earnings. Three of these sectors, all associated with government, were among the biggest losers in the earlier period: hospitals; federal, civilian government; and local government, while the largest gainer of all was the military sector. Management of companies and enterprises; insurance carriers and related activities; credit intermediation and related activities; chemical manufacturing; petroleum and coal products manufacturing; and oil and gas extraction round out the top-ten. Construction of buildings ranked as the 12th biggest gainer during this period and would have fared even better if not for a decline in relative earnings from 2005 to 2006.

Table 4 lists the sectors that saw the steepest subsidence from 2001 – 2006, in terms of their Theil elements. Of these, three are below-average earning sectors that saw increasing employment, thus contributing to increasing overall inequality: real estate; specialty trade contractors;
and food services and drinking places. The declining performance of the other seven sectors reduced overall earnings inequality. Of these, three are associated with the IT bust: professional and technical services; securities, commodity contracts, investments; and computer and electronic product manufacturing. The other four sectors whose performance contributed most to moderating inequality in this period are pipeline transportation; ambulatory health care services; publishing industries, except Internet; and motion picture and sound recording industries.

Table 1. National Sectors with the Largest Positive Changes in Theil Elements 1994 – 2000

	Theil Element		Average Earnings		Number of Jobs	
	1994	2000	1994	2000	1994	2000
Real estate	-0.0099	-0.0077	$ 11,870	$ 25,312	3,918,487	4,597,518
Oil and gas extraction	0.0013	0.0038	$ 44,226	$ 89,851	357,228	331,497
Credit intermediation and related activities	0.0034	0.0060	$ 36,311	$ 51,692	2,470,749	2,675,093
ISPs, search portals, and data processing	0.0007	0.0035	$ 38,901	$ 69,504	344,397	565,738
Management of companies and enterprises	0.0112	0.0143	$ 54,923	$ 76,496	1,554,198	1,802,743
Publishing industries, except Internet	0.0028	0.0068	$ 41,728	$ 68,337	976,432	1,147,589
Wholesale trade	0.0147	0.0187	$ 40,671	$ 55,185	5,648,604	6,341,776
Computer and electronic product manufacturing	0.0107	0.0179	$ 52,731	$ 83,848	1,654,265	1,815,622
Professional and technical services	0.0293	0.0414	$ 43,891	$ 59,773	8,227,262	10,546,452
Securities, commodity contracts, investments	0.0031	0.0170	$ 37,546	$ 75,151	1,774,768	2,238,213
Average/Total			$ 30,609	$ 39,007	145,223,600	166,758,800

Table 2. National Sectors with the Largest Negative Changes in Theil Elements 1994 – 2000

	Theil Element		Average Earnings		Number of Jobs	
	1994	2000	1994	2000	1994	2000
Ambulatory health care services	0.0176	0.010399	$ 44,852	$ 49,920	4,566,177	5,492,802
Local government	0.00797	0.000958	$ 33,531	$ 39,482	11,584,000	13,028,000
Federal, civilian	0.02371	0.017368	$ 56,837	$ 68,813	2,996,000	2,892,000
Motor vehicles, bodies and trailers, and parts manufacturing	0.01096	0.006523	$ 60,403	$ 64,469	1,186,645	1,309,800
Administrative and support services*	-0.0139	-0.017659	$ 18,215	$ 23,137	6,524,351	9,505,404
State government	0.00374	0.001501	$ 33,965	$ 40,933	4,702,000	4,949,000
Hospitals	0.00285	0.000664	$ 33,671	$ 40,041	3,948,887	4,121,120
Other transportation equipment manufacturing	0.00535	0.003872	$ 54,159	$ 65,122	769,618	754,612
Fabricated metal product manufacturing	0.00299	0.001841	$ 38,044	$ 45,155	1,607,895	1,811,324
Specialty trade contractors*	-0.003	-0.004084	$ 27,732	$ 34,543	4,848,305	6,328,749
Average/Total			$ 30,609	$ 39,007	145,223,600	166,758,800

Table 3. National Sectors with the Largest Positive Changes in Theil Elements 2001 – 2006

	Theil Element		Average Earnings		Number of Jobs	
	2001	**2006**	**2001**	**2006**	**2001**	**2006**
Insurance carriers and related activities	0.0063	0.0083	$ 53,482	$ 67,502	2,742,015	2,906,200
Management of companies and enterprises	0.0142	0.0168	$ 78,945	$ 99,931	1,802,743	1,890,700
Credit intermediation and related activities	0.0075	0.0104	$ 55,866	$ 70,277	2,675,093	3,146,300
Petroleum and coal products manufacturing	0.0058	0.0088	$ 200,367	$ 334,611	124,999	113,000
Chemical manufacturing	0.0085	0.0115	$ 82,108	$ 118,783	996,617	887,900
Hospitals	0.0016	0.0049	$ 42,695	$ 55,879	4,121,120	4,428,400
Federal, civilian	0.0184	0.0219	$ 73,997	$ 94,948	2,892,000	2,783,000
Local government	0.0019	0.0065	$ 41,100	$ 51,038	13,028,000	14,035,000
Oil and gas extraction	0.0040	0.0098	$ 90,958	$ 173,847	331,497	366,500
Military	0.0001	0.0061	$ 40,428	$ 68,239	2,075,000	2,040,000
Average/Total			$ 40,164	$47,275	167,014,700	178,342,900

Table 4. National Sectors with the Largest Negative Changes in Theil Elements 2001 – 2006

	Theil Element		Average Earnings		Number of Jobs	
	2001	**2006**	**2001**	**2006**	**2001**	**2006**
Real estate*	-0.0080	-0.0134	$ 25,871	$ 23,429	4,689,700	6,864,400
Professional and technical services	0.0392	0.0359	$ 60,576	$ 68,858	10,575,800	11,701,000
Securities, commodity contracts, investments	0.0215	0.0188	$ 88,604	$ 100,453	2,057,700	2,097,400
Specialty trade contractors*	-0.0043	-0.0069	$ 35,387	$ 38,961	6,490,800	7,754,100
Pipeline transportation	0.0041	0.0017	$ 299,978	$ 232,270	45,100	39,200
Ambulatory health care services	0.0112	0.0090	$ 51,959	$ 57,647	5,594,700	6,603,100
Computer and electronic product manufacturing	0.0137	0.0119	$ 78,198	$ 100,614	1,768,800	1,323,000
Publishing industries, except Internet	0.0057	0.0043	$ 66,733	$ 74,927	1,134,800	1,058,600
Motion picture and sound recording industries	0.0015	0.0005	$ 58,677	$ 55,299	454,900	465,000
Food services and drinking places*	-0.0195	-0.0205	$ 14,438	$ 17,139	8,866,000	9,961,100
Average/Total			$ 40,164	$47,275	167,014,700	178,342,900

Interpreting Rising Inequality Correctly: A Between-Sectors View

Rising economic inequality can have pernicious consequences, potentially affecting health,

educational attainment, democratic participation, and other social indicators (Neckerman 2004).

As such, observers on the political Left have been lamenting the rise in American economic

inequality for quite some time. It seems that distributional issues have finally become a

bipartisan concern, as in recent months the Bush Administration has issued several statements on inequality.

"Amid this country's strong economic expansion, many Americans simply aren't feeling the benefits. Many aren't seeing significant increases in their take-home pay. Their increases in wages are being eaten up by high energy prices and rising health-care costs, among others." – Secretary of the Treasury Henry Paulson; Remarks at Columbia University; August 1, 2006

"I know some of our citizens worry about the fact that our dynamic economy is leaving working people behind. We have an obligation to help ensure that every citizen shares in this country's future. The fact is that income inequality is real; it's been rising for more than 25 years. The reason is clear: We have an economy that increasingly rewards education, and skills because of that education… And the question is whether we respond to the income inequality we see with policies that help lift people up, or tear others down." – President Bush; State of the Economy Report Address at Federal Hall, New York; Jan. 31, 2007

"Thus, these three principles seem to be broadly accepted in our society: that economic opportunity should be as widely distributed and as equal as possible; that economic outcomes need not be equal but should be linked to the contributions each person makes to the economy; and that people should receive some insurance against the most adverse economic outcomes, especially those arising from events largely outside the person's control." – Chairman of the Federal Reserve Ben Bernanke, Remarks before the Greater Omaha Chamber of Commerce; February 6, 2007

Perhaps most striking, in an appearance on the Charlie Rose Show on September 20, 2007, former Federal Reserve Chairman Alan Greenspan said flatly, "You cannot have a market capitalist system if there is a significant mood in the population that its rewards are unjustly distributed."

We agree that inequality is an important metric of economic performance, but movements in the metric have nuances that the comments above, and many similar statements, fail to appreciate. To a degree, rising inequality may reflect higher poverty rates, poorly distributed opportunities, and discrimination. When inequality in pay rises as a result of higher unemployment and lower working hours at the bottom of the pay scale, the measure helps to capture a major economic problem. But inequality in earnings can rise in response to growing employment or innovation, in which case it is necessary to take a different view.

During the economic expansion of the late 1990's, earnings inequality across sectors rose, only leveling off in 2001 after employment declined. Figure 3 plots the ratio of employment to population and earnings inequality from 1990 to 2006, over which time the two series had a correlation coefficient of .84. Robust economic growth during the IT boom seemed to spur both a rise in inequality and a reduction in unemployment.

Figure 3. Earnings Inequality and Employment 1990 - 2006

Jobs Per Person — Between State Sector Inequality
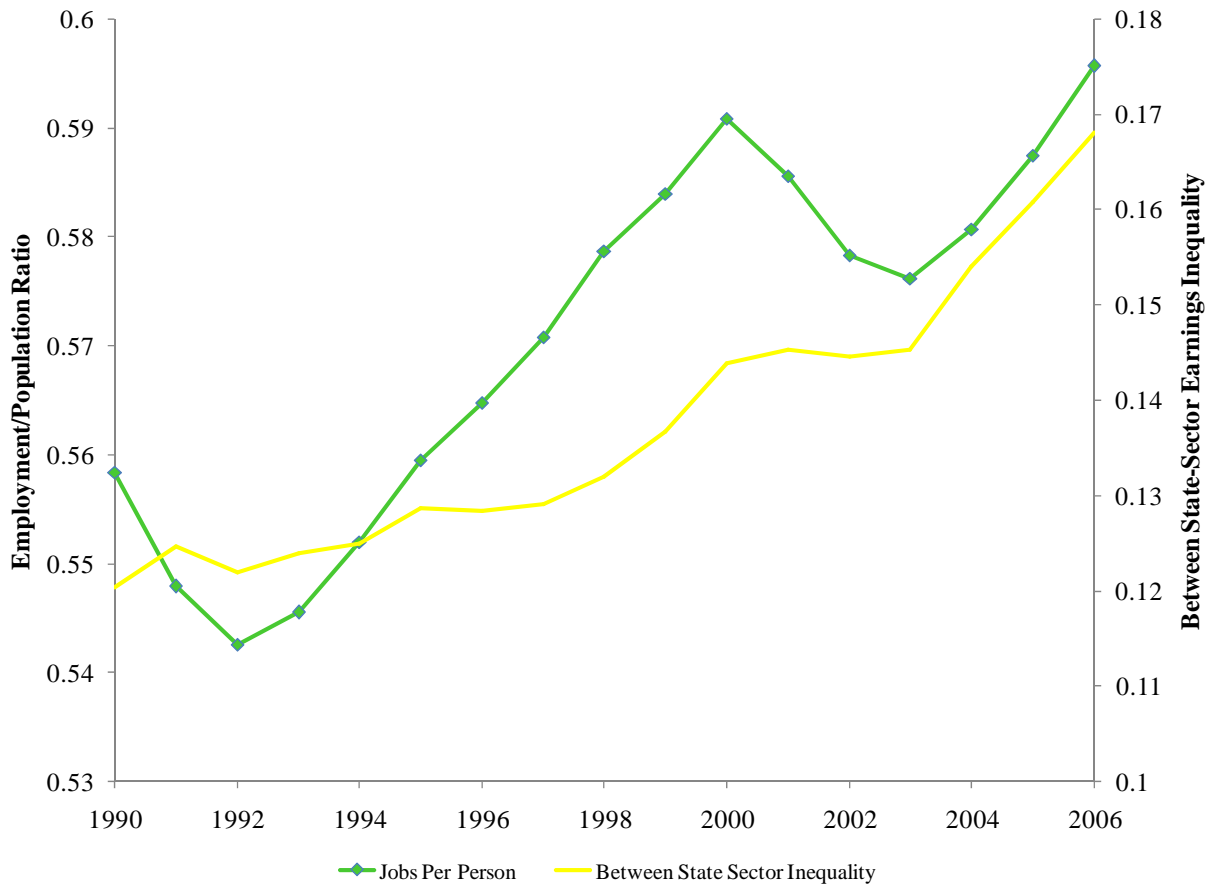
The upward trend in inequality from 1990 to 2001 was almost entirely due to gains at the top, closely associated with the technology boom and readily predicted by the movement of the NASDAQ Stock Index (Galbraith and Hale, 2006). If the influence of the highly volatile but very small tech sector is excluded, inequality between counties hardly rose at all (Galbraith and Hale 2004), and inequality measured between sectors in the (very large) remainder of the economy actually fell quite dramatically after 1994 (Conceicao, Galbraith and Bradford 2001). Thus, different measures of different aspects of the same phenomenon, at the same time, have quite different social welfare interpretations. Our focus here is on the overall distribution of earnings, whose pattern of change is strongly influenced by small numbers of high-flying sectors.

For instance, the rapid rise in pay inequality during the peak of the IT boom was the result of pay increases in sectors that contained 3.8% of all workers. Consider the wage growth from 1996 to 2001 in the twelve sectors listed in Table 5.

Table 5. Average Wages in 1996 and 2001 in 12 High-Growth Sectors

Sector	Average Wage	
	1996	2001
Computer and electronic product manufacturing	$ 57,268	$ 78,198
ISPs, search portals, and data processing	$ 44,426	$ 68,175
Other Forestry, fishing, related activities	$ 83,632	$ 107,550
Internet publishing and broadcasting	$ 54,116	$ 82,080
Funds, trusts, and other financial vehicles	$ 50,132	$ 79,931
Utilities	$ 82,384	$ 113,605
Oil and gas extraction	$ 49,765	$ 90,958
Broadcasting, except Internet	$ 91,831	$ 133,576
Securities, commodity contracts, investments	$ 46,249	$ 88,604
Petroleum and coal products manufacturing	$ 124,821	$ 200,367
Lessors of nonfinancial intangible assets	$ 91,556	$ 192,836
Pipeline transportation	$ 93,285	$ 299,978
All other Sectors	$ 31,276	$ 38,099

Had their wages grown at the rate of inflation from 1996 to 2001, these sectors would have still been among better compensated. Instead, these industries saw a 58% hike in average earnings while all other sectors gained 22%. The employment growth rate in these high flyers was roughly half that for the rest of the economy. Figure 4 shows the impact of runaway wages on inequality contrasting what actually happened (the solid line) with a counterfactual scenario in which wages grew at the rate of inflation in the twelve sectors that had the largest absolute increase in their average wages from 1996 to 2001 (the dotted line).

Figure 4. Between National Sector Earnings Inequality 1990 – 2001 and a Counterfactual

Scenario
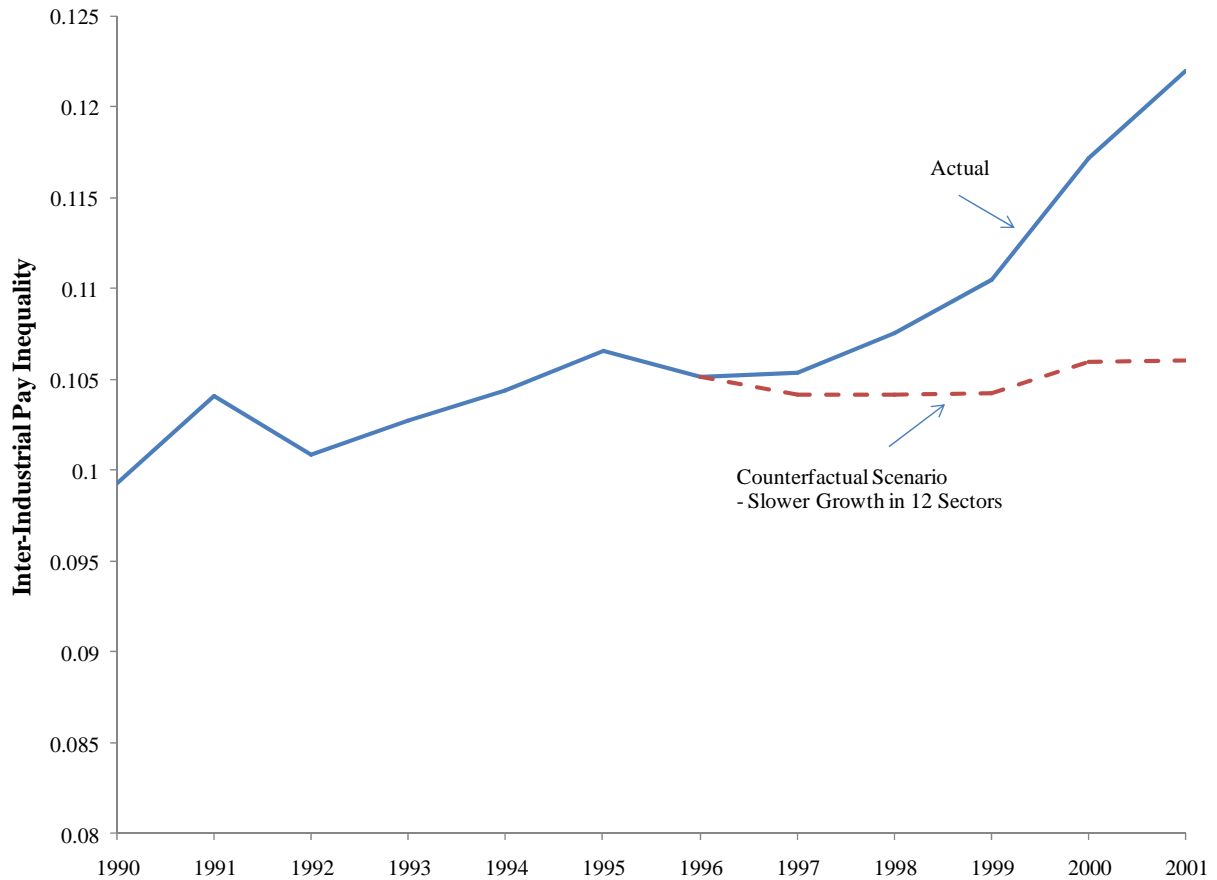
The startling growth in between-sector pay inequality since 2003 reflects wage gains in a wider

array of sectors that contain a higher percentage of employment, but the pattern is similar. Table

6 shows the average wages in fifteen high-growth sectors in 2002 to 2006. These sectors

accounted for 8.2% of total employment in 2006 after losing 104,200 jobs since 2002 while the

rest of the economy added 11.8 million new positions. The rate of wage growth in the high-

flyers doubled that in the rest of the workforce over this period.

Table 6. Average Wages in 2002 and 2006 in 15 High-Growth Sectors

Sector	Average Wage	
	2002	2006
Federal, civilian	$ 78,688	$ 94,948
Miscellaneous manufacturing	$ 57,556	$ 74,337
Securities, commodity contracts, investments	$ 83,255	$ 100,453
Computer and electronic product manufacturing	$ 82,077	$ 100,614
Primary metal manufacturing	$ 61,243	$ 80,905
Other transportation equipment manufacturing	$ 76,372	$ 96,433
Management of companies and enterprises	$ 78,769	$ 99,931
Military	$ 46,202	$ 68,239
Broadcasting, except Internet	$ 151,826	$ 174,996
Mining (except oil and gas)	$ 65,344	$ 90,591
Chemical manufacturing	$ 92,900	$ 118,783
Utilities	$ 118,385	$ 151,587
Pipeline transportation	$ 173,349	$ 232,270
Oil and gas extraction	$ 89,930	$ 173,847
Petroleum and coal products manufacturing	$ 170,711	$ 334,611
All Other Sectors	$ 37,472	$ 42,410

Had wage growth occurred at the rate of inflation in these sectors, inter-industry inequality still would have risen, but at a slower pace – an increase of 3.6% from 2002 to 2006 in the counterfactual scenario versus and actual increase of 16%. Note, that after a brief, sharp downturn from 2000 to 2002, Computer and electronic product manufacturing and Securities, commodity contracts, investing rebounded strongly.

Figure 4. Between National Sector Earnings Inequality 2000 – 2006 and a Counterfactual

Scenario
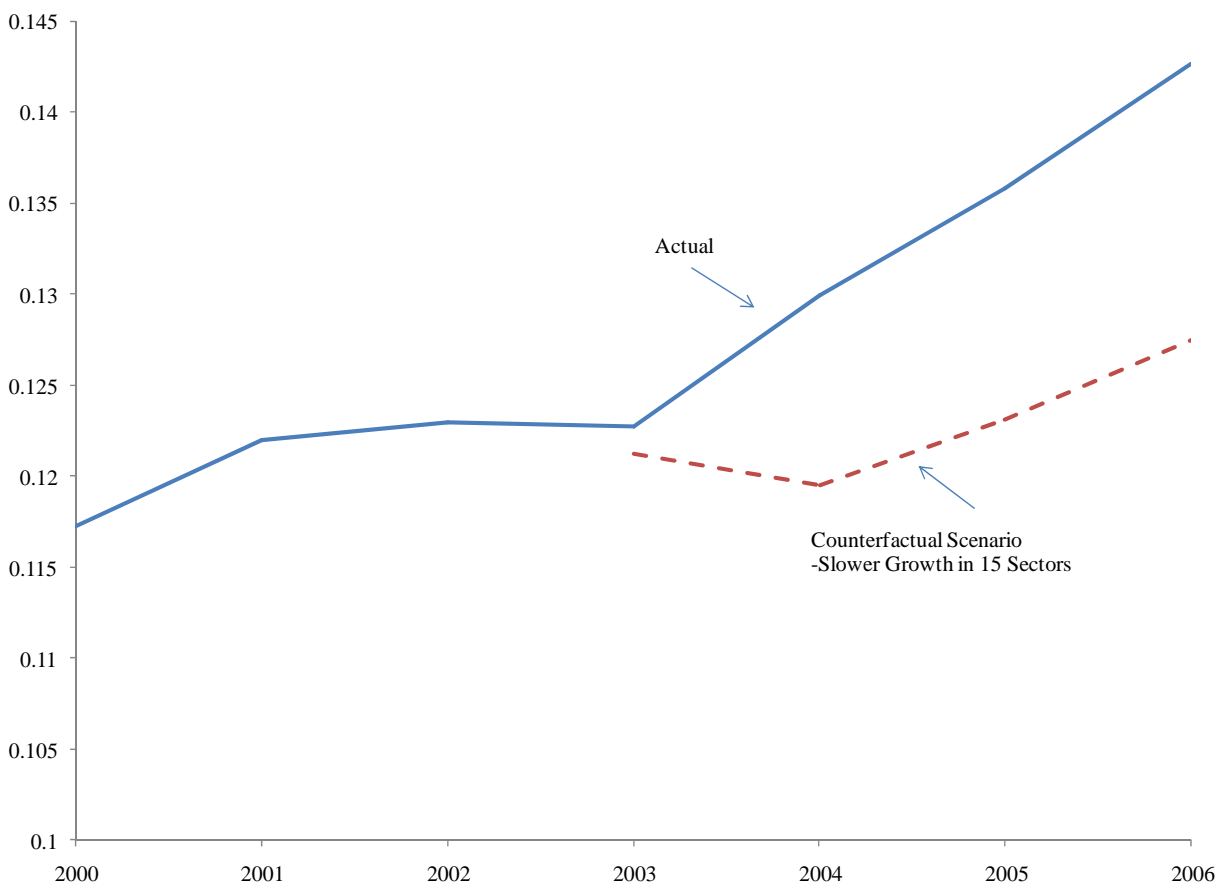
By coincidence or design, sectoral performance seems to have a political dimension.

Technologists and financiers were key pillars of support for President Clinton, and these sectors

thrived under his leadership. Under President Bush, workers in extraction industries, military,

and, ironically, government have done quite well, which reflects the administration's policies of

lax regulation and empire building. The oil business has been consistently lucrative, and will

likely remain so in a world of shrinking resources.

The cases of lagging sectors are also informative. Declining fortunes in the domestic auto industry in recent years appear to mitigate the impact of skyrocketing growth in other sectors. The Motor vehicles, bodies and trailers, and parts manufacturing sector, which consistently pays wages well above the national average, lost jobs and saw stagnant wages from 2003 to 2006. But unemployed auto workers likely take little solace in their contribution to lowering inequality, and a loss of high paying manufacturing jobs will likely reverberate into other sectors. If a highly paid autoworker loses her position, she might take a job (or two) in a low-paying sector. Since our inter-industry pay inequality measure is on a pay-per-job basis, the result could be higher overall inequality.

Inequality, Employment, Education and Training: the Obvious Fly in the Ointment

In light of continued growth in *overall* economic inequality, the Bush Administration's clearest response has been focused on the supply side of the labor market. According to Treasury Secretary Paulson (2006), the correct response to rising inequality is to "focus on helping people of all ages pursue first-rate education and retraining opportunities, so they can acquire the skills needed to advance in a competitive worldwide environment." Under the current circumstances, this response is both hollow and incomplete. The promise of increased education is hollow, because resources are not being provided. But even if they were, the simple inter-sectoral facts of the case indicate that the proposed solution would not work.

The education/training "solution" to the inequality "problem" presupposes that we know, in advance, what the education should be for. Years of education are not perfect substitutes for each

other, and it does little good to train for jobs that, in the short space of four or five years, may fall out of fashion. For the solution to be relevant, we must know how to predict the educational pattern of labor demand. But the experience of the past fifteen years clearly indicates that we do not. Rather, education and training have become a kind of lottery, whose winners and losers are entirely determined by the subsequent behavior of the economy. And the sectors that afford the best opportunities are always changing.

Students who studied information technology in the early 1990's were lucky: they met with stellar job prospects upon graduation. Students completing similar degrees a mere few years later, having followed the job forecasts of the Bureau of Labor Statistics and despite whatever advances in the quality of education that the rapid pace of technological change during those years afforded, nevertheless faced unemployment. Not only did job growth in these sectors slow dramatically, many new jobs were out-sourced to low-wage centers overseas.

Likewise, who predicted that the public sector, of all things, would fare so well, relatively speaking, under President Bush? And how long will the bureaucratic boom of these recent Republican years last? If the President follows through on recent threats to veto congressional appropriations, the Beltway Boom of which we have written elsewhere (Galbraith and Hale 2006) may soon be over. And tomorrow's college students will have, once again, to shift their majors.

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Appendix 1: NAICS Earnings Categories

Farm earnings
 Nonfarm earnings
 Private earnings
  Forestry, fishing, related activities, and other
   Forestry and logging
   Fishing, hunting, and trapping
   Agriculture and forestry support activities
   Other
  Mining
   Oil and gas extraction
   Mining (except oil and gas)
   Support activities for mining
  Utilities
  Construction
   Construction of buildings
   Heavy and civil engineering construction
   Specialty trade contractors
  Manufacturing
   Durable goods manufacturing
    Wood product manufacturing
    Nonmetallic mineral product manufacturing
    Primary metal manufacturing
    Fabricated metal product manufacturing
    Machinery manufacturing
    Computer and electronic product manufacturing
    Electrical equipment and appliance manufacturing
    Motor vehicles, bodies and trailers, and parts manufacturing
    Other transportation equipment manufacturing
    Furniture and related product manufacturing
    Miscellaneous manufacturing
   Nondurable goods manufacturing
    Food manufacturing
    Beverage and tobacco product manufacturing
    Textile mills
    Textile product mills
    Apparel manufacturing
    Leather and allied product manufacturing
    Paper manufacturing
    Printing and related support activities
    Petroleum and coal products manufacturing
    Chemical manufacturing
    Plastics and rubber products manufacturing
   Wholesale trade
  Retail trade
   Motor vehicle and parts dealers
   Furniture and home furnishings stores
   Electronics and appliance stores
   Building material and garden supply stores
   Food and beverage stores
   Health and personal care stores
   Gasoline stations
   Clothing and clothing accessories stores
   Sporting goods, hobby, book and music stores
   General merchandise stores
   Miscellaneous store retailers
   Nonstore retailers
  Transportation and warehousing
   Air transportation
   Rail transportation
   Water transportation
   Truck transportation
   Transit and ground passenger transportation
   Pipeline transportation
   Scenic and sightseeing transportation
   Support activities for transportation
   Couriers and messengers
   Warehousing and storage

  Information
   Publishing industries, except Internet
   Motion picture and sound recording industries
   Broadcasting, except Internet
   Internet publishing and broadcasting
   Telecommunications
   ISPs, search portals, and data processing
   Other information services
  Finance and insurance
   Monetary authorities - central bank
   Credit intermediation and related activities
   Securities, commodity contracts, investments
   Insurance carriers and related activities
   Funds, trusts, and other financial vehicles
  Real estate and rental and leasing
   Real estate
   Rental and leasing services
   Lessors of nonfinancial intangible assets
  Professional and technical services
  Management of companies and enterprises
  Administrative and waste services
   Administrative and support services
   Waste management and remediation services
  Educational services
  Health care and social assistance
   Ambulatory health care services
   Hospitals
   Nursing and residential care facilities
   Social assistance
  Arts, entertainment, and recreation
   Performing arts and spectator sports
   Museums, historical sites, zoos, and parks
   Amusement, gambling, and recreation
  Accommodation and food services
   Accommodation
   Food services and drinking places
  Other services, except public administration
   Repair and maintenance
   Personal and laundry services
   Membership associations and organizations
   Private households
 Government and government enterprises
  Federal, civilian
  Military
  State and local
   State government
   Local government