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High-Wage Jobs

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SUMMARY

Approximately 15 percent of all jobs in the United States pay high wages, defined as paying at least 50 percent more than the overall average wage. These high-wage jobs on average pay about twice the overall average. The number of high-wage jobs decreased between 2001 and 2004, while the number of other jobs increased slightly. However, the average wage of high-wage positions rose more between 2001 and 2004 than the average of other jobs.

High-wage jobs are highly concentrated in a minority of industrial sectors, especially in the professional, scientific and technical services sector. By occupational group, high-wage jobs are slightly less concentrated, though many are in the management group. The industries with the greatest number of high-wage jobs are offices of physicians, corporate and regional managing offices, and offices of lawyers. The occupations with the most high-wage employment are general and operations managers and accountants and auditors.

Educational attainment is correlated to the average wage. The correlation is moderate industrially and strong occupationally. Most of the industries and occupations that pay high wages can be considered to be part of the knowledge economy. Science and technology are significant features in close to half of the high-wage jobs.

In only 16 states was the proportion of high-wage jobs in 2004 higher than the national average, but several highly populous states are in this group. The highest proportions largely were in states along the Atlantic Coast from Massachusetts to Virginia, but California, Colorado and Minnesota also were among the top 10. Arizona ranks 17th — in the middle of a group of "competitor" states, but near the bottom of a group of "new economy" states.

By state, the proportion of high-wage jobs relative to the national average in 2004 was highly correlated to industrial job quality as calculated over the entire wage distribution. Differences between the two measures largely occurred in states with high or low shares of employment in tourism, a very low-paying activity.

Arizona is one of the states in which the high-wage end of the employment distribution provides a more favorable impression of its job quality than that based on all employment. Thus, Arizona's subpar job quality is not due to a scarcity of high-wage jobs, but instead results from lesser job quality in the remainder of the employment distribution. In particular, Arizona has an above-average share of very low-paying jobs that serve tourists and seasonal residents.

In turn, the low overall average wage in Arizona — 7 percent less than the U.S. average — primarily results from factors other than job quality. The average wage in Arizona is less than the U.S. average in the vast majority of industries and occupations, both high- and low-paying.

Between 2001 and 2004, the high-wage share of total employment fell slightly more in Arizona than the U.S. average. However, the average wage of these high-wage jobs rose a little more in Arizona than nationally.

Among the high-wage industries, semiconductor manufacturing is by far the largest in Arizona relative to the U.S. average. Other high-paying industries that are relatively large in Arizona include manufacturing of search and navigation instruments, manufacturing of aircraft engines, wholesale trade of electronics, management consulting, real estate credit, credit card issuing, and land subdivision. In contrast, Arizona has relatively little employment in corporate and regional managing offices, research and development, offices of lawyers, and health insurance carriers. By high-wage occupation, Arizona has relatively many working as wholesale trade representatives for scientific and technical products, electrical engineers, electronics engineers, and management analysts, but relatively few working as general and operations managers and computer systems analysts.

HIGH-WAGE JOBS IN THE UNITED STATES

A high-wage job is defined in this analysis as one in an industry or occupation in which the average wage is at least 50 percent higher than the overall average. The Bureau of Labor Statistics (BLS), part of the U.S. Department of Labor, is the source of the workforce data used in this analysis. The latest data for 2004 are compared to those of 2001, the last recessionary period.

This analysis uses data already aggregated by industry or occupation. If data for individuals were available, the results of this analysis undoubtedly would be somewhat different. In this analysis, all employment in industries or occupations identified as high-wage is counted as high-wage, though certainly a sizable fraction of the jobs in such categories, particularly by industry, pay less than 150 percent of the overall average. This is offset by not counting those high-wage jobs that exist in industries or occupations in which the average wage is not at least 50 percent higher than the overall average. Despite this aggregation issue, two estimates of high-wage employment from two separate databases — one by industry, the other by occupation — are similar at approximately 19 million nationally.

Industrial Data

The Census of Employment and Wages (CEW) — previously referred to as the unemployment insurance or ES-202 program — is a census of all workers covered by the unemployment insurance program and provides the most detailed industrial data. However, the wages of part-time workers or those who work more than 40 hours per week are not adjusted to full-time-equivalent status. Annual data for 2004 were released in October 2005.

Industrially, workforce data currently are categorized by the North American Industry Classification System (NAICS), which presents data hierarchically. The most detailed data are for industries (5- or 6-digit NAICS code). These are totaled into industry groups (4-digit), then into subsectors (3-digit), and finally into 20 sectors (2-digit). This analysis focuses on industries and sectors.

Full industrial detail is available from the CEW program, but workers not covered by the unemployment insurance program are not included. The national CEW dataset includes 1,170 industries.

In 2004, the overall average wage from the CEW dataset was $39,354. For this analysis, 190 industries (16.2 percent of all industries) had an average wage at least as high as $59,031 — 50 percent higher than the overall figure. Employment in these 190 high-wage industries totaled nearly 19.5 million, or 15.0 percent of the overall employment of 129.3 million. Thus, based on the high-wage definition used in this analysis, a little more than one-in-seven jobs paid high wages in 2004. The average wage among the 19.5 million high-wage jobs was $75,328 — 91 percent higher than the overall average.

Even though the recession ended in late 2001, the total number of jobs counted in the CEW was slightly lower (–0.3 percent) in 2004 than in 2001. Employment losses from 2001 to 2004 were significant among the high-wage industries, with the number of high-wage jobs falling 4.1 percent. In contrast, a small employment gain of 0.4 percent was registered among the 85 percent of all jobs not identified as high wage.

Not considering inflation, the overall average wage rose 8.7 percent between 2001 and 2004. The increase was greater among the high-wage industries at 9.8 percent. Adjusting for inflation using the GDP implicit price deflator, the overall average wage rose 2.8 percent over the three years, with a 3.8 percent gain in the high-wage industries. The inflation-adjusted

advances were less using the Consumer Price Index: 1.9 percent overall and 2.9 percent in the high-wage industries.

Employment and Wages by Sector and Industry

High-wage employment in 2004 was concentrated in seven of the 20 sectors (see Table 1), which accounted for 93 percent of the high-wage jobs. Only 40 percent of all jobs were in the same seven sectors. In contrast, in five sectors, no industry paid an average wage at least 50 percent higher than the overall average, though 30 percent of all employment was in these five sectors.

Among the seven sectors that accounted for nearly all of the high-wage jobs, employment in high-wage industries as a share of total sectoral employment ranged widely, from 14 percent in health care and social assistance and 20 percent in manufacturing up to approximately 70 percent each in information and professional, scientific and technical services and 100 percent in management of companies. In two other sectors — mining and utilities — employment in high-wage industries accounted for a sizable share of the sectoral total, but neither of these sectors are major employers.

Nearly 25 percent of the high-wage jobs (employment of nearly 4.8 million) were in the professional, scientific and technical services sector. The manufacturing and finance and insurance sectors had the next largest numbers of high-wage jobs at just less than 2.9 million each.

Even among the seven sectors that accounted for the bulk of the high-wage jobs, the average wage among the high-wage industries varied widely, from more than $91,000 in the finance and insurance sector to less than $65,000 in health care and social assistance. Considering both the number of high-wage jobs and the average wage of those jobs, the professional, scientific and technical services sector had the largest impact, followed by finance and insurance.

TABLE 1
HIGH-WAGE JOBS BY INDUSTRIAL SECTOR
United States

Sector	Share of High-Wage Jobs in 2004	Average Wage as a Ratio to the High-Wage Average	Percent Change in Employment between 2001 and 2004
Professional, Scientific and Technical Services	24.6%	94%	-2%
Manufacturing	14.9	101	-15
Finance and Insurance	14.7	121	2
Information	10.9	94	-17
Health Care and Social Assistance	10.3	86	7
Wholesale Trade	8.8	94	3
Management of Companies	8.7	106	-1

Source: Calculated from U.S. Department of Labor, Bureau of Labor Statistics, Census of Employment and Wages.

Employment dropped between 2001 and 2004 in half of the 20 sectors. Both the numeric and percentage decreases were largest in manufacturing and information, each of which provided a substantial number of high-wage jobs. In contrast, employment rose significantly on both a numeric and percentage basis in health care and social assistance, another sector with a considerable number of high-wage jobs. Numerically, job growth also was large in the accommodation and food services and government sectors, while the percent change was significant in the educational services and accommodation and food services sectors.

Among the 190 high-wage industries, 23 had employment of at least 194,600 — each accounting for at least 1 percent of the total high-wage figure. These 23 industries (see Table 2) were responsible for 62 percent of all high-wage jobs. Close to one-fourth of the high-wage jobs were in just three industries: offices of physicians (10.3 percent of all high-wage jobs), corporate and regional managing offices (8.2), and offices of lawyers (5.5).

Within the professional, scientific and technical services sector, six of 19 high-paying industries each accounted for at least 1 percent of all high-wage jobs. In manufacturing, just three of 75 high-paying industries had such a high employment level; two of these experienced significant job losses between 2001 and 2004. Five of 27 high-paying finance and insurance industries met the criteria of at least 1 percent of all high-wage jobs. A significant employment gain occurred in the real estate credit industry while the very high-paying securities brokerage industry experienced a large loss of jobs. In the information sector, 20 industries paid high wages. The three largest of these all had an average wage less than the overall high-wage average and experienced large job losses between 2001 and 2004.

Offices of physicians, the only industry within the health care and social assistance sector to pay high wages, employed just more than two million — more than any other high-wage industry. The corporate and regional managing offices industry was the second-largest high-wage employer with 1.6 million workers, the largest of three high-paying industries in the management of companies sector. Three of 13 high-paying wholesale trade industries met the 1 percent criteria. Among the other 13 sectors, 32 industries paid high wages. The only one to meet the 1 percent threshold was office administrative services, within the administrative services sector.

Educational Attainment by Industrial Category

The national public-use microdata sample (PUMS) from the 2000 census was used to obtain educational attainment of workers by industry. Maximum educational attainment was grouped into five categories: less than high school diploma, high school graduate, some college, bachelor's degree, and advanced degree. Because the Census Bureau grouped industries together in the PUMS, the dataset matching 2004 wage data to 2000 educational data consisted of only 215 industrial categories (versus 1,170 industries in the CEW database). The NAICS level of these categories covered the range from sectors to industries, but commonly were industry groups (four-digit).

The average wage in 2004 was correlated with the educational attainment of workers by industrial category, though the relationship was not especially strong. Simple correlations of the 2004 CEW average wage with the percentage of respondents in various educational attainment categories were as follows (see page 7):

TABLE 2
23 INDUSTRIES WITH A LARGE NUMBER OF HIGH-WAGE JOBS
United States

Sector: Industry	Share of High-Wage Jobs in 2004	Average Wage as a Ratio to the High-Wage Average	Percent Change in Employment between 2001 and 2004
Professional, Scientific and Technical Services:			
Offices of Lawyers	5.5%	91%	5%
Engineering Services	4.0	87	-2
Custom Computer Programming Services	2.6	107	-9
Research and Development	2.5	107	4
Computer Systems Design Services	2.4	104	-7
Management Consulting Services	1.5	103	4
Manufacturing:			
Pharmaceutical Preparations	1.2	113	3
Semiconductor and Related Devices	1.1	117	-25
Aircraft	1.1	98	-13
Finance and Insurance:			
Property and Casualty Insurance Carriers	2.5	81	-1
Health Insurance Carriers	1.8	79	1
Real Estate Credit	1.7	97	48
Life Insurance Carriers	1.5	91	-15
Securities Brokerage	1.5	219	-19
Information:			
Wired Telecommunications Carriers	2.8	91	-26
Data Processing and Hosting	1.4	82	-16
Software Publishers	1.2	84	-13
Health Care and Social Assistance:			
Offices of Physicians	10.3	86	7
Wholesale Trade:			
Wholesale Trade Agents and Brokers	3.3	84	23
Computers, Peripherals and Software	1.2	121	-18
Drugs and Sundries	1.1	102	8
Management of Companies:			
Corporate and Regional Managing Offices	8.2	103	-1
Other:			
Office Administrative Services	1.7	82	23

Source: Calculated from U.S. Department of Labor, Bureau of Labor Statistics, Census of Employment and Wages.

- –.52, less than high school diploma
- –.25, high school graduate
- .06, some college
- .53, bachelor's degree
- .32, advanced degree
- .52, at least a high school graduate
- .49, at least a bachelor's degree

In addition, the correlation with a composite measure of educational attainment was .50. The composite was expressed in terms of average years of schooling completed, calculated using national results for more detailed attainment categories than the five listed above and assumptions for the years of schooling in categories aggregated by the Census Bureau (for example, a value of 14.5 years in the category of those attending at least one year of college but not receiving a degree).

Limiting the independent variables to various measures of educational attainment, a series of regressions were run with the average wage as the dependent variable and industry figures as observations. By far the best fit came in an equation with each of the five categories of educational attainment as independent variables (because the five categories sum to 100 percent, the less than high school category was omitted from the regression). The adjusted R-square was .45. The positive coefficients of each of the independent variables indicate that the annual average wage in an industrial category would be boosted from an increase of 1 percentage point in the share of workers in each educational attainment category other than less than high school; for example, the coefficient of the bachelor's degree value was 2,308.

Of the 215 industrial categories, 34 paid an average wage of at least 150 percent of the overall average. Of these 34 high-wage categories, 20 had employment of at least 1 percent of the overall total. The manufacturing sector accounted for 14 of the 34 high-wage categories, but only six of the 20 large high-wage categories.

Using the composite measure of educational attainment, average educational attainment was 13.2 years among all workers in 2000. In 26 of 34 high-wage industrial categories, the average worker had attainment greater than 13.2 years, with all 20 of the large high-wage categories being above average. The greatest educational attainment among workers occurred in industry categories in the professional, scientific and technical services; educational services; and management of companies sectors, with above-average attainment also present in the information, health care and social assistance, and finance and insurance sectors. The lowest attainment was in the construction, agriculture, accommodation and food services, manufacturing, other services, retail trade, and administrative support sectors.

In some sectors, the average wage was higher than expected given the educational attainment of the workers. This was especially true in construction, mining, accommodation and food services, wholesale trade, real estate, and management of companies. In contrast, the average wage was lower than expected given the educational attainment of workers in the educational services; arts, entertainment and recreation; health care and social assistance; and "other services" sectors.

Among the 34 high-wage industrial categories, all but three had an average wage higher than predicted from the regression equation. The median differential was 30 percent. Thus, while educational attainment of the workforce contributed to the high wages in these categories, other factors played a large role.

Science and Technology Emphasis by Industry

Some of the high-wage industries are "basic," exporting a sizable share of their output. The majority, however, produce goods and services that largely are consumed domestically. Similarly, some of the high-wage industries are heavily involved with science and technology while many of the others also are part of the knowledge economy. For example, among the 23 large high-paying industries, science and technology are significant features of the following 11 industries:

- Engineering Services
- Custom Computer Programming Services
- Research and Development
- Computer Systems Design Services
- Pharmaceutical Preparations Manufacturing
- Semiconductor and Related Devices Manufacturing
- Aircraft Manufacturing
- Wired Telecommunications Carriers
- Data Processing and Hosting
- Software Publishers
- Offices of Physicians

Each of the other 12 large high-paying industries likely would be considered to be part of the knowledge economy.

The 11 science and technology industries listed above accounted for more than 30 percent of all high-wage jobs in 2004. Five of the 11 had an average wage higher than the overall high-wage average. Only three of the 11 experienced an increase in employment between 2001 and 2004.

Occupational Data

The Occupational Employment Statistics program (OES) samples employers rather than conducts a census as in the CEW. However, OES wage data are adjusted to full-time-equivalent status unlike the CEW. Data for 2004 were released in November 2005.

The Standard Occupational Classification (SOC) organizes occupations into 22 occupational groups. Though 733 occupations are defined, some data are withheld even at the national level, so that the number of occupations available in both 2001 and 2004 was 699 (including aggregations of withheld occupations for each occupational group, 721 categories were analyzed).

In 2004, the overall average wage from the OES dataset was $37,440. A wage of $56,160 is 50 percent higher — 154 occupations (22 percent of all occupations) had an average wage at least this high. Employment in these 154 high-wage occupations totaled 18.7 million, or 14.5 percent of the overall employment of 129.1 million. Thus, based on the high-wage definition used in this analysis, slightly more than one-in-seven jobs paid high wages in 2004. The average wage among the 18.7 million high-wage jobs was $78,227 — 109 percent higher than the overall average.

Unlike the smaller number of jobs counted in 2004 than in 2001 by the CEW, the OES estimates national employment in 2004 was nearly 1.2 million more than in 2001, a gain of 0.9 percent. However, the number of high-wage jobs in the OES dataset decreased 2.1 percent over the three years. The employment gain was 1.4 percent among those jobs not identified as high wage.

Not considering inflation, the overall average wage rose 10.1 percent between 2001 and 2004. The increase was much greater among the high-wage industries at 17.0 percent. Both of these estimates are higher than the corresponding figures from the CEW.

Employment and Wages by Occupational Group and Occupation

High-wage employment in 2004 was concentrated in seven of the 22 occupational groups (see Table 3), which accounted for 90 percent of all high-wage jobs. Not even 30 percent of all jobs were in the same seven groups. In contrast, in eight groups, no occupation paid an average wage at least 50 percent higher than the overall average, though 40 percent of all employment was in these eight groups.

Among the seven groups that accounted for 90 percent of the high-wage jobs, employment in high-wage occupations as a share of total group employment ranged widely, from 10 percent in sales and 27 percent in health practitioners up to more than 80 percent in management and in computer and mathematical. Employment in high-wage occupations accounted for a sizable share of the group total in the legal group, but this is not a major employer.

The greatest number of high-wage jobs — 5.4 million, or 29 percent — were in the management occupational group. The business and financial operations group employed nearly 3.4 million.

Even among the seven groups that accounted for the bulk of the high-wage jobs, the average wage among the high-wage occupations varied widely, from more than $108,000 in the legal group to $61,000 in business and financial operations. Considering both the number of high-wage jobs and the average wage of those jobs, the management group by far had the largest impact.

Employment rose between 2001 and 2004 in 16 occupational groups, with the largest numeric gain in food preparation and serving and the greatest percentage advances in the

TABLE 3
HIGH-WAGE JOBS BY OCCUPATIONAL GROUP
United States

Group	Share of High-Wage Jobs in 2004	Average Wage as a Ratio to the High-Wage Average	Percent Change in Employment between 2001 and 2004
Management	29.0%	118%	-17%
Business and Financial Operations	18.2	78	14
Computer and Mathematical	13.1	91	5
Health Practitioners and Technical	9.3	120	3
Architecture and Engineering	8.7	92	-3
Sales and Related	7.1	90	-1
Life, Physical and Social Science	4.6	81	7

Source: Calculated from U.S. Department of Labor, Bureau of Labor Statistics, Occupational Employment Statistics.

personal care and services and the business and financial operations groups. In contrast, the management group experienced a very large loss of jobs (down 17 percent).

Among the seven groups with most of the high-wage employment, a significant employment loss in high-wage occupations occurred between 2001 and 2004 in management, while a strong gain in high-wage occupations was measured in business and financial operations. However, the latter group had wages considerably lower than in the management group.

Among the 154 high-wage occupations, 26 had employment of at least 186,700 — each accounting for at least 1 percent of the total high-wage figure. These 26 occupations (see Table 4) were responsible for 54 percent of all high-wage jobs. Nearly 15 percent of the high-wage jobs were in just two occupations: general and operations managers (9.1 percent of all high-wage jobs) and accountants and auditors (5.4).

Within the management occupational group, 10 of 19 high-paying occupations each accounted for at least 1 percent of all high-wage jobs. While most of these 10 occupations paid very high wages, most experienced declining employment between 2001 and 2004. In business and financial operations, three of nine high-paying occupations had such a high employment level; each of these experienced significant job gains between 2001 and 2004 but paid less than the high-wage average. Five of 12 high-paying computer and mathematical occupations met the criteria of at least 1 percent of all high-wage jobs, with most of these enjoying employment increases between 2001 and 2004. In the health practitioners and technical group, only one of 21 high-paying occupations employed at least 186,700. Two of 19 high-paying occupations in the architecture and engineering group, four of six in the sales group, and none of the 21 in the life, physical and social science group met the 1 percent threshold.

Among the other 15 occupational groups, 47 occupations paid high wages. The only one to meet the 1 percent threshold was offices of lawyers, a very high-paying occupation within the legal group.

Educational Attainment by Occupational Category

Because the Census Bureau grouped occupations together in the 2000 PUMS, the dataset matching 2004 wage data to 2000 educational data consisted of 447 occupational categories, versus 721 from the OES database. The average wage in 2004 was highly correlated with the educational attainment of workers by occupation — a higher correlation than between attainment and industry. Simple correlations of the 2004 OES average wage with the percentage of respondents in various educational attainment categories were as follows:

- –.62, less than high school diploma
- –.64, high school graduate
- –.15, some college
- .64, bachelor's degree
- .63, advanced degree
- .62, at least a high school graduate
- .76, at least a bachelor's degree

In addition, the correlation with the composite measure of educational attainment (defined in the Industrial Data subsection of this report) was .76.

Using the various measures of educational attainment to predict the average wage, the best fit came in the regression equation with each of the five categories of educational attainment as independent variables (because the five categories sum to 100 percent, the less than high school category was omitted from the regression). The adjusted R-square was .61. The positive

TABLE 4
26 OCCUPATIONS WITH A LARGE NUMBER OF HIGH-WAGE JOBS
United States

Group: Occupation	Share of High-Wage Jobs in 2004	Average Wage as a Ratio to the High-Wage Average	Percent Change in Employment between 2001 and 2004
Management:			
General and Operations Managers	9.1%	120%	-17%
Financial Managers	2.6	120	-14
Chief Executives	1.8	180	-27
Sales Managers	1.8	124	0
Computer & Information Systems Managers	1.4	128	-1
Administrative Services Managers	1.3	87	-20
Health Services Managers	1.2	97	0
Education Administrators, Elem/Secondary	1.1	97	4
Construction Managers	1.0	102	-12
Engineering Managers	1.0	133	-12
Business and Financial Operations:			
Accountants and Auditors	5.4	73	14
Management Analysts	2.3	94	17
Loan Officers	1.6	76	43
Computer and Mathematical:			
Computer Systems Analysts	2.7	89	11
Computer Software Engineers, Applications	2.1	100	22
Computer Programmers	2.1	85	-22
Computer Software Engineers, Systems	1.7	107	23
Computer Systems Administrators	1.4	80	15
Health Practitioners and Technical:			
Pharmacists	1.2	111	1
Architecture and Engineering:			
Civil Engineers	1.2	87	10
Mechanical Engineers	1.2	89	7
Sales and Related:			
Sales Representatives, except Technical	2.0	87	3
First-line Supervisors — Non-retail	1.6	92	-2
Insurance Sales Agents	1.5	72	6
Securities, Commodities and Financial	1.3	112	-8
Other:			
Lawyers	2.8	141	8

Source: Calculated from U.S. Department of Labor, Bureau of Labor Statistics, Occupational Employment Statistics.

coefficients of each of the independent variables indicate that the average wage in an occupation would be boosted from an increase of 1 percentage point in the share of workers in each educational attainment category other than less than high school; for example, the coefficient of the bachelor's degree value was 885.

Of the 447 occupational categories, 93 paid an average wage of at least 150 percent of the overall average. Of these 93 high-wage categories, 30 had employment of at least 1 percent of the overall total. The high-wage categories were clustered in the management; business and financial operations; computer and mathematical; architecture and engineering; life, physical and social science; and health practitioners and technical groups.

Using the composite measure of educational attainment, the average worker had attainment greater than the overall average of 13.2 years in 45 percent of all occupational categories. The share was much higher among the high-wage occupational categories. In 97 percent of the 93 high-wage occupational categories, and 100 percent in the 30 large high-wage categories, average educational attainment was greater than the overall figure. Overall, the greatest educational attainment among workers occurred in occupational categories in the education, training and library; life, physical and social science; architecture and engineering; community and social services; legal; computer and mathematical; and health practitioners and technical groups. The lowest attainment was in the food preparation and serving; construction and extraction; farming, fishing and forestry; production; transportation and material moving; and building and grounds cleaning and maintenance groups.

In some groups, the average wage was higher than expected given the educational attainment of the workers. This was especially true in the management; construction and extraction; and installation, maintenance and repair groups. In contrast, the average wage was far lower than expected given the educational attainment of workers in the community and social services; education, training and library; and personal care and services groups. The average wage also was considerably less than expected in the office and administrative support; healthcare support; and arts, design, entertainment, sports and media groups.

Among the 93 high-wage occupational categories, 76 percent had an average wage higher than predicted from the regression equation. Thus, while educational attainment of the workforce contributed to the high wages in these categories, other factors also played a role.

Science and Technology Emphasis by Occupation

Many of the high-wage occupations require a strong science and technology background, including those in the computer and mathematical; architecture and engineering; life, physical and social science; and health practitioners and technical occupational groups, as well as some occupations in the management group and in the education, training and library group. The 11 large occupations in these groups were responsible for 17 percent of all high-wage jobs. Five of the 11 had an average wage greater than the high-wage average, and seven experienced an employment increase between 2001 and 2004.

THE DISTRIBUTION OF HIGH-WAGE JOBS BY STATE

The analysis of high-wage jobs by state is greatly limited by the BLS having to meet the federal disclosure restrictions that cause data to be withheld in industrial or occupational categories that have few employers or in which one employer dominates. As a result, each state has a unique dataset of disclosed industries or occupations that cannot be compared directly to other states.

In the industrial dataset, an industry with undisclosed data can be distinguished from one with no employment. Thus, in the following analysis, each state is compared to a unique national dataset in which the industries which are withheld for a state are deleted from the national dataset. Industries with no employment in a state remain in the national dataset.

In the occupational dataset, it is not possible to distinguish between occupations with no employment and those with undisclosed employment since the BLS provides a balance of group category for each occupational group. Thus, the analysis of high-wage jobs by state presented below is limited to industrial data from the CEW dataset.

High-Wage Industrial Employment by State

Of the 190 industries nationally designated as high wage, the undisclosed proportion in 2001 and/or 2004 ranged from 16 percent in California and 18 percent in Texas to 54 percent in Arkansas and New Mexico. Arizona's undisclosed proportion of 35 percent was near the median state figure of 34 percent. Since most of the undisclosed data were for industries with limited employment nationally, the proportion of employment that was undisclosed was less. In deleting the withheld industries from the national dataset, high-wage employment in the disclosed industries exceeded 14 million in all but three states, compared to the actual national total of 19.5 million high-wage jobs. The median figure of 17.6 million (which occurred in the national dataset corresponding to Arizona) was only 10 percent less than the national average.

By state, the median number of industries with no employment was 25. In half of the states, no employment occurred in between 10 and 29 of the 190 high-wage industries. However, in 13 states, more than 50 high-wage industries had no employment. Texas (2) and California (3) had the fewest high-wage industries with no employment, while South Dakota had 82 (more than 40 percent of all high-wage industries). Arizona ranked 15th lowest with 20.

The high-wage employment share in each state in 2004, measured against the national dataset modified for the undisclosed industries in each state, is shown in Table 5. Only 16 states had a higher share than the national average, but these high performers include several of the most populous states, including California, Texas and New York, such that half of the nation's residents lived in these 16 states.

The five highest ranked states, and eight of the top 11, are located along the Atlantic Coast, between Massachusetts and Virginia (see Chart 1). The other three states with a share greater than 1 percentage point higher than the national average were California, Colorado and Minnesota. The states with the lowest shares of high-wage employment relative to the national average mostly are located in the northern Plains or South, but also include Nevada and Hawaii.

Arizona's proportion of high-wage employment in 2004 was marginally less than the national figure, ranking the state 17th — similar to neighboring Utah. Arizona's share was inferior to that in California and Colorado, but better than in Nevada and New Mexico. Relative to 10 "competitor" states identified by the Greater Phoenix Chamber of Commerce, Arizona ranked in the middle. However, compared to 10 "new economy" states identified by the Milken

Institute, Arizona ranked next to last, ahead only of Washington, whose figure likely is understated due to the withholding of data related to the aircraft manufacturing industry.

The employment performance of high-wage industries across states between 2001 and 2004 was assessed by (1) comparing the three-year percent change in total employment in a state to the national average, (2) comparing the percent change in high-wage employment in a state to the national high-wage average adjusted for the industries with withheld data, and (3) taking the difference between (1) and (2).

The change in high-wage employment between 2001 and 2004 was negatively correlated with the 2004 high-wage share of jobs across the states (a correlation coefficient of –.24). Thus, states with an above-average share of high-wage jobs in 2004 tended to perform poorly between 2001 and 2004, while many of the states with a low share of high-wage jobs in 2004 did

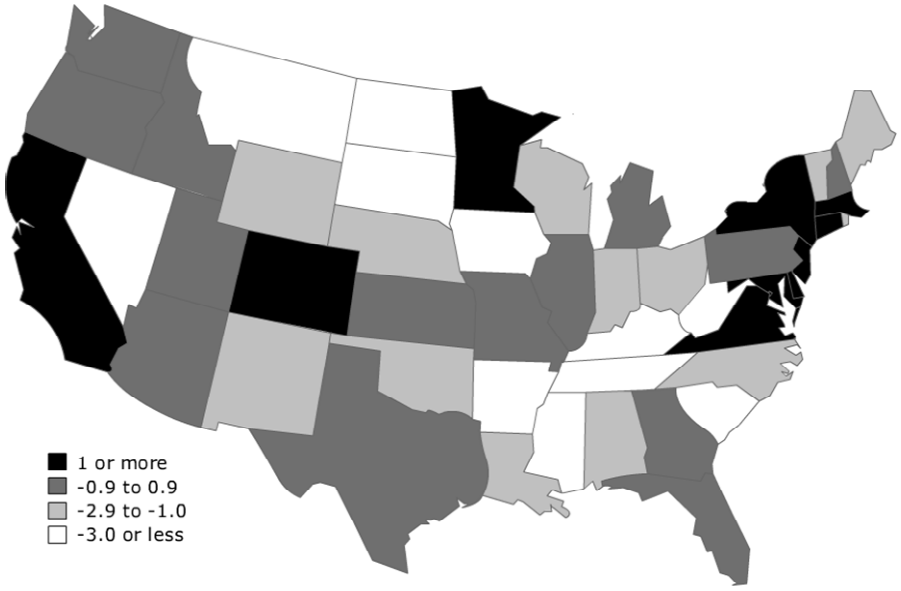
TABLE 5
HIGH-WAGE EMPLOYMENT SHARE RANKED BY STATE
BASED ON 2004 INDUSTRIAL DATA

		Share*			Share*
1.	District of Columbia	5.5	27.	Nebraska	-1.5
2.	Delaware	5.5	28.	Louisiana	-1.6
3.	Massachusetts	5.2	29.	Ohio	-1.6
4.	Connecticut	4.3	30.	North Carolina	-1.7
5.	New Jersey	3.7	31.	Alabama	-2.2
6.	California	2.9	32.	New Mexico	-2.2
7.	Virginia	2.7	33.	Vermont	-2.4
8.	New York	2.5	34.	Indiana	-2.5
9.	Colorado	2.4	35.	Maine	-2.5
10.	Minnesota	2.2	36.	Oklahoma	-2.6
11.	Maryland	1.3	37.	Wisconsin	-2.6
12.	Texas	0.9	38.	Alaska	-2.8
13.	Georgia	0.6	39.	Wyoming	-2.8
14.	Kansas	0.4	40.	Tennessee	-3.1
15.	Illinois	0.3	41.	Iowa	-3.2
16.	Utah	0.3	42.	Arkansas	-3.3
17.	Arizona	-0.1	43.	West Virginia	-3.3
18.	New Hampshire	-0.1	44.	North Dakota	-3.9
19.	Missouri	-0.4	45.	South Carolina	-3.9
20.	Pennsylvania	-0.4	46.	Hawaii	-4.1
21.	Oregon	-0.6	47.	Kentucky	-4.1
22.	Florida	-0.7	48.	Montana	-4.1
23.	Idaho	-0.7	49.	South Dakota	-4.7
24.	Washington	-0.7	50.	Nevada	-4.8
25.	Michigan	-0.9	51.	Mississippi	-5.1
26.	Rhode Island	-1.0			

* Expressed relative to the national average, with the national dataset adjusted to match each state's undisclosed data.

Source: Calculated from U.S. Department of Labor, Bureau of Labor Statistics, Census of Employment and Wages.

CHART 1
HIGH-WAGE EMPLOYMENT SHARE*
BASED ON 2004 INDUSTRIAL DATA



* Expressed relative to the national average, with the national dataset adjusted to match each state's undisclosed data.

Source: Calculated from U.S. Department of Labor, Bureau of Labor Statistics, Census of Employment and Wages.

relatively well between 2001 and 2004. The median state value was 0.4. Arizona ranked 38th with a figure of –1.9.

An assessment of the wages paid by high-wage industries in a state in 2004 relative to the overall state average wage and to the national average for high-wage industries was calculated by (1) comparing the overall average wage in a state to the national average, (2) comparing the average wage in high-wage industries in a state to the national high-wage average adjusted for the industries with withheld data, and (3) taking the difference between (1) and (2).

In most states, the 2004 high-wage average wage as a ratio to the national average was less than the overall average wage ratio. New York was a major exception. Other states with a higher high-wage ratio were Nevada, Connecticut, Arkansas, Texas, Delaware and North Carolina. The median state value was –3.8; Arizona's figure of –5.9 ranked 36th.

The wage performance of high-wage industries across states between 2001 and 2004 was assessed by (1) comparing the percent change in the overall average wage in a state to the overall national average, (2) comparing the percent change in the high-wage average wage in a state to the national high-wage average adjusted for the industries with withheld data, and (3) taking the difference between (1) and (2). The result was positive in the majority of the states, with the

median state having a value of 1.1. Hawaii and Nevada had the highest figures, with Washington and Wyoming having the lowest. Arizona ranked 33rd with a value of 0.6.

High-Wage Industrial Employment versus Industrial Job Quality by State

By state, the proportion of high-wage jobs in 2004 relative to the national average was highly correlated (correlation coefficient of .85) to industrial job quality as calculated over the entire wage distribution (for more information on job quality, see the March 2006 report listed as "Job Quality in All States" at wpcarey.asu.edu/seid/reports.cfm). Despite this high correlation, the rank on the two measures was widely different in some states.

Several states compared much more favorably on the proportion of high-wage jobs than on overall industrial job quality. Each of these states is a popular destination for tourists and/or seasonal residents. Thus, each has a high proportion of low-paying jobs related to tourism that lowers their measure of overall industrial job quality. The states with the largest rank differentials between the two measures in 2004 were Florida, Idaho, Oregon and Vermont. Arizona had the eighth largest differential.

In contrast, several states compared more favorably on overall industrial job quality than on the proportion of high-wage jobs in 2004. Job quality in the non-high-wage industries, which accounted for 85 percent of all jobs, was relatively stronger in these states than at the high end of the wage distribution. Most of these states have limited tourism. Foremost on this list were North Dakota, Oklahoma, Kentucky, Alaska, and West Virginia.

In Table 6, the share of high-wage jobs is compared to industrial job quality by region. Along the central Atlantic Coast (from Massachusetts to Virginia), both measures indicated considerable strength in 2004. North and south of this stretch along the coast, both measures were weaker, with the high-wage share more favorable than the overall job quality measure. Job quality in these northern and southern coastal states is adversely affected by low-paying tourism jobs.

Both job quality and the high-wage share were weak across the Interior South. Each of these states ranked higher on the job quality measure than the high-wage measure.

The situation was mixed in the Great Lakes region, with some states (particularly Illinois and Minnesota) comparing well on both measures, while others (especially Indiana and Wisconsin) were among the bottom tier of states on each measure. Four of these states — Pennsylvania, Ohio, Michigan and Illinois — compared less favorably on the high-wage measure than on overall job quality.

Among the Plains states, both job quality and the high-wage share generally were weak, with Texas the primary exception, though both Kansas and Missouri ranked in the middle of the states on both measures. Four of the states — the two Dakotas, Wyoming and Oklahoma — compared less favorably on the high-wage measure than on job quality.

The performance of the western states was mixed, with both measures strong in California, Colorado and Utah. Five of the states — New Mexico, Arizona, California, Oregon and Idaho — were stronger based on the high-wage measure than on overall job quality. Tourism is important to these states.

TABLE 6
HIGH-WAGE EMPLOYMENT SHARE AND JOB QUALITY BY STATE BASED ON 2004 INDUSTRIAL DATA (Organized Geographically)

	Job Quality	High-Wage Share*		Job Quality	High-Wage Share*
Atlantic Coast			**Great Lakes**		
Maine	-4.9	-2.5	Pennsylvania	-0.3	-0.4
New Hampshire	-1.3	-0.1	Ohio	-1.6	-1.6
Vermont	-6.2	-2.4	Michigan	-0.7	-0.9
Massachusetts	6.5	5.2	Indiana	-2.8	-2.5
Rhode Island	-2.0	-1.0	Illinois	1.7	0.3
Connecticut	4.6	4.3	Wisconsin	-2.9	-2.6
New York	5.4	2.5	Minnesota	1.6	2.2
New Jersey	5.2	3.7	**Plains**		
Delaware	5.9	5.5	North Dakota	-2.3	-3.9
Maryland	1.6	1.3	South Dakota	-5.1	-4.7
District of Columbia	21.4	5.5	Montana	-7.6	-4.1
Virginia	3.3	2.7	Wyoming	-2.6	-2.8
North Carolina	-2.7	-1.7	Nebraska	-2.3	-1.5
South Carolina	-5.6	-3.9	Kansas	-0.6	0.4
Georgia	-0.1	0.6	Iowa	-4.6	-3.2
Florida	-4.8	-0.7	Missouri	-0.9	-0.4
Interior South			Oklahoma	-1.3	-2.6
West Virginia	-2.6	-3.3	Texas	1.3	0.9
Kentucky	-2.6	-4.1	**West**		
Tennessee	-2.6	-3.1	New Mexico	-3.6	-2.2
Alabama	-2.0	-2.2	Arizona	-1.6	-0.1
Mississippi	-6.4	-5.1	Nevada	-9.7	-4.8
Arkansas	-2.9	-3.3	Utah	0.7	0.3
Louisiana	-1.8	-1.6	Colorado	1.8	2.4
			Idaho	-3.8	-0.7
			Washington	-1.3	-0.7
Hawaii	-8.6	-4.1	Oregon	-3.2	-0.6
Alaska	-2.0	-2.8	California	1.1	2.9

* Expressed relative to the national average, with the national dataset adjusted to match each state's undisclosed data.

Source: Calculated from U.S. Department of Labor, Bureau of Labor Statistics, Census of Employment and Wages.

Large High-Wage Industries by State

Earlier in this report, 23 large high-wage industries were identified nationally based on their 2004 employment making up at least 1 percent of the total high-wage figure; this cutoff was equal to more than 0.15 percent of total employment. Using the latter figure, large high-wage industries were identified by state. Of the 23 high-wage industries nationally with more than 0.15 percent of total employment, 22 accounted for more than 0.15 percent of total employment in Massachusetts. Other states with sizable employment in many of the 23 high-wage industries included Colorado (21); Illinois, New Jersey and Texas (20 each); and Arizona, New York and Pennsylvania (19 each).

In contrast, some states had a sizable number of employees in only a few of these industries: Wyoming (3); Alaska (5); Mississippi (6); Vermont (7); and Arkansas and South Dakota (8). These counts of large high-wage industries, however, may be understated due to data withholding. Data were withheld in at least six of the 23 large high-wage industries in Alaska, Maine, Mississippi, Vermont and Wyoming. In a few cases, substantial employment likely was withheld. For example, in three states, the figures were not disclosed for the offices of physicians industry, the largest of the high-wage industries nationally. In the state of Washington, employment was not disclosed for the aircraft manufacturing industry despite the large presence of Boeing.

Some states also had substantial employment in some of the other 167 industries that did not meet the more than 0.15 percent cutoff nationally. Twelve such industries met the employment threshold in Massachusetts and the District of Columbia, followed by 10 in New York, and eight in Colorado, Connecticut, Texas and Utah.

The numbers of all high-wage industries in each state that employed at least 0.15 percent of the total workforce are shown in Table 7. Correlation is not perfect between the number of industries meeting the threshold and the total number of workers in these industries, as measured by the share of total employment. Arizona, for example, ranked fifth on the number of sizable high-wage industries, but only 15th on the sum of employment in these industries as a share of total employment.

The states with the largest shares of employment in each of the 23 nationally large high-wage industries and in selected other high-wage industries with high shares in some states are shown in Table 8. In some of these industries, such as offices of physicians and real estate credit, not much variation in share occurred across the states. Others of these industries, such as semiconductor manufacturing, were highly concentrated in a few states in 2004.

TABLE 7
NUMBER AND SHARE OF LARGE HIGH-WAGE INDUSTRIES RANKED BY STATE BASED ON 2004 INDUSTRIAL DATA

	Rank	Share*	Rank	Number		Rank	Share*	Rank	Number
DC	1	16.12%	12	24	IN	27	8.88%	25	17
MA	2	15.80	1	34	OH	28	8.76	25	17
DE	3	15.78	18	19	LA	29	8.54	33	16
CT	4	14.66	5	26	RI	30	8.49	23	18
NY	5	13.27	2	29	WI	31	8.48	25	17
NJ	6	13.24	8	25	NC	32	8.32	23	18
VA	7	13.08	18	19	NM	33	8.30	41	13
MN	8	12.85	8	25	IA	34	8.28	25	17
CO	9	12.59	2	29	AL	35	8.25	25	17
CA	10	12.32	8	25	OK	36	8.09	34	15
MD	11	11.81	13	23	AR	37	7.82	43	12
GA	12	11.51	13	23	WV	38	7.75	34	15
TX	13	11.24	4	28	ME	39	7.49	37	14
UT	14	11.02	8	25	TN	40	7.48	25	17
AZ	15	10.99	5	26	HI	41	6.68	37	14
KS	16	10.94	37	14	SC	42	6.66	41	13
NH	17	10.63	18	19	ND	43	6.64	43	12
IL	18	10.36	5	26	KY	44	6.56	43	12
OR	19	10.35	18	19	SD	44	6.56	47	10
WA	19	10.35	16	20	NV	46	6.40	46	11
MO	21	10.18	25	17	AK	47	6.03	49	9
FL	22	10.07	13	23	MT	48	5.91	34	15
MI	23	10.03	18	19	MS	49	5.30	50	7
PA	24	9.84	16	20	VT	50	4.87	47	10
ID	25	9.58	37	14	WY	51	2.78	50	7
NE	26	9.45	25	17					

* A high-wage industry is defined as having at least 0.16 percent of total employment. The numbers and shares shown in the table are the totals of all large high-wage industries. These figures are affected by undisclosed data and therefore may understate the figures in some states.

Source: Calculated from U.S. Department of Labor, Bureau of Labor Statistics, Census of Employment and Wages.

TABLE 8
LARGE HIGH-WAGE INDUSTRIES IN 2004

		Share of Total Employment*					
Largest Industries Nationally:	**U.S.**	**Largest**		**Second**		**Third**	
Offices of Physicians	1.55%	MN	2.23%	WV	1.94%	FL	1.90%
Corporate & Regional Managing Offices	1.24	MN	2.35	MO	2.34	MA	2.02
Offices of Lawyers	0.83	DC	4.91	NY	1.45	DE	1.13
Engineering Services	0.61	VA	1.36	CO	1.26	MD	1.18
Wholesale Trade Agents & Brokers	0.49	NH	1.20	GA	0.89	MN	0.85
Wired Telecommunications Carriers	0.42	KS	1.64	CO	1.03	GA	0.73
Custom Computer Programming	0.39	VA	1.14	MD	0.95	DC	0.68
Property & Casualty Insurance Carriers	0.38	NH	0.86	OH	0.67	WI	0.67
Research and Development	0.37	NM	1.72	DC	1.46	ID	1.23
Computer Systems Design Services	0.37	VA	1.54	MD	0.99	DC	0.96
Health Insurance Carriers	0.26	NE	0.85	WI	0.57	MN	0.55
Real Estate Credit	0.26	AZ	0.45	CA	0.38	MD	0.38
Office Administrative Services	0.25	KS	0.60	DC	0.52	MD	0.39
Life Insurance Carriers	0.23	CT	1.90	IA	1.04	NE	0.52
Securities Brokerage	0.22	NY	0.96	MA	0.70	NH	0.46
Management Consulting	0.22	DC	0.87	MA	0.63	IL	0.54
Data Processing and Hosting	0.20	NE	0.73	RI	0.61	IA	0.53
Computers and Peripherals Wholesale	0.19	GA	0.41	TX	0.41	MA	0.31
Software Publishers	0.18	WA	1.45	CO	0.64	MA	0.60
Pharmaceutical Preparations Mftg	0.17	NJ	0.82	IN	0.69	NC	0.44
Semiconductor & Related Devices Mftg	0.17	ID	1.87	OR	1.56	AZ	0.92
Drugs and Sundries Wholesale	0.17	DE	0.77	TN	0.34	NJ	0.31
Aircraft Manufacturing	0.16	KS	2.22	GA	0.37	AL	0.30
Other Selected Industries:							
Credit Card Issuing	0.10	DE	3.62	SD	0.99		
Paper Mill	0.07	ME	1.12				
Aircraft Engine and Parts Manufacturing	0.06	CT	1.05				
Crude Petroleum & Nat. Gas Extraction	0.09	OK	0.91	AK	0.85	TX	0.65
Public Relations Agencies	0.04	DC	0.87				
Motion Picture and Video Production	0.15	CA	0.82				

* Because of data withholding, some states with a large share in may be understated.

Source: Calculated from U.S. Department of Labor, Bureau of Labor Statistics, Census of Employment and Wages.

HIGH-WAGE JOBS IN ARIZONA

This section provides more detail on high-wage jobs in Arizona relative to the national average. Rather than looking only at the industrial dataset as in the prior section, the occupational dataset also is examined. However, because of the inability to distinguish between occupations with no employment and those in which employment was withheld, results from the occupational data may be misleading.

Industrial Data

Nationally, 190 industries had an average wage at least 50 percent higher than the overall average in 2004. Arizona had no employment in 20 (just more than 10 percent) of these industries, with 16 of these in the manufacturing sector. The others were in the mining, utilities, and transportation sectors. Most of these 20 industries were small nationally, as a group accounting for only 0.2 percent of all U.S. employment, and 1.5 percent of the national high-wage employment, in 2004.

Due to the federal disclosure regulations, data were not disclosed for Arizona in 67 of the high-wage industries. In order to compare high-wage employment in Arizona to the national average, the same 67 industries were deleted from the national list of high-wage industries. Nationally, these 67 industries accounted for 1.5 percent of all employment and nearly 10 percent of the high-wage employment.

The 123 disclosed (zero or non-zero employment) high-wage industries in Arizona accounted for 13.5 percent of all employment, marginally less than the national share of 13.6 percent. The average wage among these high-wage industries was 79 percent higher than the overall average in Arizona, a lesser differential than the national average of 91 percent. Thus, while the overall average wage was 6.9 percent lower in Arizona than the U.S. average, the average for the high-wage industries was 12.8 percent less than the comparable national average.

Between 2001 and 2004, the number of high-wage jobs rose marginally (0.2 percent) in Arizona while the nation suffered a decrease of 4.0 percent. However, overall employment growth in Arizona (4.9 percent) exceeded the national average (–0.3 percent) by a greater degree. Thus, the high-wage share of total employment in Arizona fell slightly more between 2001 and 2004 than the national average (–0.6 percentage points in Arizona versus –0.4 points nationally).

The all-industry average wage in Arizona rose 1.0 percentage point more than the national average between 2001 and 2004. The average wage in the high-wage industries in Arizona had a marginally greater differential, rising 1.6 percentage points more than the U.S. average over the three years.

Thus, in 2004, a marginally lesser share of Arizona's employment was in high-wage industries and the average wage in these industries was further below the national average than the average of all jobs. Between 2001 and 2004, relative to the overall change in employment, Arizona's high-wage job growth was inferior to the national average. Relative to the overall change in average wage, the three-year change in average wage in the high-wage industries did slightly better in Arizona than the U.S. average.

In the majority of the 103 high-wage industries in which Arizona had employment, its sectoral share was less than the national average. The lesser shares in these industries, as well as in the 20 industries in which Arizona had no employment, more than offset the considerably higher shares in Arizona in certain industries, particularly semiconductor manufacturing. The industries with a sectoral share at least 0.10 different between Arizona and the national average are shown in Table 9.

Arizona's sectoral share was much higher than the national average in the semiconductor manufacturing industry and somewhat higher in certain other high-technology manufacturing industries and in a related wholesale trade industry. However, Arizona's shares were less than the U.S. average in some of the professional, scientific and technical services industries and in the corporate and regional managing offices industry.

In 91 of the 103 high-wage industries, the average wage in Arizona was less than the national average for that industry. In 37 industries, the average wage was more than 30 percent lower in Arizona; in only three industries was it more than 10 percent higher. Many of the industries with wide wage differentials had very little employment in Arizona. In these industries, the nature of the work done in Arizona may be considerably different from the national average.

Looking only at the 30 industries employing at least 3,175 (1 percent of all high-wage jobs) in Arizona in 2004, wages in the manufacturing and wholesale trade industries were close to the national average. In the other sectors, however, wages in most of the large industries were considerably less than the national average, particularly in the information sector.

In Table 10, Arizona is compared to the nation in each of the 23 industries that made up at least 1 percent of the nation's high-wage jobs in 2004 and in nine additional industries that accounted for at least 1 percent of Arizona's high-wage jobs. Overall, Arizona's employment made up 1.82 percent of the national average; Arizona's share of the nation's high-wage jobs

TABLE 9
HIGH-WAGE INDUSTRIES WITH A DIFFERENCE IN SECTORAL SHARE OF AT LEAST 0.10 BETWEEN ARIZONA AND THE NATIONAL AVERAGE IN 2004

Manufacturing			
Semiconductor and Related Devices	.75	Pharmaceutical Preparations	-.14
Search and Navigation Instruments	.26		
Aircraft Engines	.21		
Wholesale Trade			
Other Electronics	.25	Wholesale Trade Agents and Brokers	-.11
Professional, Scientific and Technical Services			
Management Consulting	.20	Research and Development	-.25
		Offices of Lawyers	-.25
		Custom Computer Programming	-.13
Management of Companies			
		Corporate & Regional Managing Offices	-.36
Information			
		Motion Picture and Video Production	-.12
Finance and Insurance			
Real Estate Credit	.19	Health Insurance Carriers	-.19
Credit Card Issuing	.18		
Construction			
Land Subdivision	.17		

Source: Calculated from U.S. Department of Labor, Bureau of Labor Statistics, Census of Employment and Wages.

TABLE 10
THE LARGEST HIGH-WAGE INDUSTRIES IN THE NATION AND IN ARIZONA, 2004

	Employment in Thousands		AZ Share of U.S.	U.S. Average Wage in	AZ Wage Ratio to
Large Industries Nationally	**U.S.**	**AZ**	**Employ**	**Thousands**	**U.S.**
Offices of Physicians	2,010	38.0	1.89%	$64.6	1.02
Corporate, Subsidiary & Regional Offices	1,604	20.6	1.29	77.8	0.88
Offices of Lawyers	1,073	13.7	1.28	68.8	0.99
Engineering Services	787	15.2	1.93	65.8	0.99
Wholesale Trade Agents and Brokers	637	9.1	1.42	63.3	0.92
Wired Telecommunications Carriers	538	10.5	1.94	68.2	0.78
Custom Computer Programming Services	504	6.1	1.21	80.6	0.80
Property and Casualty Insurance Carriers	494	7.8	1.57	61.3	0.87
Research and Development	480	2.9	0.61	80.8	0.77
Computer Systems Design Services	475	6.8	1.44	78.0	0.83
Health Insurance Carriers	342	1.7	0.50	59.8	0.95
Real Estate Credit	338	10.5	3.12	73.1	0.90
Office Administrative Services	326	7.6	2.34	61.6	0.74
Life Insurance Carriers	297	3.7	1.24	68.9	0.87
Securities Brokerage	290	5.6	1.93	165.3	0.46
Management Consulting	289	9.8	3.40	77.4	0.81
Data Processing and Hosting	265	5.1	1.92	61.9	0.78
Computers and Peripherals Wholesale	241	5.0	2.07	91.3	0.95
Software Publishing	235	3.5	1.50	95.5	0.67
Pharmaceutical Preparations Mftg	225	0.8	0.35	84.8	0.67
Semiconductor & Related Devices Mftg	220	21.6	9.78	88.0	1.01
Drugs and Sundries Wholesale	217	4.0	1.83	77.0	1.02
Aircraft Manufacturing	207	5.2	2.49	73.5	0.95
Other Large Industries in Arizona					
Other Electronic Wholesale	165	8.9	5.37	72.0	1.01
Search & Navigation Instrument Mftg	149	8.8	5.90	80.1	1.04
Credit Card Issuing	125	6.5	5.19	69.6	0.71
Aircraft Engine Manufacturing	78	6.4	8.14	66.9	0.99
Land Subdivision	87	5.6	6.46	59.5	1.07
Mortgage Loan Brokers	128	4.0	3.14	60.1	1.00
Architectural Services	184	3.7	2.02	59.8	0.92
Wireless Telecommunications	167	3.7	2.21	62.2	0.76
Internet Service Providers	105	3.2	3.04	86.1	0.47

Source: Calculated from U.S. Department of Labor, Bureau of Labor Statistics, Census of Employment and Wages.

was 1.81 percent. In three of five of the nation's largest high-wage industries, and in eight of the 11 largest, Arizona's employment share was well below this average. In all but one of the 20 largest national high-wage industries, Arizona's average wage was less than the national average — by at least 10 percent in 14 of the 20 industries.

In contrast, nearly 10 percent of the nation's semiconductor manufacturing employment was in Arizona in 2004, with the average wage in Arizona marginally higher than the U.S. average. Similarly, Arizona accounted for more than 5 percent of the nation's employment in five high-wage industries that made up more than 1 percent of Arizona's high-wage jobs but less than 1 percent nationally. In all but one of these industries, the average wage in Arizona was comparable to the national average.

Arizona's shares of national employment in some of these high-wage industries are shown in Chart 2, organized by sector. The vertical line displays Arizona's overall 1.82 percent share of employment (the state's share of the nation's population in 2004 was 1.95 percent). A share of 4 percent in the chart corresponds to a share of 4 or more.

The share of total employment in disclosed industries that paid at least 50 percent more than the overall average wage in 2004 was very nearly equal to the national average in Arizona and ranked 17th among the states. The high-wage end of the employment distribution, which accounted for less than one-in-seven jobs, provides a more favorable impression of Arizona's job quality than that based on all employment. Overall industrial job quality in Arizona in 2004 was 1.6 percent less than the national average, ranking 23rd. Thus, Arizona's subpar job quality is not due to a scarcity of high-wage jobs, but instead results from lesser job quality in the remainder of the employment distribution. In particular, Arizona has many very low-wage jobs that serve tourists and seasonal residents.

In turn, the low overall wage in Arizona — 7 percent less than the U.S. average — primarily results from factors other than job quality. As seen above, the state's average wage in 2004 was less than the national average in the vast majority of industries.

Occupational Data

Because of the problem noted earlier in not being able to distinguish between an occupation with missing data and one with no employment, comparisons between Arizona and the nation in this subsection must be interpreted cautiously. Any occupation not available for Arizona was deleted from the national dataset, and balance of occupational group categories were deleted from both the state and national datasets. The result may be to understate the amount of high-wage employment nationally relative to Arizona, since some of the deleted occupations may have no employment in Arizona but employment nationally.

Nationally, 160 occupations (including a few balance of group categories) had an average wage at least 50 percent higher than the overall average in 2004. In Arizona, only 111 categories were available. Deleting the balance of group categories resulted in 105 occupations in Arizona being compared to the national average. It is not known how many of the 43 occupations missing from the Arizona dataset had no employment versus undisclosed employment and therefore how much the deletion of these occupations from the national dataset inappropriately lowered the national figures. After the deletion, the national high-wage employment total was 21 percent less than the total before the deletions.

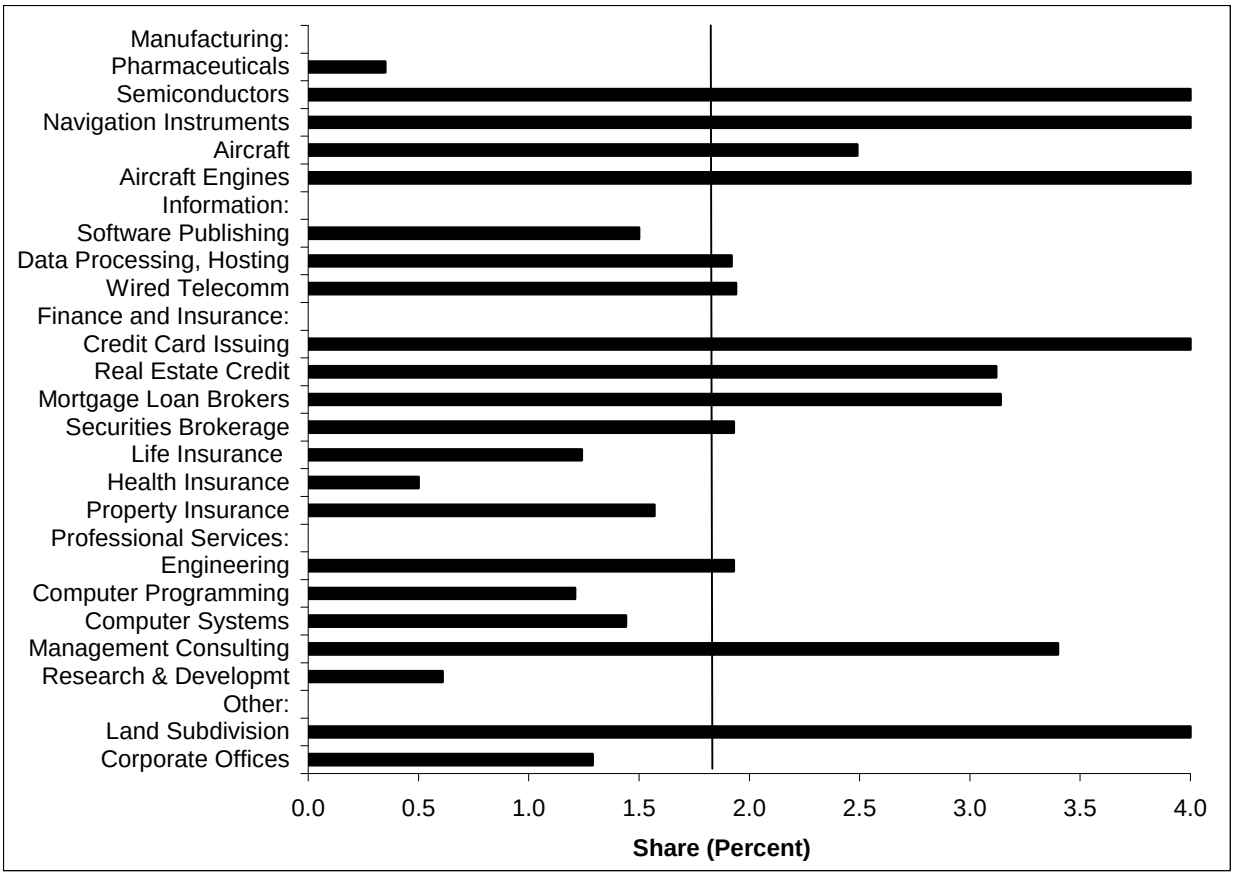
The 105 disclosed high-wage occupations accounted for nearly 12 percent of all employment in Arizona, a little more than the national share of 11.4 percent. The average wage

among these high-wage occupations was 102 percent greater than the overall average in Arizona, a lesser differential than the national average of 111 percent.

Between 2001 and 2004, the number of high-wage jobs rose 4.1 percent in Arizona while the nation suffered a decrease of 0.7 percent. However, overall employment growth in Arizona (6.3 percent) exceeded the national average (0.9 percent) by a greater degree. Thus, the high-wage share of total employment in Arizona fell slightly between 2001 and 2004 while the national average share rose marginally.

The all-occupation average wage in Arizona rose 1.6 percentage points less than the national average between 2001 and 2004. The average wage in the high-wage occupations advanced more than the overall figure both nationally and in Arizona. However, the differential

CHART 2
SELECTED HIGH-WAGE INDUSTRIES
ARIZONA SHARE OF NATIONAL EMPLOYMENT, 2004



Notes: Five industries in the chart have a share of at least 4.0. The vertical line represents the state's overall employment share of 1.82 percent. Arizona's population accounts for 1.95 percent of the national total.

Source: Calculated from U.S. Department of Labor, Bureau of Labor Statistics, Census of Employment and Wages.

in the percentage increase between all jobs and high-wage jobs was less in Arizona than the national average.

Thus, in 2004, a slightly greater share of Arizona's jobs were in high-wage occupations, but the average wage in these occupations was further below the national average than the average of all jobs. Between 2001 and 2004, relative to the overall change in employment, Arizona's high-wage job growth was inferior to the national average. Relative to the overall change in average wage, the three-year change in average wage in the high-wage industries was less in Arizona than the U.S. average.

The number of high-wage occupations with a larger employment share in Arizona than the national average was about equal to the number with a lower share. In only a few occupations was the sectoral share at least 0.10 different between Arizona and the national average and in only one was the differential greater than 0.2: Arizona's share was higher in the wholesale sales representatives for technical and scientific products, electrical engineers, electronics engineers, and management analysts occupations, but was less in the general and operations managers (by .27) and computer systems analysts occupations.

In 99 of the 105 high-wage occupations, the average wage in Arizona was less than the national average for that occupation. In 17 occupations, the average wage was more than 20 percent lower in Arizona; in only three occupations was it more than 10 percent higher: loan officers, general practitioner physicians, and dental hygienists.

Looking only at the 33 occupations employing at least 2,850 (1 percent of all high-wage jobs) in Arizona in 2004, wages in the architecture and engineering group were close to the national average. In the other groups, however, wages in most of the large occupations were considerably less than the national average, particularly in the sales group.

In Table 11, Arizona is compared to the nation in each of the 33 industries that made up at least 1 percent of the nation's high-wage jobs in 2004 and in four additional industries that accounted for at least 1 percent of Arizona's high-wage jobs. Overall, Arizona's employment made up 1.84 percent of the national average; Arizona's share of the nation's high-wage jobs was 1.92 percent. The state's employment share was not substantially different from this figure in the majority of occupations. In all but three of the 33 largest national high-wage occupations, Arizona's average wage was less than the national average — by at least 10 percent in 16 of the occupations.

Arizona's shares of national employment in some of these high-wage occupations are shown in Chart 3, organized by occupational group. The vertical line displays Arizona's overall 1.84 percent share of employment (the state's share of the nation's population in 2004 was 1.95 percent). In the majority of the selected high-wage occupations, Arizona's share was above average, but Arizona's share in 2004 was below average in each of the computer occupations.

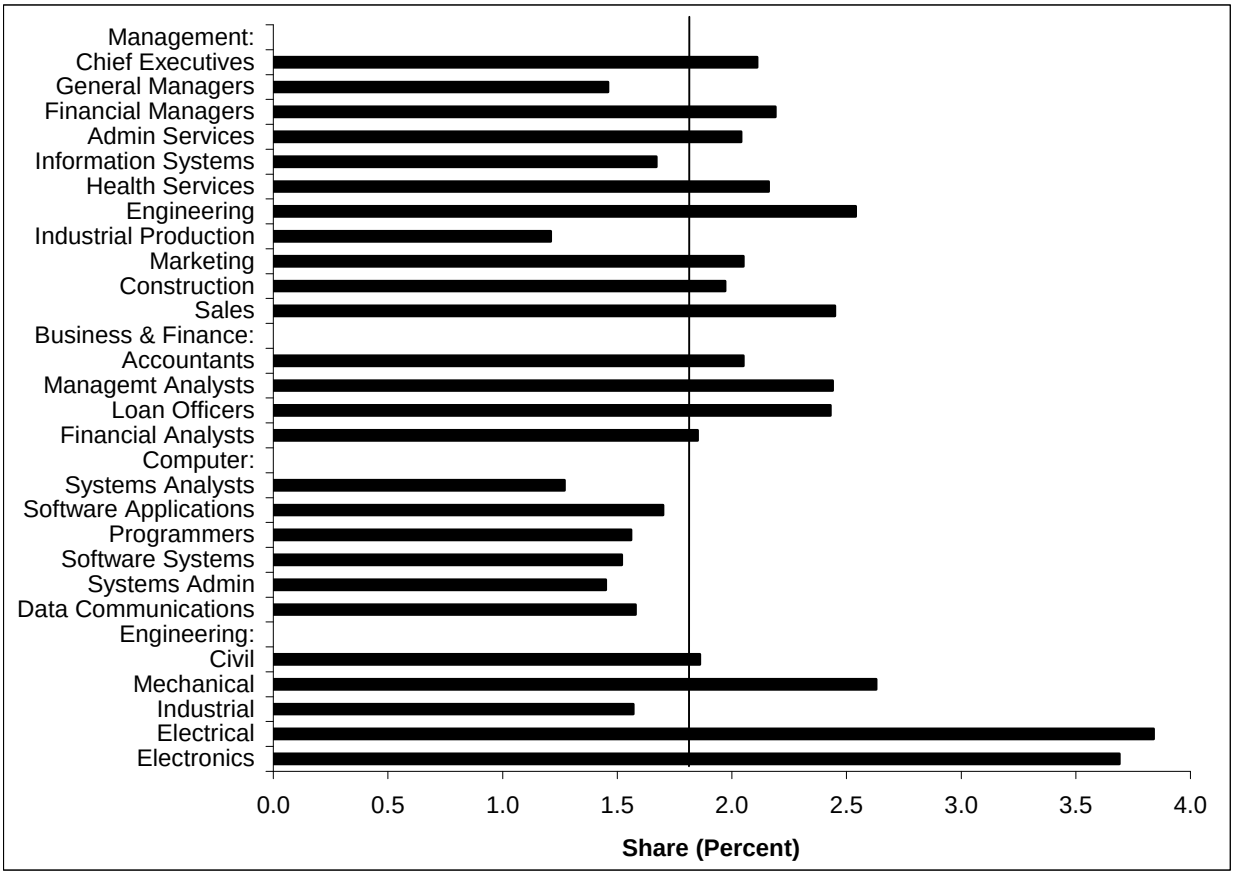
The share of total employment in disclosed occupations that paid at least 50 percent more than the overall average wage in 2004 was a little above the national average in Arizona. The high-wage end of the employment distribution, which accounted for less than one-in-six jobs, provides a more favorable impression of Arizona's job quality than that based on all employment. Overall occupational job quality in Arizona in 2004 was 0.5 percent less than the national average, ranking 23rd. Thus, the occupational data verify that Arizona's subpar job quality is not due to a scarcity of high-wage jobs, but instead results from lesser job quality in the remainder of the employment distribution.

TABLE 11
THE LARGEST HIGH-WAGE OCCUPATIONS IN THE NATION AND IN ARIZONA, 2004

Large Occupations Nationally	Employment in Thousands U.S.	Employment in Thousands AZ	AZ Share of U.S. Employ	U.S. Average Wage in Thousands	AZ Wage Ratio to U.S.
General and Operations Managers	1,704	24.8	1.46%	$93.6	0.91
Accountants and Auditors	1,008	20.7	2.05	57.2	0.88
Lawyers	528	8.3	1.57	110.6	0.85
Computer Systems Analysts	497	6.3	1.27	69.5	0.94
Financial Managers	489	10.7	2.19	94.2	0.84
Software Engineers, Applications	440	7.5	1.70	78.6	0.91
Management Analysts	425	10.4	2.44	73.5	0.92
Computer Programmers	396	6.2	1.56	66.5	0.89
Wholesale Representatives, Technical	383	11.1	2.90	67.7	0.74
Chief Executives	335	7.1	2.11	140.9	0.94
Computer Software Engineers, Systems	321	4.9	1.52	83.5	0.92
Sales Managers	318	7.8	2.45	97.0	0.84
Loan Officers	305	7.4	2.43	59.5	1.26
Supervisors – Non-retail Sales	303	5.9	1.94	72.1	0.83
Insurance Sales Agents	284	6.8	2.38	56.3	0.90
Information Systems Managers	264	4.4	1.67	100.1	0.90
Computer Systems Administrators	263	3.8	1.45	62.3	0.95
Financial Services Sales Agents	249	3.9	1.58	87.5	0.83
Administrative Services Managers	249	5.1	2.04	68.1	0.81
Health Services Managers	228	4.9	2.16	75.8	0.87
Pharmacists	226	3.8	1.69	86.9	0.99
Civil Engineers	226	4.2	1.86	68.3	0.98
Mechanical Engineers	219	5.8	2.63	69.5	1.03
Education Administrators, El/Secondary	209	3.3	1.58	76.1	0.88
Construction Managers	189	3.7	1.97	80.1	0.92
Engineering Managers	189	4.8	2.54	104.2	0.98
Industrial Engineers	185	2.9	1.57	67.8	0.98
Market Research Analysts	184	2.8	1.51	64.1	0.85
Financial Analysts	181	3.4	1.85	71.3	0.80
Data Communications Analysts	177	2.8	1.58	64.1	0.93
Marketing Managers	172	3.5	2.05	100.0	0.80
Dental Hygienists	158	2.6	1.62	59.8	1.16
Industrial Production Managers	156	1.9	1.21	80.6	0.99
Other Large Occupations in Arizona					
Electrical Engineers	147	5.7	3.84	75.5	0.98
Electronics Engineers	133	4.9	3.69	78.6	0.93
Aerospace Engineers	80	3.2	4.06	83.6	1.03
Credit Analysts	64	2.9	4.53	57.6	0.76

Source: Calculated from U.S. Department of Labor, Bureau of Labor Statistics, Occupational Employment Statistics.

CHART 3
SELECTED HIGH-WAGE OCCUPATIONS
ARIZONA SHARE OF NATIONAL EMPLOYMENT, 2004



Notes: The vertical line represents the state's overall employment share of 1.84 percent. Arizona's population accounts for 1.95 percent of the national total.

Source: Calculated from U.S. Department of Labor, Bureau of Labor Statistics, Census of Employment and Wages.

THE PRODUCTIVITY AND PROSPERITY PROJECT

The Productivity and Prosperity Project: An Analysis of Economic Competitiveness (P3) is an ongoing initiative begun in 2005, sponsored by Arizona State University president Michael M. Crow. P3 analyses incorporate literature reviews, existing empirical evidence, and economic and econometric analyses.

Enhancing productivity is the primary means of attaining economic prosperity. Productive individuals and businesses are the most competitive and prosperous. Competitive regions attract and retain these productive workers and businesses, resulting in strong economic growth and high standards of living. An overarching objective of P3's work is to examine competitiveness from the perspective of an individual, a business, a region, and a country.

THE CENTER FOR COMPETITIVENESS AND PROSPERITY RESEARCH

The Center for Competitiveness and Prosperity Research is a research unit of the L. William Seidman Research Institute in the W. P. Carey School of Business at Arizona State University. The Center administers the Productivity and Prosperity Project: An Analysis of Economic Competitiveness (P3), and the Office of the University Economist. These ongoing initiatives began in 2005 and are sponsored by university president Michael M. Crow.

Specializing in applied economic and demographic research with a geographic emphasis on Arizona and the metropolitan Phoenix area, the Center also conducts research projects under sponsorship of private businesses, nonprofit organizations, government entities, and other ASU units.

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