REGIONAL HIGHLIGHTS

Special Issue: December 2004

Was Job Quality "Job One" in the Tri-State Region's Economic Recovery?[1]

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December 20, 2004

Employment growth has been the most hesitant part of this recovery. Labor markets have been weaker for longer in this recovery than in the other postwar recoveries, even the so-called "jobless recovery" of 1991-92, at least by some measures. As of October 2004, the U.S. was still down about a half million jobs since the peak in employment at the start of the last recession in March 2001, 43 months

[1] The views expressed here are those of the authors and do not necessarily reflect those of the Federal Reserve Bank of Philadelphia or of the Federal Reserve System.

The authors thank Daniel Aaronson and Sara Christopher for helpful discussion about their methodology.

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earlier (Figure 1). At a similar stage during the last recovery, the U.S. had added about 2.75 million jobs. This year, we have begun to see gradual improvement in the pace of job growth (Figure 2).[2]

As of October, payrolls in Pennsylvania, New Jersey, and Delaware, the three states in the Third Federal Reserve District, had just recovered to the level of the last peak in employment. (Since the end of the recession, New Jersey has shown the strongest job growth of the three states and Pennsylvania the weakest.) Unlike the nation, our region is doing considerably better this time compared to 1990-91 – then, it took over four years to get back to the previous employment peak, reflecting the relative severity of the 1990 recession in our region (Figure 3). We are on track for a somewhat swifter return this time compared to 1991, and our recovery has been similar to the nation's (Figure 4).

But what types of jobs are being added in our region? Are they high quality jobs in terms of paying a high wage, or are they low-paying jobs? Have secular shifts in the distribution of employment led to different types of jobs being added compared to earlier recoveries? Does the pattern of job growth differ in our region relative to the nation?

Aaronson and Christopher (2004)[3] recently examined this issue for the nation and concluded that the distribution of jobs between higher paying and lower paying industries during this recovery has been similar to that of previous recoveries. Typically, when a recovery begins and employment begins to grow, the first jobs added are in those industries that are relatively low paying, while higher paying jobs are added later on as the economy and employment continue to expand.

In this note, we apply a modified version of the Aaronson and Christopher methodology to examine the recent employment experience in the three states of Pennsylvania, New Jersey, and Delaware.[4] Similar to Aaronson and Christopher, we find that the private sector adds more lower paying

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[2] The data used here are through October 2004, since this is the latest month for which state employment data are available. Note, these data are subject to revision.

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

[4] Because the regional data are somewhat more limited than the national data (in particular, state employment data are available for a smaller number of 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 vs.

than higher paying jobs at the beginning of recoveries both in the region and in the nation. As the economic expansion takes hold, the ratio of high-pay to low-pay jobs added increases. For example, by our measure, it was not until the end of last year that the average monthly growth in higher paying jobs over the past 12 months exceeded average monthly growth in lower paying jobs in the nation. Our region has lagged the nation somewhat in the process of adding higher paying jobs, but this milestone was reached in June. For example, in the 12 months ending in October 2004, the region added an average of about 9,500 private-sector payroll jobs per month (monthly growth averaged 0.11 percent). Of these jobs added, about 5,600, or 59 percent, were in higher paying industries, and 3,900, or 41 percent, were in lower paying industries in the region (monthly growth of jobs in higher paying industries averaged 0.066 percent, while monthly growth of jobs in lower paying industries averaged 0.045 percent). In contrast, a year ago, the region had lost an average of about 2,900 private-sector payroll jobs per month in the 12 months ending in October 2003 (monthly growth averaged −0.033). There were average losses of 4,700 per month in higher paying industries and average gains of 1,800 per month in lower paying industries (monthly growth averaged −0.054 percent and 0.021 percent, respectively). So to answer the question in the title, job quality was not "job one" in the region's recovery, since low-paying jobs were added first. But as the expansion continues, if the typical pattern holds, relative job quality will rise both in the region and in the nation.

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

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. Like Aaronson and Christopher, because of data limitations, we will limit the analysis to differences in average hourly earnings, available from the Bureau of Labor Statistics. Note that these data are also limited in a

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employment growth in industries with lower paying jobs) differs somewhat from the Aaronson and Christopher

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, determining whether a job added is high or low wage is based on the average wage paid for all jobs in the industry. Moreover, we do not have state level data on average hourly earnings by industry, except for manufacturing. Thus, determining whether a job added in our region is high or low wage is based on the national wage in that industry. Note that the underlying assumption is that wages are determined in a national labor market.

Since we are applying our analysis to the three-state region (Pennsylvania, New Jersey, and Delaware), we focus on the industry sectors defined by the NAICS (North American Industry Classification System) whose payroll employment data are available for the region.[5] 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).

As seen in Figure 5A, wages differ across industries and over time, but the ranking of industries into those with average hourly earnings above the national average for private-sector industries in the month, and those with average hourly earnings below the national average for private-sector industries in the month, has been relatively stable over time. In each month, we can classify industries into high-paying and low-paying in terms of whether their average hourly earnings are above or below,

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index.

[5] State payroll employment data for industries classified by the NAICS begin only in January 1990. While state data on industries classified by the SIC (Standard Industrial Classification) 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.

respectively, the national average hourly earnings across private industries. For example, applying this methodology in October 2004 yields the following classification:

	Average Hourly Earnings, October 2004
Total Private Industries	$15.83
High-Paying Industries:	
Information Services	$21.59
Construction	$19.33
Natural Resources and Mining	$18.20
Construction and Natural Resources and Mining	$18.72
Financial Activities	$17.73
Professional and Business Services	$17.64
Manufacturing	$16.27
Education and Health Services	$16.24
Low-Paying Industries	
Trade, Transportation, and Utilities	$14.76
Other Services	$13.98
Leisure and Hospitality	$9.00

As seen in Figure 5B, the groups of high-paying and low-paying industries have been very stable over our sample period January 1990 to October 2004. Only two industries switched classifications over this time period: Education and Health Services paid above industry average from mid-1991 to mid-1998 and from 2001 onward, and so would be classified as a high-paying industry in these periods. In the rest of the sample period, it paid below industry average, and so would be classified as a low-paying industry in these periods. Financial Activities paid below industry average from 1990 through 1991 and above industry average from 1992 onward.

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

The distribution of jobs across industries in the region is similar to that in the nation, with some differences. As shown in Figure 6A, compared to the nation, our region has slightly less employment in leisure and hospitality, which is currently a low-paying industry; slightly less employment in construction, natural resources, and mining, a high-paying industry; and somewhat more in education and

health services, a high-paying industry.[6] These shares have shifted a bit over time – e.g., the share of manufacturing has fallen from over 16 percent in both the region and the nation in 1990 to about 11 percent in the region and nation in 2004. Similarly, the share of private-sector employment (i.e., payroll employment in all sectors excluding the government) in low-wage and high-wage industries has shifted as well. In our three-state region, as well as in the nation, in 2004 about 60 percent of private-sector jobs were in high-paying industries, while 40 percent were in low-paying industries. In 1990, these shares were reversed, with about 40 percent of private-sector jobs in high–paying industries and about 60 percent in the low-paying industries**.**

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

We modified the method Aaronson and Christopher used in studying the nation to construct an index that measures the difference between job additions in our region in high-paying vs. low-paying industries using the available state level monthly payroll employment data by nine industrial sectors. We computed comparable statistics for the nation.[7] In addition, we looked at the pattern of job creation in high-paying industries and in low-paying industries separately over time.

The first index measures the difference between the change in employment in high-paying sectors as a share of total private-sector employment vs. the change in employment in low-paying sectors as a share of total private-sector employment.[8] 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:

[6] Note, the region also has fewer government employees. Earnings data are not available for this sector.
[7] Because we can include only nine sectors in our regional analysis, our comparable national index could potentially differ from that of Aaronson and Christopher, who construct two indexes, one based on 14 industrial supersectors and one based on 84 sectors. This does not appear to be the case, since our national results are quite similar to those of Aaronson and Christopher.
[8] Because earnings data are unavailable for government jobs, we chose to formulate our index based on high-paying and low-paying jobs as shares of private-sector employment, whereas Aaronson and Christopher look at high- and low-paying jobs as a share of total employment.

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

where

$E_{S,t}$ = monthly employment in sector S in the region (or nation) 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 monthly 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, $E_{H,t} + E_{L,t} = E_t$).

We then calculated the 12-month moving average of this index for the region (or nation), that is,[9]

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

Unlike Aaronson and Christopher, we also looked at the individual components of the index for the high-wage and low-wage sectors. These individual components provide important additional information. Note that the index $Diff_t$ could equal zero because both high-wage and low-wage 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-wage and low-wage 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

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

[9] 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.

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

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

$$= \text{Growth in private-sector jobs in month t,}$$

and

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

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

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

Our data allow us to examine the behavior of our moving-average indexes only since January 1991, but this does include two recoveries.[10] Figures 7 - 9 show the indexes

Figure 7 shows the index $AvgDiff_t$ for the nation and our three states. As seen in the figure, similar to Aaronson and Christopher, we find that when the national economy and employment begin to recover after a recession, first more lower paying jobs than higher paying jobs are added. This happened in the 1991 recovery and in the 2001 recovery. For example, by our measure, it was not until December of last year that growth in higher paying jobs over the previous 12 months exceeded growth in lower

[10] The recessions are indicated on the accompanying charts by the shaded bars.

paying jobs in the previous 12 months in the nation. We also find that our region has lagged the nation somewhat in the process of adding higher paying jobs. It was not until June, seven months after the nation, that growth in higher paying jobs exceeded growth in lower paying jobs in our region. Private employment growth in the region averaged 0.110 percent per month over the 12 months ending in October 2004. Creation of high-paying jobs contributed 0.066 percentage point to that growth rate, while creation of low-paying jobs contributed 0.045 percentage point to that growth rate. Thus, the weighted-average difference in growth rates between high-paying and low-paying jobs in the region (i.e., the value of *AvgDiff*) stood at 0.021 percentage point in October 2004, compared to 0.065 percentage point for the nation

But the *AvgDiff* index obscures some interesting dynamics. Figure 8A shows the *AvgDiff* index along with its components, the high-paying and low-paying growth rate indexes, *AvgHigh-pay* and *AvgLow-pay*, for the three-state region. Here we see that in the 1991 recovery, the regional economy continued to lose jobs in both high- and low-pay industries for some time after the recession ended in March 1991, and these sectors both began to add jobs at around the same time, October 1992. In contrast, during the current recovery, our region began to add some jobs in the low-paying sector quite soon after the recovery began, but these gains were swamped by continued losses in the high-paying sector. The 12-month average monthly growth of jobs in the high-paying sector did not turn positive until March 2004, about 28 months after the recovery began.

As seen in Figure 8B, this pattern across the two recoveries in the region is somewhat different from what we saw in the nation. The nation lost jobs in both the high-paying and low-paying sector at the start of the 1991 recovery (as was true in the region), but the nation showed employment gains in both sectors much sooner than the region did. (The *AvgHigh-pay* and *AvgLow-pay* indexes for the nation turned positive in May 1992 and July 1992, respectively, compared to October 1992 for both in the region.) In contrast to the region's, the nation's pattern of employment growth during the current

recovery was similar to that seen in 1991, with both high-paying and low-paying job growth taking time to get started after the recovery began.

Although the indexes are considerably more noisy, when we look at the three individual states in our region (in Figures 9A-9C), we see that New Jersey and Delaware are now adding more high-wage than low-wage jobs than earlier in this recovery. New Jersey has shown the strongest job growth in the region, and in the 12 months ending in October 2004, the rate of high-wage job growth has exceeded that of low-wage job growth by about 0.067 percentage point a month. Because low-wage job growth has slowed and high-wage job growth has risen in recent months in Delaware, the difference in monthly growth rates between the high-wage sector and low-wage sector is the highest among the three states, currently at 0.070 percentage point. But Delaware's data are considerably volatile, since Delaware is a relatively small state.[11] Pennsylvania has only recently shown growth in high-wage jobs, and the growth rate in the high-wage sector remains below that of the low-wage sector (so *AvgDiff* remains negative).

Conclusions

As we've discussed, there are a number of 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 wages across industries differs across regions. The NAICS employment data by state are available only from January 1990 onward, so we cannot analyze regional differences across more than two business cycles. Also, the employment data by NAICS classification are being revised going forward but history is not being revised, which can cause large swings in the industry-state employment data. For example, in a small state like Delaware, reclassification of employees from one industry to another caused a large shift in employment share in 2002. However, these problems are mitigated by looking at the three-state total. The analysis is limited to the nine industry subsectors

[11] Delaware employment accounts for about 4 percent of the tri-state region's employment. Pennsylvania employment accounts for about 56 percent, and New Jersey employment accounts for about 40 percent.

available for our region. Using a greater number of subsectors would reduce the distortions of combining different jobs within one category. There is no distinction between jobs that pay well above the industry average and those that pay only a little over industry average.

Despite these caveats, our analysis suggests that our region's job dynamics since the beginning of the recovery have been fairly similar to those in the nation, although it did take our states longer to begin adding higher paying jobs than it took the nation. Our region's job dynamics appear to be somewhat different than they were during the previous recovery in the early 1990s. Then, it took a while for the region to begin adding jobs, but when it did, both low-paying and high-paying jobs were added. This time, the region created low-paying jobs considerably sooner than it created high-paying jobs – job quality was not "job one" in the region's recovery. But over time, as has happened in other recoveries, the rate of job creation in the high-paying sector has begun to overtake that in the low-paying sector.

Figure 1. U.S. Payroll Growth Since Cycle Peak

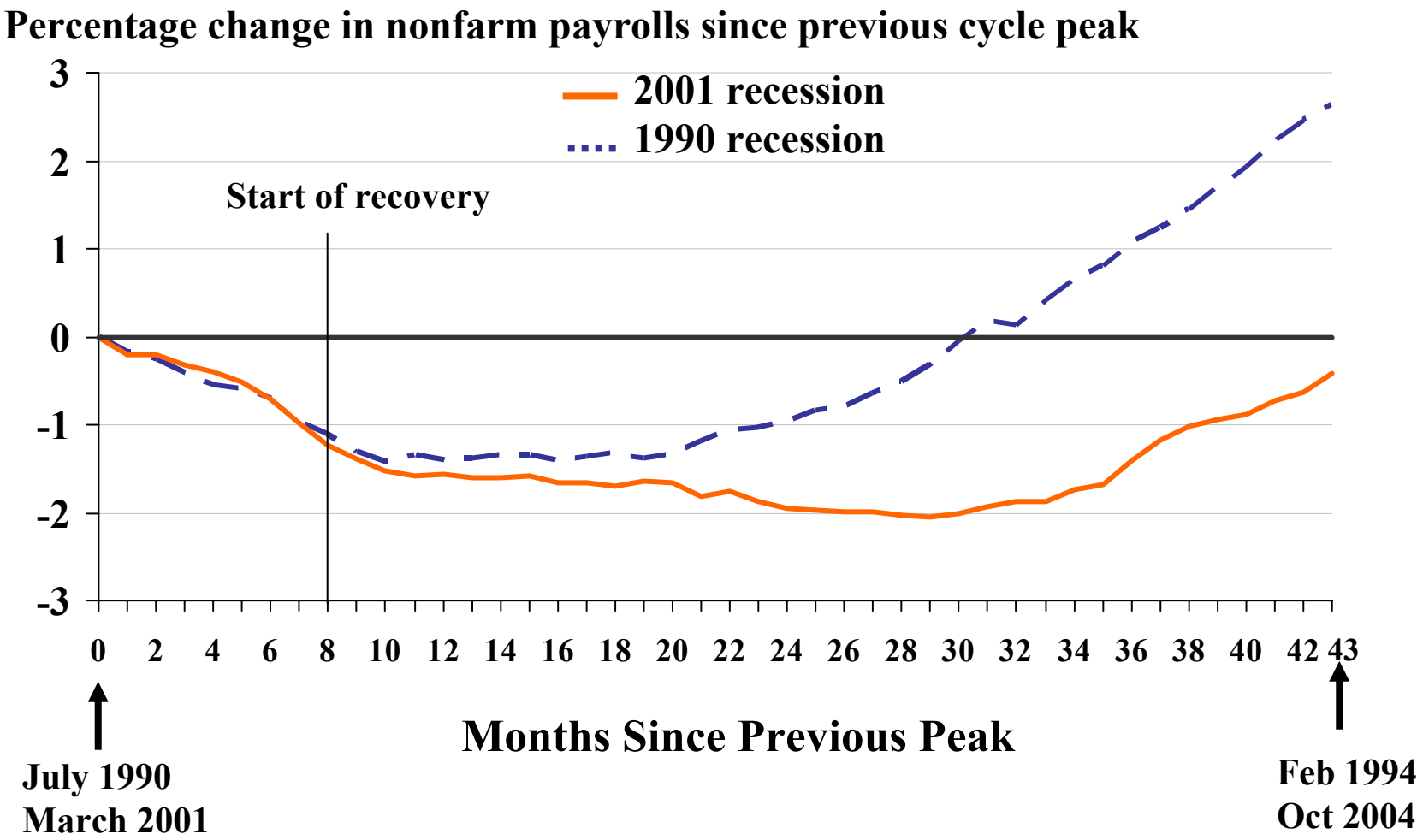


Figure 2. U.S. Payroll Growth

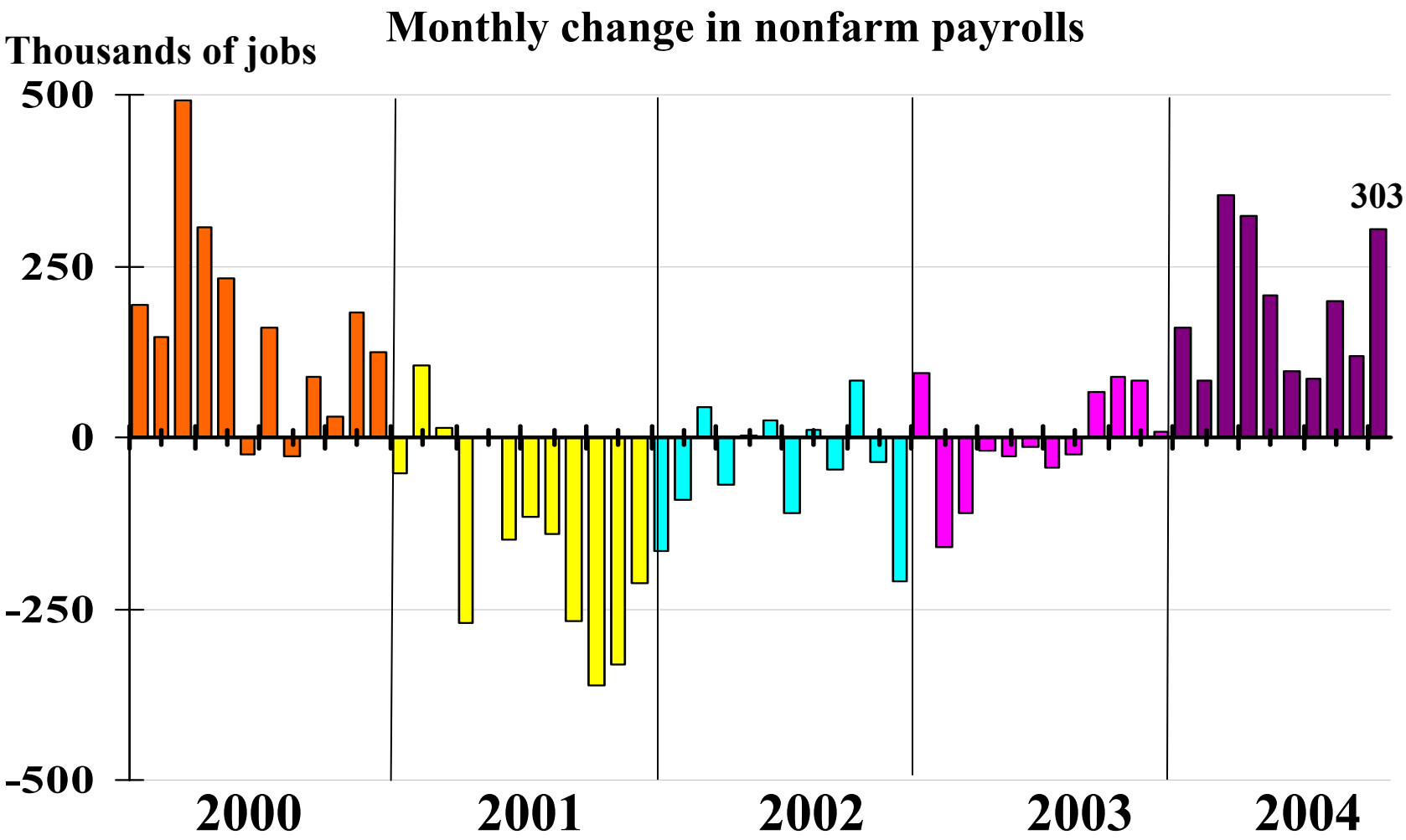


Figure 3. Three-State Payroll Growth Since Cycle Peak

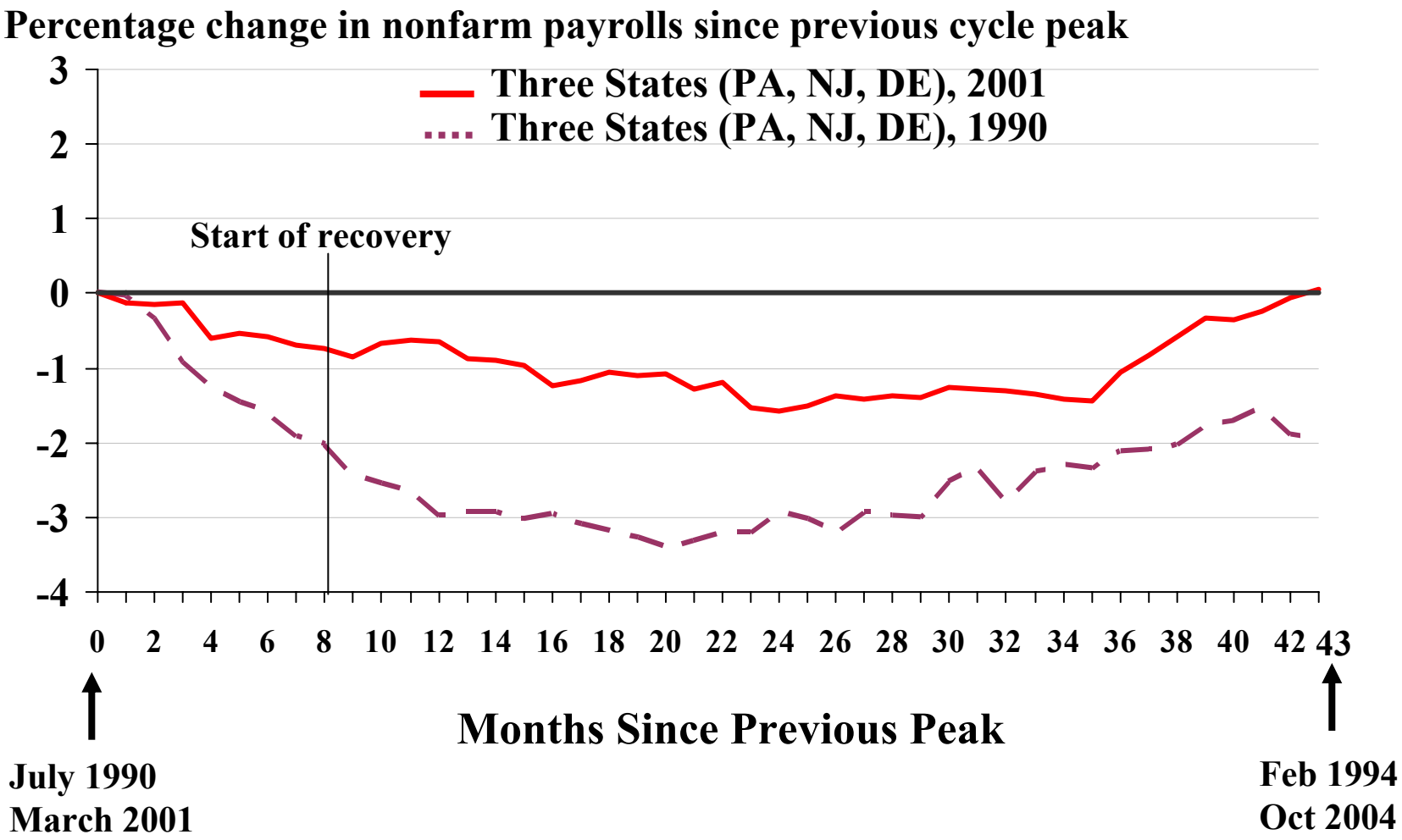


Figure 4. Payroll Job Growth for U.S. and Three States Since Recession Trough

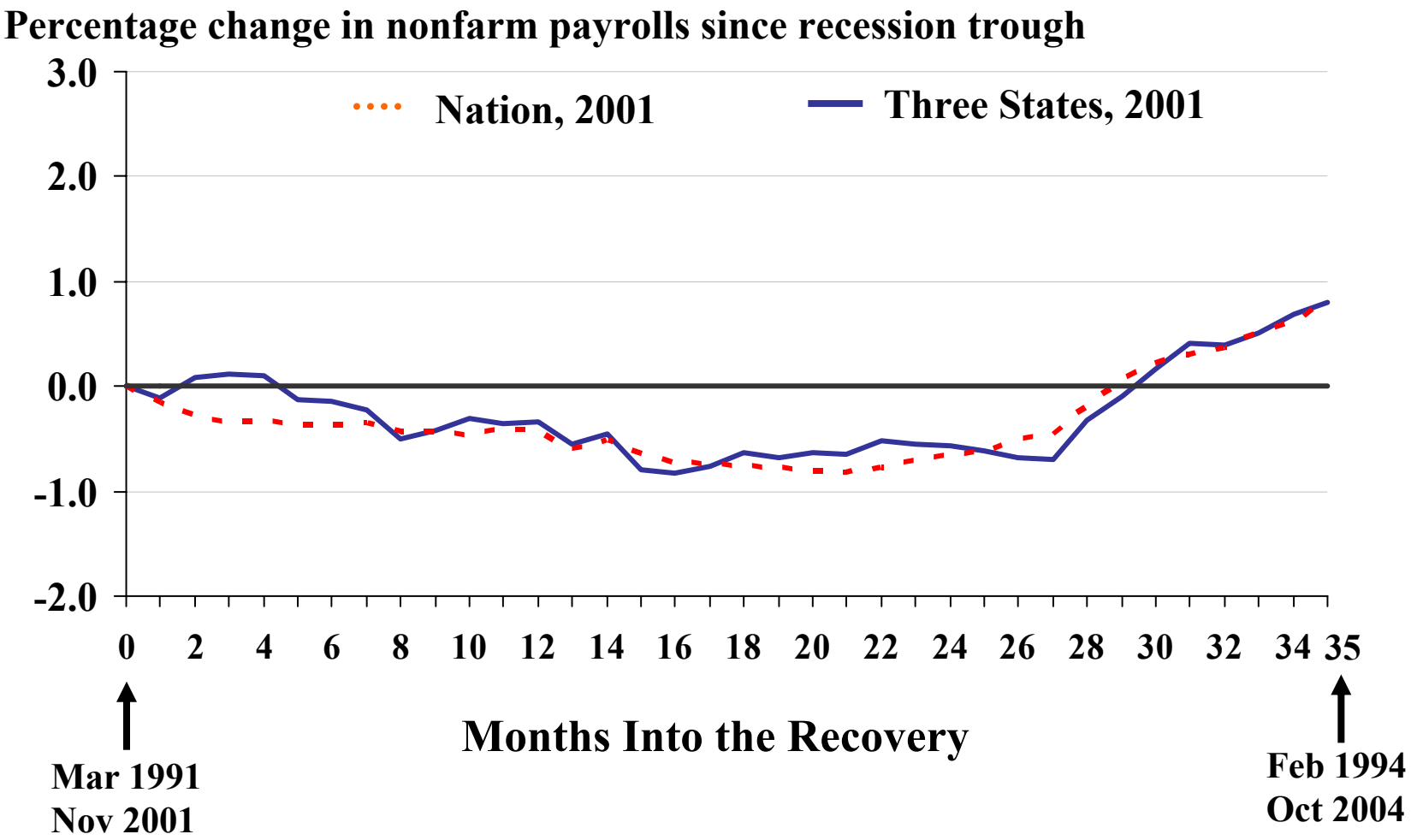


Figure 5A. Average Hourly Earnings by Industry

Jan 1964 – Oct 2004

$/Hour, seasonally adjusted

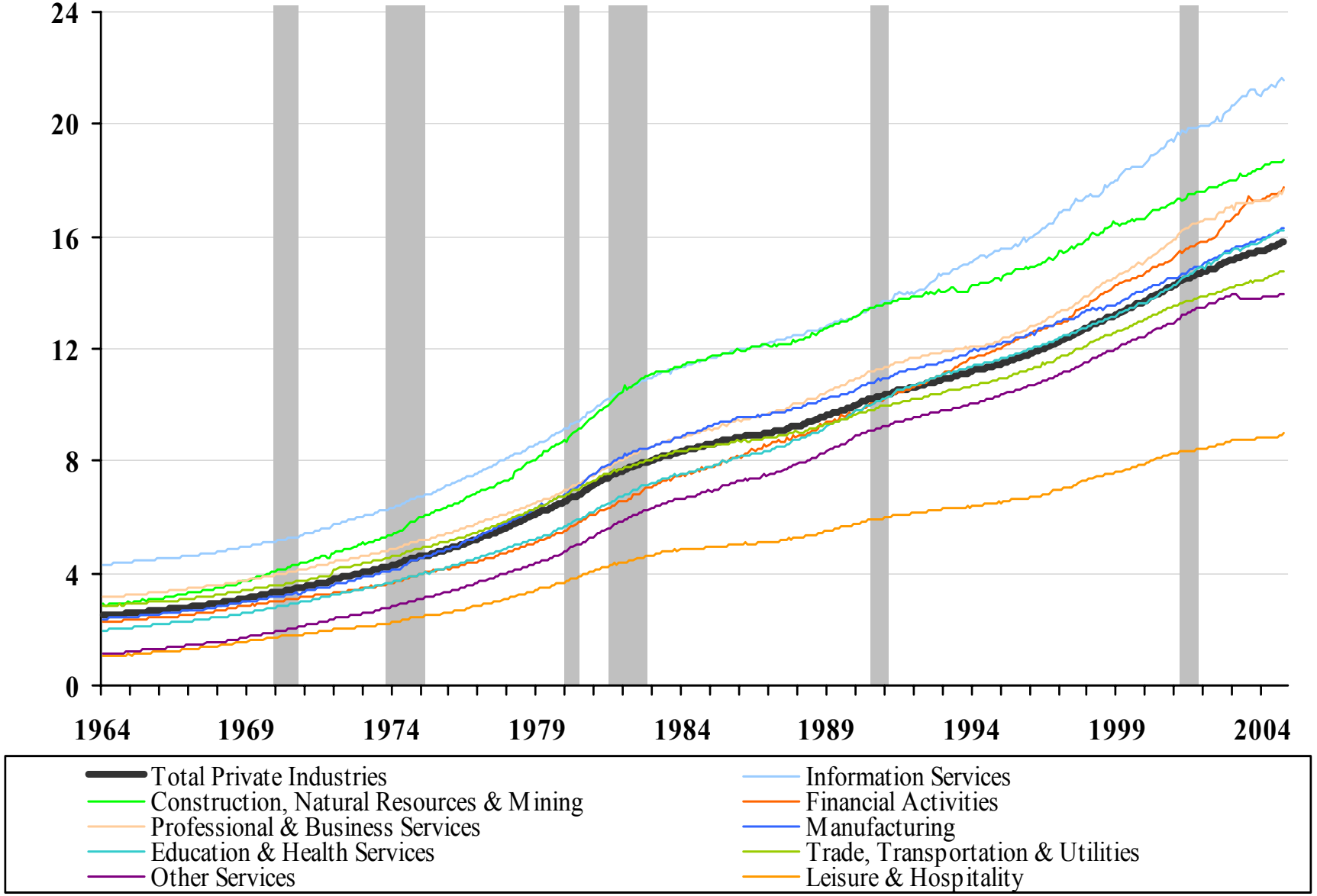


Figure 5B. Average Hourly Earnings by Industry

Jan 1990 – Oct 2004

$/Hour, seasonally adjusted

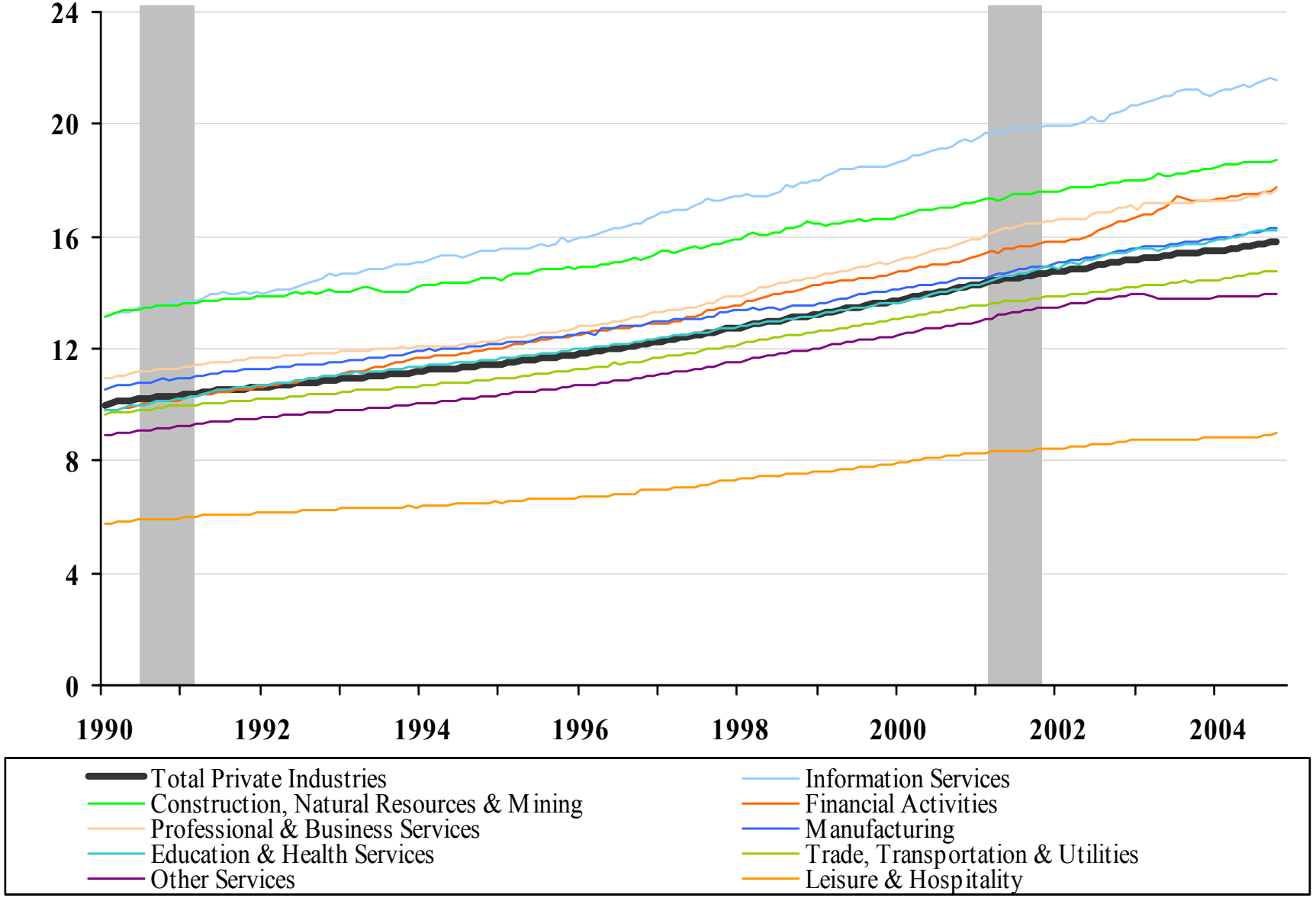
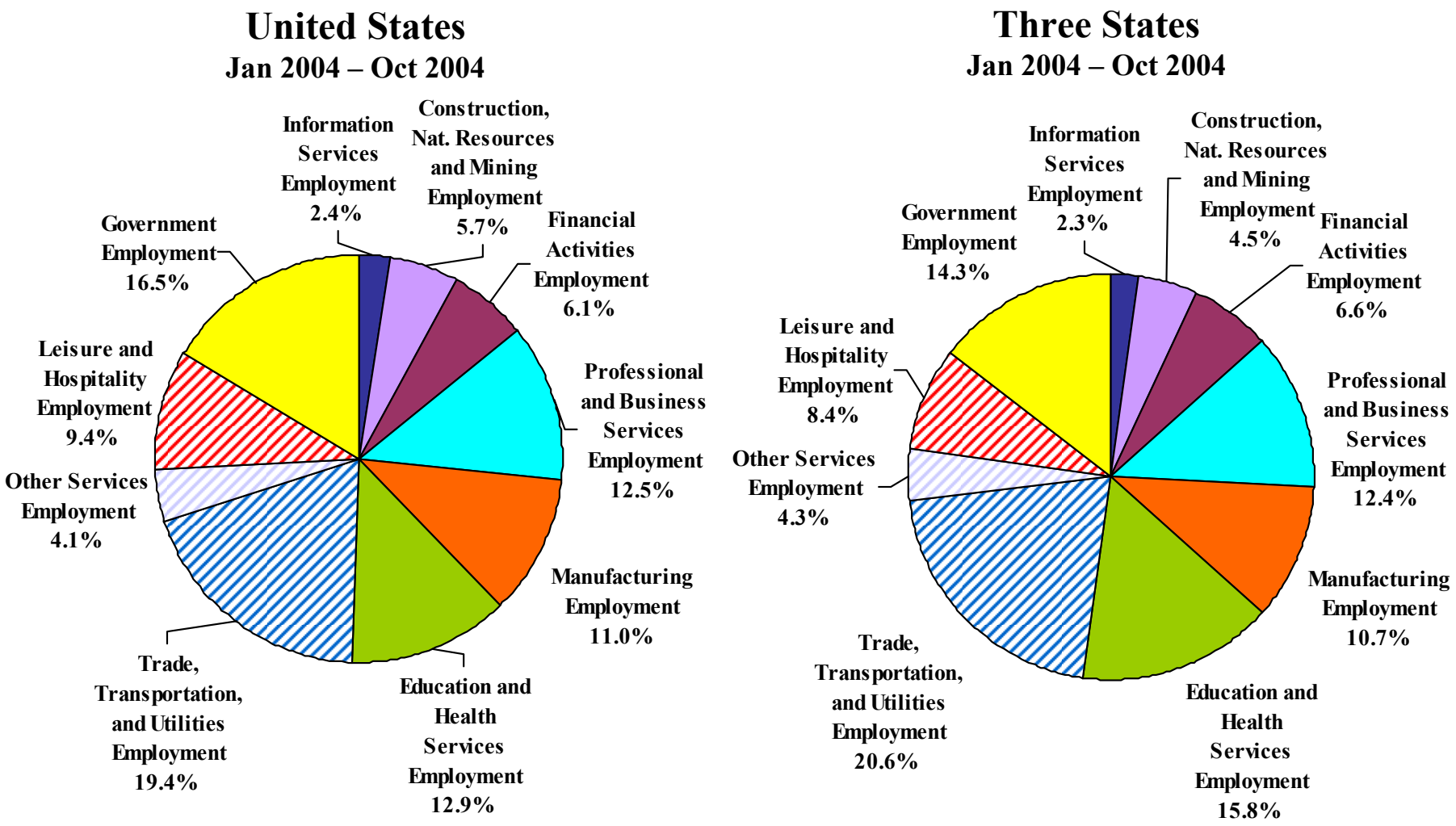
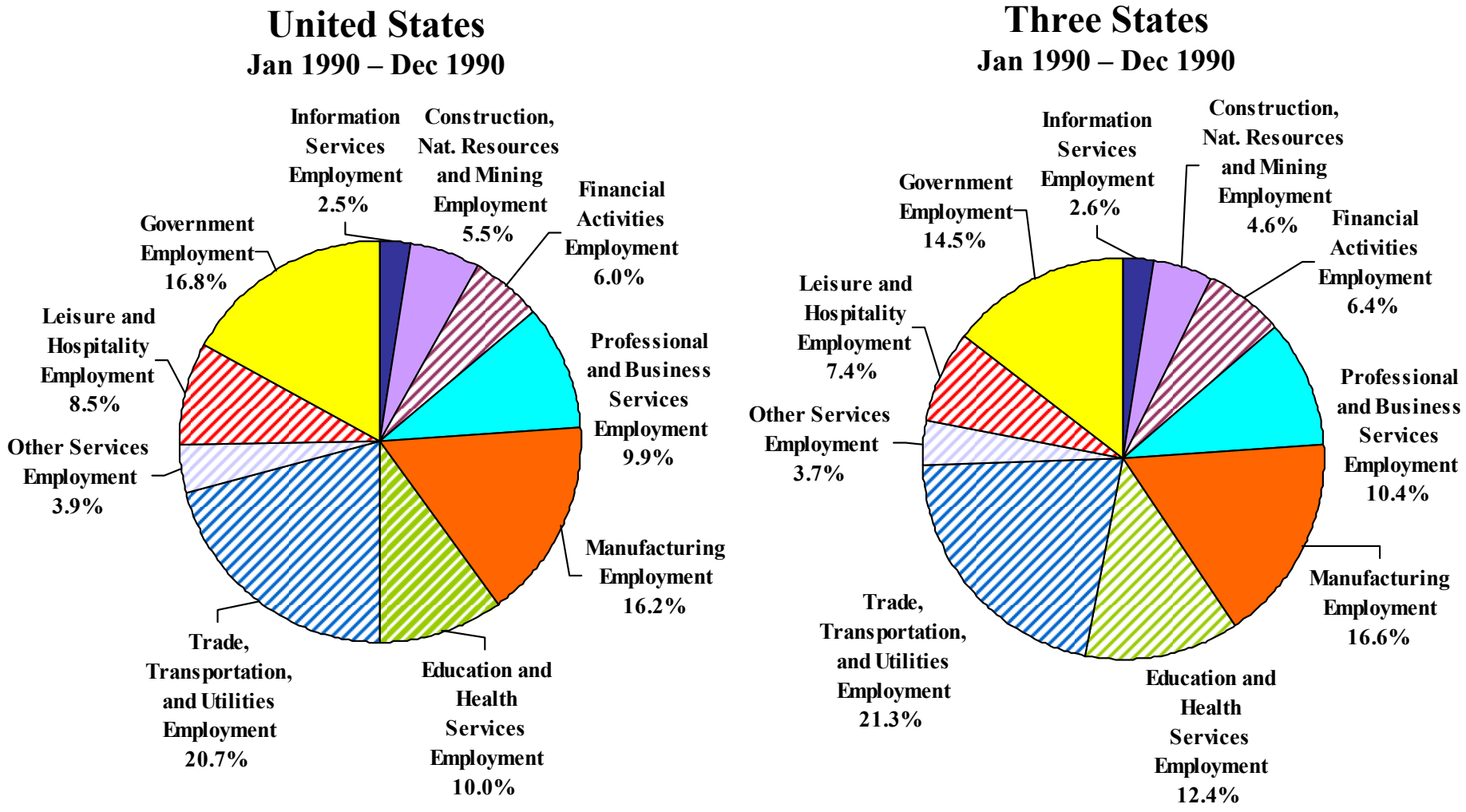


Figure 6A. Employment Shares by Industry
(including government employment)



*** Low-wage industries as of Oct 2004 are indicated with hatch marks**

Figure 6B. Employment Shares by Industry
(including government employment)



* Low-wage industries as of Dec 1990 are indicated with hatch marks

Figure 7. Difference Between 12-Month Moving Average Growth in High-Paying and Low-Paying Jobs = $AvgDiff_t$

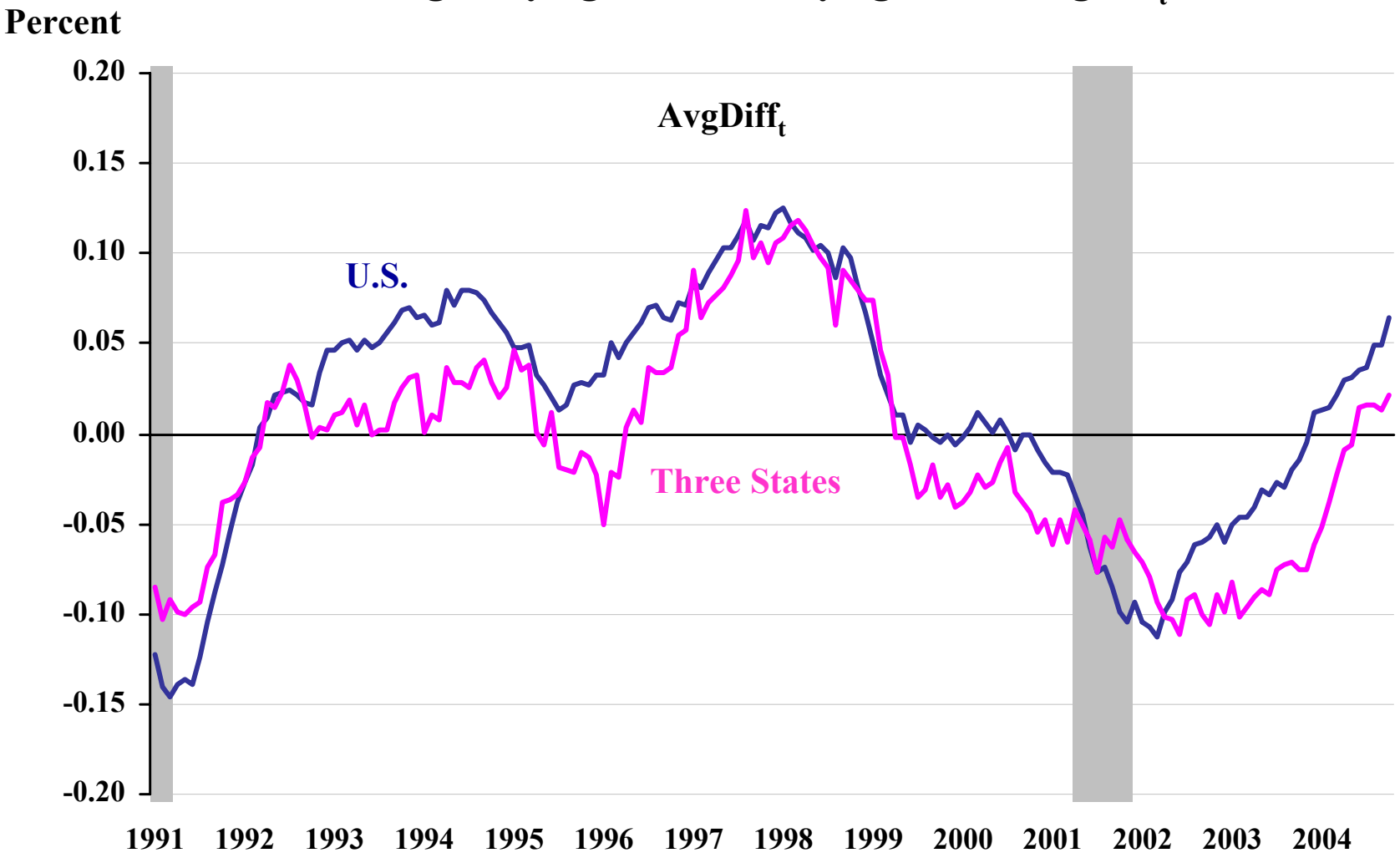


Figure 8A. 12-Month Moving Average Growth in High-Paying and Low-Paying Jobs and the Difference for the Three-State Region

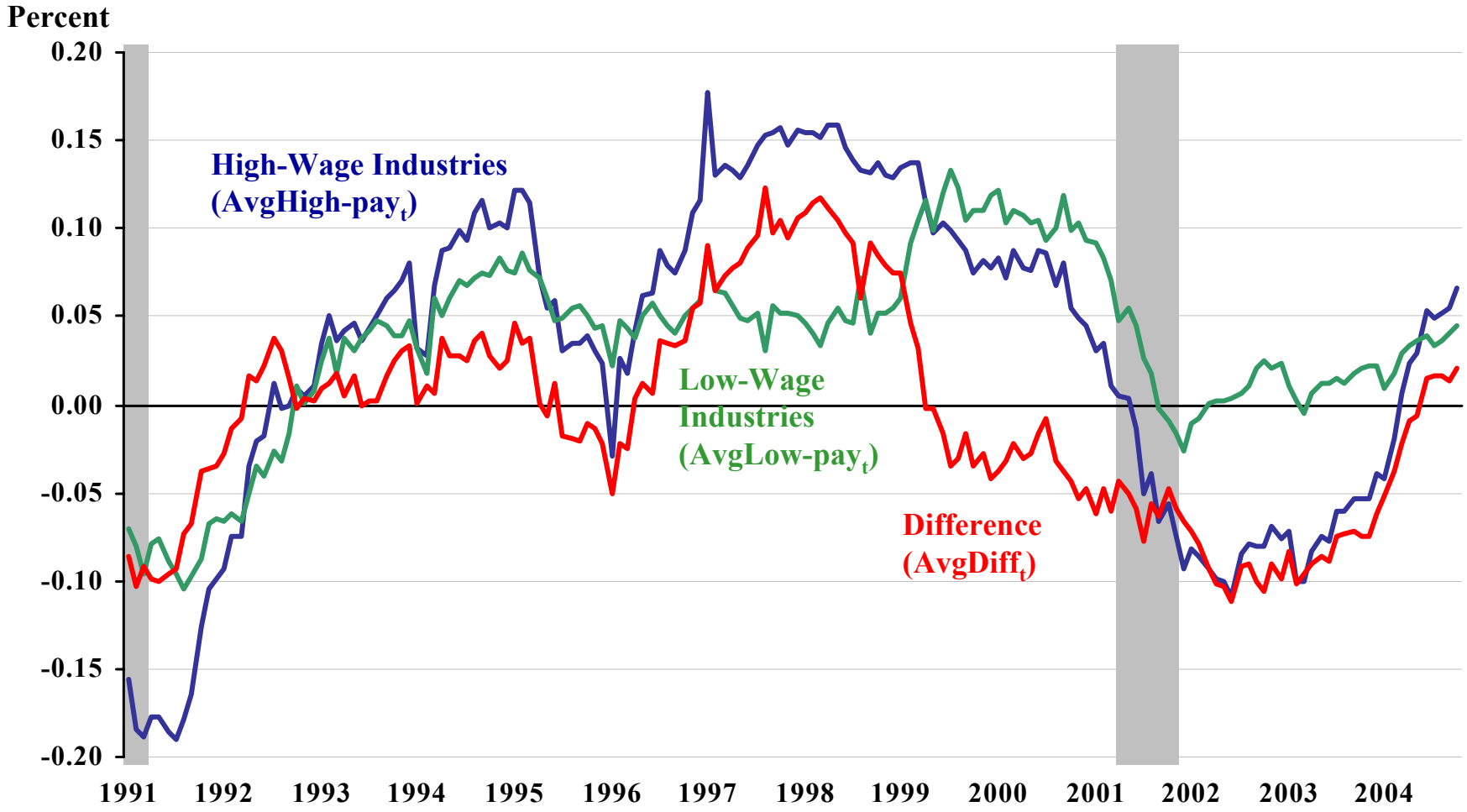


Figure 8B. 12-Month Moving Average Growth in High-Paying and Low-Paying Jobs and the Difference for the Nation

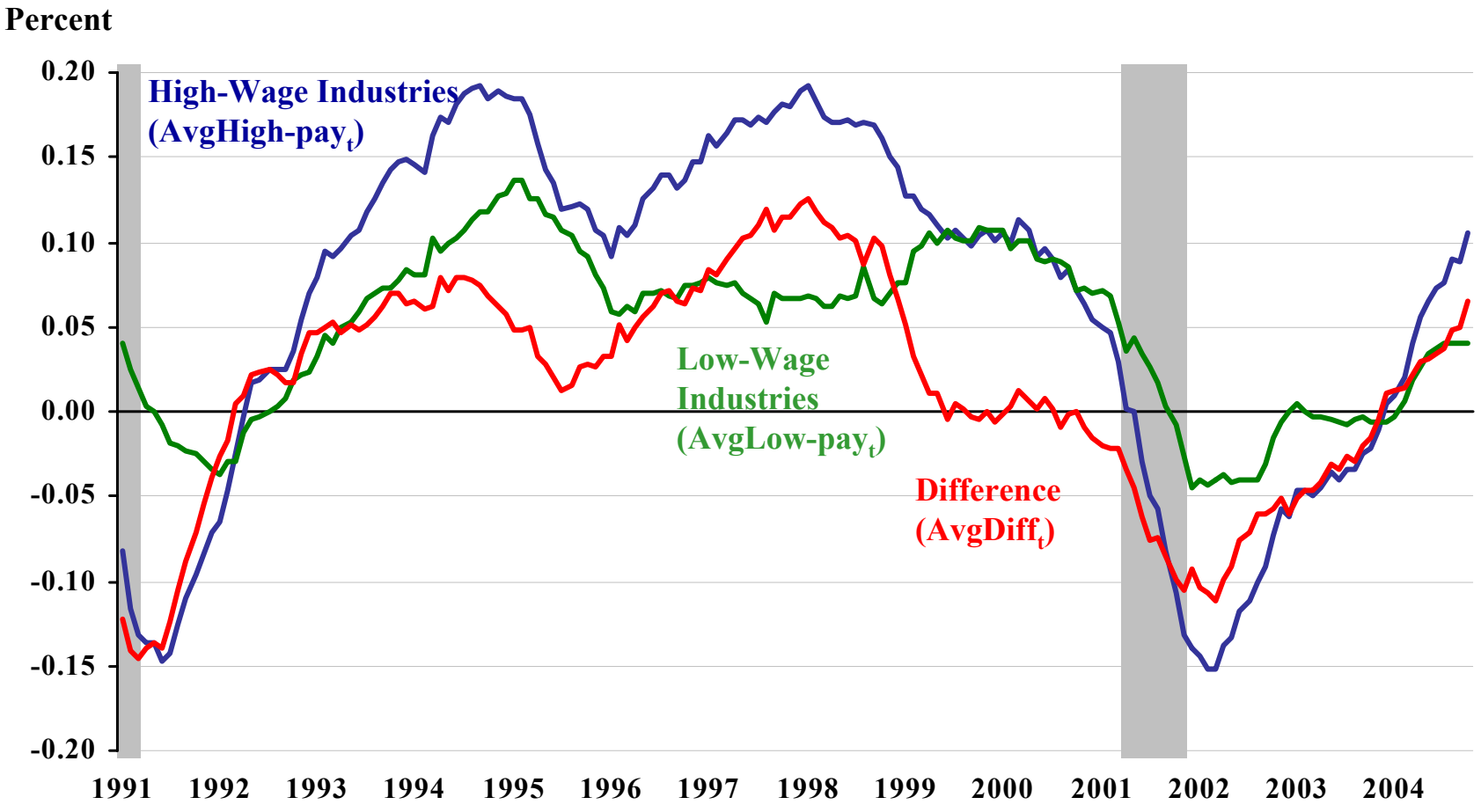


Figure 9A. 12-Month Moving Average Growth in High-Paying and Low-Paying Jobs and the Difference for Pennsylvania

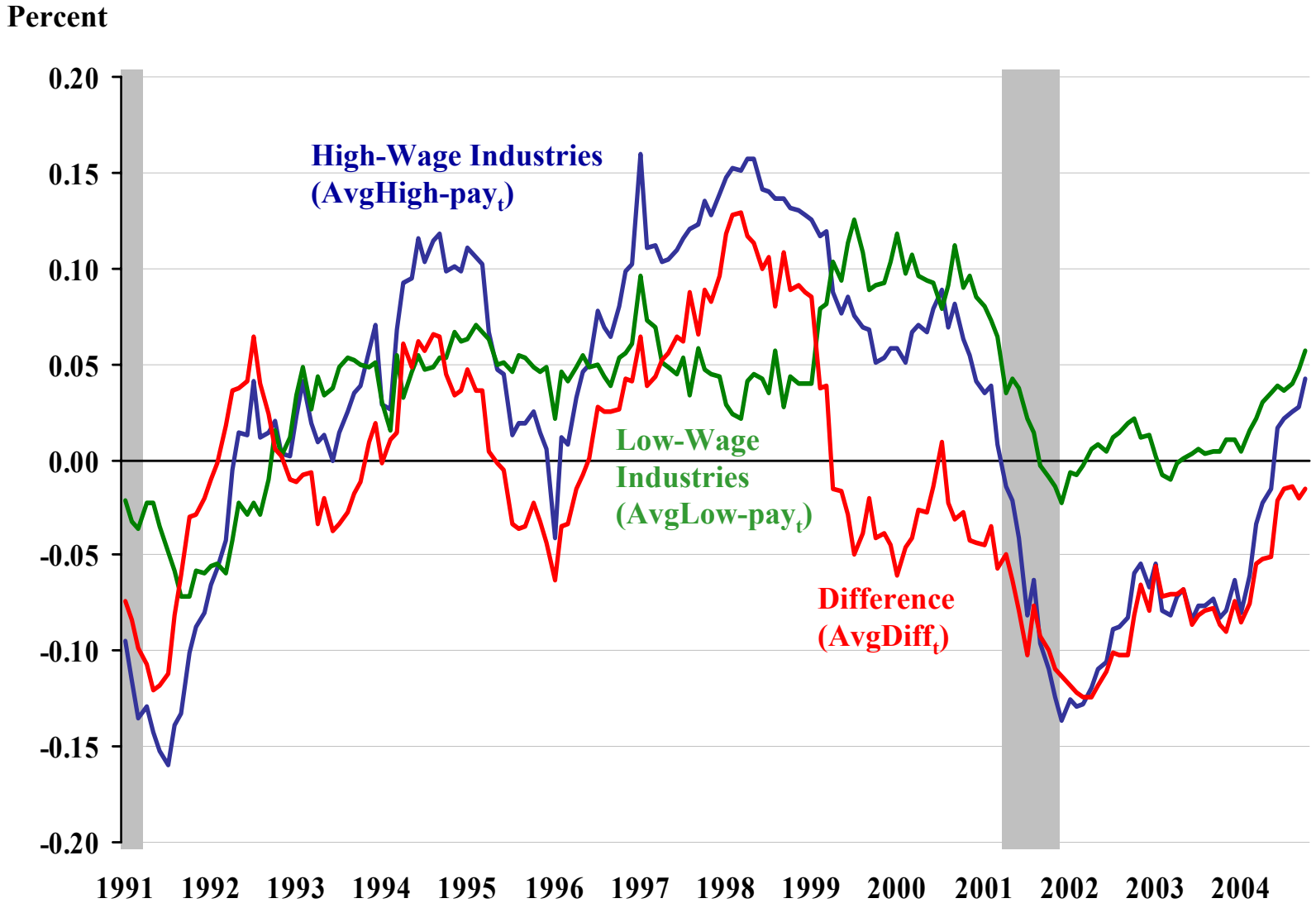


Figure 9B. 12-Month Moving Average Growth in High-Paying and Low-Paying Jobs and the Difference for New Jersey

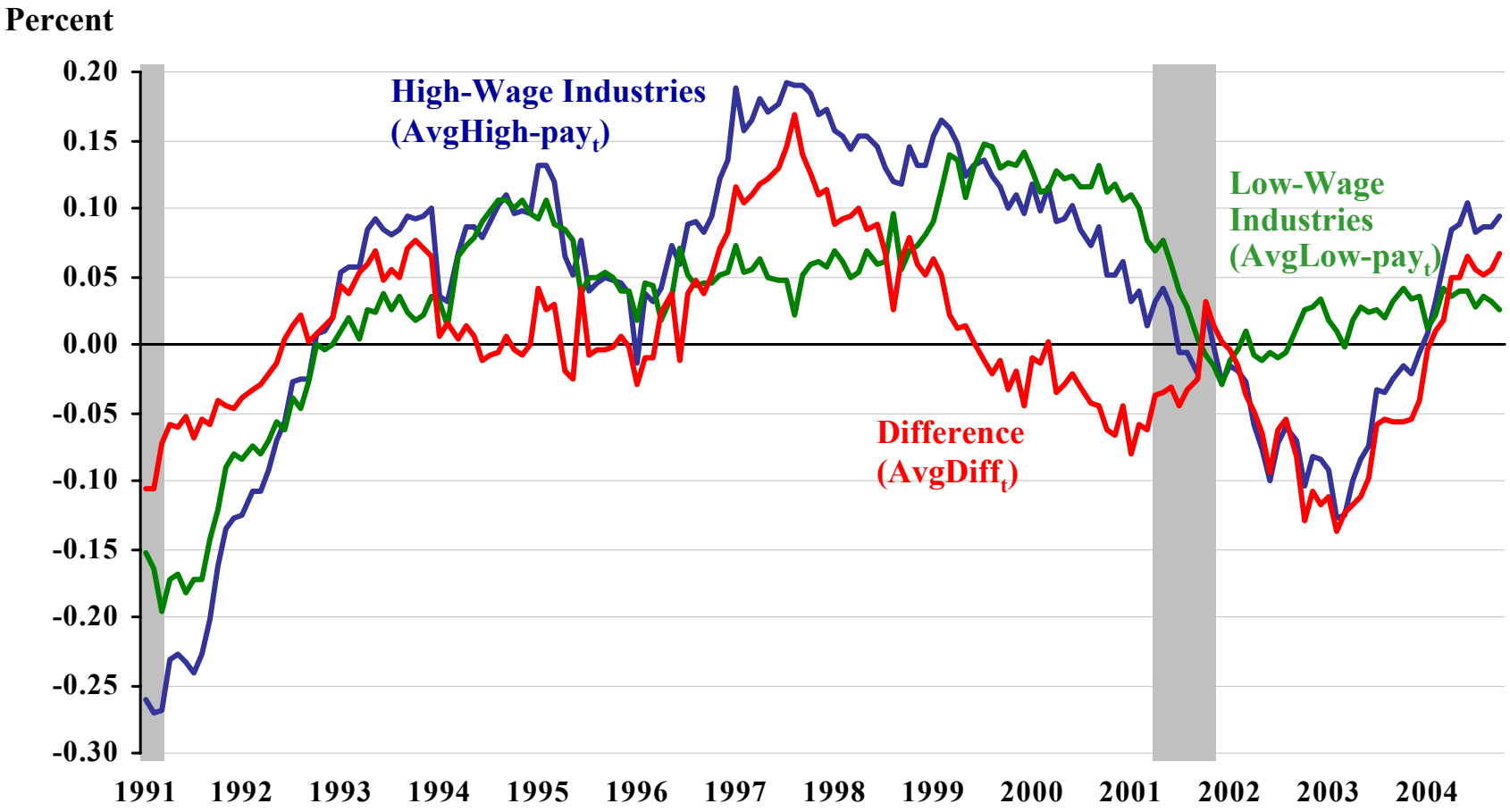


Figure 9C. 12-Month Moving Average Growth in High-Paying and Low-Paying Jobs and the Difference for Delaware