

Washington Wage Report

1990 - 2002

Written by Scott Bailey, Regional Labor Economist



February 2004



**Labor Market and
Economic Analysis Branch**
Greg Weeks, *Director*



For more labor market information, visit our Internet site at:

www.workforceexplorer.com

Revised 06/30/2004

TABLE OF CONTENTS

Executive Summary	3
Introduction	4
Findings, 1990-2002	5
<i>Hourly Earnings</i>	5
<i>Median & Percentile Earning</i>	7
<i>Carving Up the Wage Pie</i>	11
<i>Wages By Size of Employer</i>	14
Industry Data	15
<i>Work Week by Industry</i>	15
<i>Hourly Wages by Industry</i>	16
<i>High-Wage Jobs</i>	18
<i>Better-Than-Average Jobs</i>	34
<i>Jobs Around the Median</i>	34
<i>Low-Wage Jobs</i>	34
<i>Differences by County</i>	34
Individual Trends	36
<i>New Entrants</i>	36
<i>Wage Progression</i>	36
Summary	40
<i>Methodology</i>	40
Technical Appendix	42

Washington Wage Report, 1990 – 2002

Written by Scott Bailey, Regional Labor Economist

Employment Security is an equal opportunity employer and provider of employment and training services. Auxiliary aids and services are available upon request to persons with disabilities.

EXECUTIVE SUMMARY

1. Hourly wages, adjusted for inflation, increased across the board in the state of Washington from 1990 to 2002. The percentage of jobs paying below \$8 per hour fell sharply. The share of jobs paying \$30 per hour or more rose substantially.
2. The median hourly wage, adjusted for inflation, increased from \$14.63 per hour in 1990 to \$16.95 in 2002, a change of 16 percent. The median wage has increased in every year since 1990, except in 1994, including gains of 3.8 percent in 2001 and 1.3 percent in 2002.
3. While wages went up across the board, the increase was much greater at the upper end. The average hourly wage for the lowest-paid 10 percent of jobs rose from \$6.21 to \$7.34, an increase of 18 percent. Wages for the top ten percent of jobs averaged \$47.14 in 1990, and \$70.11 in 2002, a gain of 49 percent. For the best-paid 5 percent of jobs, the average wage grew even more, at 59 percent. However, wages at the top declined over the 2000-2002 period, likely because of a drop-off in stock options.
4. If King County is excluded from the mix, there were still gains across the spectrum. The increase was identical for the lowest decile of jobs, but was smaller for all other deciles. At the median, the gain for 1990-2002 was 13 percent (versus 21 percent for King), and for the highest decile, the average wage rose by 25 percent (versus 71 percent for King).
5. Out of \$95 billion in payroll in 2002, the top 10 percent of jobs garnered almost \$30 billion (31 percent), while the bottom 10 percent of jobs captured \$3.1 billion (3.3 percent).
6. The distribution of wages has grown more unequal over time. In 1990, the 90/10 ratio—the ratio of the average wage of the top 10 percent of jobs to the bottom 10 percent of jobs—was 7.6. The ratio peaked at 12.4 in 2000, before receding to 10.1 in 2002.
7. Large firms pay more on average than small firms.
8. Median hourly wages in 2002 ranged from \$7.53 in limited-service restaurants up to \$38.06 for software publishers.
9. There are also large differences at the county level. In 2002, Okanogan County's median hourly wage was \$10.01 while in King County the median wage was \$18.99.
10. "Full-time" workers (defined as individuals who worked the equivalent of at least three-quarters of the year (1,560 hours or more)) had a median gain of \$0.63 per hour per year in average hourly wages from 1997 to 2002. This was higher than the \$0.37 change during the 1990-1997 period.
11. Out of 850,000 individuals working full-time in both 1997 and 2002, one out of every six had a lower hourly wage in 2002.
12. The median gain for lower-wage workers was smaller than for other workers. Of those who earned below \$8 per hour in 1997, 46 percent were earning less than \$10 per hour in 2002.

Introduction

Each year, the Employment Security Department publishes the average monthly employment, total payroll, and average annual wage for all jobs covered by unemployment insurance¹. The average wage is available by industry and by county, and is often used to gauge the health of the economy. Like all averages, however, it can conceal as much as it reveals. For example, because the average annual wage is not adjusted for part-time workers, changes in the average may be due as much to changes in the average number of hours worked as to changes in the hourly wage. Further, changes in the average give no clue as to how the entire distribution of wages is changing. As is evident from data at the national level, a rising average income has not meant that all income levels have benefited equally.

This study attempts to deal with these two issues by tracking how the distribution of hourly wages has changed over time, specifically the 1990-2002 period.

Exclusions

The Wage Files include all workers at Washington businesses covered by state unemployment insurance. Workers not included: federal employees, self-employed workers, railroad employees, 100 percent commission sales workers (such as most real estate agents and insurance agents), most corporate officers, and casual labor. Coverage was largely unchanged between 1990 and 2002, with one exception: workers employed by private households (NAICS 814), such as nannies, those providing in-home care for the elderly, domestic servants, etc. Reporting requirements changed for these workers in the mid-1990s, and as a result their numbers increased dramatically. Comparisons over time in this report exclude this industry.

¹ Most jobs are covered by unemployment insurance. The major exceptions are the self-employed, 100% commission sales agents (common in insurance and real estate sales), corporate officers, employees of religious organizations, work-study students, elected officials, and casual labor.

Findings, 1990 - 2002

Overview

In 2002, according to published data, covered employment² in the state of Washington averaged over 2.6 million jobs a month, with a total payroll of \$101 billion and an average annual wage of \$38,240 per worker. What these averages do not reveal is the dynamic mix of comings and goings, jobs beginning and ending, workers entering and leaving the workforce.

Analyzing the quarterly wage files gives us a chance to get considerably more detail. For example, the mix of full-time and part-time jobs can be converted to a full-time equivalency (FTE) basis of 40 hours per week and 2,080 hours per year. On an FTE basis, there were 2,021,505 jobs. The average workweek per job was 31.9 hours. The average hourly wage was \$22.61³.

Almost 3.19 million different people worked for employers in the state that year, clocking over 4.2 billion hours (see *Table 1*). Some were employed only briefly; others worked full-time, year-round, or more. Those who worked at least 1,560 hours—the equivalent of working 30 hours or more per week, year-round—came to 48 percent of the total, up from 44 percent in 1990.

Hours Worked	Number	2002 Percent of Total	1990 Percent of Total
520 or less	752,695	24%	26%
521-1040	447,798	14%	15%
1041-1560	469,983	15%	14%
1561-2080	818,768	26%	27%
2081-2600	637,628	20%	16%
More than 2600	62,575	2%	1%
Total	3,189,447	100%	100%

Hourly Earnings

Graph 1 and *Table 2* on the following page show the percent of all jobs falling in different hourly wage ranges for 1990 and 2002. Data were grouped by two-dollar increments, where the \$8 - \$10 range includes all hourly wages from \$8.00 to \$9.99. The highest frequency (mode) was below \$8 in 1990, with 15 percent of all FTE jobs. In 2002, the mode was the \$8 to \$10 per hour range, with 10 percent. The share of jobs decreases as the hourly wage increases. For convenience of presentation, hourly wages at the top of the scale have been grouped into three categories: \$30 - \$40/hour, \$40 - \$50/hour, and \$50/hour and up.

² “Covered” means covered by unemployment insurance, including about 90 percent of the jobs in the state.

³ Total wages in the wage files came to \$96 billion, \$5 billion short of the published total for the state. The difference was due to the absence of federal workers in the state database, and the exclusion of jobs coded to 1000 hours per quarter, which included room and board or other non-wage benefits as part of the working conditions.

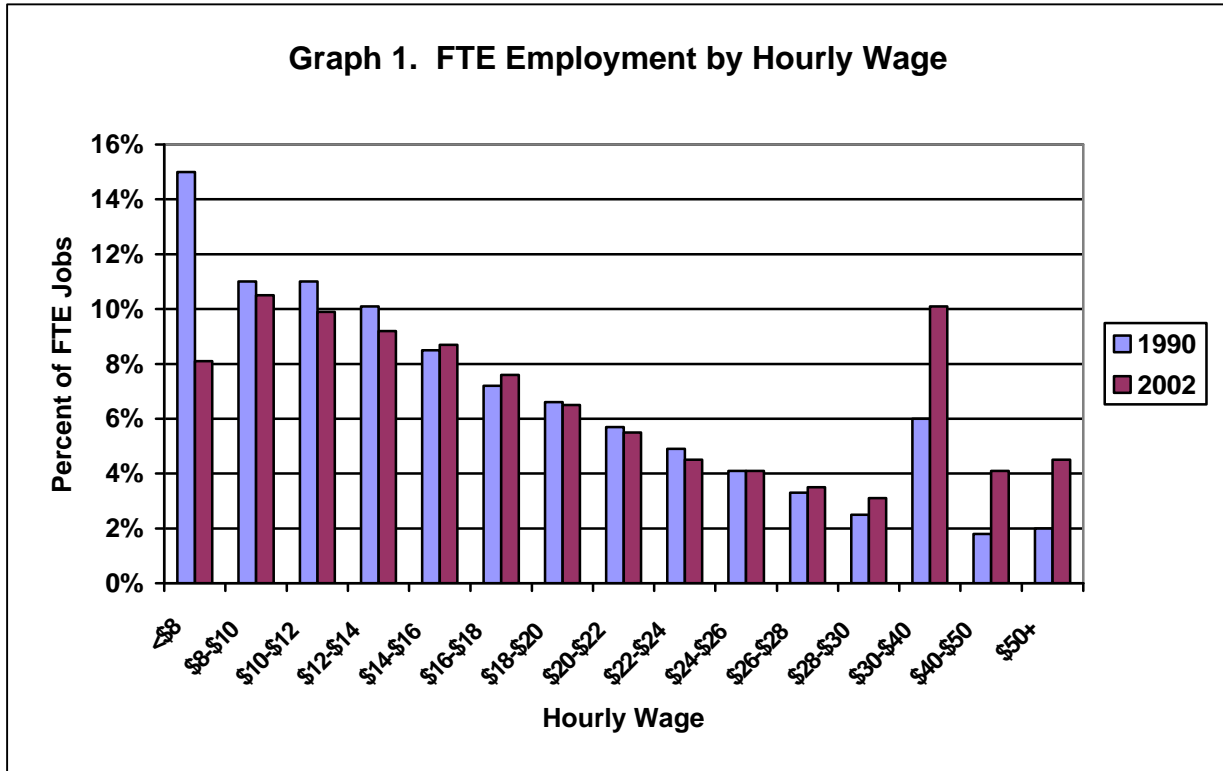


TABLE 2. FTE JOBS BY HOURLY WAGE, STATE TOTAL, 2002

Hourly Wage	Number of FTE Jobs	2002 Percent of Total	1990 Percent of Total
$\leq \\$8.00$	163,145	8%	15%
\$8.00 - \$11.99	411,316	20%	22%
\$12.00 - \$15.99	361,500	18%	19%
\$16.00 - \$23.99	489,550	24%	24%
\$24.00+	595,995	29%	20%
Total	2,021,505	100%	100%

There was clearly a substantial increase in the state’s wage structure over the past dozen years. The percentage of lower-wage jobs fell, while the percentage of higher-wage jobs rose.

As is often the case in analyzing the state’s economy, there was a marked difference between King County and the rest of Washington. *Graph 2* compares King County’s 2002 wage profile with the rest of the state. There is a marked difference between the two areas. As *Table 3* indicates, 38 percent of King County’s jobs paid greater than \$24 per hour in 2002, versus only 23 percent for the rest of the state. While wages rose throughout the state, the improvement was greater in King County.

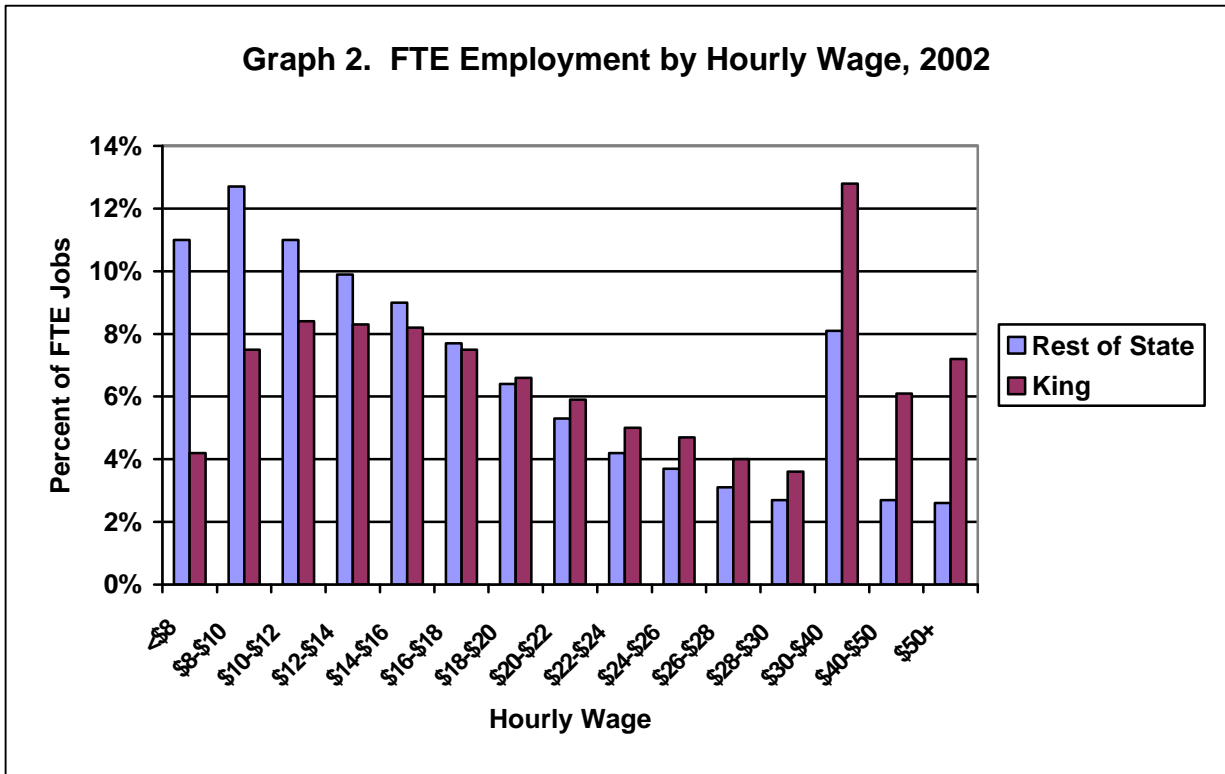


TABLE 3. FTE JOBS BY HOURLY WAGE, 1990-2002

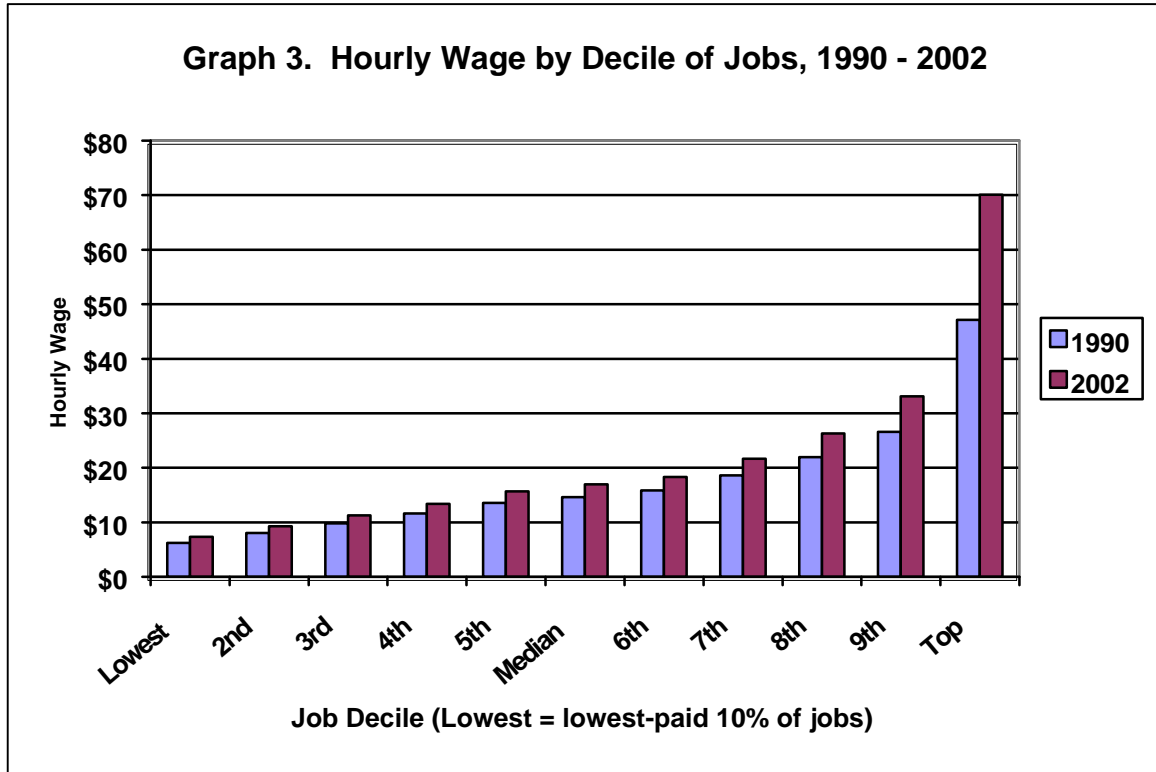
Hourly Wage	King County		Rest of State	
	1990	2002	1990	2002
<\$8.00	9.8%	4.2%	19.4%	11.0%
\$8.00 - \$11.99	20.5%	15.9%	23.4%	23.7%
\$12.00 - \$15.99	18.6%	16.5%	18.6%	18.9%
\$16.00 - \$23.99	26.4%	25.1%	22.8%	23.6%
\$24.00+	24.7%	38.4%	15.9%	22.9%
Total	100.0%	100.0%	100.0%	100.0%

Median and Percentile Earnings

Does a rising tide lift all boats? Or, in the case of wages, does an increase in the average wage mean that workers across the board benefit? The easiest way to answer this question is to calculate percentile wages. The most common percentile wage is the median wage: the wage at which half of all jobs pay more, and half pay less. In the analysis that follows, the job pie was divided into ten parts, with the lowest-paying 10 percent of all jobs falling in the lowest decile, and the highest-paid 10 percent of jobs falling into the top decile, and the median being the dividing line.

Percentile earnings are shown in *Graph 3 and Table 4*. The median wage was \$16.95/hour in 2002, up from \$14.63 in 1990. Jobs in the lowest decile averaged \$7.34, up from \$6.21, while

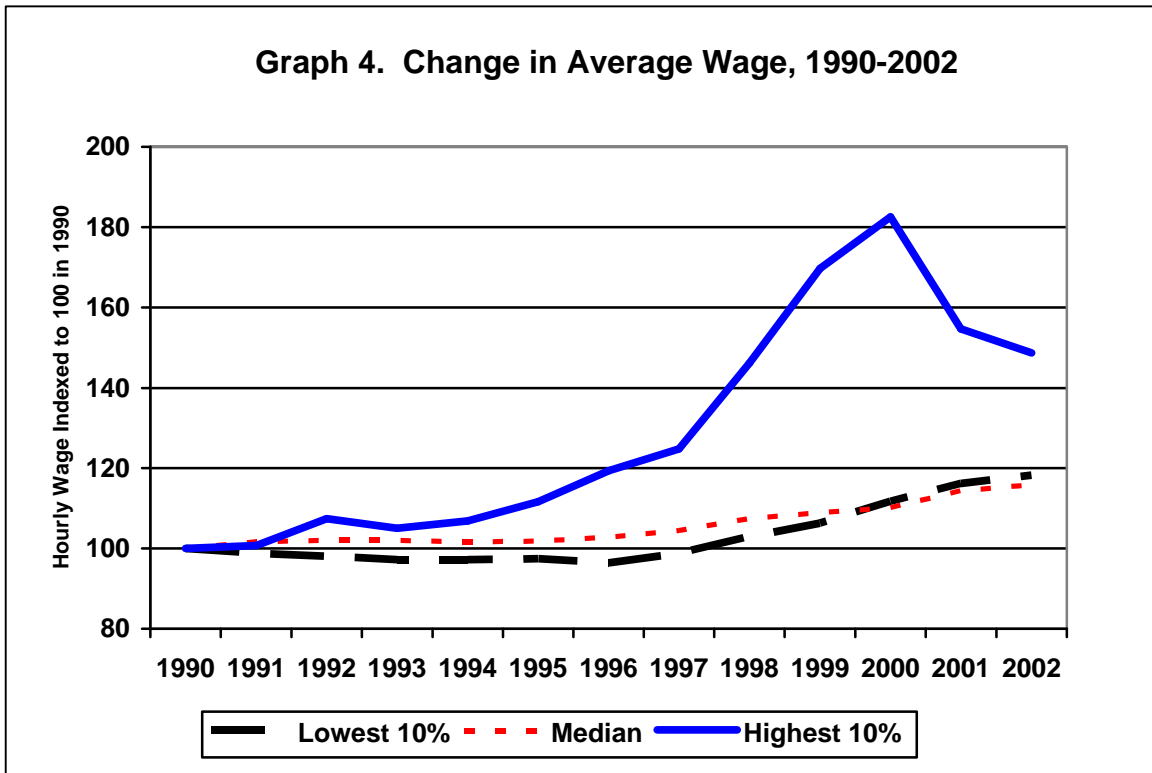
those in the highest decile averaged \$70.11, up from \$47.14. The top five percent of jobs averaged \$98 per hour, and the top one percent \$241 per hour⁴.



Decile wages, and the median wage, rose between 15 percent and 20 percent between 1990 and 2002 for the lower 80 percent of jobs. The 9th decile average moved up by 25 percent. The top decile of jobs had an even larger increase at 49 percent. At a finer level of detail, the average wage for the top five percent of jobs climbed by 59 percent, and in the top percentile, by 91 percent.

The trends at the bottom, middle, and upper end are shown in more detail in *Graph 4* on the next page. The average wage for the bottom decile actually declined through 1996, before increasing in 1997 as the labor market tightened. In subsequent years, the minimum wage was increased and indexed to inflation, pushing up wages in the lowest decile. The median wage rose slowly through 1996, gaining only 3 percent over the period, before steadily increasing through 2002. Wages at the upper end followed a completely different trend, rising with a burst at the beginning of the 1990s, stagnating in 1993 and 1994, and then booming with the stock market. The average has fallen over the past two years, however, with the drop in asset prices.

⁴ There were a number of high-paying “jobs” that were actually individuals cashing in stock options, so the hourly wage starts to lose its meaning in this rarefied atmosphere.



To calculate whether “the poor are getting poorer,” or more precisely, if low-wage jobs are paying any more over time, we can compare the 10th percentile wage in different years. To determine whether the gap between high-wage jobs and low-wage jobs is increasing, we can look at three ratios:

- The 90/10 ratio, numerically, equals the average wage for the top decile divided by the average wage of the bottom decile wage, and measures the span between top and bottom.
- The 90/50 ratio measures the gap between the top decile wage and the median.
- The 50/10 ratio similarly measures the gap between the median hourly wage and the bottom decile.

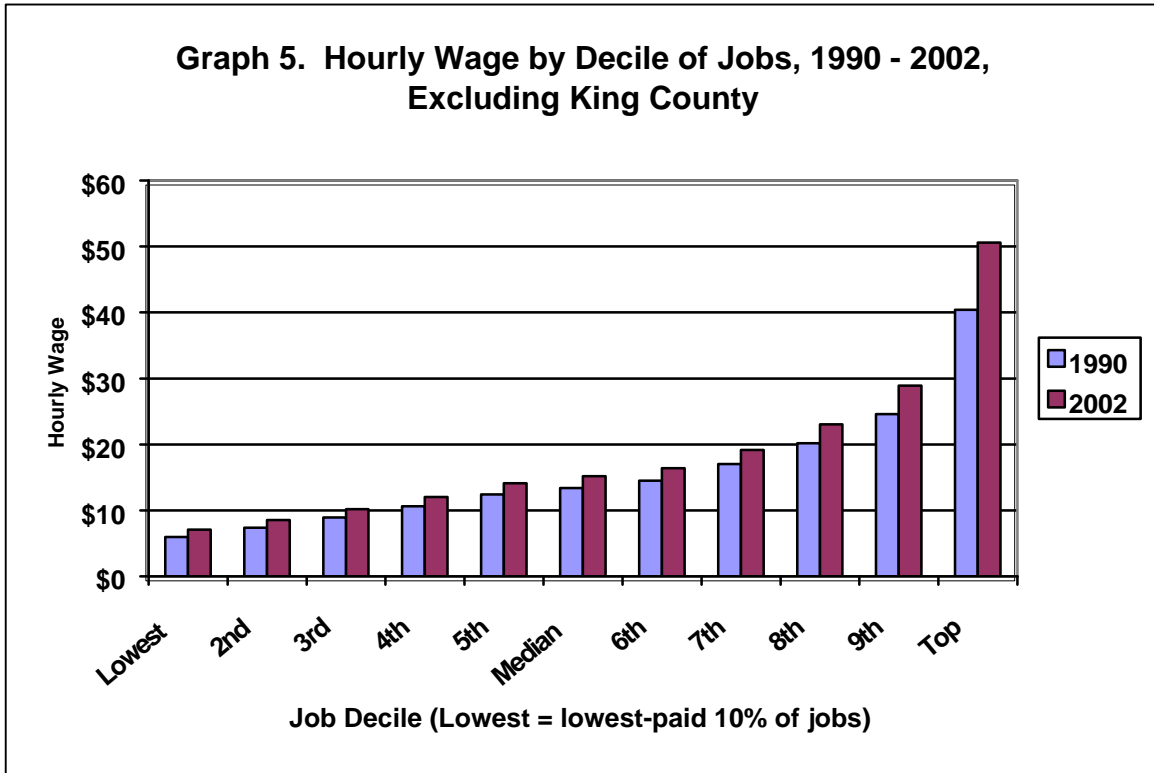
Following these three ratios over time allows a precise measurement of whether hourly wages are becoming more or less widely dispersed.

In 1990, the 90/10 ratio was 7.6, the 90/50 ratio was 3.2, and the 50/10 ratio was 2.4. That is, the average wage for the top decile paid 7.6 times the average for the bottom decile, and paid 3.2 times the median wage. By 2000, the ratios had changed to 12.4, 5.3, and 2.3. This means that the spread between the top decile and the bottom decile increased significantly. The same was true about the spread between the top decile and the median. However, the gap between the median and the lower decile closed slightly. By 2002, however, the gaps with the top had closed somewhat, to 9.6 for the 90/10 and 4.1 for the 90/50. The 50/10 remained at 2.3.

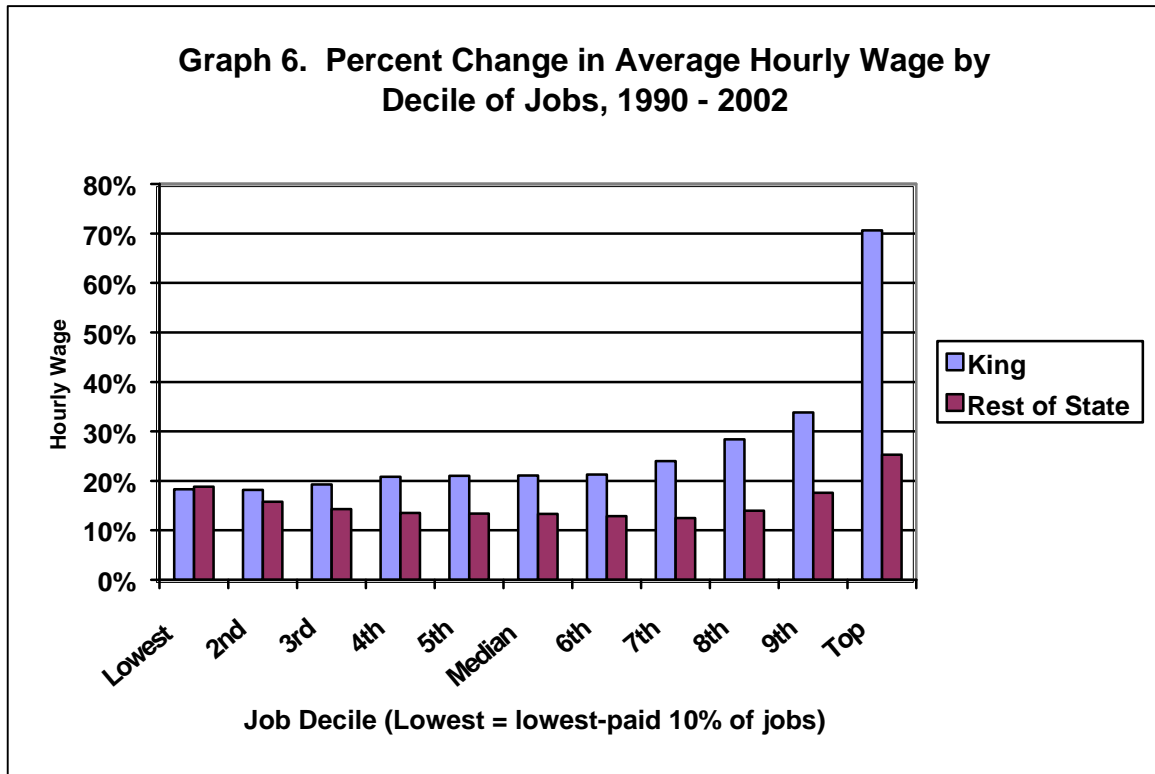
In summary, then, while all boats were lifted with the tide, some were lifted higher than others. Mid-level jobs rose the least; lower-wage jobs rose a bit more, due to the inflation-indexed increase in the minimum wage. Higher-wage jobs rose the most, especially at the very top, through the average wage dropped with the stock market. The “top,” however, still does not include corporate officers, who are given the option of exempting themselves from unemployment

insurance coverage and are often the highest-paid employees in a corporation. Other studies have shown dramatic increases in CEO, even through the recession.

Breaking out King County leads to different, but not dissimilar, results. Wages in non-King counties rose across the board, just as in the state as a whole, as shown in *Graph 5*.



The average wage for the bottom decile of jobs climbed by 18 percent, identical to King County, and to the state (see *Graph 6*). Wages at the median, however, were higher by 13 percent, less than the 21 percent increase in King and the 15 percent gain for all counties. The average wage for the top decile of jobs also went up at a slower rate: 25 percent for non-King counties versus 71 percent for King (and 49 percent for all counties). Thus, the gap between the top and bottom job tiers increased outside of King County, but not to the same degree; and the gap between the bottom and the median widened in King County, but closed outside of King.



Carving Up the Wage Pie

From a different angle, one can think of the total payroll as a wage “pie,” and compare the size of the slices served for jobs as the hourly wage increased (see *Graph 7*). Out of over \$96 billion in wages, \$3 billion (3 percent of the total) were paid to the 10 percent representing the lowest-hourly wage jobs, and \$4 billion (4 percent) to the next lowest decile. Meanwhile, \$30 billion (33 percent) accrued to the highest-paid decile of jobs. Again, corporate officers were not in the database, so the many of the highest-paid positions in the private sector were not part of the analysis. By comparison, in 1990, the top ten percent of jobs garnered 26 percent of total covered payroll. All deciles lost share from 1990 to 2002, except for the top.

Graphs 7. Share of the Wage Pie by Deciles, 2002

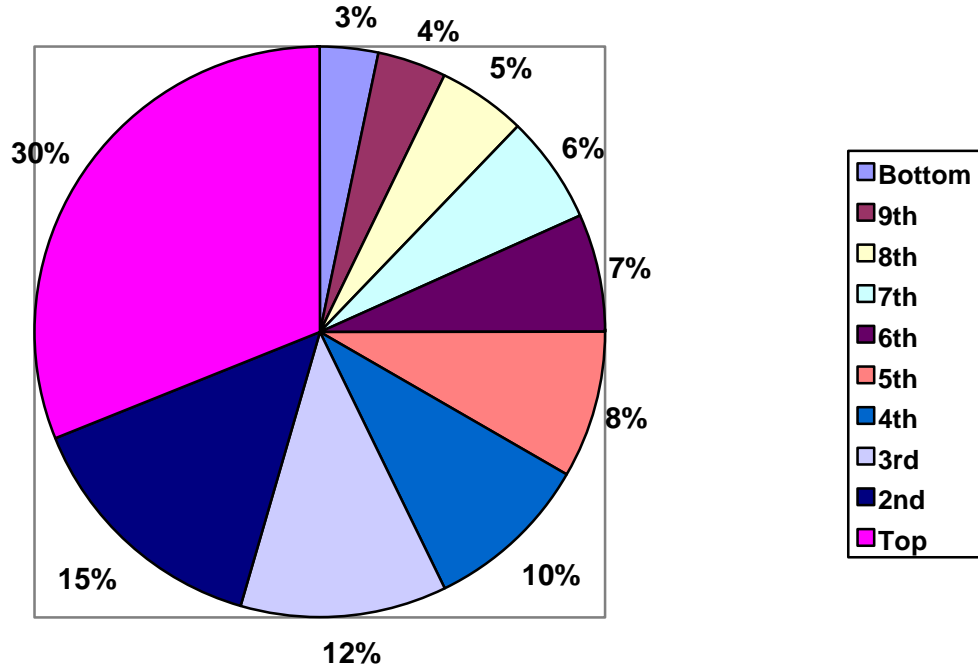
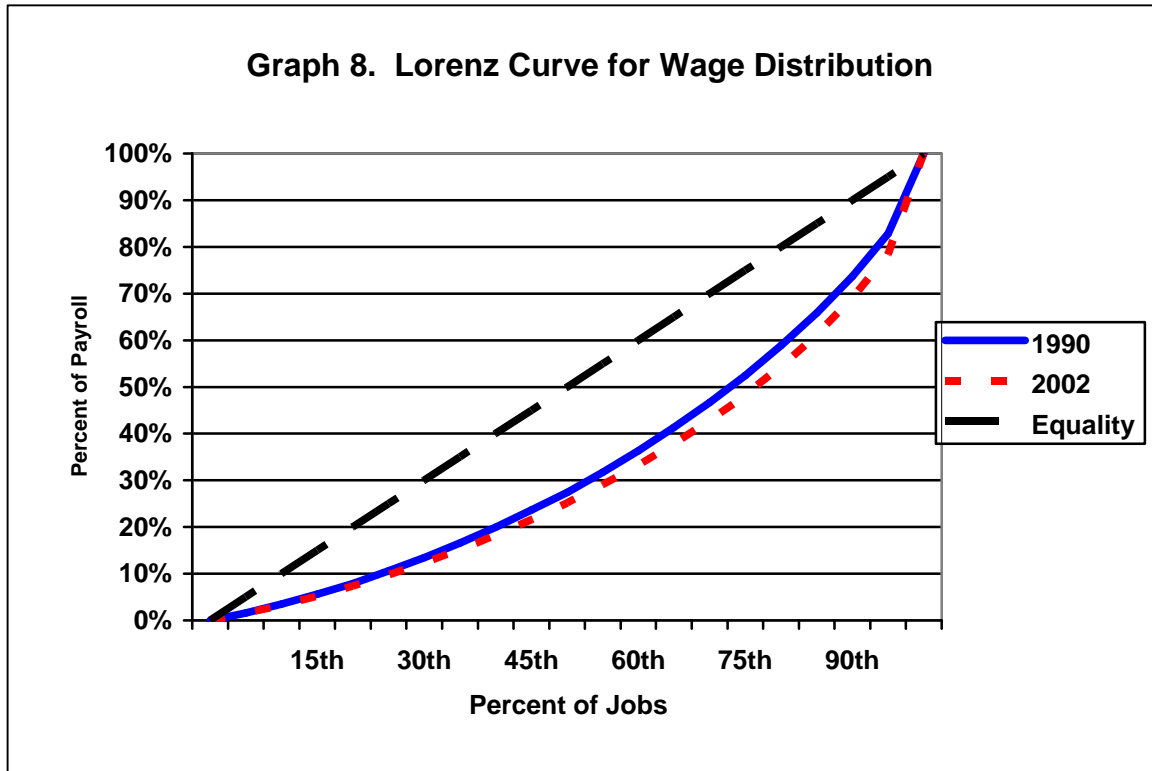


TABLE 4. WAGE DATA BY PERCENTILE OF FTE JOBS

FTE Jobs by Hourly Wage	Average Hourly Wage			Share of Total Payroll		
	1990	2002	Change	1990	2002	Change
Bottom 10%	\$6.12	\$7.11	16%	3.5%	3.2%	-0.3%
Next 10%	\$7.91	\$9.07	15%	4.5%	4.1%	-0.4%
Next 10%	\$9.67	\$11.00	14%	5.5%	4.9%	-0.6%
Next 10%	\$11.46	\$13.04	14%	6.4%	5.8%	-0.7%
Next 10%	\$13.36	\$15.26	14%	7.6%	6.8%	-0.7%
Median	\$14.43	\$16.46	14%	NA	NA	NA
Next 10%	\$15.64	\$17.79	14%	8.9%	8.0%	-0.9%
Next 10%	\$18.38	\$20.97	14%	10.4%	9.4%	-1.0%
Next 10%	\$21.65	\$25.34	17%	12.2%	11.4%	-0.9%
Next 10%	\$26.20	\$31.62	21%	14.8%	14.2%	-0.6%
Top 10%	\$46.50	\$71.80	54%	26.3%	32.2%	5.9%
Top 5%	\$61.57	\$97.99	59%	17.2%	21.2%	23%
Top 1%	\$126.07	\$241.35	91%			
90-10 Ratio	7.6	9.6	26%			
90-50 Ratio	3.2	4.1	28%			
50-10 Ratio	2.4	2.3	-2%			

A graph of a Lorenz curve is displayed below in *Graph 8*. In a Lorenz curve, a perfectly equal distribution would be a straight line at a 45-degree angle, as shown by the black line. The further away from the line, the more unequal the distribution becomes. Clearly, wage distribution in the state has grown more unequal over the decade, especially in the upper brackets.



Wages by Size of Employer

For the most part, larger employers pay higher wages than smaller employers. *Table 5* shows that the median hourly wage for small (less than 20 employees) firms was \$13.85, about 70 percent of the median wage for firms with 1,000 or more employees. Moving up by decile, the data indicates that larger firms pay higher wages across the entire spectrum.⁵

Decile of FTE Jobs	Average Annual Employment of Employer						
	0-19	20-49	50-99	100-249	250-499	500-999	1000+
Bottom 10%	\$6.63	\$6.80	\$6.92	\$6.94	\$7.06	\$6.94	\$7.41
Next 10%	\$8.09	\$8.28	\$8.63	\$8.88	\$9.15	\$9.22	\$10.31
Next 10%	\$9.55	\$9.81	\$10.24	\$10.62	\$10.98	\$11.16	\$12.77
Next 10%	\$11.07	\$11.57	\$12.07	\$12.51	\$12.94	\$13.14	\$15.25
Next 10%	\$12.85	\$13.57	\$14.16	\$14.64	\$15.06	\$15.23	\$17.98
Median	\$13.85	\$14.66	\$15.27	\$15.78	\$16.24	\$16.38	\$19.51
Next 10%	\$14.90	\$15.81	\$16.49	\$17.03	\$17.49	\$17.69	\$21.14
Next 10%	\$17.25	\$18.48	\$19.24	\$20.02	\$20.45	\$20.71	\$24.91
Next 10%	\$20.44	\$22.16	\$23.10	\$24.16	\$24.60	\$24.66	\$29.22
Next 10%	\$26.24	\$28.15	\$29.27	\$30.55	\$31.09	\$30.53	\$34.92
Top 10%	\$55.99	\$57.64	\$60.75	\$63.75	\$63.68	\$64.89	\$92.51

⁵ The distribution of firms and employment by size class differs by industry. The largest size class, for example, has a disproportionately higher percentage of high-wage industries such as manufacturing and information, but a lower than average share of construction. The largest firms include a relatively high number of retailers, but low numbers from the food and accommodations industry.

Industry Data

Work Week by Industry

An average workweek can be calculated for each industry based on the number of hours worked for each job. The average will vary by industry according to the number of part-time jobs, the number of short-term jobs, the amount of seasonal work, the amount of turnover, and the amount of overtime in each industry. *Table 6* illustrates the range of values.

TABLE 6. AVERAGE WORK WEEK FOR SELECTED INDUSTRIES, 2002			
Industry	NAICS⁶	FTE Jobs	Average Workweek
Seafood Processing	3117	6,760	42.5
Semiconductor and Other Electronic Component Manufacturing	3344	7,418	40.9
Fishing, Hunting and Trapping	114	1,970	40.6
Paper Manufacturing	322	13,299	40.3
Water Transportation	483	3,034	39.9
Average, all industries		2,021,505	31.9
Sporting Goods, Hobby, Book, and Music Stores	451	10,439	23.4
Limited-Service Eating Places	7222	40,302	21.9
Performing Arts, Spectator Sports, and Related Industries	711	4,364	21.8
Amusement, Gambling, and Recreation Industries	713	16,474	21.5
Motion Picture and Sound Recording Industries	512	2,344	20.0

⁶ North American Industry Classification System

Hourly Wages by Industry

Wages vary greatly by industry, due to factors such as occupational makeup, unionization, and size of employer.

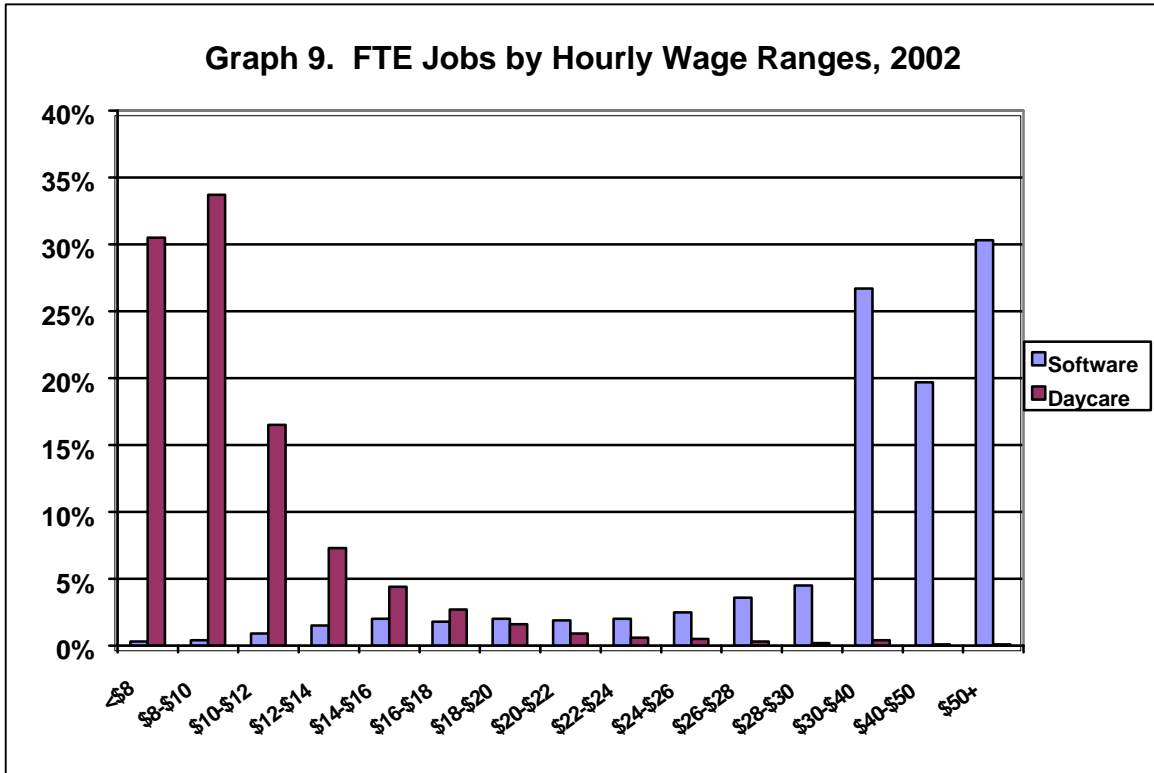
Median wages for assorted industries are shown in *Table 7* below. The median for all jobs was \$16.95 per hour. Industry medians ranged from \$7.53 per hour in limited-service eating places (fast-food outlets, coffee shops, etc.) up to \$38.06 per hour in software publishers. Five of the top ten industries are related to computers, the Internet, and telecommunications. Aerospace, its largest constituent, and petroleum refining, a relatively small segment, represented manufacturing. Utilities, scientific research & development, and waste management & remediation also made the top ten list. Lower-wage industries included two entries from agriculture (crops and reforestation), and three from the food & accommodations industry. Apparel manufacturing, day care, and gas stations also made the bottom ten, as did the motion picture industry, which includes movie theaters (but not video rental).

Industry	NAICS	FTE	Median
Software Publishers	5112	35,556	\$39.99
Publishing Industries	511	45,326	\$35.65
Aerospace Product and Parts Manufacturing	3364	70,668	\$34.25
Internet publishing and broadcasting	516	1,098	\$31.47
Computer Systems Design and Related Services	5415	20,239	\$31.26
Scientific Research and Development Services	5417	13,371	\$28.35
Petroleum and Coal Products Manufacturing	324	2,372	\$26.87
Utilities	22	3,752	\$26.84
Waste Management and Remediation Services	562	11,900	\$26.66
Pharmaceuticals	3254	2,349	\$26.07
Total, all industries		2,021,505	\$16.95
Full-Service Restaurants	7221	49,251	\$10.13
Other Food Services and Drinking Places ⁷	7223-4	9,509	\$10.01
Sporting Goods, Hobby, Book, and Music Stores	451	10,439	\$9.71
Accommodation	721	19,255	\$9.63
Motion Picture and Sound Recording Industries	512	2,344	\$9.11
Child Day Care Services	6244	9,800	\$9.00
Support Activities for Agriculture and Forestry	115	10,464	\$8.67
Gasoline Stations	447	10,155	\$8.26
Crop Production	111	36,724	\$8.11
Limited-Service Eating Places	7222	40,302	\$7.75

From a different angle, *Graph 9* contrasts wages in the software publishing industry (NAICS 5112) and the daycare industry (NAICS 6244). Almost a third of the daycare jobs paid below \$8 per hour, and two-thirds were below \$10 per hour. In software publishing, three-fourths of the jobs paid above \$30 per hour, and 30 percent topped \$50 per hour.

⁷ Includes food service contractors, catering, mobile food services, and taverns/bars.

The hourly wage profile for selected industries in 2002 are shown next (*Graphs 10-45*), compared with the state as a whole. Note that the left-hand scale is different for each graph, due to the wide diversity of profiles. The more divergent from the state average, the higher the scale will go, to accommodate higher percentages of high-wage or low-wage jobs, depending upon the industry. Data for all 99 industries is listed in tables in the appendix.

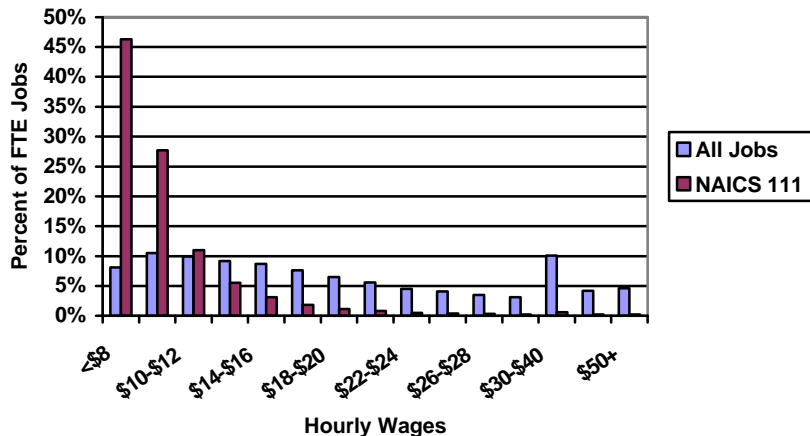


High-Wage Jobs (Paying Above \$30 Per Hour)

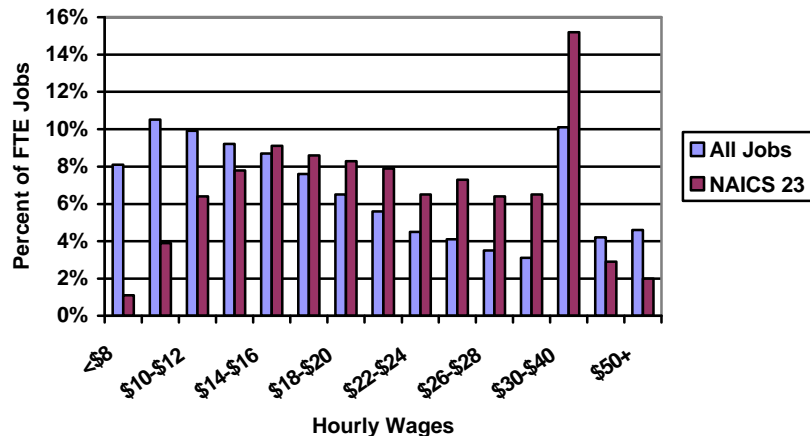
About 380,000 jobs paid \$30.00 per hour or more in 2002—19 percent of the total. As shown in *Table 8*, page 25, one out of five of these jobs was in manufacturing. Over 47,000 high-wage jobs—12 percent of the total—were in aerospace. The second major source of high-wage jobs was local government, with more than 52,000. These were split almost equally between K-12 public education and other local agencies. The information industry was the third largest provider of high-wage jobs, with almost 41,000 in all. Software publishers and telecom accounted for the lion's share. These industries all had higher than average concentrations of high-wage jobs, led by software publishers: 77 percent of the jobs in that industry paid \$30 per hour or more. In contrast, only 2 percent of jobs in accommodations & food services were in this category. Other sectors with few high-wage jobs: agriculture (3 percent), arts, entertainment & recreation (7 percent), and retail trade (8 percent). Crop production, gas stations, food services, and daycare all had 1 percent of their employment in high-wage jobs.

Besides software publishers, industries with high concentrations of high-wage jobs included aerospace (67 percent), Internet publishing & broadcasting (54 percent), computer systems design (53 percent), research & development (47 percent), pharmaceuticals (44 percent), and wireless telecom carriers (40 percent). These and other industries listed in *Table 8* had large numbers of highly skilled workers such as engineers, machinists, and computer programmers, sometimes in a unionized environment.

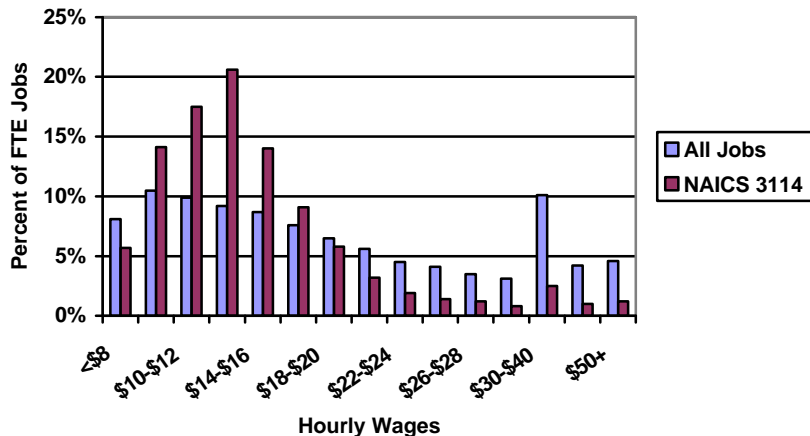
**Graph 10. FTE Jobs by Hourly Wages
Crop Production (NAICS 111)**



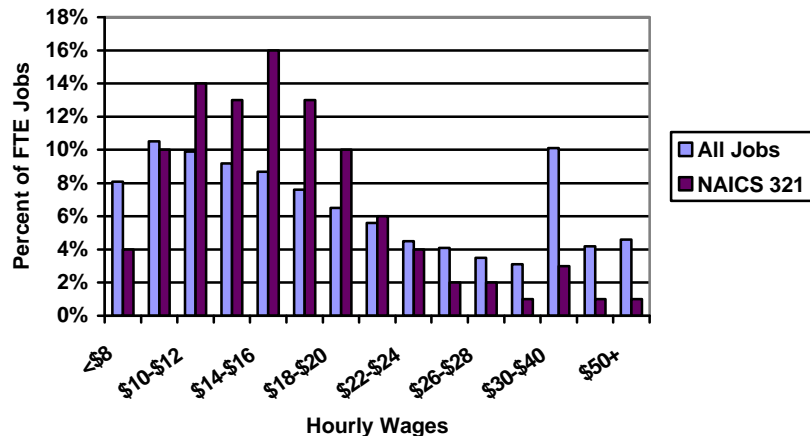
**Graph 11. FTE Jobs by Hourly Wages
Construction (NAICS 23)**



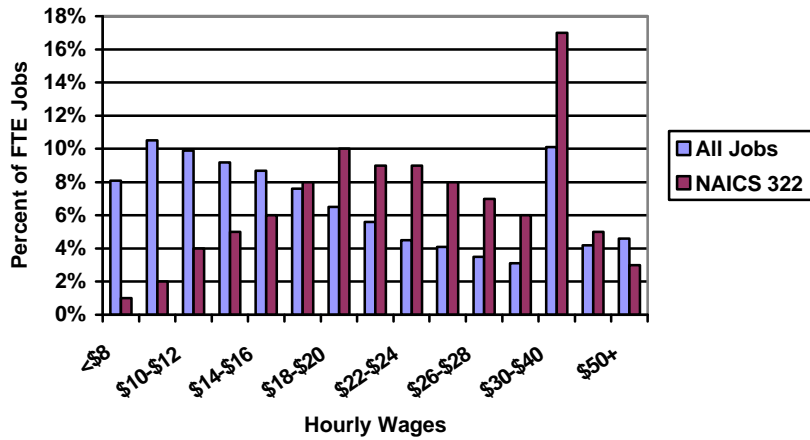
**Graph 12. FTE Jobs by Hourly Wages
Fruit & Vegetable Processing (NAICS 3114)**



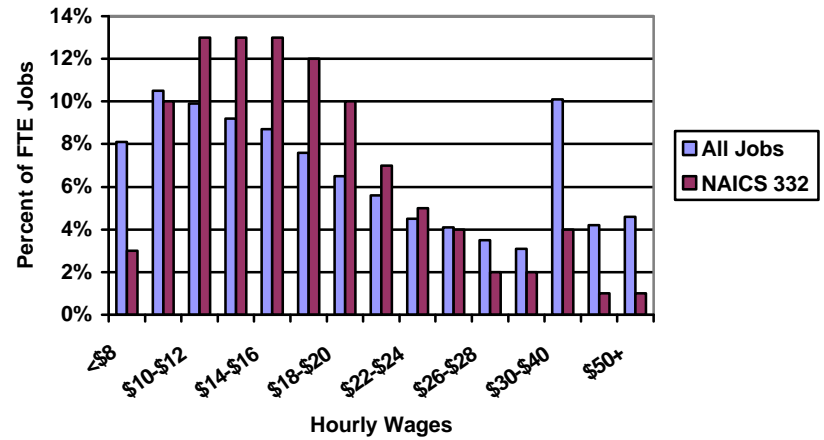
**Graph 13. FTE Jobs by Hourly Wages
Wood Products (NAICS 321)**



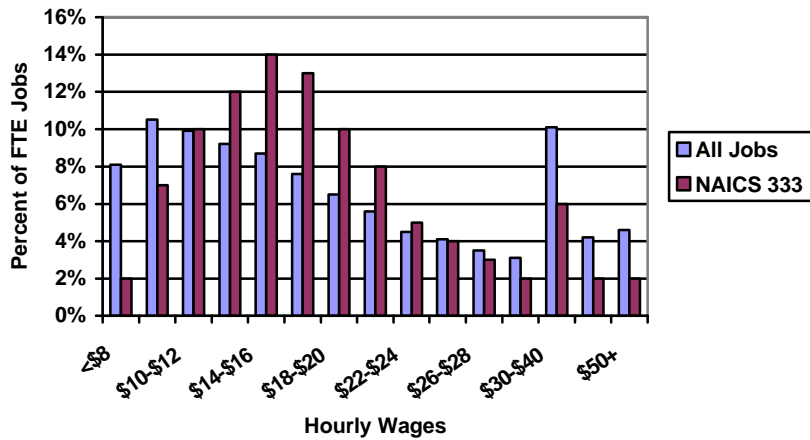
**Graph 14. FTE Jobs by Hourly Wages
Paper Products (NAICS 322)**



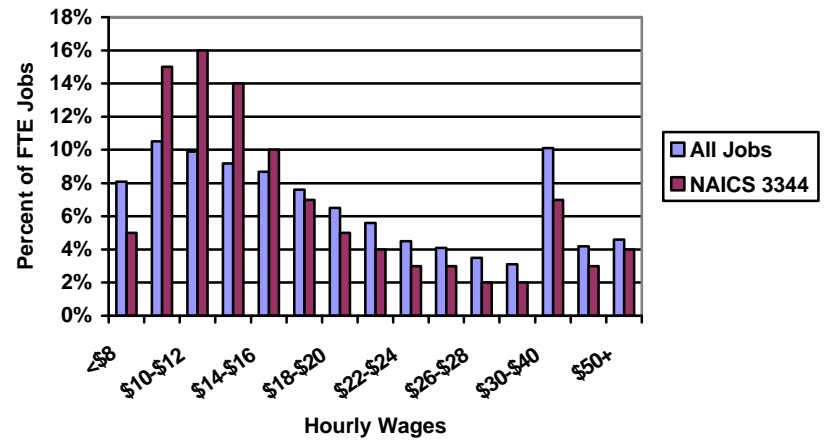
**Graph 15. FTE Jobs by Hourly Wages
Fabricated Metals (NAICS 332)**



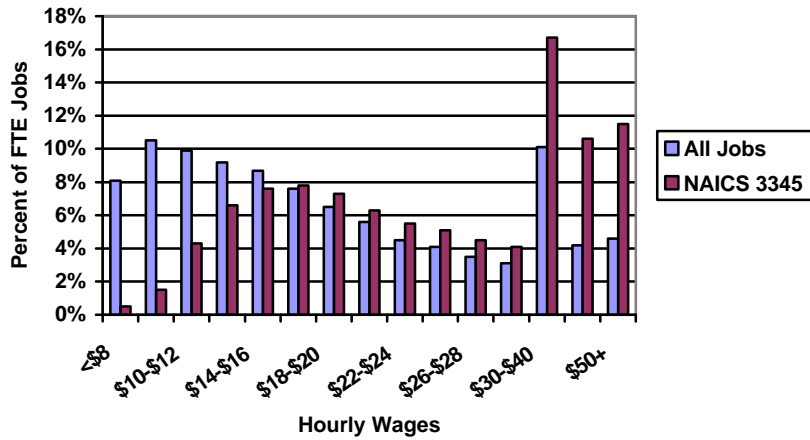
**Graph 16. FTE Jobs by Hourly Wages
Machinery (NAICS 333)**



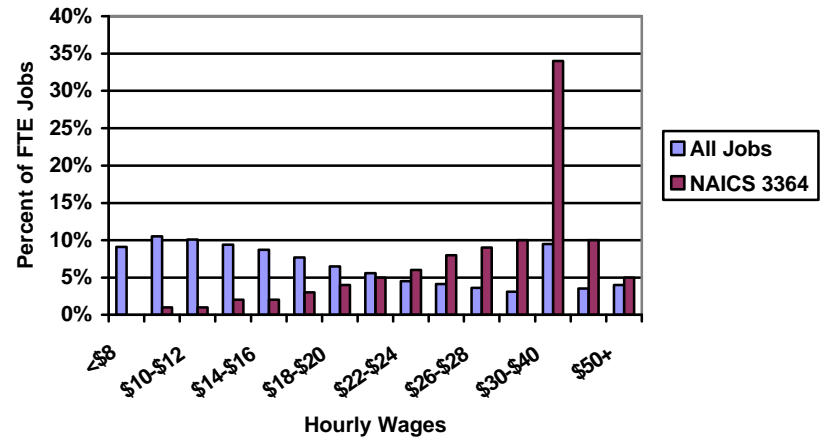
**Graph 17. FTE Jobs by Hourly Wages
Semiconductors (NAICS 3344)**



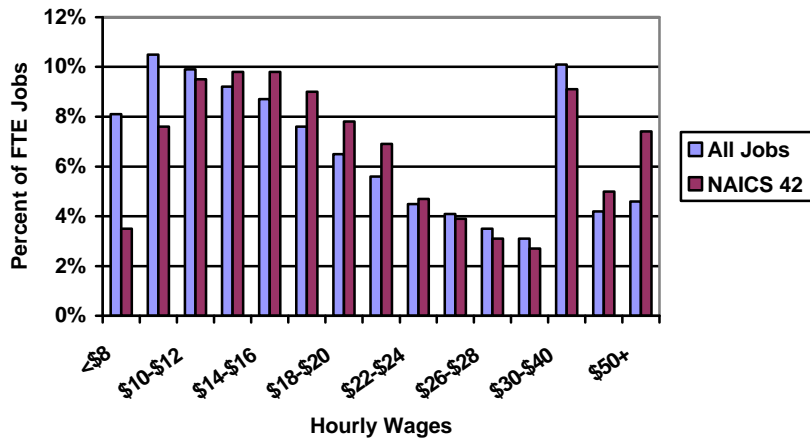
**Graph 18. FTE Jobs by Hourly Wages
Instruments (NAICS 3345)**



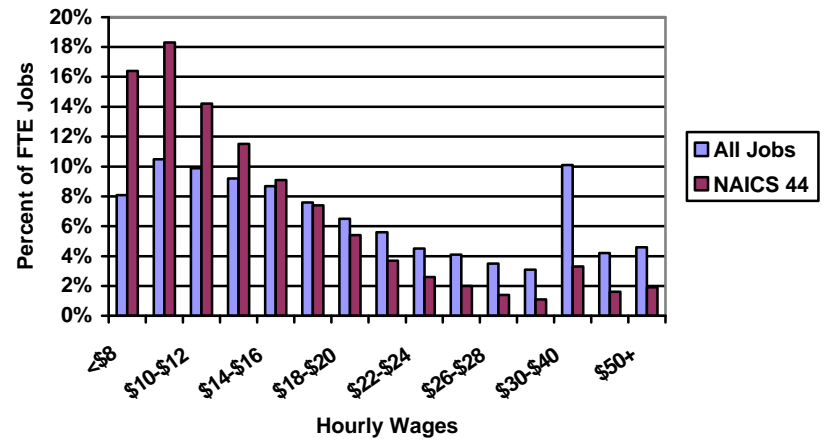
**Graph 19. FTE Jobs by Hourly Wages
Aerospace (NAICS 3364)**



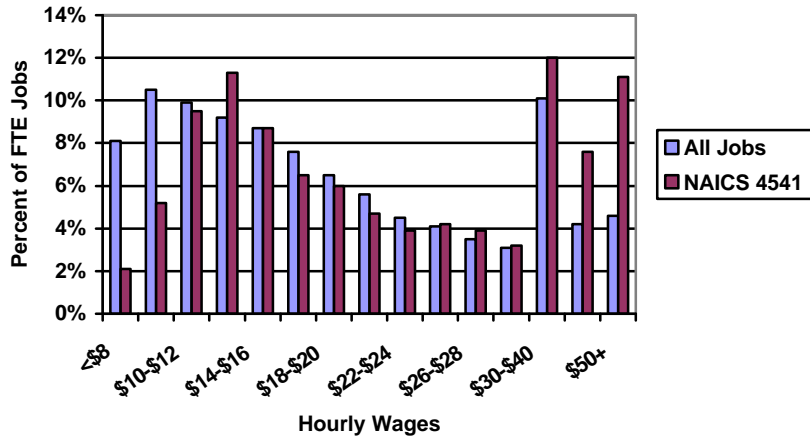
**Graph 20. FTE Jobs by Hourly Wages
Wholesale Trade (NAICS 42)**



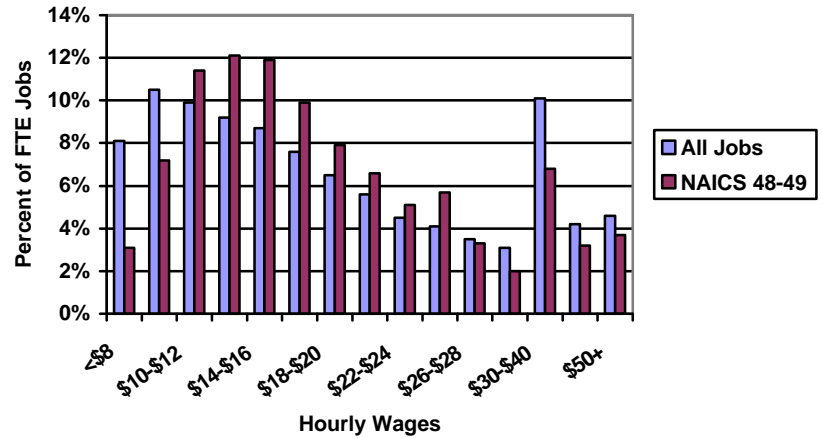
**Graph 21. FTE Jobs by Hourly Wages
Retail Trade (NAICS 44)**



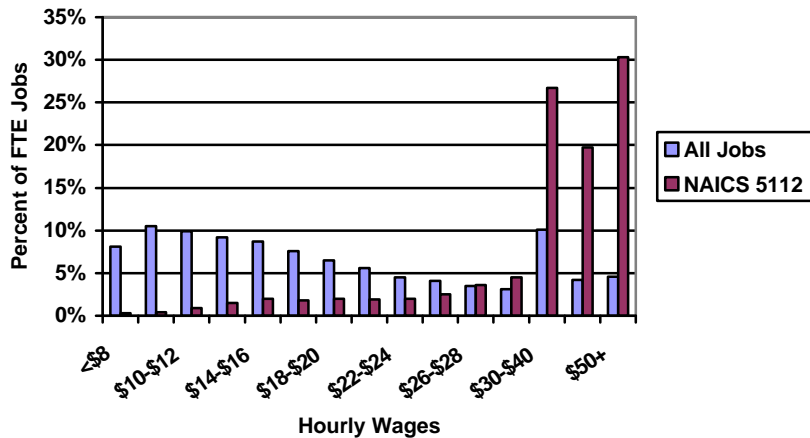
**Graph 22. FTE Jobs by Hourly Wages
Electronic Retailing (NAICS 4541)**



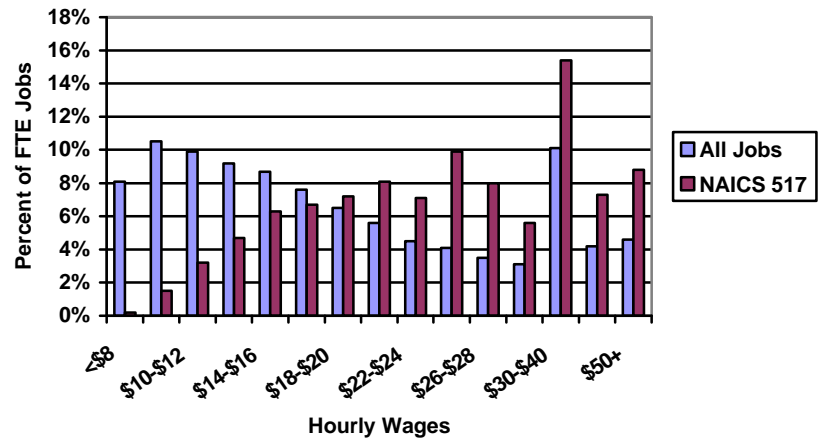
**Graph 23. FTE Jobs by Hourly Wages
Transportation & Warehousing (NAICS 48-49)**



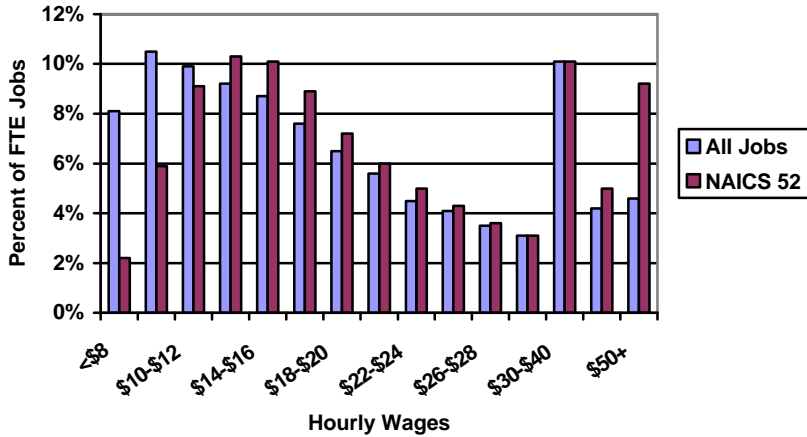
**Graph 24. FTE Jobs by Hourly Wages
Software Publishing (NAICS 5112)**



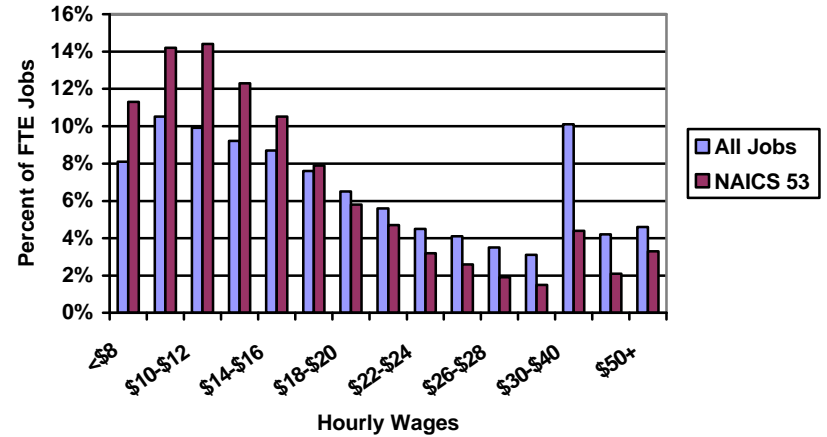
**Graph 25. FTE Jobs by Hourly Wages
Telecom (NAICS 517)**



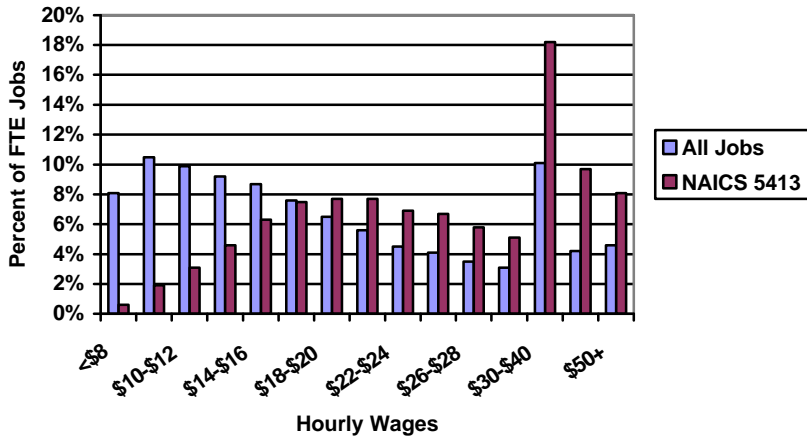
**Graph 26. FTE Jobs by Hourly Wages
Finance & Insurance (NAICS 52)**



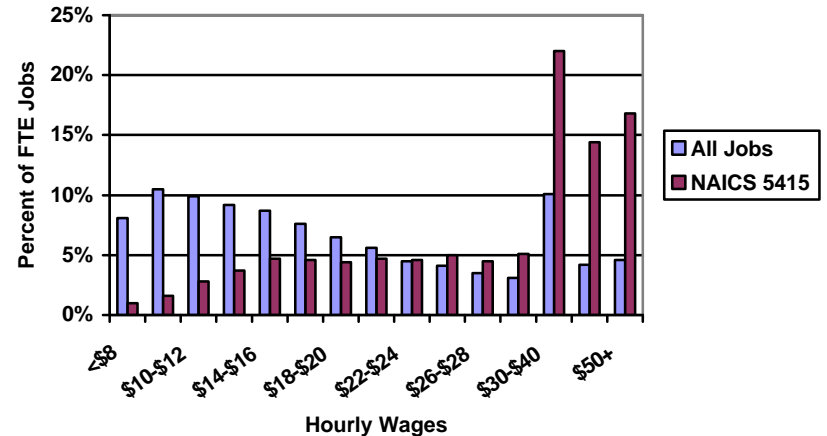
**Graph 27. FTE Jobs by Hourly Wages
Real Estate & Leasing (NAICS 53)**



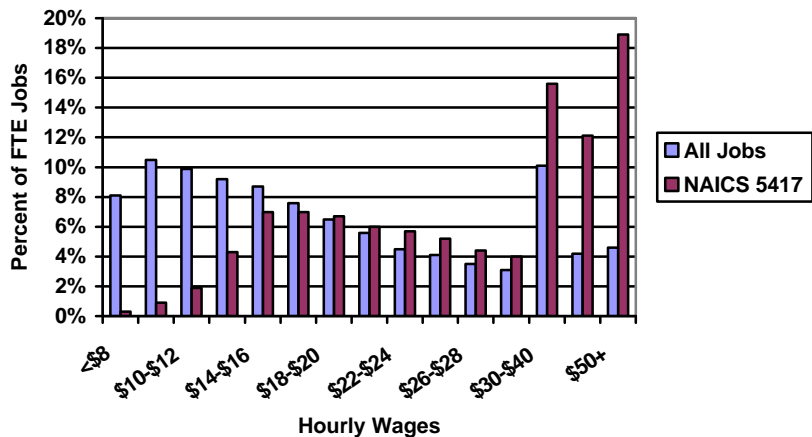
**Graph 28. FTE Jobs by Hourly Wages
Architecture & Engineering Services (NAICS 5413)**



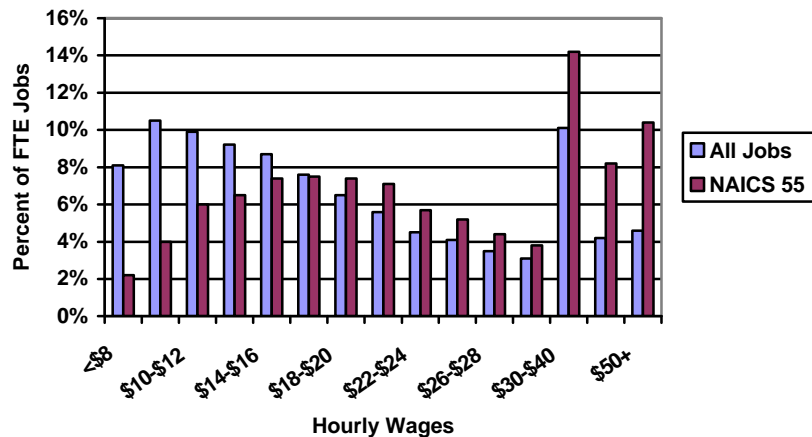
**Graph 29. FTE Jobs by Hourly Wages
Computer Systems Design (NAICS 5415)**



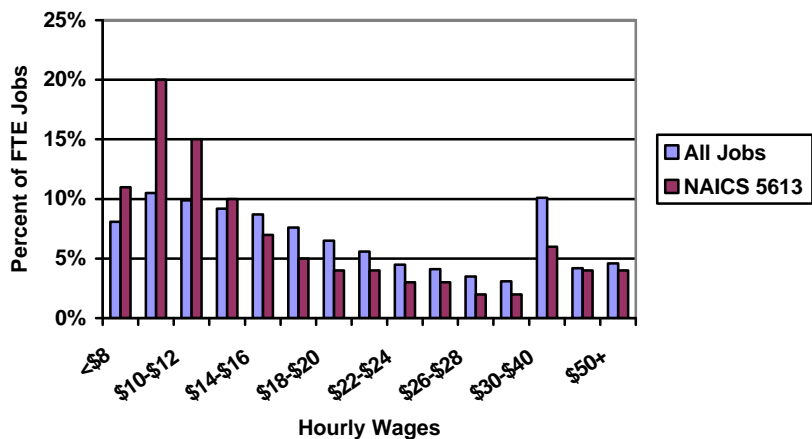
**Graph 30. FTE Jobs by Hourly Wages
Scientific Research & Development (NAICS 5417)**



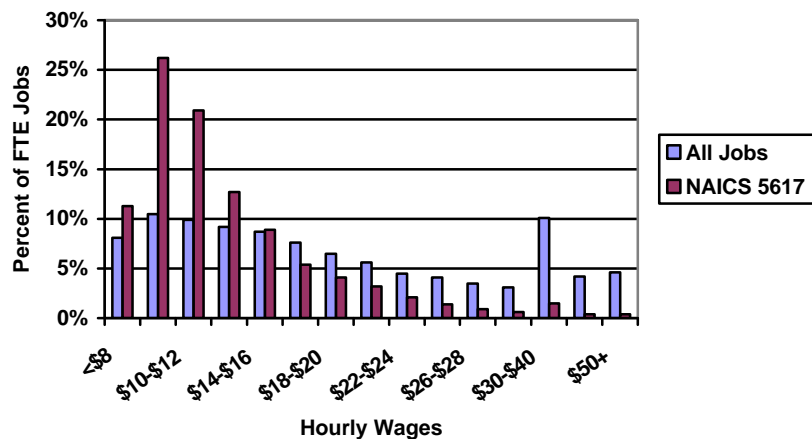
**Graph 31. FTE Jobs by Hourly Wages
Corporate Offices (NAICS 55)**



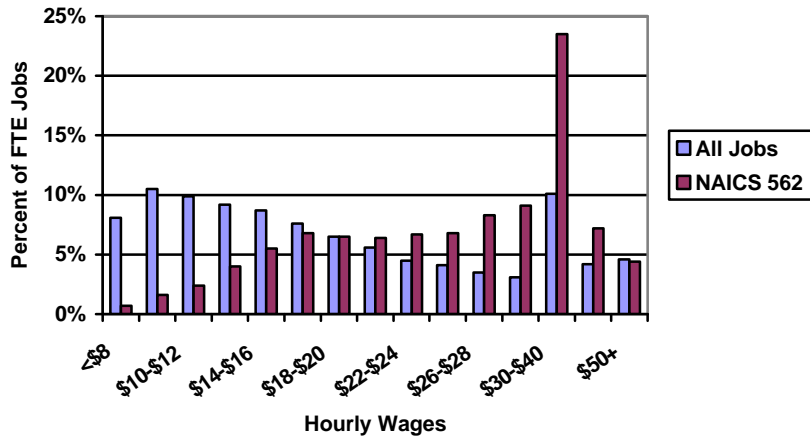
**Graph 32. FTE Jobs by Hourly Wages
Employment Services (NAICS 5613)**



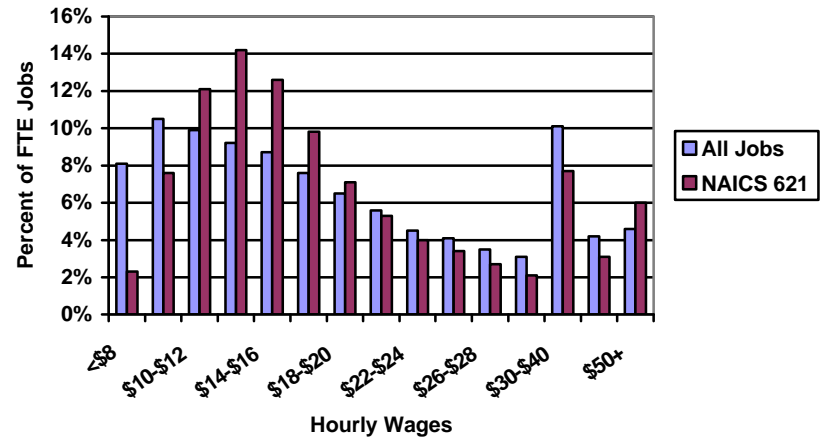
**Graph 33. FTE Jobs by Hourly Wages
Services to Buildings & Dwellings (NAICS 5417)**



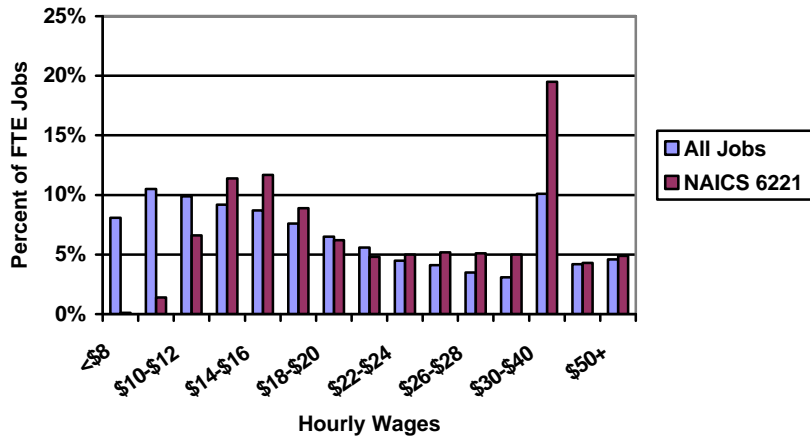
**Graph 34. FTE Jobs by Hourly Wages
Waste & Remediation Services (NAICS 562)**



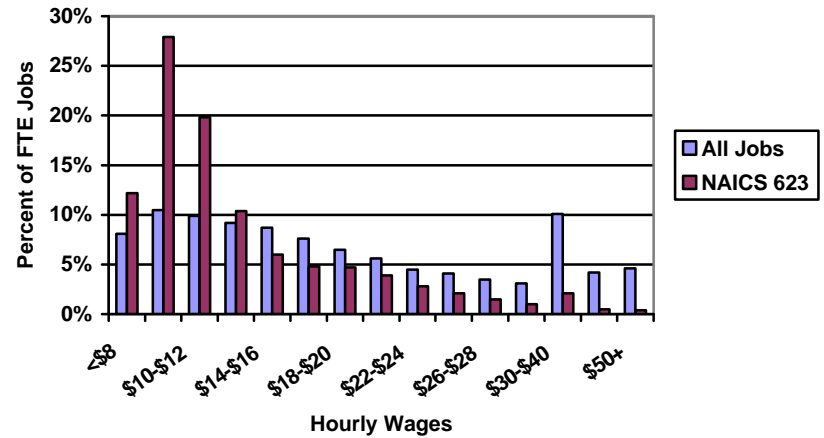
**Graph 35. FTE Jobs by Hourly Wages
Outpatient Health Care (NAICS 621)**



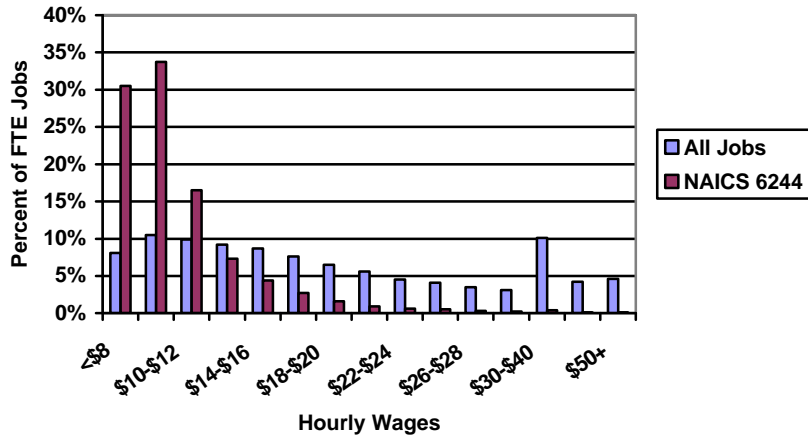
**Graph 36. FTE Jobs by Hourly Wages
General Medical & Surgical Hospitals (NAICS 6221)**



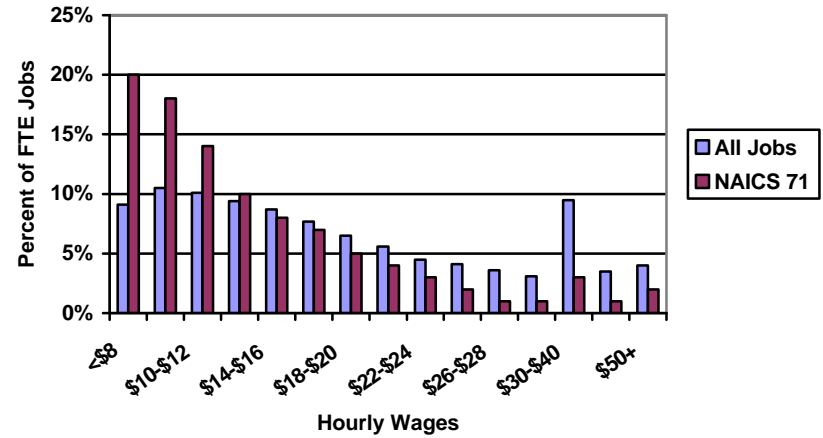
**Graph 37. FTE Jobs by Hourly Wages
Nursing & Residential Care (NAICS 623)**



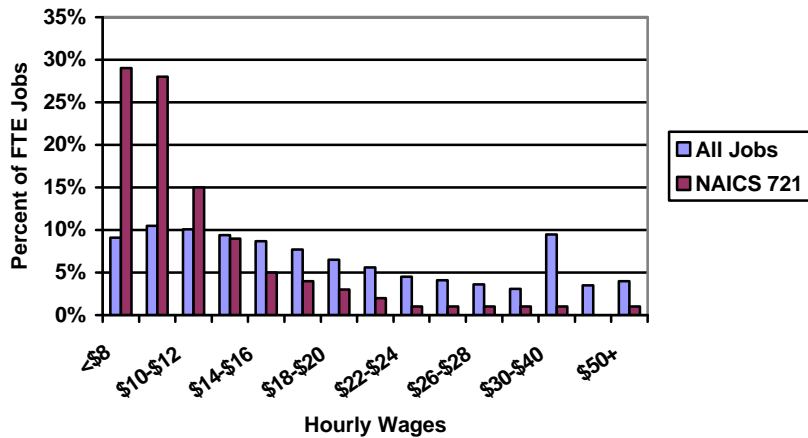
**Graph 38. FTE Jobs by Hourly Wages
Child Day Care (NAICS 6244)**



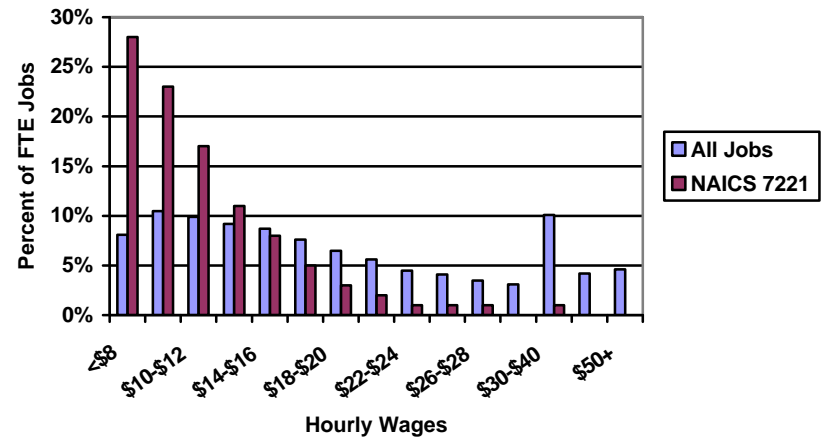
**Graph 39. FTE Jobs by Hourly Wages
Arts, Entertainment, Recreation (NAICS 71)**



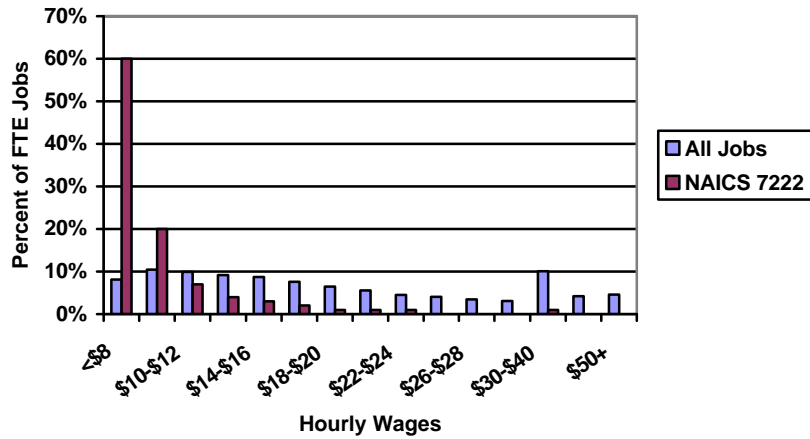
**Graph 40. FTE Jobs by Hourly Wages
Accommodations (NAICS 721)**



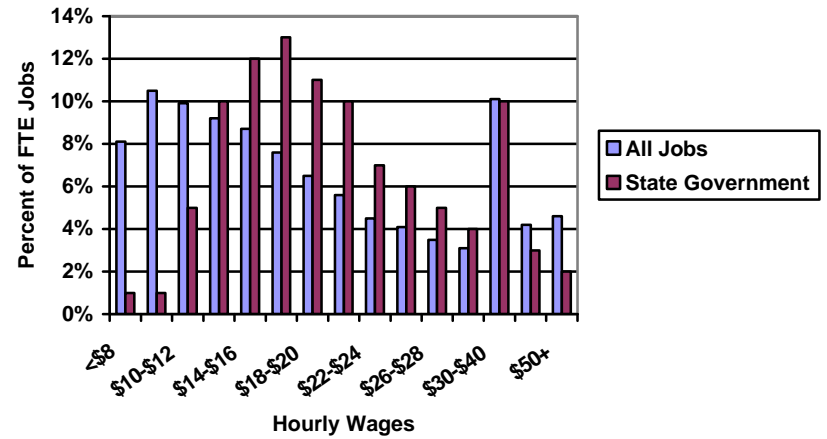
**Graph 41. FTE Jobs by Hourly Wages
Full-Service Restaurants (NAICS 7221)**



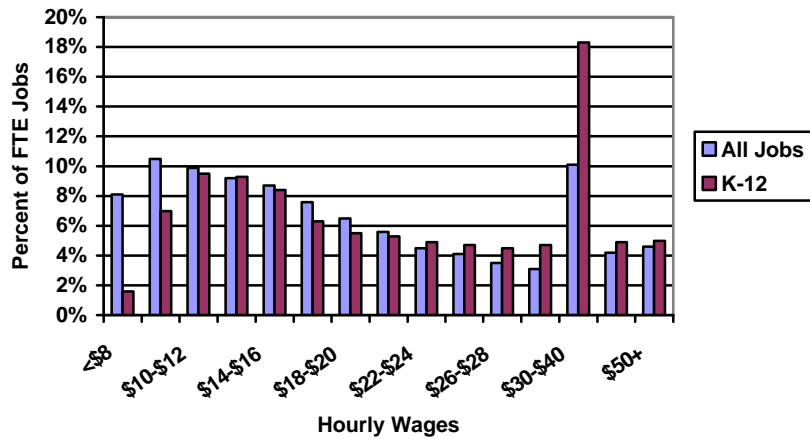
**Graph 42. FTE Jobs by Hourly Wages
Limited-Service Restaurants (NAICS 7222)**



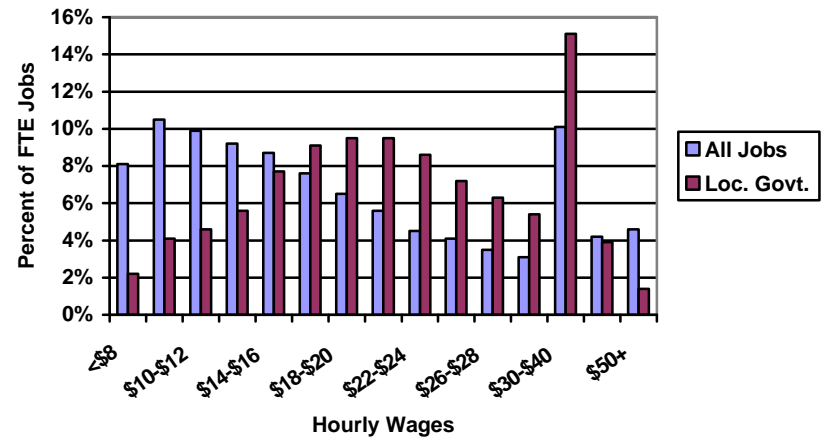
**Graph 43. FTE Jobs by Hourly Wages
State Government (NAICS 53)**



**Graph 44. FTE Jobs by Hourly Wages
K-12 Public Education**



**Graph 45. FTE Jobs by Hourly Wages
Local Government, except education**



Industry	NAICS	Number Jobs \$30+/ Hour	Percent of All \$30+/ Hour Jobs	Percent Jobs in Industry
TOTAL		380,331	100%	19%
Construction	23	23,021	6%	20%
Manufacturing	31-33	73,298	19%	28%
<i>Aerospace</i>	3364	47,088	12%	67%
Wholesale Trade	42	21,909	6%	22%
Retail Trade	44	15,602	4%	7%
Information	51	40,651	11%	48%
<i>Software Publishers</i>	5112	27,261	7%	77%
Finance and Insurance	52	21,157	6%	24%
Professional, Scientific & Tech Services	54	38,155	10%	35%
<i>Computer Systems Design and Related Services</i>	5415	10,761	3%	53%
Administrative and Support and Waste Management and Remediation	56	10,339	3%	12%
Health Care and Social Assistance	62	29,057	8%	15%
<i>Ambulatory Health Care Services</i>	621	12,748	3%	17%
<i>General Medical & Surgical Hospitals</i>	6221	13,984	4%	29%
State Government		17,721	5%	17%
Local Government		51,907	14%	24%
<i>K-12 Public Education</i>		25,902	7%	28%
<i>Other Local Government</i>		26,005	7%	20%

Industry	NAICS	Number Jobs \$30+ / Hour	Percent Jobs in Industry
Software Publishers	5112	27,261	77%
Aerospace Product and Parts Manufacturing	3364	47,088	67%
Internet publishing and broadcasting	516	591	54%
Computer Systems Design and Related Services	5415	10,761	53%
Scientific Research and Development Services	5417	6,231	47%
Pharmaceuticals	3254	1,042	44%
Wireless Telecommunications Carriers	5172	5,004	40%
Navigational, Measuring, Electromedical, and Control	3345	4,172	39%
Securities, Commodity Contracts, and Other Financial	523	3,858	39%
Petroleum and Coal Products Manufacturing	324	870	37%

TABLE 10. INDUSTRIES WITH THE MOST “BETTER-THAN-AVERAGE” JOBS, 2002

Industry	NAICS	Number Jobs \$20-\$30/ Hour	Percent Jobs \$20-\$30/ Hour	Percent Jobs in Industry
TOTAL		419,669	100%	21%
Construction	23	39,784	9%	35%
Manufacturing		58,004	14%	22%
<i>Aerospace Product and Parts Manufacturing</i>	3364	16,650	4%	24%
Wholesale Trade	42	21,502	5%	21%
Retail Trade	44	24,583	6%	11%
Transportation and Warehousing	48	15,030	4%	23%
Information	51	21,011	5%	25%
Finance and Insurance	52	19,080	5%	22%
Professional, Scientific, and Technical Services	54	28,297	7%	26%
Administrative and Support and Waste Management an	56	12,993	3%	15%
Health Care and Social Assistance	62	32,760	8%	17%
<i>Ambulatory Health Care Services</i>	621	13,216	3%	17%
<i>General Medical & Surgical Hospitals</i>	6221	12,170	3%	25%
State Government		36,255	9%	35%
<i>Educational Services</i>		11,911	3%	28%
<i>Other State Government</i>		24,344	6%	39%
Local Government		67,201	16%	31%
<i>Educational Services</i>		22,078	5%	24%
<i>Other Local Government</i>		45,123	11%	7%

TABLE 11. CONCENTRATION OF “BETTER-THAN-AVERAGE” JOBS, 2002, SELECTED INDUSTRIES

Industry	NAICS	Number Jobs \$20-\$28/Hour	Percent Jobs in Industry
Wired Telecommunications Carriers	5171	5,924	60%
Heavy Construction	237	7,229	44%
Mining	21	1,275	43%
Paper Manufacturing	322	5,348	40%
Other State Government	92x	24,344	39%
Waste Management and Remediation Services	562	4,452	37%
Other Local Government	93x	42,010	37%
Utilities	22	1,383	37%
Primary Metal Manufacturing	331	2,229	37%
Couriers and Messengers	492	3,091	35%

TABLE 12. INDUSTRIES WITH THE MOST JOBS AROUND THE MEDIAN, 2002

Industry	NAICS	Number Jobs \$10-\$20/ Hour	Percent Jobs \$10-\$20/ Hour	Percent Jobs in Industry
TOTAL		846,652	100%	42%
Construction	23	46,106	5%	40%
Manufacturing	3	105,714	12%	40%
Wholesale Trade	42	46,640	6%	46%
Retail Trade	44-45	108,883	13%	48%
<i>Food and Beverage Stores</i>	445	25,555	3%	52%
<i>General Merchandise Stores</i>	452	17,856	2%	46%
Transportation and Warehousing	48-49	35,279	4%	53%
Finance and Insurance	52	39,565	5%	46%
Professional, Scientific, and Technical Services	54	35,690	4%	33%
Administrative and Support and Waste Management and Remediation Services	56	38,454	5%	44%
Health Care and Social Assistance	62	97,463	12%	49%
<i>Ambulatory Health Care Services</i>	621	42,265	5%	56%
<i>General Medical & Surgical Hospitals</i>	622	22,389	3%	45%
Accommodation and Food Services	72	41,074	5%	35%
<i>Food Services and Drinking Places</i>	722	33,868	4%	34%
<i>Full-Service Restaurants</i>	7221	22,467	3%	46%
Other Services (except Public Administration)	81	30,787	4%	52%
State Government		49,373	6%	47%
Local Government		83,080	10%	38%

TABLE 13. CONCENTRATION OF JOBS AROUND THE MEDIAN, 2002, SELECTED INDUSTRIES

Industry	NAICS	Number Jobs \$10-\$20/Hour	Percent Jobs in Industry
Fruit and Vegetable Preserving and Specialty Food	3114	6,095	67.0%
Truck Transportation	484	12,719	66.5%
Sawmills and Wood Preservation	3211	5,243	66.3%
Transit and Ground Passenger Transportation	485	2,744	65.0%
Warehousing and Storage	493	4,512	64.9%
Furniture and Related Product Manufacturing	337	4,438	64.2%
Plastics and Rubber Products Manufacturing	326	5,463	61.0%
Fabricated Metal Product Manufacturing	332	9,126	60.5%
Building Material and Garden Equipment and Supplies	444	11,402	60.3%
Machinery Manufacturing	333	6,948	57.0%

Industry	NAICS	Number Jobs <\$10/ Hour	Percent Jobs <\$10 Hour	Percent Jobs in Industry
TOTAL		374,853	100%	19%
Agriculture, Forestry, Fishing and Hunting	11	37,077	10%	62%
<i>Crop Production</i>	111	27,198	7%	74%
Manufacturing	3	26,307	7%	10%
Wholesale Trade	42	11,250	3%	11%
Retail Trade	44	78,943	21%	35%
<i>Food and Beverage Stores</i>	445	18,138	5%	37%
<i>General Merchandise Stores</i>	452	16,168	4%	42%
Administrative and Support and Waste Management and Remediation	56	25,333	7%	29%
<i>Employment Services</i>	5613	9,874	3%	37%
Health Care and Social Assistance	62	37,930	10%	19%
<i>Nursing & Residential Care Facilities</i>	623	16,092	4%	40%
<i>Social Assistance</i>	624	13,590	4%	43%
Accommodation and Food Services	72	69,942	19%	59%
<i>Accommodation</i>	721	10,431	3%	54%
<i>Food Services and Drinking Places</i>	722	59,511	16%	60%
<i>Full-Service Restaurants</i>	7221	23,489	6%	48%
<i>Limited-Service Eating Places</i>	7222	31,316	8%	78%
Other Services	81	15,148	4%	25%
Local Government		16,036	4%	7%

Industry	NAICS	Number Jobs <\$10/Hour	Percent Jobs in Industry
Limited-Service Eating Places	7222	31,316	77.7%
Crop Production	111	27,198	74.1%
Gasoline Stations	447	7,471	73.6%
Support Activities for Agriculture and Forestry	115	6,993	66.8%
Child Day Care Services	6244	6,299	64.3%
Accommodation	721	10,431	54.2%
Motion Picture and Sound Recording Industries	512	1,247	53.2%
Sporting Goods, Hobby, Book, and Music Stores	451	5,541	53.1%
Other Food Services and Drinking Places	722x	4,707	49.5%
Full-Service Restaurants	7221	23,489	47.7%

Better-Than-Average Jobs (Jobs Paying \$20 to \$30 Per Hour)

Industry detail on jobs paying \$20.00 to \$29.99 per hour is shown in *Tables 10 and 11* above. About 21 percent of all jobs fell into this category. One out of seven of these jobs was in manufacturing, and 25 percent were in state & local government. Sixty percent of all wired telecom jobs paid in this range. Other industries with high concentrations included heavy construction, mining, and paper manufacturing.

Jobs Around the Median (Jobs Paying \$10 to \$20 Per Hour)

Forty-two percent of all jobs—some 850,000—paid around the median wage, between \$10.00 and \$19.99 per hour. These jobs were dispersed more evenly across major sectors such as retail trade, manufacturing, and health care.

Low-Wage Jobs (Jobs Paying Below \$10 Per Hour)

One out of every five jobs—almost 375,000—paid below \$10.00 per hour. Almost 80,000 were in retail trade, and another 70,000 were in food services. A number of industries had high concentrations of low-wage jobs, including limited service eating places (a.k.a. fast food restaurants, and coffee venues), crop production, gas stations, and daycare services.

Differences by County

The state of Washington has a remarkably diverse array of economies at the regional and county level. The political conversation about the “other Washington” has long contrasted the east and the west sides of the state. But the differences are much more complex than that. Clark, Whatcom, the Tri-Cities, and Yakima, for example, are all metropolitan counties, with distinct economies, as different from each other as they are from Seattle.

It’s no surprise, then, that there are wide differences in wage distribution at the county level. For example, the median wage varied from a low of \$10.47 in Columbia County to a high of \$19.76 in King County. Only four counties had a higher median hourly wage than the state: King, Snohomish, Benton, and Thurston. Aerospace played a major role in the first two, Hanford contractors in the third, while state government played a major role in the latter.

The dispersion of wages—measured by the 90/10 ratio—also varied widely. King County, which had by far the highest average wage for the top decile, had a 90/10 ratio of 11.6.

TABLE 16. MEDIAN WAGE BY COUNTY, 2002			
Area	Median Wage	Rank	90/10 Ratio
State	\$16.95		9.6
Adams	\$11.11	37	5.5
Asotin	\$13.57	24	5.8
Benton	\$17.79	3	8.1
Chelan	\$12.44	32	6.5
Clallam	\$14.19	20	5.7
Clark	\$15.84	8	7.9
Columbia	\$10.47	39	5.1
Cowlitz	\$15.89	7	6.5
Douglas	\$12.01	34	5.7
Ferry	\$13.36	25	5.8
Franklin	\$12.38	33	5.7
Garfield	\$12.59	31	4.7
Grant	\$11.50	36	5.8
Grays Harbor	\$15.22	11	6.0
Island	\$14.04	22	6.4
Jefferson	\$14.61	16	5.5
King	\$19.76	1	11.6
Kitsap	\$14.74	14	6.5
Kittitas	\$13.36	26	5.6
Klickitat	\$12.97	27	5.8
Lewis	\$14.45	18	5.7
Lincoln	\$12.89	28	6.1
Mason	\$15.00	12	5.5
Okanogan	\$10.52	38	5.6
Pacific	\$12.89	29	5.2
Pend Oreille	\$14.91	13	6.7
Pierce	\$15.95	6	7.3
San Juan	\$15.37	10	5.3
Skagit	\$14.37	19	6.3
Skamania	\$14.01	23	4.9
Snohomish	\$18.20	2	7.6
Spokane	\$14.73	15	7.1
Stevens	\$14.16	21	5.6
Thurston	\$17.23	4	6.8
Wahkiakum	\$16.12	5	5.4
Walla Walla	\$12.69	30	6.0
Whatcom	\$14.54	17	6.1
Whitman	\$15.66	9	6.8
Yakima	\$11.69	35	5.8

Individual Trends

New Entrants to the Labor Force

Out of the 3.26 million different people who worked for a Washington employer in 2002, over 379,000 (about 11.6 percent) could be classified as new entrants—they did not appear in the state’s wage files in 1990 - 2001. They accounted for 80,800 FTE jobs through the year (about 4 percent). These new entrants might be:

- People of any age, but most likely young adults, entering the workforce for the first time.
- People re-entering the workforce after a long absence.
- People who re-located to the state during 2002.
- People who worked temporarily in the state during the year.

The hourly wages of these new entrants tended to be far below the average. While 20 percent of all jobs paid below \$10 per hour, 48 percent of the jobs held by new entrants were in this range. The median wage was \$10.28 per hour. Only about half as many of the jobs held by new entrants paid above \$20 per hour as for all jobs (22 percent versus 38 percent).

The industry profile of new entrants differed from the profile for all jobs in several ways. Compared with the average worker, new entrants were much more likely to be found in food services, agriculture, temp agencies, janitorial and landscape services, construction, software, food processing, and grocery stores. They were relatively scarce in local and state government, manufacturing (especially aerospace), finance and insurance, outpatient health care, hospitals, and wholesale trade.

Wage Progression

There were more than 850,000 individuals who worked at least 1,560 hours (0.75 FTE, the equivalent of working at least 30 hours per week year-round) in both 1997 and 2002. Analyzing the change in wages can shed some light on what the “wage ladder” looks like.

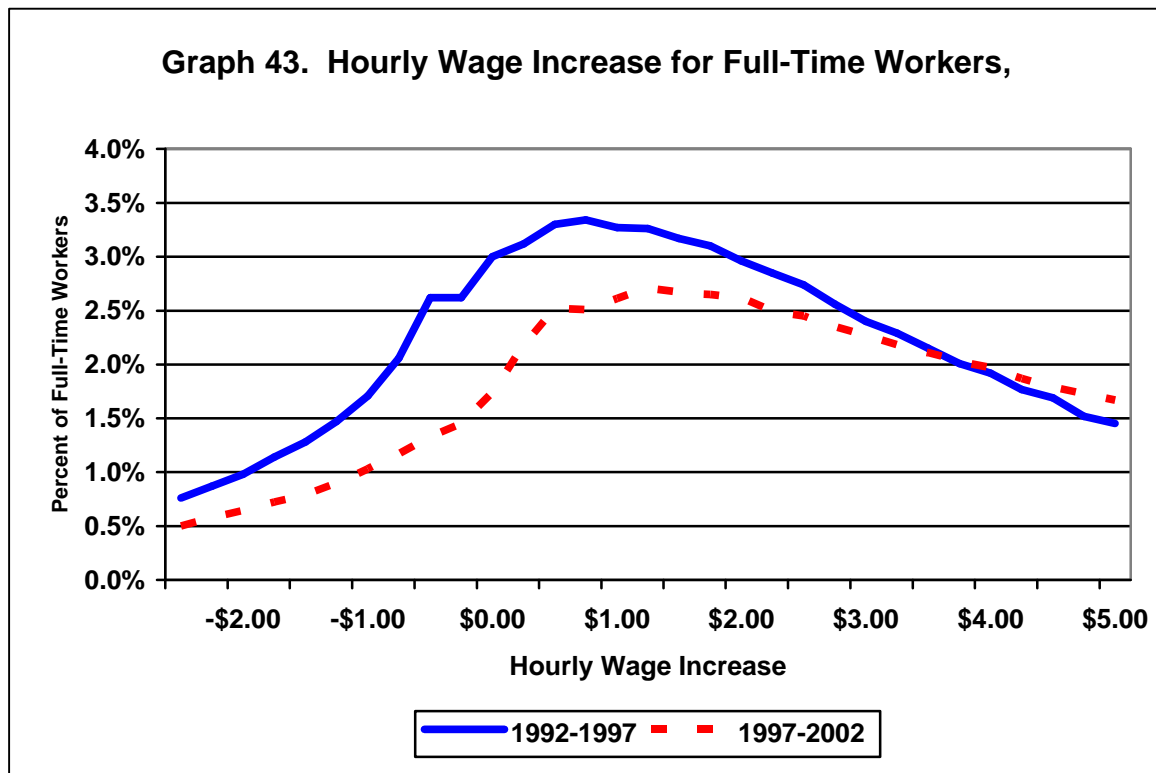
The median increase in hourly wages, adjusted for inflation, was \$4.91, an average of \$0.98 per year. In comparison, the median increase for the 1992-1997 period was \$0.27 per year. The median percent increase was 3.7 percent per year, versus 4.0 percent for the 1992-97 period.

Most “full-time” workers earned a higher hourly wage in 2002 than in 1997, but as shown in *Table 18*, about one in six suffered a drop in hourly earnings. *Graph 43* illustrates the curve for all full-time workers, with each data point a quarter-dollar increment. For example, about 2.8 percent of all workers gained between \$1.25 and \$1.50 in hourly wages. Over the limited range shown, the graph indicates that the 1992-1997 period had more workers with a decline in real wages or a smaller increase than in the most recent period.

TABLE 17. INFLATION-ADJUSTED CHANGE IN HOURLY EARNINGS, "FULL-TIME" WORKERS, 1997-2002

Change In Earnings	Number of Workers	Percent of Workers	1992-1997 Percent
Gain of \$10/hour or more	140,814	16%	8%
Gain of \$9 - \$10/hour	25,623	3%	2%
Gain of \$8 - \$9/hour	30,955	4%	2%
Gain of \$7 - \$8/hour	38,121	4%	3%
Gain of \$6 - \$7/hour	45,908	5%	4%
Gain of \$5 - \$6/hour	54,894	6%	5%
Gain of \$4 - \$5/hour	64,325	7%	7%
Gain of \$3 - \$4/hour	75,197	9%	9%
Gain of \$2 - \$3/hour	86,853	10%	11%
Gain of \$1 - \$2/hour	93,054	11%	13%
Gain of \$0 - \$1/hour	78,286	9%	13%
Loss of less than \$1/hour	43,521	5%	9%
Loss of \$1 - \$2/hour	26,691	3%	5%
Loss of \$2 - \$3/hour	17,030	2%	3%
Loss of \$3 - \$4/hour	11,611	1%	2%
Loss of \$4 or more	41,897	5%	5%
Total	874,780	100%	100%

Graph 43. Hourly Wage Increase for Full-Time Workers,



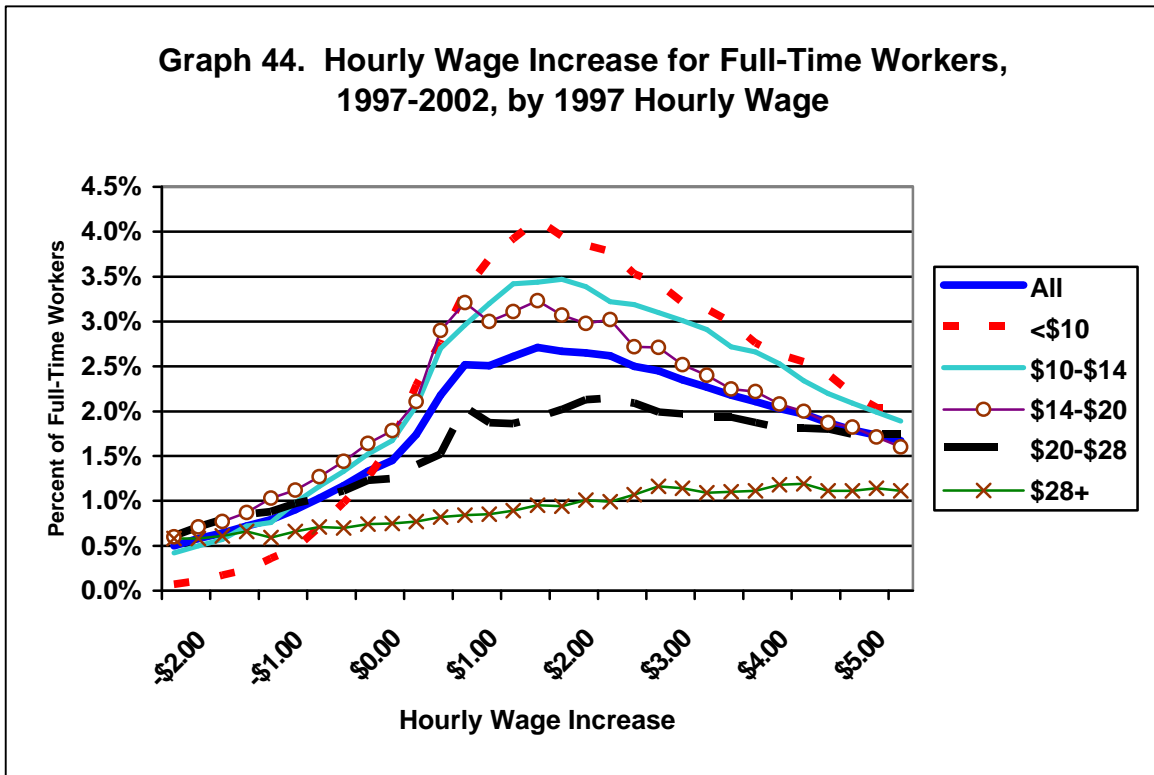
The results differed somewhat, depending on what a worker was earning in 1997, as shown in *Table 18* and *Graph 43*; the higher the wage, the wider the range of gain and loss. Lower-wage workers tended to have smaller changes in their hourly wages.

Change In Earnings	Percent of Workers, by 1997 Hourly Wage					
	All Workers	<\$10 per hour	\$10-\$14 per hour	\$14-\$20 per hour	\$20-\$28 per hour	\$28+ per hour
Gain of \$10/hour or more	16.1	8.0	9.7	12.0	18.3	34.4
Gain of \$9 - \$10/hour	2.9	2.5	2.4	2.5	3.6	3.5
Gain of \$8 - \$9/hour	3.5	3.3	3.1	3.0	4.3	3.8
Gain of \$7 - \$8/hour	4.4	4.4	4.1	3.7	5.3	4.2
Gain of \$6 - \$7/hour	5.2	5.7	5.3	4.7	6.1	4.4
Gain of \$5 - \$6/hour	6.3	7.2	6.9	5.9	6.8	4.5
Gain of \$4 - \$5/hour	7.4	9.2	8.6	7.4	7.1	4.6
Gain of \$3 - \$4/hour	8.6	11.5	10.8	9.0	7.5	4.5
Gain of \$2 - \$3/hour	9.9	13.9	12.5	11.0	8.2	4.4
Gain of \$1 - \$2/hour	10.6	15.9	13.7	12.4	7.9	3.8
Gain of \$0 - \$1/hour	8.9	12.1	10.9	11.2	6.8	3.3
Loss of less than \$1/hour	5.0	4.6	5.7	6.1	4.6	2.9
Loss of \$1 - \$2/hour	3.1	1.2	3.0	3.8	3.5	2.5
Loss of \$2 - \$3/hour	1.9	0.3	1.6	2.4	2.4	2.2
Loss of \$3 - \$4/hour	1.3	0.1	0.8	1.5	1.7	1.9
Loss of \$4 or more	4.8	0.0	0.6	3.3	5.6	15.3
Total	100.0	100.0	100.0	100.0	100.0	100.0

For example, of the roughly 110,000 full-time workers earning below \$10 per hour in 1997, 30 percent were still below \$10 per hour in 2002. Of the 40,000 earning below \$8 in 1997, 47 percent were below \$10 in 2002. *Table 19* gives more details on the progression of lower-wage workers.

2002 Hourly Wage	1997 Hourly Wage				
	<\$7.00	\$7.00 - \$7.99	\$8.00 - \$8.99	\$9.00 - \$9.99	Total <\$10.00
<\$7.00	4%	1%	1%	0%	1%
\$7.00 - \$7.99	18%	9%	3%	1%	6%
\$8.00 - \$8.99	18%	17%	10%	4%	10%
\$9.00 - \$9.99	14%	15%	14%	8%	12%
\$10.00 - \$10.99	10%	13%	14%	13%	13%
\$11.00 - \$11.99	8%	10%	13%	14%	12%
\$12.00+	28%	34%	46%	59%	45%
Total	100%	100%	100%	100%	100%

Individuals who worked in a different industry in 2002 than in 1997 fared better than those who remained in the same industry. About 70 percent of the pool were in the same industry (by three-digit NAICS); their median hourly wage increase was \$2.95 per hour. In contrast, those workers who shifted to a different industry had a median increase of \$3.76. The latter group had a higher incidence of workers who had lower than average hourly wages in 1997. Of those workers who earned below \$7 per hour in 1997, and \$12 or more per hour in 2002, 70 percent were in a different industry.



These findings confirm the results of the *1997 Washington Wage Study*: wage progression for lower-wage workers is often very slow, and often not enough to move them into a position to be economically independent, particularly if they were in a single-income household. Most of the workers that made the most progress changed industries, leaving low-wage industries such as food services and agriculture for higher-wage industries; a working hypothesis would be that they changed occupations, as well.

Summary

The Washington Wage Report and the accompanying data provide a wealth of information for analysts and policymakers. The data clearly shows that:

- Wages have been rising across the board, with some retrenchment at the upper end in the past two years.
- Wage inequality has been increasing; without the increase in the state minimum wage, the gap between low-wage and high-wage jobs would have been even wider.
- Wage progression, particularly among lower-wage workers, is not rapid, suggesting that for WorkFirst clients, simply getting them into the labor market is not enough to ensure that they are on the road to economic independence.

The study years so far have covered the long economic expansion of the 1990s, which was unique in many ways in terms of the creation of new wealth and the proliferation of stock options. It will be interesting to see what the 2002 and 2003 numbers reveal: how different industries fared, whether wage distribution is becoming more or less equitable, and how wage progression is changing.

Methodology

The data for the study come from quarterly unemployment insurance reports submitted by all employers in the state to the Employment Security Department. Each record in the database includes the employer's account number, the social security number of an employee, the number of hours worked by that employee during the quarter, and the total wages earned (benefits and tips are not included). Roughly 2.5 to 3.0 million records are in each quarter's database. Because of the way data is reported, it is impossible to tell definitively whether a worker is seasonal, part-time, or in transition from one job to another or into/out of the labor market.

Each record was assigned the county and industry of the employer. For multi-county and multi-industry employers, an algorithm was developed to assign the county and industry, based on the share of total wages of each establishment. Unfortunately, there is no way to identify the age, sex, or occupation of the employee. For about five to eight percent of the records, the number of hours worked was not identified; for these records, hours worked were estimated using similar records from the same industry. In addition, a small number of workers received room and board along with wages; in the database, they were assigned 1000 hours as a convention. These records were excluded from the analysis.

A final adjustment was made in the case of employers who in some quarters assigned the same number of hours (usually 520) to all of their employees, resulting in a substantial number of records with very low hourly wages. In these cases, the employer's prior and subsequent quarters were checked to see if there was a stable wage pattern. If so, that pattern, adjusted for inflation and resized for employment growth or decline, was substituted.

The average hourly wage for each employee was calculated by dividing total wages by total hours worked in each quarter. The average was adjusted for inflation using the U.S. Implicit Price Deflator for Personal Consumption Expenditures (PCE)⁸.

⁸ The U.S. Implicit Price Deflator for Personal Consumption Expenditures is similar in nature to the Consumer Price Index (CPI), but is adjusted for changing consumer-purchasing patterns.

The choice of a price deflator has substantial consequences for interpreting the results of wage data. For the 1990-2002 period, the PCE implicit price deflator rose by 29.7 percent, while the U.S. Consumer Price Index (CPI) increased by 37.6 percent, and the Seattle CPI by 49.3 percent. There is a fairly broad consensus among economists (including those at the Bureau of Labor Statistics that produce the CPI) that the CPI has consistently overstated the rate of inflation, so the PCE deflator, in the author's opinion, is a superior choice.

In this case, we're concerned not with the difference in the cost of living, but the change in the cost of living for the 1990-2002 period. That also varied by county, but there is no way of determining which counties had a higher than average inflation rate, and which had a lower than average rate. For those areas where the cost of living increased faster than the U.S. average, wages did not improve as much as this report suggests (or in the case of a decline, were slightly worse than indicated). For those areas where inflation was actually lower than the national average, wages grew faster than this report suggests (or didn't decline as much).

Using the Consumer Price Index as a basis, it would be a fair assumption that prices increased faster than the U.S. average in the Seattle metro area, and in Clark County. This would mean that wages in these counties did not improve as much as this study suggests. The outcome is less clear for other counties; some rural counties, for example, experienced a run-up in housing prices during the 1990s, while housing prices were relatively slow-growing in others.

Technical Appendix

Living Databases

This study is built on two databases, the quarterly wage files and the name and address files. The quarterly wage files are composed of the individual wage and hour records of those working at employers in the state of Washington, for each quarter of the year. The name and address files include monthly employment and total quarterly payroll for employers in the state, broken out by industry and location. These files are “living” in the sense that they are subject to update at different points in their history, and depending on when they were downloaded, may not be in perfect agreement.

Database Structure

The quarterly wage files include the employer identification number, the social security number of the employee, the hours worked by the employee in that quarter with that employer, and the wages paid. Theoretically, the payroll data in the name and address file should match total payroll for each employer in the wage file. However, employment counts will be different, because the wage file includes all employees during the quarter, while the name and address file includes a point-in-time monthly count. If an employer has no turnover during the quarter, then the monthly employment will match the number of employee records in the wage file, but this is rarely the case.

Zero-hour Records

For about ten percent of all records, no hours were reported. These records were not randomly distributed by industry, so hours were estimated using the median hours reported for records with the same or similar wages in the same industry. For instance, suppose there was a job in the banking industry with no hours reported and \$6,400 in wages. The number of hours would have been estimated by selecting all records from the banking industry paying \$6,400, and then calculating the median hours worked for these records.

Multi-County Operations

Roughly one-fourth of all jobs in the state are with employers that have operations in more than one county, or more than one industry, or both. The name and address file has monthly employment and total payroll by county and industry for each location of these employers. However, individual records in the wage file had no county or industry identifier. To “estimate” the county and industry of these records, the following procedure was used. To clarify, we’ll use a fictitious employer that, according to the name and address file, had 1,000 employees and total payroll of \$10 million, with 200 of those employees and \$220 million in payroll in Clark County, and the remaining employment and payroll in other counties. In the wage file in the same quarter, there were 1,200 records, with a total of \$10 million in wages.

The percentage of total employment in each location was calculated from the name and address file, and was applied to the wage file. In our example, ten percent of the total employment was in Clark County, so it was assumed that ten percent of the 1,200 wage file records—120 records—for that employer were in Clark County. We’ll refer to the percentage as “p” and the number of records for the location as “n.”

The records were ordered by wages paid in that quarter; in our example, all 1,200 records would be ordered.

A sample of “n” records was selected from the ordered set, starting with record 1/2p, and skipping each 1/p records. In our example, we’d start at the 5th record, and continue selecting the 15th, 25th, and so on, records.

The total wages of these records was summed and compared to the total wages for that location from the name and address file. If the difference was less than \$1,000, then the sample was judged to be close enough. If the difference was larger, then the starting point and the span of records skipped was adjusted up or down, until the difference was less than \$1,000.

The procedure was repeated, starting with the location with the smallest employment and working up. The balance of records was allotted to the location with the largest employment.

In a few cases, the difference could not be reconciled, and the county or industry was left blank for those records.

Validity of Data—Sources of Error

The data in the wage file has never been validated against employer records. Sources of error include:

- Reporter error. Employers may have made errors in reporting hours and wage data, and may have omitted some employees.
- Input error. The Employment Security Department may have made errors when inputting data.
- The estimates of hours for records where no hours were reported, and for county and industry for multi-location reporters, introduced some error into the analysis.

While most multi-county employers report employment in each county, some do not. There was thus error in location for these records. In particular, most of the “big box” building supply retail outlets do not split out their employment, along with some but not all temp agencies.

Some employers are miscoded in terms of their industry or location. The Employment Security Department contacts all employers on a rotating basis every three years to verify location and industry, but with over 200,000 employers in the state, some error is inevitable.