RESEARCH RAP Special Report

Has Job Quality Been "Job One" in the Economic Recovery?[1]

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The Great Recession of 2007-09 has been followed by a Not-So-Great Recovery. The U.S. economy lost more than 8.7 million jobs, representing 6.3 percent of total U.S. payroll employment, on net, during the Great Recession. But while the recovery from this very deep recession began in June 2009, the first net increase in payrolls did not occur until March 2010, eight months into the recovery. In recent months, payroll job growth in the U.S. has picked up **(Figure 1)**.[2] For the first seven months of 2013, payrolls have risen by 193,000 jobs per month, up from 183,000 per month in 2012. But as of July 2013, the U.S. still has 23 percent fewer jobs, about 2 million fewer, than it had when the Great Recession began over five years ago. If job growth continues at its current pace, it will take another year or so for employment to return to its prior peak, which occurred in January 2008. In contrast, at a similar point during the recoveries after the 1990-91 and 2001 recessions, the U.S. had added almost 9 million and almost 4 million jobs, respectively, on net **(Figure 2)**.

The current employment recovery in Pennsylvania, New Jersey, and Delaware — the three states in the Third Federal Reserve District — has been similar to the nation's **(Figure 3)**. It has been slower than in previous recoveries, even the recovery after the 1990-91 recession, a recovery that was considerably weaker in our region than in the nation **(Figure 4)**. Payrolls in the tri-state region are still

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[2] The data used here are through July 2013 for the nation and June 2013 for the tri-state region comprising Pennsylvania, New Jersey, and Delaware, as of August 4, 2013. Note that these data are subject to revision.

about 200,000 jobs below their previous peak.[3] Pennsylvania has fared better than the other two states during this business cycle. It lost a smaller percentage of its jobs than the other two states (and the nation), and it has recovered a larger percentage of jobs lost during the recession than either New Jersey or Delaware **(Figure 5)**.

But what is the quality of jobs being added? Are they high-paying or low-paying jobs? Have secular shifts in the distribution of employment favored the creation of different types of jobs compared with earlier recoveries? Does the pattern of job growth differ in our region relative to the nation? To answer these questions, we update and extend Mester and Olney (2004) to examine the recent employment experience in the nation and our three states.[4] Many things influence job quality from a worker's perspective. Earnings certainly are an important aspect, but other factors such as job security, retirement benefits, health-care benefits, opportunities for advancement, and working conditions also help determine the quality of a job. As in Mester and Olney (2004), we limit the analysis to differences in average hourly earnings.

Summary of Findings

As discussed in Aaronson and Christopher (2004) and Mester and Olney (2004), when employment begins to grow in a recovery, the first jobs added are typically in industries that are relatively low-paying, while higher-paying jobs are added later as the economy and employment continue to expand. We find that this pattern was true for the 1991 and 2001 recoveries both in the nation and in the region. As the recovery took hold, the ratio of high-pay to low-pay jobs added increased. For example, by our measure, it was not until April 2004 (two-and-a-half years after the start of the recovery) that the average monthly growth in higher-paying jobs over the previous 12 months consistently exceeded the average monthly growth in lower-paying jobs in the nation. Our region reached this milestone two months later, in June 2004.

But the experience in the current cycle appears to be different. In particular, instead of losing high-pay jobs at a faster pace than low-pay jobs during the recession and recovering them more quickly at the start of the recovery, high-pay jobs were cut less sharply during the Great Recession and have been added at the same or a faster pace than low-pay jobs during the recovery.[5] See **Table 1** for some comparisons.

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[3] Three-state employment peaked in January 2008.

[4] Mester and Olney (2004) applied a modified version of the Aaronson and Christopher (2004) methodology to study the job recovery in the Third District states during the 2001 recovery. Because the regional data are somewhat more limited than the national data (in particular, state employment data are available for fewer industries than are the national employment data) and because we focus on shares of private sector jobs rather than total employment (which is private sector jobs plus government sector jobs), our index of job quality (i.e., the difference between employment growth in industries with higher paying jobs versus employment growth in industries with lower paying jobs) differs somewhat from the Aaronson and Christopher index.

[5] Another difference in the current recovery is that government jobs have been cut.

Table 1. Payroll Job Growth Over the Past 12 Months Compared With Earlier in the Current Recovery

	U.S		Three States	
Monthly Averages	**12 months ending July 2013**	**12 months ending June 2010**	**12 months ending June 2013**	**12 months ending June 2010**
Private-sector jobs added or cut	192,917	–55,500	8,816	–917
Growth in private-sector jobs	0.171 %	–0.052 %	0.101 %	–0.011 %
High-pay jobs added or cut	107,500	–7,917	6,658	542
Growth of high-pay jobs	0.193 %	–0.015 %	0.149 %	0.013 %
Share of high-pay jobs added or cut	55.7 %	14.3 %	75.5 %	–59.1 %
Low-pay jobs added or cut	85,417	–47,583	2,158	–1,458
Growth of low-pay jobs	0.150 %	–0.087 %	0.051%	–0.035%
Share of low-pay jobs added or cut	44.3 %	85.7 %	24.5 %	159.1 %

Source: U.S. Bureau of Labor Statistics via Haver Analytics, and authors' calculations.

For example, in the 12 months ending in July 2013, the nation added an average of about 193,000 private-sector jobs per month. Of these, about 108,000, or 56 percent, were in higher-paying industries, and about 85,000, or 44 percent, were in lower-paying industries. Even earlier in the recovery, when jobs were still being cut, high-pay jobs performed better than low-pay jobs. Over the 12 months ending in June 2010, about a year into the recovery, the nation lost an average of about 56,000 private-sector payroll jobs per month. But low-pay jobs constituted a higher share of the losses than did high-pay jobs. On average, the economy was losing about 8,000 high-pay jobs but about 48,000 low-pay jobs per month.

For the region, we get a similar picture. For example, in the 12 months ending in June 2013, the region added an average of about 8,800 private-sector jobs per month. Of these, about 6,600, or 76 percent, were high-pay, and about 2,200, or 24 percent, were low-pay. For the 12 months ending in June 2010, the three states were actually adding high-pay jobs at the rate of about 500 per month, but these gains were more than offset by the average 1,500 per month loss of low-pay jobs.

So to answer the question in the title of this report, job quality has been "job one" in this recovery in the sense that high-pay jobs were added first, and growth in high-pay jobs has outpaced that of low-pay jobs. As we discuss below, one source of the difference in this cycle compared with earlier cycles was the switch in classification of manufacturing from high-pay to low-pay in 2006.

The remainder of this report presents the details of the analysis.

Details of the Analysis

Which industries have relatively low-paying jobs and which industries have relatively high-paying jobs?

The data on average hourly earnings are available from the Bureau of Labor Statistics. These data are limited in a number of ways. Average hourly earnings do not include nonwage compensation. The data are not available for particular types of jobs within an industry, but only as an average for production and nonsupervisory workers within the industry. Thus, the determination of whether a job added is high-paying or low-paying is based on the average hourly earnings paid for all jobs in the industry. Moreover, we do not have comparable state-level data on average hourly earnings by industry, except for manufacturing. Thus, the determination of whether a job added in our region is high- or low-pay is based on the national earnings in that industry. The underlying assumption is that earnings are determined in a national labor market.

We focus on the industry sectors defined by the North American Industry Classification System (NAICS), whose payroll employment data are available for the region.[6] These industry sectors are:

1. Construction, Natural Resources, and Mining
2. Manufacturing
3. Trade, Transportation, and Utilities
4. Information Services
5. Financial Activities
6. Professional and Business Services
7. Education and Health Services
8. Leisure and Hospitality
9. Other Services (which includes repair and maintenance services, personal and laundry services, and membership associations and organizations).

For each month, we can classify industries into high-pay and low-pay according to whether their average hourly earnings are above or below, respectively, the national average for all private industries.[7] Applying this ranking in July 2013 yields the following classification:

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[6] State payroll employment data for industries classified by the NAICS begin only in January 1990. While state data on industries classified by the Standard Industrial Classification (SIC) system have a longer history, these data were discontinued in 2002. The monthly payroll employment data are available for the three states in our region only for nine industrial sectors. This is a potential limitation of our regional analysis. Aaronson and Christopher show that the results for the nation are somewhat sensitive to the level of industry aggregation used.

[7] When the industry wage equals the industry average, we classify the industry as low-pay for the purposes of this analysis.

Table 2. Average Hourly Earnings by Industry Category

	Average Hourly Earnings, July 2013
Total Private Industries	$ 20.14
High-Paying Industries	
Information Services	$ 27.61
Natural Resources and Mining	$ 26.80
Construction	$ 24.28
Construction and Natural Resources and Mining	$ 25.63
Financial Activities	$ 24.04
Professional and Business Activities	$ 23.67
Education and Health Services	$ 21.47
Lower-Paying Industries	
Manufacturing	$ 19.28
Other Services	$ 17.90
Trade, Transportation, and Utilities	$ 17.67
Leisure and Hospitality	$ 11.76

Source: U.S. Bureau of Labor Statistics via Haver Analytics.

As seen in **Figure 6**, earnings differ across industries and over time, but the ranking of industries has been relatively stable over our sample period of January 1990 to July 2013. Only three industries switched classifications over this period: Education and Health Services paid above the industry average from August 1991 to December 1997, in April 1998, and from January 2001 onward, and so it is classified as a high-paying industry in these periods. In the rest of the sample period, it paid below the industry average and so is classified as a low-paying industry in these periods. Financial Activities paid below the industry average from January 1990 through January 1992 and above the industry average thereafter. More recently, manufacturing switched categories. It was a high-pay industry from January 1990 through June 2006, and it has been a low-pay industry since then.

How is employment distributed among high-paying industries and low-paying industries?

The distribution of jobs across industries in the region is similar to the national distribution. As shown in **Figure 7**, the region has a higher concentration in education and health services, a high-pay industry, than does the nation.[8] As shown in the right panel of **Figure 8**, the shares of high-pay and low-pay jobs in the U.S. are now about equal, but the relative share of high-to-low-pay jobs is lower than

[8] The region also has fewer government employees. Earnings data are not available for this sector.

before the Great Recession. The share of high-pay jobs in the nation is currently 42 percent, down from its average of 47 percent between 1990 and 2006, before the Great Recession. The region has a higher share of high-pay jobs than the nation, but the region too saw its relative share fall somewhat compared with before the Great Recession. The share of high-pay jobs in the three states is currently 44 percent, down from its 1990-2006 average of 48 percent.

How have employment gains during the recovery been distributed among the high-paying and low-paying industry categories?

We use the method of Mester and Olney (2004) to construct an index that measures the difference in the nation and in our region between job additions in high-paying versus low-paying industries using the available monthly payroll employment data for nine industrial sectors.

The first index measures the difference between the change in employment in high-paying sectors as a share of total private-sector employment versus the change in employment in low-paying sectors as a share of total private-sector employment.[9] This is equivalent to the weighted-average difference in employment growth in the high-paying and low-paying sectors, where weights are the share of private sector employment in the region in that sector. That is:

$$Diff_t = \left[\left(\frac{E_{H,t} - E_{H,t-1}}{E_{H,t-1}}\right) \times \left(\frac{E_{H,t-1}}{E_{t-1}}\right)\right] - \left[\left(\frac{E_{L,t} - E_{L,t-1}}{E_{L,t-1}}\right) \times \left(\frac{E_{L,t-1}}{E_{t-1}}\right)\right]$$

where

$E_{S,t}$ = monthly employment in sector S in the nation or in the region at month t, where S = H for high-paying industries or L for low-paying industries, where the high-paying industries are those whose average hourly earnings in month t are greater than average hourly earnings for all private-sector industries in month t, and low-paying industries are those whose average hourly earnings in month t are less than average hourly earnings for all private-sector industries in month t,

and

E_t = monthly private-sector employment in the region (or nation) at month t. (Note, $E_{H,t} + E_{L,t} = E_t$).

[9] Because earnings data are unavailable for government jobs, the index is based on high-paying and low-paying jobs as shares of private-sector employment.

We then calculated the 12-month moving average of this index for the nation or the region, that is,[10]

$$AvgDiff_t = \frac{1}{12}\sum_{i=1}^{12} Diff_{t-(i-1)} .$$

Like Mester and Olney (2004), we also looked at the individual components of the index for the high-pay and low-pay sectors. The index $Diff_t$ could equal zero because both high-pay and low-pay industries are adding jobs at the same rate or because they are both shedding jobs at the same rate. The individual component indexes can distinguish these cases. These individual components represent the contribution of the high-pay and low-pay sectors to overall private-sector employment growth. That is:

$$High\text{-}pay_t = \left[\left(\frac{E_{H,t} - E_{H,t-1}}{E_{H,t-1}}\right)\times\left(\frac{E_{H,t-1}}{E_{t-1}}\right)\right]$$

and

$$Low\text{-}pay_t = \left[\left(\frac{E_{L,t} - E_{L,t-1}}{E_{L,t-1}}\right)\times\left(\frac{E_{L,t-1}}{E_{t-1}}\right)\right]$$

We computed the 12-month moving averages of these indices:

$$AvgHigh\text{-}pay_t = \frac{1}{12}\sum_{i=1}^{12} High\text{-}pay_{t-(i-1)}$$

and

$$AvgLow\text{-}pay_t = \frac{1}{12}\sum_{i=1}^{12} Low\text{-}pay_{t-(i-1)} .$$

Note that

$$High\text{-}pay_t + Low\text{-}pay_t = \left(\frac{E_t - E_{t-1}}{E_{t-1}}\right)$$

= Growth in private-sector jobs in month t,

and

[10] In calculating the moving average, any month in which an industry switched categories from high-paying to low-paying, or vice versa, was omitted. This avoids large one-month swings in the growth rates of the category gaining and the category losing the industry.

$$AvgHigh\text{-}pay_t + AvgLow\text{-}pay_t = \frac{1}{12}\sum_{i=1}^{12}\frac{E_{t-(i-1)} - E_{t-i}}{E_{t-i}}$$

$$= 12\text{-month moving average of private-sector employment growth.}$$

We calculated all the indexes for both the nation and the tri-state region.

Figure 9 shows the index $AvgDiff_t$ for the nation and our three states. As seen in the figure, we find that when the national economy and employment began to recover after the 1990 and 2001 recessions, $AvgDiff_t$ was negative. More low-pay jobs than high-pay jobs were added early in these recoveries. For example, by our measure, following the 2001 recession, it was not until April 2004 that growth in higher-paying jobs over the previous 12 months consistently exceeded growth in lower-paying jobs in the previous 12 months in the nation. Our region showed a similar pattern. Growth in higher-paying jobs began to consistently exceed growth in lower paying-jobs in our region in June 2004. However, this behavior of job growth in the current recovery has been different. Growth in high-pay jobs has outpaced growth in low-pay jobs throughout the recovery in the nation and our three states. As shown in **Table 1** above, private employment growth in the nation averaged 0.171 percent per month over the 12 months ending in July 2013. Creation of high-paying jobs contributed 0.095 percentage point to that growth rate, while creation of low-paying jobs contributed 0.076 percentage point to that growth rate. Thus, the weighted-average difference in growth rates between high-paying and low-paying jobs in the nation (i.e., the value of *AvgDiff*) stood at 0.019 percentage point. In the tri-state region, for the 12 months ending in June 2013, private-sector job growth has averaged 0.101 percent per month (somewhat weaker than in the nation, which is usual for our region). Creation of high-paying jobs contributed 0.077 percentage point to that growth rate, while creation of low-paying jobs contributed 0.025 percentage point to that growth rate. The weighted-average difference in growth rates between high-paying and low-paying jobs (i.e., the value of *AvgDiff*) stood at 0.052 percentage point for the region.

But the *AvgDiff* index obscures some interesting dynamics. **Figures 10a** and **10b** show the *AvgDiff* index along with its components, the high-pay and low-pay growth rate indexes, *AvgHigh-pay* and *AvgLow-pay*, for the nation and region. Here we see that there were sharper cuts in high-pay jobs than low-pay jobs during the recessions in 1990 and 2001, and as noted above, low-pay jobs were added first in the recovery. But during the Great Recession, both high-pay and low-pay industries experienced significant job losses, but there were sharper cuts in low-pay jobs than in high-pay jobs. And as noted above, after a delayed start to the jobs recovery, high-pay jobs are being added at a faster pace than low-pay jobs.

Indeed, as shown in **Figure 11**, in the nation, 58 percent of the 7.7 million private-sector jobs lost during the Great Recession were low-pay jobs and 42 percent were high-pay jobs. During the recovery to date, the pattern has reversed: 58% of the private-sector job gains have been high-pay jobs and 42% have been low-pay jobs. In the three states, this pattern is even more pronounced: 63 percent of the lost private-sector jobs in the recession were low-pay while 37 percent were high-pay. During the recovery, 71 percent of private-sector jobs added have been high-pay.

Finally, one can ask why this recession and recovery look different in terms of the destruction and creation of low-pay and high-pay jobs. An important factor is that manufacturing, which had been a high-pay job from January 1990 to June 2006, switched to being a low-pay job in July 2006. If we do a counterfactual analysis and count manufacturing as a high-pay job, you can see in Figure 12 that the patterns during the Great Recession and the Not-So-Great Recovery now look similar to the two previous cycles, although the most recent recession was deeper. This points out a caveat in such analysis: One must be careful to understand the industry dynamics that are obscured by broad categorizations of industries into high-pay and low-pay.

Conclusions

There are several caveats to this analysis. Job quality entails more than just earnings. Average hourly earnings for most industries are not available on a state level, so the classification of jobs into high-paying and low-paying may not be strictly applicable to our region to the extent that the distribution of earnings across industries differs across regions. The NAICS employment data by state are available only from January 1990 onward, so we can analyze regional differences only for recent business cycles. We have limited our analysis to the nine industry sectors available for our region. Using a greater number of sectors would reduce the distortions resulting from combining different jobs within one category. The methodology does not distinguish between jobs that pay well above the industry average and those that pay only a little above the industry average. Similarly, it does not distinguish between jobs that pay well below and those that pay only a little below the industry average. And as noted above, industries can switch categories, which has to be considered when looking at the time series.

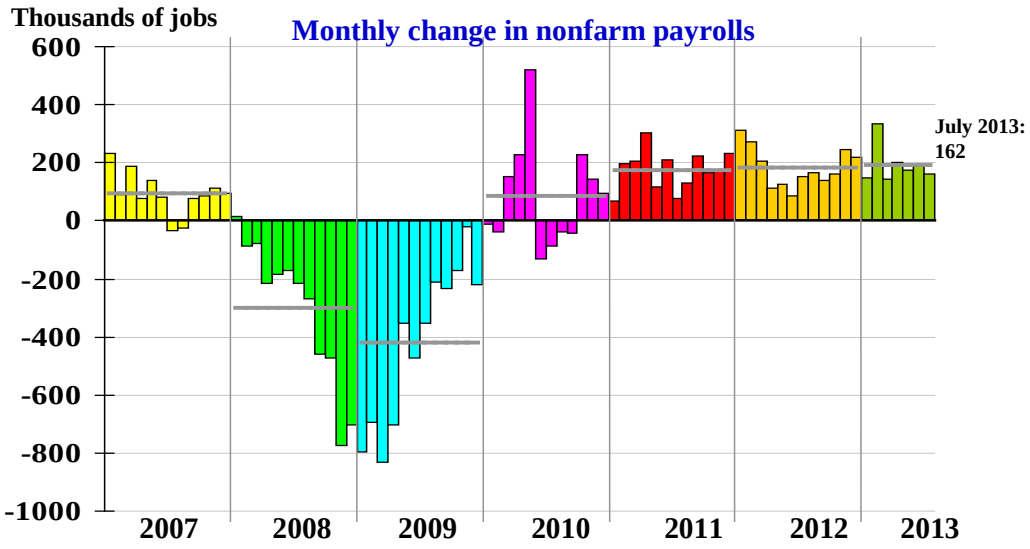
Despite these caveats, our analysis suggests that while there were deep job losses during the Great Recession and delayed and slow job gains during the Not-So-Great Recovery, it is not the case that the economy lost only high-pay jobs and has been adding only low-pay jobs. Instead, in both the nation and in the region, we saw sharper cuts in low-pay jobs than high-pay jobs during the recession and faster growth in high-pay jobs than low-pay jobs during the recovery.

References

Aaronson, Daniel and Sara Christopher, "Employment Growth in Higher-Paying Sectors," *Chicago Fed Letter*, Federal Reserve Bank of Chicago, Number 206, September 2004.

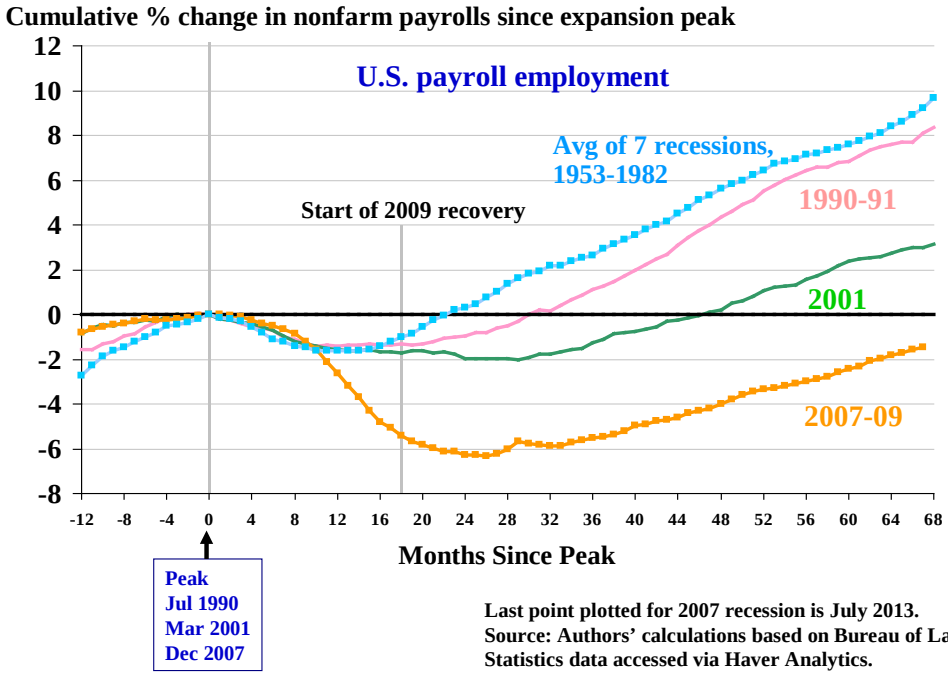
Mester, Loretta J., and William Olney, "Was Job Quality 'Job One' in the Tri-State Region's Economic Recovery?" *Regional Highlights: Special Issue*, Federal Reserve Bank of Philadelphia, December 20, 2004.

Figure 1. U.S. Payroll Growth



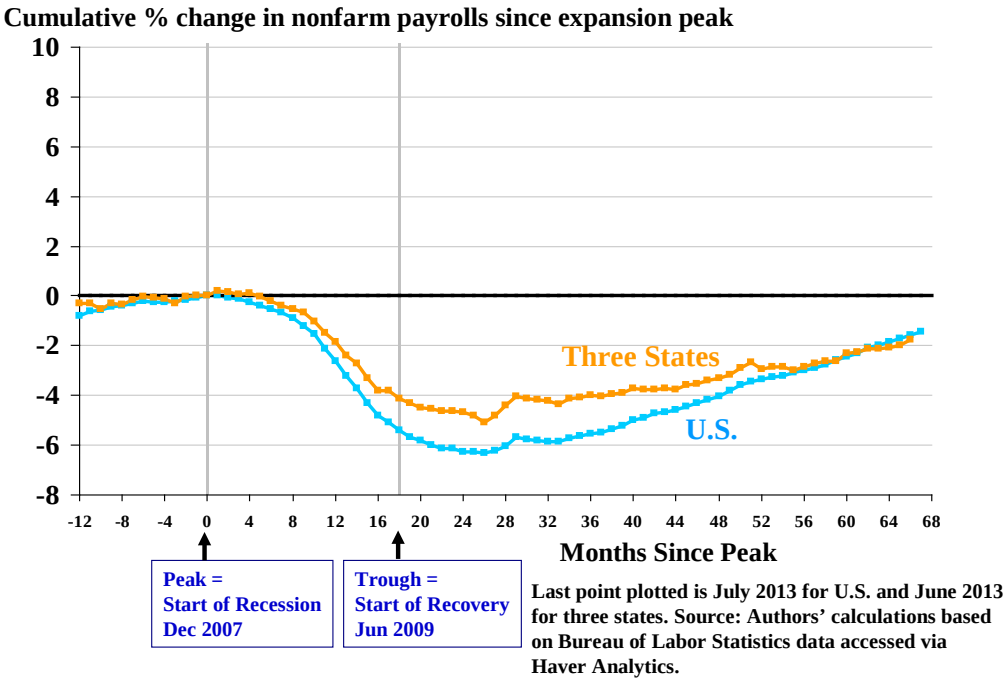
Average monthly gains for each year are indicated by the grey lines.
Last month plotted is July 2013, as of August 4, 2013.
Source: Authors' calculations based on Bureau of Labor Statistics data accessed via Haver Analytics.

Figure 2. Payroll Job Growth for U.S. Since Expansion Peaks



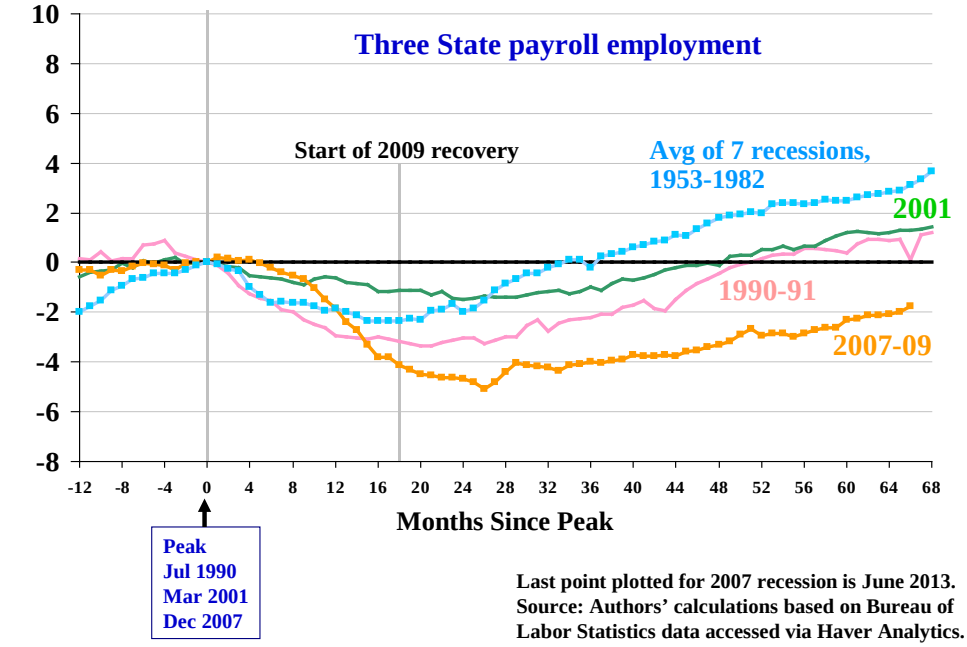
Last point plotted for 2007 recession is July 2013.
Source: Authors' calculations based on Bureau of Labor Statistics data accessed via Haver Analytics.

Figure 3. Payroll Job Growth for U.S. and Three States Since the Expansion Peak



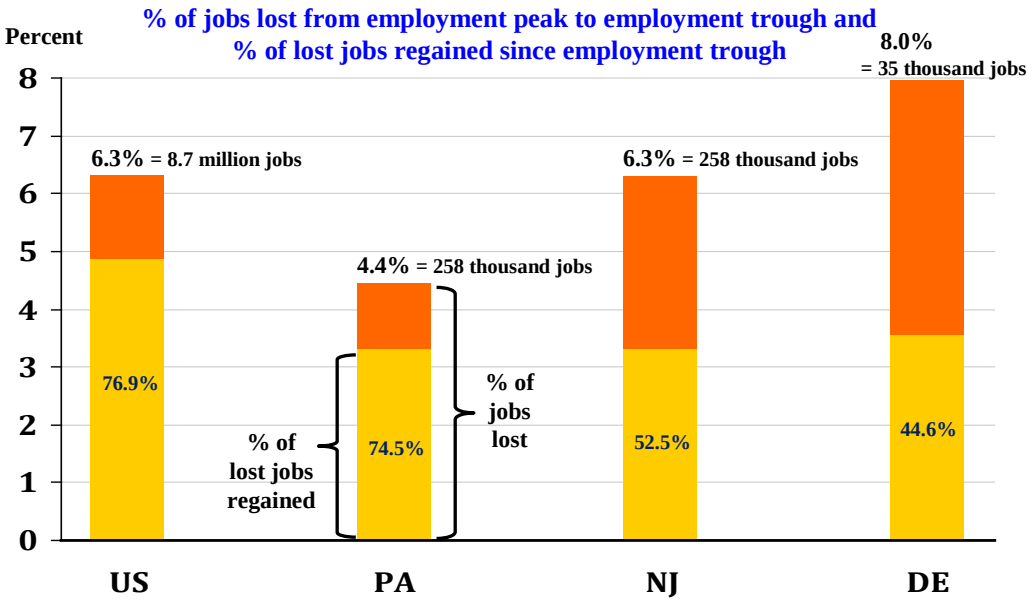
Last point plotted is July 2013 for U.S. and June 2013 for three states. Source: Authors' calculations based on Bureau of Labor Statistics data accessed via Haver Analytics.

Figure 4. Payroll Job Growth for Three States Since Expansion Peaks



Last point plotted for 2007 recession is June 2013. Source: Authors' calculations based on Bureau of Labor Statistics data accessed via Haver Analytics.

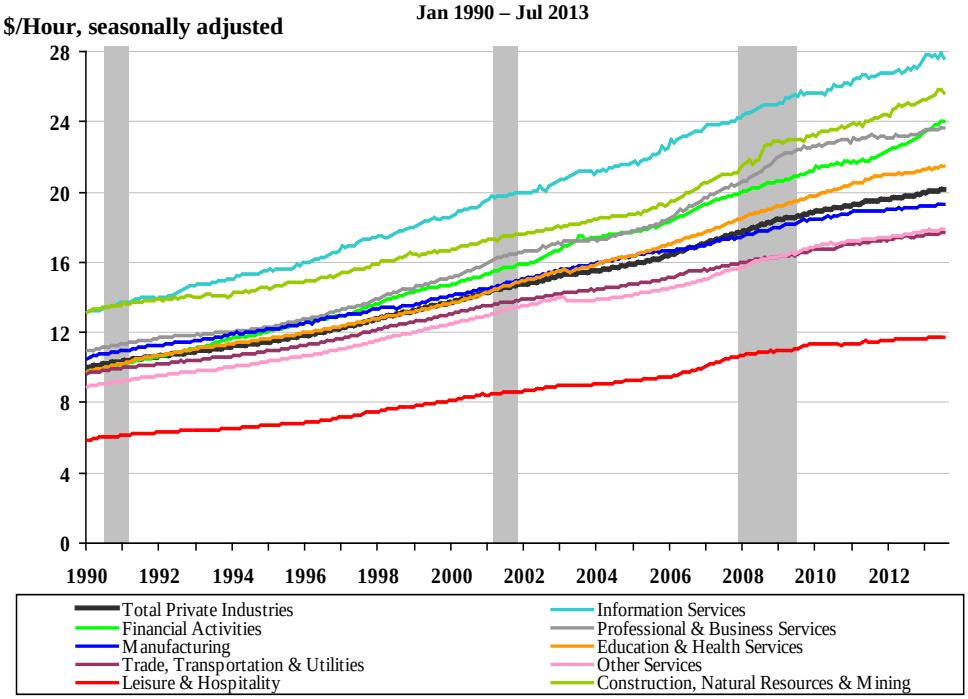
Figure 5. Job Recovery in the U.S. and Three States



Incorporates July 2013 data for U.S. and June 2013 data for three states as of August 4, 2013.
Employment peaks are in Jan 2008 for the U.S. and NJ, Feb 2008 for DE, and Apr 2008 for PA.
Employment troughs are in Feb 2010 for the U.S., PA, and DE, and Jan 2011 for NJ.
Source: Authors' calculations based on Bureau of Labor Statistics data accessed via Haver Analytics.

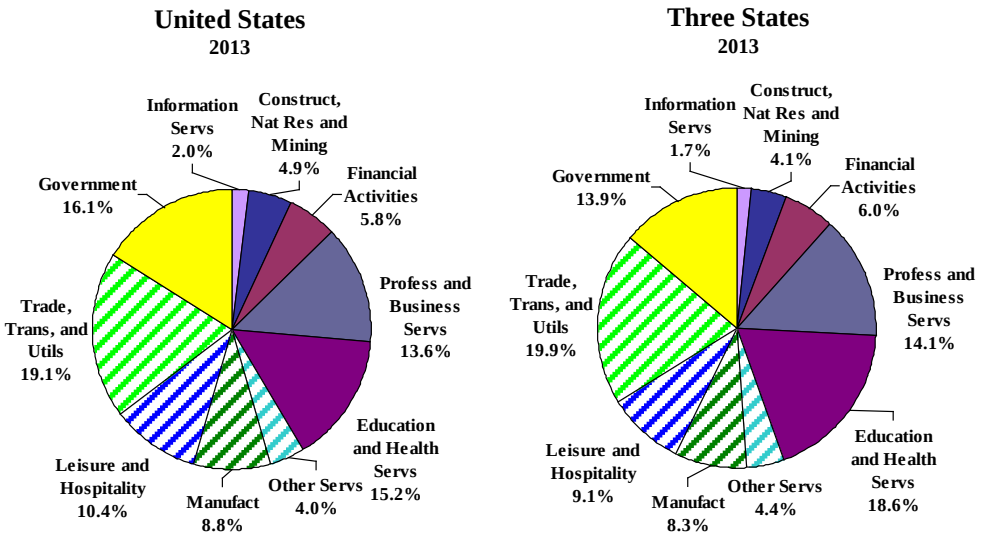
Figure 6. Average Hourly Earnings by Industry

Jan 1990 – Jul 2013



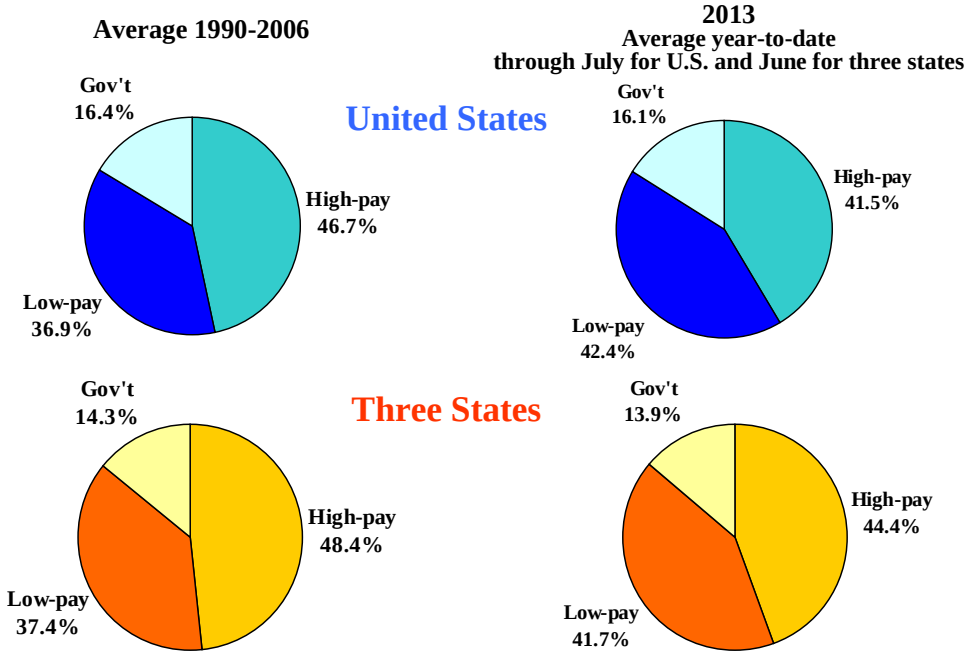
Source: Authors' calculations based on Bureau of Labor Statistics data accessed via Haver Analytics.

Figure 7. Employment Shares by Industry (Including Government Employment)



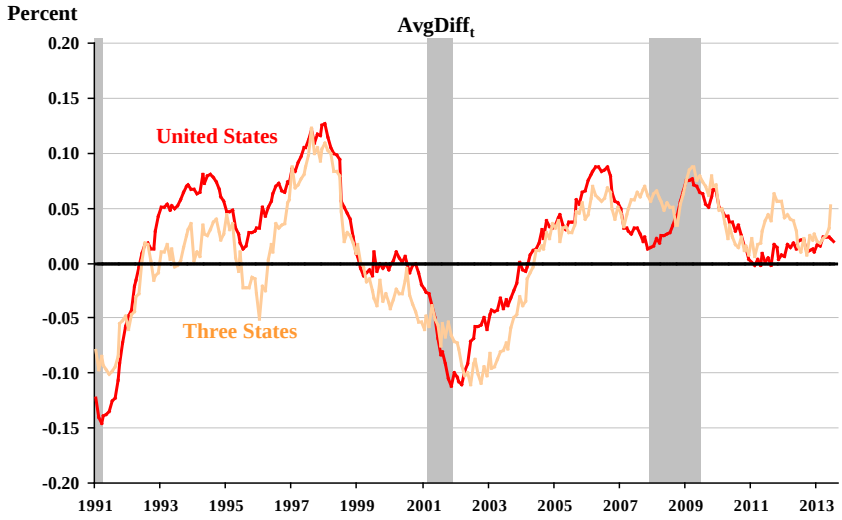
Average shares for 2013 year-to-date through July 2013 for U.S. and through June 2013 for three states.
Low-wage industries are indicated with hatch marks. Shares indicated may not sum to 100 due to rounding.
Source: Authors' calculations based on Bureau of Labor Statistics data accessed via Haver Analytics.

Figure 8. Shares of Total Payroll Jobs



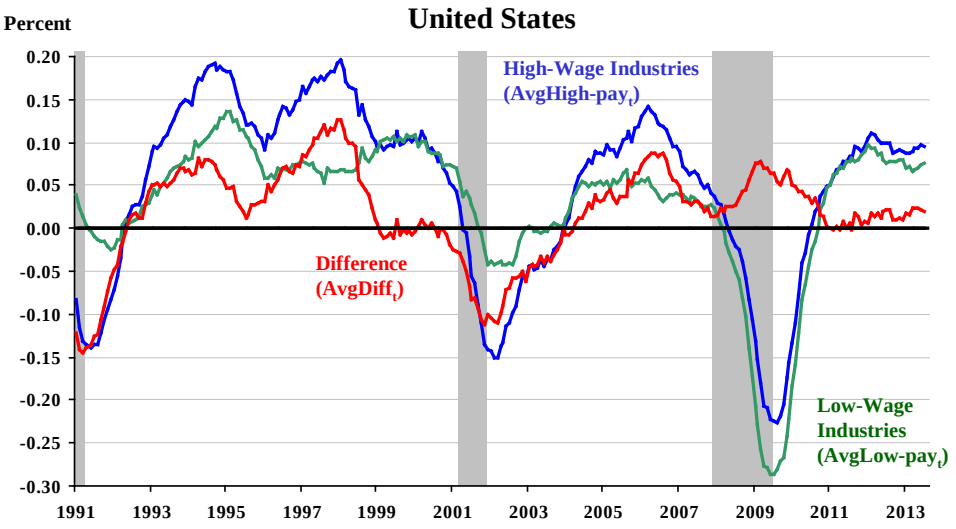
Shares indicated may not sum to 100 due to rounding.
Source: Authors' calculations based on Bureau of Labor Statistics data accessed via Haver Analytics.

Figure 9. Difference Between 12-Month Moving Average Growth in High-Pay and Low-Pay Jobs = $AvgDiff_t$



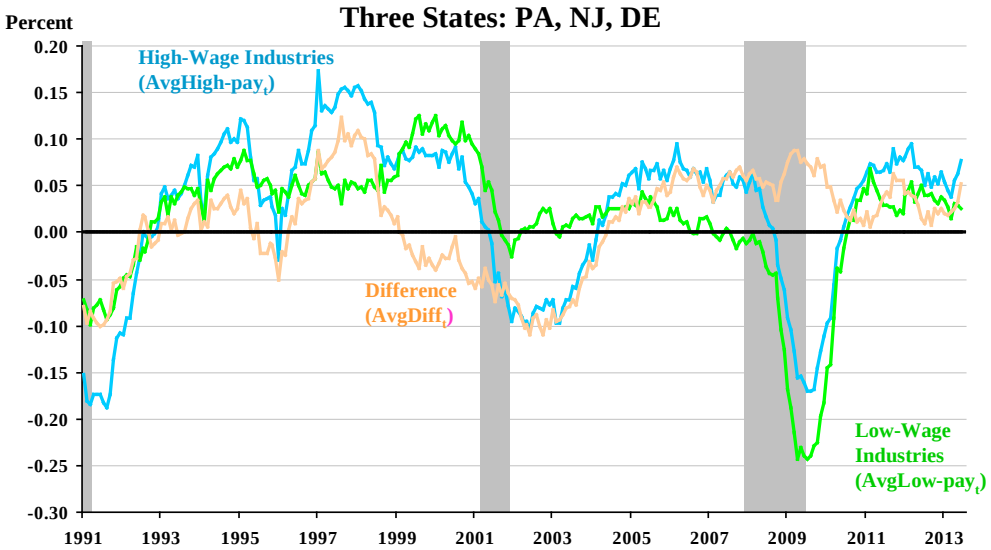
Grey bars indicate recessions.
Last month plotted is July 2013 for U.S. and June 2013 for three states, as of August 4, 2013
Source: Authors' calculations based on Bureau of Labor Statistics data accessed via Haver Analytics.

Figure 10a. 12-Month Moving Average Growth in High-Pay and Low-Pay Jobs and the Difference



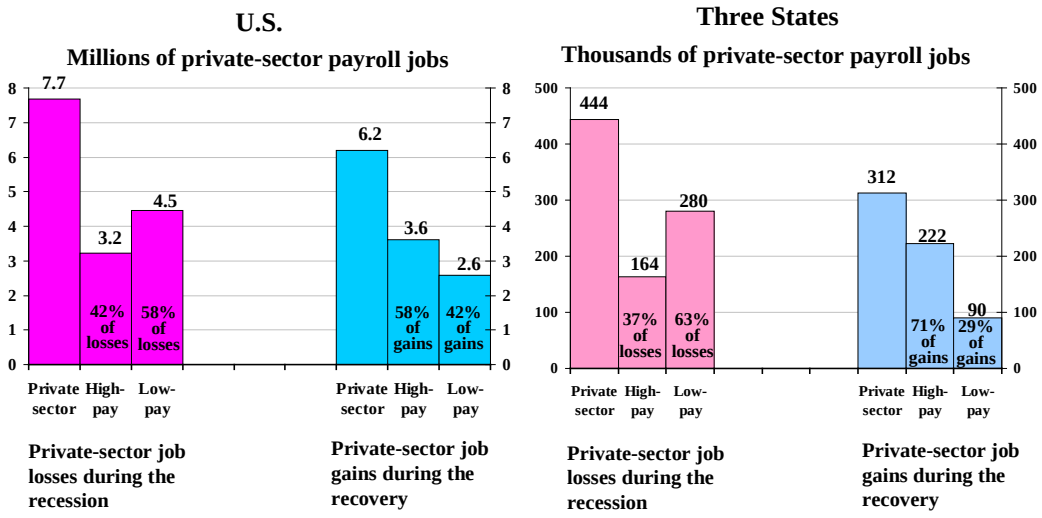
Grey bars indicate recessions.
Last month plotted is July 2013, as of August 4, 2013
Source: Authors' calculations based on Bureau of Labor Statistics data accessed via Haver Analytics.

Figure 10b. 12-Month Moving Average Growth in High-Pay and Low-Pay Jobs and the Difference



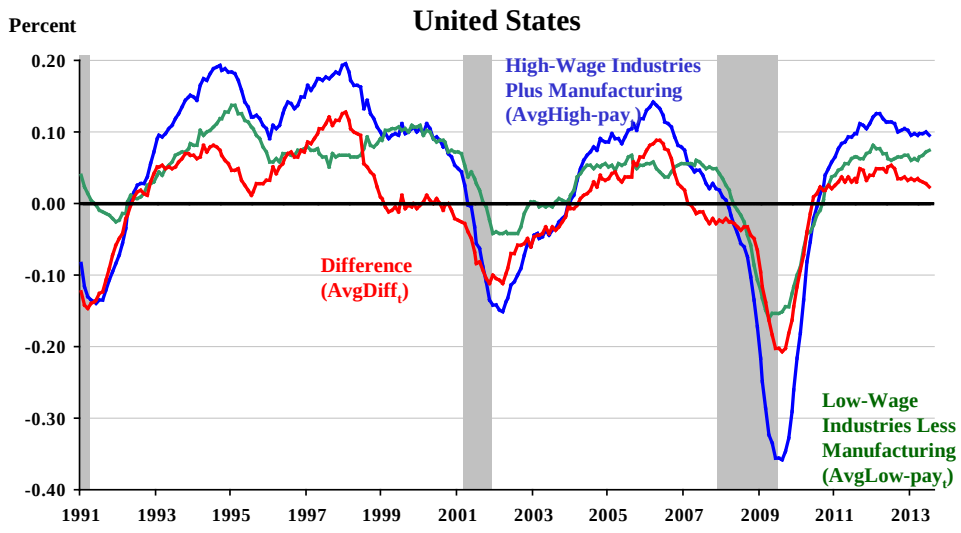
Grey bars indicate recessions.
Last month plotted is June 2013, as of August 4, 2013
Source: Authors' calculations based on Bureau of Labor Statistics data accessed via Haver Analytics.

Figure 11. Private-Sector Jobs Losses During the Great Recession and Private-Sector Job Gains During the Recovery to Date



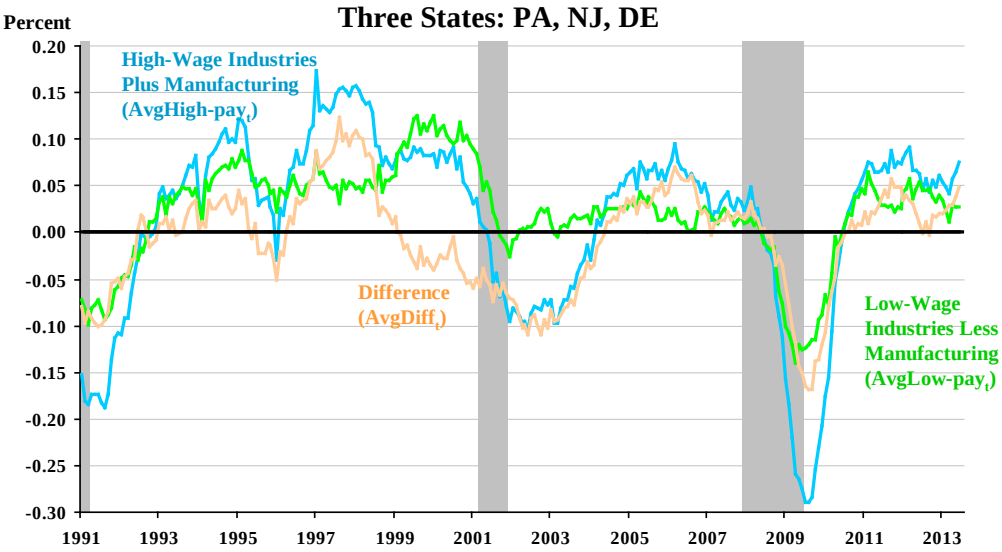
Incorporates data for July 2013 for U.S. and June 2013 for three states, as of August 4, 2013.
Source: Authors' calculations based on Bureau of Labor Statistics data accessed via Haver Analytics.

Figure 12a. Counterfactual: 12-Month Moving Average Growth in High-Pay and Low-Pay Jobs and the Difference when Manufacturing Treated as High-Pay



Grey bars indicate recessions.
Last month plotted is July 2013, as of August 4, 2013
Source: Authors' calculations based on Bureau of Labor Statistics data accessed via Haver Analytics.

Figure 12b. Counterfactual: 12-Month Moving Average Growth in High-Pay and Low-Pay Jobs and the Difference when Manufacturing Treated as High-Pay



Grey bars indicate recessions.
Last month plotted is June 2013, as of August 4, 2013
Source: Authors' calculations based on Bureau of Labor Statistics data accessed via Haver Analytics.