NATIONAL JOB QUALITY THROUGH 2003

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Tom Rex, M.B.A.
Associate Director, Center for Competitiveness and Prosperity Research;
and Manager of Research Initiatives, Office of the University Economist

P3 | PRODUCTIVITY AND PROSPERITY PROJECT

ASU W. P. CAREY SCHOOL of BUSINESS
ARIZONA STATE UNIVERSITY

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A Report from the Productivity and Prosperity Project (P3), Supported by the Office of the University Economist

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Associate Director, Center for Competitiveness and Prosperity Research;
and Manager of Research Initiatives, Office of the University Economist

Center for Competitiveness and Prosperity Research
L. William Seidman Research Institute
W. P. Carey School of Business
Arizona State University
Box 874011
Tempe, Arizona 85287-4011

(480) 965-5362
FAX: (480) 965-5458
EMAIL: Tom.Rex@asu.edu
wpcarey.asu.edu/research/competitiveness-prosperity-research
economist.asu.edu

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SUMMARY

The quality of jobs in the United States became a national concern in the 1980s after a long period of losses of relatively high-paying manufacturing jobs and gains of frequently low-paying service jobs. National job quality remains a concern today, as witnessed by the debate in the 2004 presidential campaign.

A new measure of job quality indicates that the long-term trend has been toward lower-quality jobs in the United States, where quality is defined in terms of wages. Nationally, the rate of decline in job quality has been relatively modest. Had no erosion in job quality occurred between 1969 and 2003, the average wage in 2003 would have been 5 percent higher than the actual figure.

Losses in job quality occur during economic recessions and in the recovery phase following recessions. Job quality on average is flat during the middle and latter years of economic expansions.

The manufacturing sector has been a major cause of the national decline in job quality over the last 35 years. Many manufacturing industries pay above-average wages, but their workforces have declined as a share of total employment. In contrast, some low-paying industries, particularly in retail trade and services, have experienced strong employment growth.

Between 2000 and 2003 — a period marked by a recession in 2001 and a slow recovery that extended into 2003 — job quality nationally decreased at a rapid rate. A considerable number of jobs in high-paying management occupations were lost during this period.

Most states experienced a decline in job quality between 2000 and 2003, with few having a change that was much different from the national average. The best-performing states were the District of Columbia, Hawaii, Rhode Island, Wyoming and Alaska. Little pattern can be seen in the change in job quality over this period except that states with the weakest industrial mixes generally had the strongest gains in industrial job quality.

The highest job quality in the nation in 2003 was along the Atlantic Coast from Massachusetts to Virginia, with very strong job quality in the District of Columbia and Massachusetts. Outside of this region, the strongest job quality was in Illinois and Colorado.

Job quality was weakest in most of the mid-section of the country, stretching from the northern Rocky Mountains through the Great Plains and the South. However, the states with the lowest job quality were Nevada and Hawaii, both with a high percentage of low-paying tourism jobs.

The overall average wage is a measure of prosperity or well-being, but is not in itself a measure of job quality since job quality is just one of several factors — including cost of living, productivity, and desirability of an area — that affect the overall average wage. Little information on these factors is available by state. Adjusting for job quality reduces the state-by-state variation in wages. However, even after adjusting for job quality, the average wage still varies substantially by state.

INTRODUCTION

The analysis of the change over time in the nation's job quality has been plagued by data deficiencies and methodological shortcomings. This report addresses the methodological issues, presenting a new measure of job quality and the change in job quality over time.

The overall average wage is not by itself a good measure of job quality. While the overall average wage incorporates job quality, it also reflects such other factors as labor force supply and demand, perceived quality of place, productivity, and cost of living. Similarly, increases over time in the overall average wage do not necessarily indicate improvements in job quality. For example, technological innovations increase productivity and raise wages without any change in job quality.

Ideally, an analysis of job quality would be conducted using a microdataset of workers that includes numerous workforce characteristics, such as occupation, industry, wages adjusted for number of hours worked, and benefits. Microdata from the decennial census provide much of this type of information, but the 10-year gap between data points and changes in both the industrial and occupational classification systems between the last two decennial censuses greatly limits the use of this dataset.

A variety of other datasets are subject to other limitations, particularly that the data are presented in an aggregated fashion. Most provide data only by industry or by occupation, most do not adjust for the number of hours worked, and most provide data only on wages and salaries of wage and salary employees.

Data limitations become more serious for analyses made by state or other subnational levels of geography. Small sample sizes limit the analysis using decennial census microdata. Undisclosed industrial or occupational data significantly affect the analyses using other datasets, none of which provide both occupational and industrial data.

For most of the datasets analyzed in this project, job quality is measured either by occupation or by industry, using the share of total employment and the average wage in each industry or occupation. An overall estimate of job quality is derived from a combination of job quality by industry and job quality by occupation. Nationally, only the change over time in job quality is measured. By state, in addition to the change, job quality in a given year — expressed relative to the national average — also is presented.

The research for this report was conducted in two phases. The first phase analyzed the change in national job quality using multiple datasets, going back as far as 1970. In addition, the level and change in job quality was estimated for one state (Arizona). Some inconsistencies in the measurement of job quality exist across datasets. Complete results of this analysis, with a strong focus on Arizona data, are available in the report *Introduction to Job Quality in Arizona*, available at http://economist.asu.edu/p3/job-quality.

The second phase analyzed data for all states but was limited to two datasets, one presenting industrial data, the other occupational data. Because of the limited availability of state data by occupation, the time period analyzed was restricted to the years 2000 and 2003. The level of job

quality in 2003 and the change between 2000 and 2003 are presented. The findings of the second phase are included in this report and its companion report *Arizona Job Quality Through 2003*, also available at http://economist.asu.edu/p3/job-quality.

Literature Review

The first study of changes in national job quality was made by Bluestone and Harrison in 1986. They placed the categorical changes in employment into three groups — low, medium, and high earnings. They found that the proportion of low-wage workers rose between 1979 and 1985. However, using similar data and similar methods, Koster and Ross (1987, 1988) came to a contradictory conclusion.

Subsequent studies used similar methods, ranking categories (of occupations, industries, or a cross-tabulation of the two) by average wage (mean or median), breaking the distribution into two parts (above/below the median), three parts (above, near average, and below), quartiles, or deciles. The groupings (e.g. quartiles) were made by employment sectoral share, with the goal being to keep the sectoral share nearly equal across the groups. Among the studies using this method were three done by U.S. Bureau of Labor Statistics employees published in the *Monthly Labor Review* (Rosenthal, 1995; Ilg, 1996; Ilg and Haugen, 2000). The 1999 U.S. Department of Labor "Report on the American Workforce" also used this method, as did Wright and Dwyer (2000).

An important finding of the work done by the BLS is that the results vary depending on whether industrial or occupational data are used — national job quality generally has been found to be worsening by more based on industrial data than using occupational data. The BLS believes that a cross-section of occupational and industrial data provides the most reliable results. However, few such datasets exist, especially for geographic areas smaller than the nation.

The prevailing method of dividing the distribution of industrial or occupational categories into groups is simplistic, with results difficult to interpret since relative employment changes can vary widely by group in an erratic manner. As indicated by the contradictory results from Bluestone and Harrison and Koster and Ross, this method is sensitive to small changes in assumptions, methods, and data (Costrell, 1990).

More importantly, this method does not fully utilize all of the available data in the analysis. It does not recognize that the average wage can vary widely within a group. For example, even when splitting a distribution into deciles, a significant difference in the average wage exists across categories in the top (and bottom) decile.

A recent study again illustrates the method's problems. A national analysis of the change in job quality between 2001 and 2004 recently was conducted by the Annenberg Political Fact Check Project (FactCheck.org). A cross-tabulation of national industrial and occupational data from the Current Population Survey was used for 151 categories for which both wage and employment data were available. The average weekly wage in 2003 was used to rank the 151 categories. The categories were split into two groups based on the median wage figure. The results were striking: All of the net job growth both from 2001 to 2004 and from 2003 to 2004 (measured as of June of each year) was in categories with wages above the median.

Despite the seemingly overwhelming evidence of an improvement in job quality, a more sophisticated analysis by Gould et. al. of the Economic Policy Institute (Gould, 2004) of the same dataset results in the opposite conclusion for the three-year period: job quality worsened. The differing conclusions result from the Annenberg analysis not considering sectoral/occupational shares of employment and employment change and not incorporating the very large intragroup differences in wages in their simplistic above- and below-median-wage groups.

Thus, Annenberg's analysis did not consider that 11 of the 12 highest-paying categories lost jobs (employment in the 12th was flat), with a net loss of 716,000 jobs over the three years in these 12 categories. In contrast, five of the seven lowest-paying categories gained jobs, with a net gain of 734,000. One category with an average wage moderately above the median — professional occupations in the educational and health services sectors — had a three-year increase in employment of 1.38 million, which was greater than the overall increase of 1.07 million. In contrast, the category of production occupations in manufacturing (with earnings slightly below the median) lost 1.27 million jobs.

The methodology used by the EPI is similar to that used in this report (detailed in the next section), utilizing all of the available data. They split the 151 categories into two groups: those with gains in employment share and those with losses in employment share. In each group, a weighted share for each category was created using the total change in share for the group. By category, the weighted share was multiplied by the average wage, with this weighted wage summed over all categories in each group. For the three-year period, the weighted average wage of categories with gains in employment was 7 percent less than the weighted average wage of categories with job losses.

Methodology

Instead of ranking and dividing categories into groups, an overall measure of the change in job quality can be calculated, using all of the available data. The change in job quality (sometimes referred to as the "score" in this report) for the nation is calculated from formula (1), summing over all categories (industries or occupations):

(1) (change over time in categorical share of national employment) * (ratio of the national categorical average wage to overall national average wage – 1) * 100.

The mid-point of the change in job quality score is zero; that is, categorical employment change that is exactly proportionate to employment shares results in a score of zero. A negative score indicates a deterioration in job quality while a positive score signals an improvement in job quality. The multiplication by 100 in the formula converts the results to percentages. For example, a job quality score of -0.5 indicates that deterioration in job quality had a downward effect of 0.5 percent on the overall average wage.

The wage data used in this calculation can be for either the first or last year of the time period being analyzed. (The first year has been used in this paper.) For short time periods, the choice of year results in only slightly different measures, but the differences may be significant when analyzing a long time period. An alternative for longer time periods in which annual data are

available is to calculate the annual change in job quality, then to cumulate the annual scores. When annual data exist, the cumulation of annual scores is the preferred method since it allows the average wage data to be updated each year, rather than held constant.

A measure of job quality as of a point in time cannot be calculated for the nation. However, such a measure can be calculated for subnational areas, expressed relative to the national average. This measure of job mix (either industrial mix or occupational mix) is calculated from formula (2), summing over all categories:

(2) (difference in share of employment between the subnational area and the nation) * (ratio of the national categorical average wage to overall national average wage – 1) * 100.

To isolate the effect of geographic differences in the employment structure, the average wage is held constant in the calculation of job mix by using national wage data. (Since local wages are not used, geographic differences in living costs and other factors that affect local wage levels do not distort the analysis.) For example, a job mix value of 2.5 indicates that the job mix in the local area raises the area's average wage by 2.5 percent relative to the national average.

The change in subnational job quality over time can be computed using any of three formulas. The simplest technique is to calculate the difference in job mix over time: use formula (2) to calculate the job mix value in each of two years and take the difference between the two job mix values. Geographic differences in living costs and other factors that affect local wage levels do not distort this calculation. Thus, it is the preferred method when the focus is to compare states.

If the focus is to examine one subnational area's performance over time, the change in job quality can be calculated from formula (3), which is the same as formula (1) except for substituting the subnational employment and average wage for the national figures:

(3) (change over time in categorical share of subnational employment) * (ratio of the subnational categorical average wage to overall subnational average wage – 1) * 100.

When looking at only one geographic area, this method has the advantage of acknowledging the unique wage structure of the area.

The results from formula (3) can be considerably different from those of formula (2). In some industrial or occupational categories, the average wage (as a ratio to the overall average wage) in a subnational area may be much different from the national average. A large difference is more likely in categories with little employment in the subnational area, such that the mix of jobs within the category may be substantially different from the national average.

A third option to calculate the change in subnational job quality is to use formula (4), which substitutes national for subnational wages in formula (3):

(4) (change over time in categorical share of subnational employment) * (ratio of the national categorical average wage to overall national average wage – 1) * 100.

The result differs from the change in job mix calculation — formula (2) — in part because it uses the average wage in just one year while the job mix calculation uses the wage data in each year.

Using any of the formulae, the overall job mix or change in job quality score can vary substantially depending on the amount of categorical detail used. For example, the national change in industrial job quality between 2000 and 2003 was –0.88 using broad sectoral data but –1.48 using detailed industrial data. Conceptually, the more detailed the data, the more robust the results will be. However, a practical limitation applies at subnational levels when using formula (3): if an industry or occupation has few employees, its average wage may be unrepresentative.

The job quality scores of individual categories can be used to identify the major contributors to the overall change in job quality. Faster-than-average growth in a higher-than-average-paying category results in a positive score, as does slower-than-average growth in a lower-than-average-paying category. Categorical job mix values can be interpreted similarly.

Comparison of Methodologies

To compare the results from formula (1) to the calculation used by the EPI, two tests were run. First, formula (1) was applied to the Annenberg dataset used by the EPI. The job quality scores were calculated to be –0.09 in 2002, –0.20 in 2003, and 0.07 in 2004. Thus, job quality declined marginally in 2002 and 2003 and rose slightly in 2004. The three-year score was –0.21. (The 2003 average wage — the only figure supplied by Annenberg — was used in the formula for each time period. Thus, the scores for these three one-year periods sum to the three-year figure.) Thus, the two methods agree that job quality declined over the three-year period.

The second test used Bureau of Economic Analysis industrial data that are available back to 1969, for both national data and that of one state (Arizona). The long time series was split into several shorter periods corresponding to economic cycles and breaks in the time series. Applying the EPI calculation to the BEA data, the percent difference in the weighted wage between the expanding sectoral share group and the declining share group is presented in Table 1 for selected time periods.

The EPI measure and the score from formula (1) generally correspond closely: (1) the sign is always the same; (2) the rank order across the six time periods is similar for Arizona and the nation; and (3) the magnitude of the differential in the two measures generally is similar across the time periods (e.g. the EPI measure is 12 times greater than the score for the 1969-to-1974 period for Arizona).

Relative to the EPI measure, the use of formula (1) has the advantage of simplicity of the formula and ease of calculation in a spreadsheet. The results are easier to interpret. In addition, the categorical scores from formula (1) can be used directly to identify the categories with the largest positive and negative influences on job quality.

Data

Since all available datasets of employment and wages have significant but varying limitations (particularly for subnational areas), five datasets were examined in the first phase of this project. Three datasets present industrial data, one provides occupational data, and the fifth contains both

TABLE 1
COMPARISON OF EPI MEASURE TO JOB QUALITY SCORE

	EPI			Score		
	Arizona	Nation	Difference	Arizona	Nation	Difference
1969-74	4%	-6%	10%	0.32	-0.31	0.63
1975-82	-4	-7	3	-0.36	-0.42	0.06
1982-87	-15	-19	4	-1.39	-1.29	-0.10
1988-92	-25	-17	-8	-1.55	-0.72	-0.83
1992-2000	-10	-10	0	-1.00	-0.70	-0.30
2001-03	-25	-36	11	-0.90	-1.08	0.18

Source: Calculated from U.S. Department of Commerce, Bureau of Economic Analysis.

occupational and industrial data — but its latest data are for 1999. The second phase of the project used the occupational dataset and one of the industrial datasets to compare states.

Industrially, workforce data currently are categorized by the North American Industry Classification System (NAICS). The Standard Industrial Classification (SIC) was used prior to NAICS. Changes over time to the SIC, then the switch from the SIC to the NAICS, result in data that are not comparable over time.

The NAICS 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 (2-digit) sectors. The SIC used a similar system, grouping 4-digit industries progressively into 3-digit industry groups, 2-digit major groups, and 1-digit divisions.

The classification system for occupational data also has been revised, causing discontinuities in the time series. Currently, the Standard Occupation Classification (SOC) system is used. The SOC defines more than 700 occupations, which are combined into 22 major occupational groups.

A limitation to all government data is the withholding of data that violates the federal government's disclosure restrictions. To prevent the identification of data for a specific company, data are withheld if too few companies are represented in a given industry or occupation or if one company dominates the category. Data for a second category must be withheld, even if its disclosure restriction is not violated, so that the data for the first category cannot be calculated from available data.

This disclosure restriction has little effect on national data but a considerable impact on published data for most subnational areas. A substantial portion of the industrial or occupational data may be withheld from geographic areas with few employers. For this project, categories with withheld data were combined by sector or occupational group — the data for these aggregations could be calculated from the figures at the next higher level of industrial or occupational detail and figures for other categories at the same level.

Bureau of Labor Statistics Occupational Data (OES)

The Bureau of Labor Statistics (BLS), part of the U.S. Department of Labor, is the main provider of workforce data. The BLS produces various employment series.

Occupational data generally are perceived to be superior to industrial data when examining job quality. The Occupational Employment Statistics program (OES) is the only source of occupational data by state other than the decennial census. OES data are adjusted to full-time-equivalent status, but are based on a sample of employers. Moreover, a limited history of occupational data is available by state, with a discontinuity in 1999 when the SOC was adopted. The BLS currently conducts the OES survey semiannually; previously the data were collected annually. However, since employers are contacted only once every three years, fully comparable data exist only for three-year comparisons. For both phases of this study, data for 2003 were compared to those for 2000.

The national OES dataset contains 733 occupations, but the number available by state in both 2000 and 2003 ranges from 681 in California to 364 in Rhode Island and 313 in the District of Columbia. This number includes an aggregation of multiple occupations with withheld data within each of the 22 major occupational groups.

Bureau of Labor Statistics Industrial Data (ES-202)

The unemployment insurance (ES-202) program — now called the Quarterly Census of Employment and Wages — provides data for the nation, states and counties. The ES-202 data are a census of all workers covered by the unemployment insurance program and provide the most detailed industrial data. The wages of part-time workers are not adjusted to full-time-equivalent status. Historical data were recalculated by the BLS based on the NAICS, resulting in a consistent time series from 1990 through 2003. Full industrial detail is available from the ES-202 program, but considerable data are withheld and workers not covered by the unemployment insurance program are not included. The unclassified category — establishments for which the NAICS industry is unknown — was excluded from the dataset used for this project.

The first phase of the study used the entire 1990-to-2003 time series. The second phase was limited to 2000 and 2003 to match the years available from the OES. The national ES-202 dataset includes 1,170 industries, but the number available by state in both 2000 and 2003 ranges from 1,053 in California to only 263 in Wyoming and 242 in the District of Columbia.

The goal of this project was to retain as much industrial detail as possible, so six-digit industries are the unit of analysis. However, because of the intensive data collection and manipulation that was necessary, a compromise was made in that all withheld six-digit industries were combined for each two-digit NAICS sector, rather than using the intermediate three-digit and four-digit subsector and industry group data.

In a few states, even sectoral data were withheld. In these states, the undisclosed sectoral total was combined with the unclassified category (which also was withheld). Otherwise, the unclassified category was excluded from the analysis.

(The most commonly used BLS employment by industry series — monthly estimates from a survey of employers [‘790’ program] — was not included in this study. The main advantage of the 790 series is its timeliness; disadvantages stem from its survey nature and incomplete coverage of employment. In addition, the data have limited industrial detail and inconsistencies over time because of changes in the industrial classification system.)

Bureau of Economic Analysis (BEA)
The BEA, a part of the U.S. Department of Commerce, provides annual employment, wage and salary, earnings, and personal income data for the nation, states, and counties. The primary source of the BEA data is the ES-202 dataset produced by the Bureau of Labor Statistics, but the BEA adds estimates for those employers not covered by the ES-202 program, thereby producing a more complete dataset. In addition to this broad coverage, an advantage of using the BEA dataset is its relatively lengthy time series, from 1969 through 2003. However, inconsistencies in the time series exist in 1975 and 1988 when updates to the SIC were implemented. The NAICS was implemented in 2001, causing a discontinuity: industry data prior to 2001 cannot be compared to 2001 or later data.

A serious limitation of the BEA data is that only an intermediate level of industrial detail is available, generally corresponding to the 2-digit SIC and 3-digit NAICS. The number of available categories is 74 for the SIC data and 94 for the NAICS data. Even at this moderate level of detail, some data are withheld in some states. Because of the limited sectoral data, this dataset was not used in the second phase of this project.

The BEA recently released compensation data for wage and salary workers, with history back to 1998 (the 1998-to-2000 data are by SIC). In the first phase of the project, three measures of industrial mix and change in job quality were calculated from the BEA data for the 2001-to-2003 period: (1) the average wage (the primary measure used in this report) is computed from wage and salary disbursements and wage and salary employment; (2) average compensation — also for wage and salary employment — adds several other types of compensation to wages and salaries: employer payments for pension plans, group health and life insurance, government social insurance, and other supplemental payments; and (3) average earnings adds proprietors' income and other compensation to wage and salary compensation for all workers. Little difference was found across the three measures on the national or Arizona change in job quality in 2002 and 2003.

Census Bureau County Business Patterns (CBP)
The U.S. Census Bureau, part of the U.S. Department of Commerce, annually reports establishment, employment, and payroll data for the nation, states, and counties. Full industrial detail is available for most sectors, but the public sector, farming, and certain other industries are not included in this dataset. In most subnational areas the employment and payroll data are withheld for many industries and higher-level NAICS categories. The latest data are for 2002.

The conversion to NAICS occurred in 1998 in this series, in contrast to 2001 in the BEA series. To take advantage of the longer NAICS series, the 1998 and 2002 data from CBP were analyzed in the first phase of this study. The intermediate years (1999 through 2001) were not included because of the processing time. Like the ES-202 dataset, the unclassified category was excluded. Because of the significant size of the industries not included in the CBP dataset, an alternative version of the dataset — that adds BEA data for the missing industries — also was used in this project.

Results from this dataset were somewhat inconsistent with those from the BEA and ES-202 datasets. Because of this and its data limitations, this dataset was not used in the second phase.

Census Bureau Decennial Census (PUMS)
The Public Use Microdata Sample is a very different dataset from the others used in this study. PUMS provides raw data by person for a multitude of variables (including both industry and occupation), while in the other datasets a limited number of indicators (such as employment or wages) are already aggregated into industrial or occupational categories.

Four measures of employment and wages were created from the PUMS dataset for 1999 (much of the economic data in the decennial census is for the prior year, e.g. 1999 from the 2000 census) in the first phase of this project. In order to match the PUMS results to those of other datasets, one measure limits the analysis to people who had wage and salary income, with no consideration to how much the person worked during the year (since most of the other datasets do not adjust the wage figures for the number of weeks worked during the year or the average number of hours per week worked). The second measure adds self-employment income to wages and salaries to obtain a measure of earnings. Each of these two measures then were adjusted to full-time equivalency: the wage and salary income or earnings figure was divided by the approximate number of hours worked in the year (obtained from the number of weeks worked in 1999 and the average number of hours per week worked), then this hourly wage was multiplied by 2,080 hours. Conceptually, the full-time-equivalent measure of earnings — the most comprehensive of the four measures — is superior to the others. It was the only measure used for the 1989 data. Modest differences in the job mix for Arizona in 1999 were calculated across the four measures.

The Census Bureau combined some industries prior to producing the PUMS file, so that 264 industries are available from the 2000 census (243 from the 1990 census). Occupations were similarly combined, so that 473 are available for 2000 (504 for 1990).

PUMS has several shortcomings: it is available only every 10 years, both the industrial and occupational codes differ between 1990 and 2000 so that the job quality score cannot be calculated (meaning that PUMS is useful only to estimate job mix by state in 1989 and 1999), it is only a 5 percent sample of the population, and it uses an alternative definition of public sector employment. (Most datasets put all public-sector employees in the government sector. The alternative classification assigns most public-sector employees to other sectors, with the remainder placed in the public administration sector). Further, the accuracy/validity of the responses provided by individuals who completed the long-form of the decennial census cannot be verified.

In terms of this project, the accurate reporting of earnings, industry, and occupation in the decennial census is of key importance. On the 2000 census long-form questionnaire, respondents were asked to provide the name of their employer and the “kind of business or industry.” Census Bureau personnel used this information to assign the NAICS industry. Similarly, respondents were asked to state the “kind of work” and the “most important activities or duties,” which were used by the Census Bureau to assign the SOC occupation.

Both the industrial structure and occupational structure reported in the decennial census are considerably different from those of other datasets. These differences are reflected in the results, where estimates of average wage and job quality from the PUMS data are not consistent with

those of other datasets, even when the unadjusted wage and salary measure from the PUMS dataset is used for the comparison.

The ES-202 dataset can be used to calculate sectoral employment based on the public administration classification as well as on the government classification. Relative to the ES-202 public administration data for 1999, the 1999 census data report a much lesser share of the workforce employed in the administrative support sector, with other lesser shares in accommodation and food services, management of companies, and retail trade. A greater share of the workforce was in the construction, educational services, and other services sectors.

The census 1999 occupational data were compared to the OES data (for 2000). The census considerably underreported food preparation and serving and administrative support occupations, with lesser shares also in the transportation and material moving and production occupational groups. Census shares for the management group were much higher, with higher shares also in business and financial occupations.

RESULTS FOR THE UNITED STATES

The first phase of this project measured the change in job quality nationally and in one state (Arizona) as well as the job mix for the state from each of five datasets. Because of the many content and measurement differences across the datasets (see for example Table 2), the results vary somewhat by dataset.

Generally, results from the BEA, ES-202, and OES datasets are similar in terms of average wage, ratio of the Arizona average wage to the national average, job quality, and the change in job quality. Results from CBP differ: the average wage is lower, the Arizona average wage is lower relative to the national average, Arizona's industrial mix value is lower, and the change in job quality nationally and in Arizona are somewhat different from those of the other datasets. Supplementing the CBP with BEA data reduces the differences in results relative to the other datasets, but the CBP results still are not in line with those from other datasets. See Table 3 for a comparison of national results.

TABLE 2
COMPARISON OF MOST RECENT NATIONAL DATA BY DATASET

Dataset	Employment	Average Wage
2003 BEA	137,137,000	$37,154
2003 ES-202	127,795,829	37,765
2002 CBP	112,400,654	35,098
2003 OES	127,420,170	36,520

Sources: U.S. Department of Commerce, Bureau of Economic Analysis (BEA); U.S. Department of Commerce, Census Bureau (CBP); U.S. Department of Labor, Bureau of Labor Statistics (ES-202 and OES).

TABLE 3
COMPARISON OF CHANGE IN NATIONAL JOB QUALITY BY DATASET

	ES-202	BEA	CBP*	OES**
1998-to-1999	-0.1	-0.2		
1999-to-2000	-0.0	0.1		
2000-to-2001	-0.1			
2001-to-2002	-0.4	-0.7		
2002-to-2003	-0.3	-0.4		
1998-to-2002	-0.6		0.3	
1991-to-2000	-1.1	-0.9		
2000-to-2003	-1.5			-0.9

* Adjusted for missing industries
** Based on occupational data, other measures based on industrial data

Sources: Calculated from U.S. Department of Commerce, Census Bureau (CBP) and Bureau of Economic Analysis (BEA), and U.S. Department of Labor, Bureau of Labor Statistics (ES-202 and OES).

The remainder of this section presents results on the national change in job quality. Long-term changes in industrial job quality were estimated using BEA data (since 1969) and ES-202 data (since 1990). To match the results to the second phase, the change in national job quality between 2000 and 2003, both industrially and occupationally, is presented.

Long-Term Change in Industrial Job Quality

Annual changes in job quality scores as well as scores for selected multi-year periods have been produced from the BEA data. Changes in the industry classification system — the 1972 SIC implemented by the BEA in 1975, the 1987 SIC implemented by the BEA in 1988, and the switch to NAICS implemented by the BEA in 2001 — result in inconsistencies in the time series. Scores were produced for 1975 and 1988, but caution is urged in their interpretation. It is not possible to produce a score for 2001. The selection of multi-year periods correspond to the economic cycle except that the unavailability of data for 2001 consistent with earlier years causes the 1991-to-2001 economic cycle to be shortened by a year. Scores were calculated for 1969-to-1975, 1975-to-1982, 1982-to-1991, 1991-to-2000, and 2001-to-2003 using the cumulation of years technique (see Table 4).

A strong relationship exists between the job quality score and the stage of the economic cycle. On average, job quality declines during recessionary and recovery periods. Job quality is flat during the middle and latter years of economic expansions. During the 1969-to-1975 and 1975-to-1982 economic cycles, gains in job quality occurred during middle years of the cycles but losses during recessions were significant. During the 1982-to-1991 and 1991-to-2001 cycles, small losses in job quality occurred even during the middle years of the expansions but declines during recessions were modest. (However, decreases in recovery years — including 2002 and 2003 — were as large as in prior cycles.)

During each of the four economic cycles between 1969 and 2001, job quality decreased. The least decline occurred during the 1975-to-1982 cycle. The biggest drop was in the 1982-to-1991 cycle. However, when considering the number of years in each cycle, little difference in the annual average rate of loss of job quality across the economic cycles has occurred.

Since the end of the latest recession in 2001, job quality has dropped, with the declines in both 2002 and 2003 larger than the historical norms for the first and second years of recovery. The national scores for 2002 and 2003 are somewhat larger than those from the Annenberg dataset, with each dataset showing declines in the nation's job quality in both years.

Over the entire 1969-to-2003 period, job quality declined in 22 of 33 years. The annual scores have ranged from 0.5 to -0.7, with the lowest score occurring in 2002. If job quality were the same in 2003 as in 1969, the average wage in 2003 would have been 4.6 percent higher.

As a means of summarizing the detailed industrial data, the categories were aggregated back to the SIC divisional level for each of the four multi-year periods through 2000 that the BEA has reported using the SIC (see Table 5). Manufacturing was a major cause of the decline in job quality throughout the 1969-to-2000 period, accounting for between 68 and 94 percent of the overall decline in job quality in each of the four cycles. Many manufacturing industries pay above-average wages but have had a decreasing sectoral share of employment over time while

TABLE 4
CHANGE IN NATIONAL INDUSTRIAL JOB QUALITY SCORES*

Single Year	ES-202	BEA	Difference
1970		-0.34	
1971		-0.37	
1972		0.11	
1973		0.21	
1974		0.04	
1975**		-0.69	
1976		-0.18	
1977		0.12	
1978		0.16	
1979		0.28	
1980		-0.22	
1981		-0.02	
1982		-0.65	
1983		-0.67	
1984		0.12	
1985		-0.16	
1986		-0.37	
1987		-0.23	
1988**		0.51	
1989		-0.12	
1990		-0.02	
1991	-0.05	-0.18	0.13
1992	-0.25	-0.32	0.07
1993	-0.40	-0.26	-0.14
1994	-0.40	-0.08	-0.32
1995	-0.30	-0.25	-0.05
1996	-0.18	-0.06	-0.12
1997	0.15	0.07	0.08
1998	-0.08	0.07	-0.15
1999	0.06	-0.20	0.26
2000	0.32	0.10	0.22
2001**	-0.01		
2002	-0.72	-0.70	-0.02
2003	-0.45	-0.35	-0.10
Multi-Year* **			
1969-75		-1.03	
1975-82		-0.52	
1982-91		-1.11	
1991-2000	-1.08	-0.93	-0.15
2001-03	-1.17	-1.06	-0.11

***** Sum by category of (change over time in sectoral share of employment) * (ratio of average wage to overall average wage – 1) * 100

** The 1975 and 1988 scores are estimated and the 2001 BEA scores are unavailable due to changes in the industrial classification

*** Calculated by cumulating annual scores

Source: Calculated from U.S. Department of Commerce, Bureau of Economic Analysis.

TABLE 5
CHANGE IN NATIONAL JOB QUALITY SCORES* BY INDUSTRIAL DIVISION

Division	1969-75	1975-82	1982-91	1991-2000
Finance, Insurance and Real Estate	-0.06	0.12	0.18	0.31
Construction	-0.07	-0.04	-0.04	0.02
Retail Trade	-0.46	-0.53	-0.49	0.01
Agriculture	-0.04	0.15	0.18	-0.01
Wholesale Trade	0.15	0.07	-0.07	-0.05
Government	0.20	-0.08	0.04	-0.06
Mining	0.05	0.18	-0.40	-0.14
Transport, Communication, Public Util	-0.12	-0.09	-0.28	-0.15
Services	0.15	0.19	0.69	-0.24
Manufacturing	-0.82	-0.49	-0.92	-0.63
TOTAL	**-1.03**	**-0.52**	**-1.11**	**-0.93**

* (Change over time in divisional share of employment) * (ratio of average wage to overall average wage – 1) * 100. The division figures are calculated as the sum of the scores of the more detailed values within each division. Multi-year scores are calculated by cumulating annual scores.

Source: Calculated from U.S. Department of Commerce, Bureau of Economic Analysis.

large gains have been registered in other sectors. Until the last economic cycle (1991 to 2000), rapid growth in the low-paying retail trade sector also was a major factor in the decline in job quality. Services replaced retail trade as the secondary cause of declines in job quality during the 1991-to-2000 period.

A consistent NAICS series from 1990 through 2003 allows the complete 1991-to-2001 economic cycle to be measured by the ES-202 data. Similarly, the latest data for 2003 can be compared to those for 1993, the comparable year of the prior economic cycle. In each of these 10-year periods, job quality dropped. The only individual years to post a gain were 1997, 1999 and 2000.

The scores calculated from the much more industrially detailed ES-202 dataset based on the NAICS are not significantly different from the less detailed SIC data from the BEA. Annual differences between the two scores mostly offset across the economic cycle.

ES-202 scores by sector for the 1991-to-2001 and 1993-to-2003 periods are shown in Table 6. The score was positive in nine of 20 sectors in the first period and only seven sectors in the second period. The overall score was negative in each period primarily because of large negative scores in two sectors: manufacturing, a high-paying sector with declines in sectoral share, and administrative support, a low-paying sector with increases in share. Government and accommodation and food services also contributed to the negative scores. The only sector with a moderately large positive score was professional, scientific and technical services.

Change in Job Quality Between 2000 and 2003

The change in national job quality between 2000 and 2003 was measured industrially using the ES-202 data and occupationally using the OES data. Industrial job quality fell –1.5 percent over the three years while occupational job quality dropped –0.9 percent. These relatively large

TABLE 6
CHANGE IN NATIONAL JOB QUALITY SCORES* BY SECTOR

Sector	1991-2001	1993-2003
Professional, Scientific, Technical Services	0.67	0.52
Retail Trade	0.29	0.22
Information	0.26	0.10
Agriculture, Forestry, Fishing and Hunting	0.04	0.05
Finance and Insurance	0.15	0.03
Arts, Entertainment and Recreation	0.08	0.02
Real Estate and Rental and Leasing	0.01	0.02
Wholesale Trade	-0.03	-0.01
Construction	0.00	-0.02
Transportation and Warehousing	-0.01	-0.02
Management of Companies	0.05	-0.05
Educational Services	-0.04	-0.06
Other Services	-0.03	-0.07
Mining	-0.12	-0.09
Health Care and Social Assistance	-0.15	-0.15
Utilities	-0.18	-0.17
Accommodation and Food Services	-0.30	-0.32
Government	-0.36	-0.33
Administrative Support	-0.71	-0.47
Manufacturing	-0.70	-0.78
TOTAL	**-1.09**	**-1.60**

***** (Change over time in sectoral share of employment) * (ratio of average wage to overall average wage – 1) * 100. The sector figures are calculated as the sum of the scores of industries within each sector. Multi-year scores are calculated by cumulating annual scores.

Source: Calculated from U.S. Department of Labor, Bureau of Labor Statistics (ES-202).

decreases for a three-year period are related to the phase of the economic cycle: a recession in 2001 followed by a slow recovery.

Aggregating the industry values back to the sectoral level indicates that once again manufacturing was the single largest cause of the decline in job quality. Fourteen other sectors had a negative value, with the largest in the information and accommodation and food services sectors. Of the five sectors with a positive value, only administrative support had a value more than marginally higher than zero. In addition to the sectoral job quality scores, Table 7 also displays the sectoral average wage as a ratio to the overall average and the change in sectoral share, the two components of the calculation of the change in job quality. However, the calculation occurs at the industry level, with wages and employment growth varying widely by industry within most sectors.

No individual industry had a large score (see Table 8). A decline in sectoral share in the low-paying temporary help industry (part of the administrative support sector) resulted in the largest positive value. An increase in sectoral share in the low-paying full-service restaurants industry was the largest negative influence on the change in job quality.

Using the occupational data, one of the 22 major occupational groups — management — had a negative score greater than the overall score (see Table 9). None of the other occupational groups had a large score. Ten of the 22 groups had a positive value.

Several occupations in the management group contributed to the decline in job quality, most notably general managers and chief executives (see Table 10). These high-paying occupations experienced a decline in occupational share. No individual occupation had much of a positive value.

TABLE 7
2000-03 CHANGE IN NATIONAL JOB QUALITY SCORES BY SECTOR

Sector	Score*	2000 Average Wage Ratio	2000-03 Change in Sectoral Share
Administrative and Support and Waste Mgt	0.19	0.65	-0.29
Retail Trade	0.02	0.62	-0.09
Arts, Entertainment, and Recreation	0.01	0.70	0.01
Agriculture, Forestry, Fishing and Hunting	0.01	0.55	-0.02
Real Estate and Rental and Leasing	0.01	0.90	0.04
Mining	-0.00	1.64	0.00
Utilities	-0.01	1.79	-0.01
Transportation and Warehousing	-0.03	0.99	-0.14
Educational Services	-0.04	0.87	-0.19
Wholesale Trade	-0.04	1.36	-0.05
Finance and Insurance	-0.05	1.70	0.25
Construction	-0.06	1.05	0.09
Management of Companies	-0.07	1.97	-0.08
Government	-0.08	1.00	0.92
Other Services	-0.08	0.63	0.14
Health Care and Social Assistance	-0.13	0.89	1.06
Professional, Scientific and Technical Services	-0.14	1.64	-0.05
Accommodation and Food Services	-0.25	0.38	0.36
Information	-0.28	1.66	-0.30
Manufacturing	-0.44	1.22	-2.03
TOTAL	**-1.48**		

***** (Change over time in sectoral share of employment) * (ratio of average wage to overall average wage – 1) * 100. The sectoral figures are calculated as the sum of the industry scores within each sector.

Source: Calculated from U.S. Department of Labor, Bureau of Labor Statistics (ES-202).

TABLE 8
2000-03 CHANGE IN NATIONAL JOB QUALITY SCORES BY INDUSTRY
Industries with a Score of at Least 0.05

Industry	Score*	2000 Average Wage Ratio	2000-03 Change in Sectoral Share
Positive Score			
Temporary Help Services	0.19	0.52	-0.40
Offices of Physicians	0.09	1.63	0.15
Department Stores except Discount Stores	0.07	0.48	-0.13
Investment Advice	0.05	3.51	0.02
Negative Score			
Full-Service Restaurants	-0.17	0.36	0.26
Securities Brokerage	-0.13	4.17	-0.04
Wired Telecommunications Carriers	-0.09	1.77	-0.11
Limited-Service Restaurants	-0.08	0.29	0.11
Warehouse Clubs and Superstores	-0.08	0.48	0.15
Semiconductor & Related Devices Manufacturing	-0.08	2.70	-0.04
Electronic Computer Manufacturing	-0.07	3.70	-0.03
Local Government	-0.07	0.92	0.83
Internet Service Providers	-0.07	2.49	-0.05
Computer Systems Design Services	-0.07	2.18	-0.06
Custom Computer Programming Services	-0.07	2.21	-0.05
Corporate, Subsidiary, Regional Managing Offices	-0.06	1.88	-0.07
Computer Equipment & Software Merchant Whlsl	-0.06	2.63	-0.03
Telephone Apparatus Manufacturing	-0.05	2.29	-0.04
Subtotal of Categories with a Positive Score	0.40		
Subtotal of Categories with a Negative Score	-1.15		
Industries Not Shown	-0.73		
TOTAL	**-1.48**		

* (Change over time in industrial share of employment) * (ratio of average wage to overall average wage – 1) * 100.

Source: Calculated from U.S. Department of Labor, Bureau of Labor Statistics (ES-202).

TABLE 9
2000-03 CHANGE IN NATIONAL JOB QUALITY SCORES BY OCCUPATIONAL GROUP

Occupational Group	Score*	2000 Average Wage Ratio	2000-03 Change in Occupational Share
Production	0.32	0.80	-1.52
Business and Financial Operations	0.22	1.47	0.40
Education, Training, and Library	0.10	1.15	0.42
Health Practitioners and Technical	0.06	1.46	0.26
Life, Physical, and Social Science	0.06	1.45	0.06
Legal	0.05	2.10	0.06
Protective Service	0.04	0.94	0.02
Arts, Design, Entertainment, Sports and Media	0.02	1.17	0.08
Computer and Mathematical	0.00	1.77	-0.04
Construction and Extraction	0.00	1.05	0.02
Transportation and Material Moving	-0.00	0.78	-0.05
Installation, Maintenance, and Repair	-0.00	1.03	-0.01
Farming, Fishing, and Forestry	-0.01	0.57	0.01
Building, Grounds Cleaning and Maintenance	-0.01	0.60	0.03
Community and Social Services	-0.01	1.00	0.17
Office and Administrative Support	-0.02	0.80	0.06
Healthcare Support	-0.07	0.64	0.20
Architecture and Engineering	-0.07	1.64	-0.14
Sales and Related	-0.08	0.85	0.20
Personal Care and Service	-0.15	0.62	0.30
Food Preparation and Serving	-0.20	0.49	0.42
Management	-1.11	2.07	-0.94
TOTAL	**-0.85**		

***** (Change over time in occupational share of employment) * (ratio of average wage to overall average wage – 1) * 100. The occupational group figures are calculated as the sum of the occupation scores within each group.

Source: Calculated from U.S. Department of Labor, Bureau of Labor Statistics (OES).

TABLE 10
2000-03 CHANGE IN NATIONAL JOB QUALITY SCORES BY OCCUPATION
Occupations with a Score of at Least 0.05

Occupation	Score*	2000 Average Wage Ratio	2000-03 Change in Occupational Share
Positive Score			
Miscellaneous Production	0.11	0.77	-0.47
Stock Clerks	0.06	0.63	-0.16
Management Analysts	0.05	1.83	0.06
Packers, Hand	0.05	0.52	-0.11
Negative Score			
General and Operations Managers	-0.30	2.14	-0.27
Chief Executives	-0.24	3.18	-0.11
Miscellaneous Management	-0.16	1.94	-0.17
Financial Managers	-0.10	2.21	-0.08
Waiters and Waitresses	-0.09	0.45	0.15
Office Clerks	-0.08	0.68	0.26
Computer Programmers	-0.08	1.85	-0.09
Miscellaneous Architects and Engineers	-0.08	1.75	-0.10
Engineering Managers	-0.06	2.60	-0.04
Cashiers	-0.06	0.48	0.12
Personal Aides	-0.06	0.49	0.11
Retail Salespersons	-0.06	0.62	0.15
Hand Laborers	-0.06	0.62	0.15
Subtotal of Categories with a Positive Score	0.27		
Subtotal of Categories with a Negative Score	-1.43		
Occupations Not Shown	0.31		
TOTAL	**-0.85**		

* (Change over time in occupational share of employment) * (ratio of average wage to overall average wage – 1) * 100.

Source: Calculated from U.S. Department of Labor, Bureau of Labor Statistics (OES).

RESULTS BY STATE

The second phase of the project measured the industrial job mix from the ES-202 data and the occupational job mix from the OES data for all states for 2003 as well as the change in the job mixes between 2000 and 2003. The industrial and occupational results were combined to estimate overall job quality and its change over time.

The states (including the District of Columbia) were ranked on each of these measures. The U.S. average is quite different from the value for the median (26th) state on some of the measures because of the wide differences in size among the states. For example, employment in California in 2003 was greater than the combined employment of the 21 smallest states.

Industrial Data

Only 15 mostly populous states had an industrial mix in 2003 that had a positive effect on the state's average wage relative to the national average. The seven states, and eight of the top 10, with the strongest industrial mixes in 2003 are located along the northern-to-central Atlantic Coast stretching from Massachusetts to Virginia (see Table 11). The only other states with a positive industrial mix value were California, Colorado, Texas and Utah in the West; Illinois and Minnesota in the mid-section of the country; and Georgia (barely) in the South. States with the weakest industrial mixes were scattered around the country. The states with the lowest job quality were Nevada and Hawaii, both with a high percentage of low-paying tourism jobs. Generally, however, the weakest figures were in an area ranging from the northern Rocky Mountains through the Great Plains and the South.

Professional, scientific and technical services; finance and insurance; and manufacturing were the largest sectoral sources of state-by-state differences in industrial mix. Wages in each of these sectors are well above average and employment in each is geographically concentrated.

Thirty-three states experienced an increase in industrial mix value between 2000 and 2003, as seen in Table 12. The change in industrial mix was inversely related to the 2003 level in most states: States with the strongest industrial mixes in 2003 generally experienced declines between 2000 and 2003 while most of the states with the greatest improvement over the three years still had low values in 2003. Nearly every state in the Great Plains/northern Rocky Mountain and southern regions experienced a gain in industrial mix.

The manufacturing sector caused the most variation among states in the change in industrial mix over the three years. Government; finance and insurance; professional, scientific and technical services; information; and management of companies also had variable scores by state.

A positive change in industrial mix means only that a state performed better than the national average, not that job quality improved. Between 2000 and 2003, the national industrial job quality score was –1.5. Based on formula (4) rather than the change based on formula (2), only three states did not have a negative score for this three-year period: Wyoming (a score of 0.5), Hawaii (0.2) and Rhode Island (0.0).

The industrial mix in 2000 and 2003 and the change in industrial job quality based on the various formulae are shown in Table 13. The change in industrial mix is calculated from the industrial

mix values in 2000 and 2003 using formula (2). The state score is calculated from formula (3) using state wages and from formula (4) using national wages. The difference in score between the nation and each state can be compared to the change in industrial mix. The score and difference in score calculated using state wages in formula (3) is affected by factors other than change in job quality.

TABLE 11
INDUSTRIAL MIX* IN 2003 RANKED BY STATE

1.	District of Columbia	20.4	27.	Rhode Island	-2.1
2.	Massachusetts	6.5	28.	North Dakota	-2.2
3.	Delaware	5.2	29.	Indiana	-2.4
4.	New Jersey	5.0	30.	Tennessee	-2.4
5.	New York	4.5	31.	Kentucky	-2.4
6.	Connecticut	4.2	32.	Alaska	-2.5
7.	Virginia	3.1	33.	West Virginia	-2.6
8.	Colorado	2.0	34.	North Carolina	-2.6
9.	Illinois	1.7	35.	Arkansas	-2.8
10.	Maryland	1.5	36.	Wisconsin	-2.9
11.	Minnesota	1.4	37.	Nebraska	-2.9
12.	California	1.3	38.	Oregon	-3.0
13.	Texas	1.2	39.	Wyoming	-3.3
14.	Utah	1.1	40.	New Mexico	-3.7
15.	Georgia	0.4	41.	Idaho	-4.1
16.	Michigan	-0.2	42.	Iowa	-4.5
17.	Pennsylvania	-0.3	43.	South Dakota	-4.7
18.	Kansas	-0.3	44.	Florida	-4.9
19.	Washington	-0.9	45.	Maine	-5.0
20.	Missouri	-1.1	46.	South Carolina	-5.2
21.	New Hampshire	-1.2	47.	Vermont	-5.9
22.	Ohio	-1.5	48.	Mississippi	-6.4
23.	Oklahoma	-1.5	49.	Montana	-7.4
24.	Arizona	-1.5	50.	Hawaii	-8.8
25.	Louisiana	-1.6	51.	Nevada	-9.0
26.	Alabama	-2.0			

* Sum over all industries of (state – U.S. employment share) * (ratio of average wage to overall U.S. average wage – 1) * 100.

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

TABLE 12
CHANGE IN INDUSTRIAL MIX* BETWEEN 2000 AND 2003 RANKED BY STATE

1.	District of Columbia	4.4	27.	Delaware	0.8
2.	Wyoming	2.5	28.	Connecticut	0.8
3.	Hawaii	2.4	29.	Pennsylvania	0.7
4.	Montana	2.0	30.	New Mexico	0.7
5.	Louisiana	1.9	31.	Missouri	0.5
6.	North Dakota	1.8	32.	Vermont	0.2
7.	Rhode Island	1.8	33.	Virginia	0.1
8.	Iowa	1.6	34.	Illinois	-0.0
9.	Alaska	1.6	35.	Washington	-0.2
10.	West Virginia	1.5	36.	Georgia	-0.3
11.	Wisconsin	1.5	37.	Indiana	-0.4
12.	Oklahoma	1.5	38.	Arizona	-0.4
13.	South Dakota	1.4	39.	Utah	-0.4
14.	South Carolina	1.3	40.	Texas	-0.5
15.	Florida	1.3	41.	Arkansas	-0.5
16.	Nevada	1.3	42.	Minnesota	-0.8
17.	Nebraska	1.2	43.	Michigan	-0.9
18.	Tennessee	1.1	44.	Oregon	-1.0
19.	Mississippi	1.1	45.	Idaho	-1.2
20.	Maryland	1.0	46.	New York	-1.6
21.	North Carolina	1.0	47.	New Jersey	-1.6
22.	Kansas	1.0	48.	Colorado	-1.7
23.	Maine	1.0	49.	California	-1.9
24.	Kentucky	0.9	50.	New Hampshire	-2.1
25.	Alabama	0.9	51.	Massachusetts	-2.7
26.	Ohio	0.9			

* Sum over all industries of (state – U.S. employment share) * (ratio of average wage to overall U.S. average wage – 1) * 100.

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

TABLE 13
INDUSTRIAL JOB QUALITY BY STATE

	Industrial Mix*			Difference in Score**		State Score**	
	2000	2003	Change	State Wage	U.S. Wage	State Wage	U.S. Wage
Alabama	-2.85	-1.97	0.88	0.65	0.67	-0.73	-0.71
Alaska	-4.12	-2.49	1.63	0.61	0.39	-0.63	-0.84
Arizona	-1.13	-1.51	-0.38	0.41	-0.11	-1.04	-1.57
Arkansas	-2.23	-2.77	-0.54	0.26	-0.59	-1.13	-1.98
California	3.22	1.28	-1.94	-1.34	-1.23	-2.84	-2.73
Colorado	3.71	1.97	-1.74	-1.07	-1.02	-2.56	-2.51
Connecticut	3.43	4.18	0.75	1.13	0.69	-0.28	-0.72
Delaware	4.33	5.15	0.82	-2.66	0.47	-4.02	-0.89
District of Columbia	16.00	20.43	4.42	1.17	1.14	-0.28	-0.31
Florida	-6.18	-4.88	1.30	1.30	0.95	-0.21	-0.56
Georgia	0.72	0.44	-0.28	0.27	-0.06	-1.21	-1.53
Hawaii	-11.19	-8.83	2.36	1.46	1.55	0.15	0.24
Idaho	-2.91	-4.09	-1.17	-0.88	-0.49	-2.33	-1.93
Illinois	1.74	1.70	-0.03	-0.04	-0.15	-1.53	-1.64
Indiana	-1.98	-2.35	-0.38	-1.78	-0.89	-3.20	-2.32
Iowa	-6.10	-4.47	1.64	0.79	0.89	-0.58	-0.49
Kansas	-1.34	-0.34	1.01	0.74	0.58	-0.63	-0.79
Kentucky	-3.32	-2.42	0.90	0.39	0.57	-1.08	-0.90
Louisiana	-3.46	-1.60	1.86	1.38	1.34	-0.09	-0.12
Maine	-5.98	-5.02	0.96	0.45	0.46	-0.88	-0.87
Maryland	0.48	1.52	1.04	0.73	0.68	-0.76	-0.81
Massachusetts	9.19	6.54	-2.65	-1.39	-1.70	-2.86	-3.16
Michigan	0.70	-0.17	-0.87	-4.48	-1.19	-5.95	-2.65
Minnesota	2.14	1.38	-0.76	-0.00	-0.36	-1.50	-1.86
Mississippi	-7.48	-6.42	1.06	0.53	0.57	-0.80	-0.76
Missouri	-1.60	-1.12	0.48	0.31	0.10	-1.08	-1.29
Montana	-9.43	-7.39	2.04	0.68	1.26	-0.65	-0.06
Nebraska	-4.10	-2.93	1.17	1.42	0.90	0.03	-0.49
Nevada	-10.24	-8.99	1.25	1.60	1.07	0.20	-0.33
New Hampshire	0.92	-1.18	-2.10	-0.89	-1.27	-2.38	-2.76
New Jersey	6.58	4.96	-1.61	-0.92	-1.26	-2.38	-2.72
New Mexico	-4.41	-3.69	0.72	0.43	0.19	-1.01	-1.26
New York	6.08	4.49	-1.59	-1.42	-1.28	-2.91	-2.78
North Carolina	-3.69	-2.65	1.04	0.90	0.97	-0.56	-0.48
North Dakota	-4.08	-2.23	1.85	1.32	1.13	0.05	-0.14
Ohio	-2.35	-1.48	0.87	0.31	0.51	-1.20	-1.00
Oklahoma	-2.99	-1.49	1.50	0.78	1.08	-0.62	-0.32
Oregon	-2.07	-3.02	-0.95	0.42	-0.12	-1.09	-1.63
Pennsylvania	-1.02	-0.29	0.73	0.66	0.40	-0.82	-1.08
Rhode Island	-3.90	-2.09	1.81	1.92	1.33	0.60	0.01
South Carolina	-6.47	-5.16	1.31	0.74	0.96	-0.61	-0.39
South Dakota	-6.04	-4.68	1.36	0.22	0.43	-1.14	-0.92
Tennessee	-3.51	-2.40	1.12	1.14	0.89	-0.25	-0.50
Texas	1.74	1.24	-0.51	-0.14	-0.08	-1.66	-1.60
Utah	1.45	1.07	-0.38	0.24	-0.37	-1.23	-1.84
Vermont	-6.05	-5.88	0.17	-0.04	-0.25	-1.25	-1.46
Virginia	2.98	3.07	0.09	0.34	0.35	-1.15	-1.16
Washington	-0.78	-0.94	-0.16	0.77	0.36	-0.72	-1.13
West Virginia	-4.16	-2.62	1.54	0.19	0.79	-1.10	-0.51
Wisconsin	-4.42	-2.89	1.54	0.94	1.02	-0.50	-0.42
Wyoming	-5.74	-3.28	2.46	2.28	1.84	0.96	0.52

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TABLE 13 (continued)
INDUSTRIAL JOB QUALITY BY STATE

* Sum over all industries of (state – U.S. employment share) * (ratio of average wage to overall U.S. average wage – 1) * 100.

** Sum over all industries of (change over time in sectoral share of employment) * (ratio of average wage to overall average wage – 1) * 100.

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

Occupational Data

Only 19 states had an occupational mix in 2003 that had a positive effect on the state's average wage relative to the national average, with only 13 having a value of at least 1. The states with the strongest occupational mixes in 2003 are disproportionately located along the northern-to-central Atlantic Coast, filling eight of the top 12 positions (see Table 14). Outside of this region, the only states with a strong occupational mix were Alaska, Idaho, Colorado, Minnesota and Illinois. States in the mid-section of the country disproportionately had the weakest occupational mixes.

The management occupational group by far had the most variation across states in occupational mix value in 2003. Other high-wage groups that are concentrated geographically that contributed to the state-by-state variation included computer and mathematical and business and financial operations. The below-average-paying production group also had a relatively wide range of occupational mix values across the states.

Twenty-nine states experienced an increase in occupational mix value between 2000 and 2003, though only 12 had a gain of at least 1 (see Table 15). Unlike the industrial mix, in which the change between 2000 and 2003 was inversely related to the 2003 level in most states, the change in occupational mix was not related to its level. The states with the greatest improvements in occupational mix are scattered across the country, though several states in New England or along the central Atlantic Coast experienced gains.

Large changes in occupational mix between 2000 and 2003 occurred in the management occupational group. None of the other groups accounted for much of the state-to-state variation.

A positive change in occupational mix means only that a state performed better than the national average, not that job quality improved. Between 2000 and 2003, the national occupational job quality score was –0.9. Based on formula (4) rather than the change based on formula (2), 11 states experienced an improvement in the occupational mix.

The occupational mix in 2000 and 2003 and the change in occupational job quality based on the various formulae are shown in Table 16. The change in occupational mix is calculated from the occupational mix values in 2000 and 2003 using formula (2). The state score is calculated from formula (3) using state wages and from formula (4) using national wages. The difference in score between the nation and each state can be compared to the change in occupational mix. The score and difference in score calculated using state wages in formula (3) is affected by factors other than change in job quality.

TABLE 14
OCCUPATIONAL MIX* IN 2003 RANKED BY STATE

1.	District of Columbia	30.7	27.	Kansas	-1.4
2.	Massachusetts	7.4	28.	Missouri	-1.5
3.	Maryland	6.8	29.	Ohio	-1.5
4.	Alaska	4.4	30.	North Carolina	-1.8
5.	Illinois	4.0	31.	Maine	-2.0
6.	Connecticut	3.6	32.	Louisiana	-2.2
7.	Virginia	3.4	33.	Montana	-2.3
8.	Colorado	2.8	34.	Tennessee	-2.3
9.	Delaware	2.5	35.	Wyoming	-2.5
10.	New York	1.4	36.	Nebraska	-2.7
11.	Idaho	1.4	37.	West Virginia	-2.8
12.	New Hampshire	1.4	38.	South Carolina	-3.2
13.	Minnesota	1.2	39.	Alabama	-3.3
14.	California	0.7	40.	Kentucky	-3.4
15.	New Jersey	0.7	41.	Florida	-3.6
16.	Georgia	0.4	42.	Vermont	-4.0
17.	Texas	0.3	43.	Wisconsin	-4.1
18.	Washington	0.3	44.	Indiana	-4.3
19.	Pennsylvania	0.3	45.	Iowa	-4.8
20.	Michigan	-0.0	46.	Hawaii	-4.9
21.	New Mexico	-0.1	47.	North Dakota	-5.0
22.	Arizona	-0.1	48.	Arkansas	-6.3
23.	Utah	-0.2	49.	Mississippi	-6.7
24.	Rhode Island	-0.8	50.	South Dakota	-7.1
25.	Oregon	-0.8	51.	Nevada	-9.9
26.	Oklahoma	-0.9			

* Sum over all occupations of (state – U.S. employment share) * (ratio of average wage to overall U.S. average wage – 1) * 100.

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

TABLE 15
CHANGE IN OCCUPATIONAL MIX* BETWEEN 2000 AND 2003 RANKED BY STATE

1.	District of Columbia	7.2	27.	Virginia	0.1
2.	Hawaii	1.7	28.	Wisconsin	0.1
3.	Rhode Island	1.7	29.	California	0.0
4.	Idaho	1.6	30.	Delaware	-0.0
5.	Minnesota	1.4	31.	Nevada	-0.0
6.	Alaska	1.3	32.	South Dakota	-0.0
7.	Georgia	1.3	33.	North Carolina	-0.2
8.	Massachusetts	1.2	34.	Pennsylvania	-0.2
9.	Illinois	1.2	35.	Montana	-0.2
10.	Oregon	1.2	36.	West Virginia	-0.3
11.	Maryland	1.2	37.	Colorado	-0.4
12.	Vermont	1.1	38.	New Jersey	-0.4
13.	Connecticut	0.9	39.	Ohio	-0.5
14.	Utah	0.8	40.	North Dakota	-0.7
15.	Wyoming	0.7	41.	Kansas	-0.7
16.	Tennessee	0.7	42.	Maine	-0.8
17.	New York	0.7	43.	Missouri	-0.9
18.	Michigan	0.5	44.	Nebraska	-0.9
19.	Kentucky	0.5	45.	Louisiana	-1.0
20.	Oklahoma	0.5	46.	New Mexico	-1.0
21.	Indiana	0.5	47.	Washington	-1.2
22.	South Carolina	0.4	48.	Florida	-1.2
23.	Arkansas	0.2	49.	Alabama	-1.3
24.	New Hampshire	0.1	50.	Iowa	-1.8
25.	Mississippi	0.1	51.	Texas	-1.9
26.	Arizona	0.1			

* Sum over all occupations of (state – U.S. employment share) * (ratio of average wage to overall U.S. average wage – 1) * 100.

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

TABLE 16
OCCUPATIONAL JOB QUALITY BY STATE

	Occupational Mix*			Difference in Score**		State Score**	
	2000	2003	Change	State Wage	U.S. Wage	State Wage	U.S. Wage
Alabama	-2.02	-3.32	-1.30	-1.15	-0.97	-2.05	-1.86
Alaska	3.11	4.44	1.32	1.30	0.74	0.34	-0.21
Arizona	-0.20	-0.12	0.08	0.32	0.21	-0.64	-0.75
Arkansas	-6.44	-6.26	0.19	0.86	0.84	-0.02	-0.05
California	0.72	0.74	0.02	0.38	-0.11	-0.49	-0.98
Colorado	3.19	2.83	-0.36	-0.41	-0.36	-1.30	-1.25
Connecticut	2.72	3.57	0.85	0.72	0.70	-0.19	-0.20
Delaware	2.49	2.48	-0.02	-0.84	-0.50	-1.74	-1.40
District of Columbia	23.50	30.74	7.24	2.81	4.03	1.90	3.12
Florida	-2.34	-3.56	-1.22	-1.01	-0.97	-1.90	-1.86
Georgia	-0.91	0.36	1.27	0.95	1.14	0.07	0.26
Hawaii	-6.68	-4.94	1.74	2.43	1.98	1.45	1.00
Idaho	-0.19	1.41	1.60	1.25	1.38	0.25	0.38
Illinois	2.76	3.97	1.21	1.13	0.66	0.24	-0.23
Indiana	-4.76	-4.31	0.45	0.54	0.93	-0.38	0.01
Iowa	-2.98	-4.78	-1.80	-1.27	-1.23	-2.20	-2.16
Kansas	-0.61	-1.36	-0.74	-0.81	-0.43	-1.72	-1.34
Kentucky	-3.97	-3.45	0.53	0.45	0.78	-0.45	-0.11
Louisiana	-1.28	-2.23	-0.95	-0.64	-0.72	-1.59	-1.67
Maine	-1.18	-2.00	-0.82	-0.76	-0.73	-1.67	-1.64
Maryland	5.60	6.76	1.16	0.84	0.47	-0.06	-0.43
Massachusetts	6.17	7.40	1.23	0.41	0.45	-0.48	-0.45
Michigan	-0.55	-0.02	0.53	-0.02	0.61	-0.89	-0.26
Minnesota	-0.16	1.25	1.41	1.10	1.41	0.20	0.52
Mississippi	-6.80	-6.72	0.08	0.48	0.63	-0.39	-0.23
Missouri	-0.64	-1.50	-0.86	-0.97	-0.78	-1.88	-1.68
Montana	-2.05	-2.28	-0.22	-0.23	-0.20	-1.15	-1.12
Nebraska	-1.81	-2.70	-0.88	0.11	-0.37	-0.79	-1.27
Nevada	-9.89	-9.93	-0.04	1.12	0.73	0.18	-0.21
New Hampshire	1.26	1.39	0.13	-0.13	-0.18	-1.07	-1.11
New Jersey	1.10	0.72	-0.38	-0.29	-0.29	-1.18	-1.18
New Mexico	0.84	-0.11	-0.95	-0.43	-1.04	-1.37	-1.98
New York	0.75	1.44	0.70	0.73	0.59	-0.15	-0.29
North Carolina	-1.60	-1.81	-0.21	-0.03	-0.09	-0.90	-0.95
North Dakota	-4.31	-4.96	-0.66	-0.17	-0.21	-1.15	-1.19
Ohio	-1.03	-1.52	-0.49	-0.50	-0.36	-1.39	-1.26
Oklahoma	-1.34	-0.88	0.46	0.52	0.43	-0.39	-0.48
Oregon	-2.05	-0.85	1.20	1.46	1.30	0.51	0.35
Pennsylvania	0.49	0.27	-0.22	-0.37	-0.41	-1.26	-1.30
Rhode Island	-2.51	-0.80	1.71	2.42	1.83	1.54	0.95
South Carolina	-3.62	-3.18	0.44	0.70	0.58	-0.17	-0.28
South Dakota	-7.00	-7.05	-0.05	1.06	0.85	0.10	-0.10
Tennessee	-3.03	-2.30	0.72	0.81	0.75	-0.06	-0.12
Texas	2.27	0.34	-1.94	-1.89	-1.94	-2.78	-2.82
Utah	-1.00	-0.21	0.79	1.57	0.97	0.70	0.10
Vermont	-5.05	-3.98	1.07	1.43	1.86	0.49	0.93
Virginia	3.36	3.44	0.08	-0.10	0.10	-0.98	-0.79
Washington	1.46	0.30	-1.17	-0.82	-0.72	-1.71	-1.61
West Virginia	-2.50	-2.77	-0.27	-0.01	0.13	-0.90	-0.76
Wisconsin	-4.16	-4.08	0.07	0.47	0.71	-0.40	-0.16
Wyoming	-3.28	-2.54	0.74	1.29	1.14	0.36	0.21

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TABLE 16 (continued)
OCCUPATIONAL JOB QUALITY BY STATE

* Sum over all occupations of (state – U.S. employment share) * (ratio of average wage to overall U.S. average wage – 1) * 100.

** Sum over all occupations of (change over time in sectoral share of employment) * (ratio of average wage to overall average wage – 1) * 100.

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

Overall Job Quality

Overall job quality is approximated as the sum of the industrial mix and occupational mix values. In most states, the 2003 industrial mix and occupational mix values were correlated: both the industrial mix and the occupational mix either were stronger or weaker than the national average. Alaska was the biggest exception, with a weak industrial mix but the fourth strongest occupational mix in the country. In some states, the combined effect of the industrial and occupational mixes was substantial. As seen in Table 17, job quality in Massachusetts had a positive effect of 14 percent on its average wage relative to the national average while the job mix in four states had a depressing effect on the average wage of at least 10 percent.

Job quality was greater than the national average in only 17 states. The strongest job quality in 2003 was in seven states and the District of Columbia that border the Atlantic Ocean, stretching from Massachusetts to Virginia. Job quality was weakest in most of the mid-section of the country, stretching from the northern Rocky Mountains through the Great Plains and the South. In the rest of the country, including most of the West and the Great Lakes region, job quality varied by state from below to a little above the national average. Outside of the northern-to-middle Atlantic Coast region, the strongest job quality was in Illinois and Colorado.

The change in industrial mix was not correlated to the change in occupational mix between 2000 and 2003. Nearly two-thirds of the states experienced a gain in one measure but a loss in the other measure. Thus, the overall change in job quality was small in most states. Only seven states experienced a gain of at least 2, while only four states had a decline of that magnitude.

Thirty-six states had a positive change in job quality between 2000 and 2003, though the gain was 1 percent or more in only 21 states (see Table 18). The change in job quality did not have much of a regional pattern.

TABLE 17
OVERALL JOB QUALITY IN 2003 RANKED BY STATE

		Total	Ind Mix*	Occ Mix^			Total	Ind Mix*	Occ Mix^
1.	District of Columbia	51.2	20.4	30.7	27.	Ohio	-3.0	-1.5	-1.5
2.	Massachusetts	13.9	6.5	7.4	28.	New Mexico	-3.8	-3.7	-0.1
3.	Maryland	8.3	1.5	6.8	29.	Louisiana	-3.8	-1.6	-2.2
4.	Connecticut	7.8	4.2	3.6	30.	Oregon	-3.9	-3.0	-0.8
5.	Delaware	7.6	5.2	2.5	31.	North Carolina	-4.5	-2.6	-1.8
6.	Virginia	6.5	3.1	3.4	32.	Tennessee	-4.7	-2.4	-2.3
7.	New York	5.9	4.5	1.4	33.	Alabama	-5.3	-2.0	-3.3
8.	New Jersey	5.7	5.0	0.7	34.	West Virginia	-5.4	-2.6	-2.8
9.	Illinois	5.7	1.7	4.0	35.	Nebraska	-5.6	-2.9	-2.7
10.	Colorado	4.8	2.0	2.8	36.	Wyoming	-5.8	-3.3	-2.5
11.	Minnesota	2.6	1.4	1.2	37.	Kentucky	-5.9	-2.4	-3.4
12.	California	2.0	1.3	0.7	38.	Indiana	-6.7	-2.4	-4.3
13.	Alaska	1.9	-2.5	4.4	39.	Wisconsin	-7.0	-2.9	-4.1
14.	Texas	1.6	1.2	0.3	40.	Maine	-7.0	-5.0	-2.0
15.	Utah	0.9	1.1	-0.2	41.	North Dakota	-7.2	-2.2	-5.0
16.	Georgia	0.8	0.4	0.4	42.	South Carolina	-8.3	-5.2	-3.2
17.	New Hampshire	0.2	-1.2	1.4	43.	Florida	-8.4	-4.9	-3.6
18.	Pennsylvania	-0.0	-0.3	0.3	44.	Arkansas	-9.0	-2.8	-6.3
19.	Michigan	-0.2	-0.2	-0.0	45.	Iowa	-9.2	-4.5	-4.8
20.	Washington	-0.6	-0.9	0.3	46.	Montana	-9.7	-7.4	-2.3
21.	Arizona	-1.6	-1.5	-0.1	47.	Vermont	-9.9	-5.9	-4.0
22.	Kansas	-1.7	-0.3	-1.4	48.	South Dakota	-11.7	-4.7	-7.1
23.	Oklahoma	-2.4	-1.5	-0.9	49.	Mississippi	-13.1	-6.4	-6.7
24.	Missouri	-2.6	-1.1	-1.5	50.	Hawaii	-13.8	-8.8	-4.9
25.	Idaho	-2.7	-4.1	1.4	51.	Nevada	-18.9	-9.0	-9.9
26.	Rhode Island	-2.9	-2.1	-0.8					

* Industrial mix: Sum over all industries of (state – U.S. employment share) * (ratio of average wage to overall U.S. average wage – 1) * 100.

^ Occupational Mix: Sum over all occupations of (state – U.S. employment share) * (ratio of average wage to overall U.S. average wage – 1) * 100.

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

TABLE 18
OVERALL CHANGE IN JOB QUALITY BETWEEN 2000 AND 2003
RANKED BY STATE

		Total	Ind Mix*	Occ Mix^			Total	Ind Mix*	Occ Mix^
1.	District of Columbia	11.7	4.4	7.2	27.	Idaho	0.4	-1.2	1.6
2.	Hawaii	4.1	2.4	1.7	28.	Utah	0.4	-0.4	0.8
3.	Rhode Island	3.5	1.8	1.7	29.	Ohio	0.4	0.9	-0.5
4.	Wyoming	3.2	2.5	0.7	30.	Nebraska	0.3	1.2	-0.9
5.	Alaska	3.0	1.6	1.3	31.	Kansas	0.3	1.0	-0.7
6.	Maryland	2.2	1.0	1.2	32.	Oregon	0.2	-1.0	1.2
7.	Oklahoma	2.0	1.5	0.5	33.	Virginia	0.2	0.1	0.1
8.	Tennessee	1.8	1.1	0.7	34.	Maine	0.1	1.0	-0.8
9.	Montana	1.8	2.0	-0.2	35.	Florida	0.1	1.3	-1.2
10.	South Carolina	1.8	1.3	0.4	36.	Indiana	0.1	-0.4	0.5
11.	Wisconsin	1.6	1.5	0.1	37.	Iowa	-0.2	1.6	-1.8
12.	Connecticut	1.6	0.8	0.9	38.	New Mexico	-0.2	0.7	-1.0
13.	Kentucky	1.4	0.9	0.5	39.	Arizona	-0.3	-0.4	0.1
14.	South Dakota	1.3	1.4	-0.0	40.	Michigan	-0.3	-0.9	0.5
15.	West Virginia	1.3	1.5	-0.3	41.	Arkansas	-0.3	-0.5	0.2
16.	Vermont	1.2	0.2	1.0	42.	Missouri	-0.4	0.5	-0.9
17.	Nevada	1.2	1.3	-0.0	43.	Alabama	-0.4	0.9	-1.3
18.	North Dakota	1.2	1.8	-0.7	44.	New York	-0.9	-1.6	0.7
19.	Illinois	1.2	-0.0	1.2	45.	Washington	-1.3	-0.2	1.2
20.	Mississippi	1.1	1.1	0.1	46.	Massachusetts	-1.4	-2.7	1.2
21.	Georgia	1.0	-0.3	1.3	47.	California	-1.9	-1.9	0.0
22.	Louisiana	0.9	1.9	-1.0	48.	New Hampshire	-2.0	-2.1	0.1
23.	North Carolina	0.8	1.0	-0.2	49.	New Jersey	-2.0	-1.6	-0.4
24.	Delaware	0.8	0.8	-0.0	50.	Colorado	-2.1	-1.7	-0.4
25.	Minnesota	0.6	-0.8	1.4	51.	Texas	-2.4	-0.5	-1.9
26.	Pennsylvania	0.5	0.7	-0.2					

* Industrial mix: Sum over all industries of (state – U.S. employment share) * (ratio of average wage to overall U.S. average wage – 1) * 100.

^ Occupational Mix: Sum over all occupations of (state – U.S. employment share) * (ratio of average wage to overall U.S. average wage – 1) * 100.

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

Average Wage After Adjusting for Job Quality

Job quality is just one of several factors that affect wage levels. Major factors other than job quality that affect the average wage include

- Productivity: the greater the productivity of a state's workforce, the higher the wages.
- Cost of living: the higher the cost of living, the higher the wages.
- The desirability of the area: the more desirable the area, the lower the wages.

While both the average wage and the average wage adjusted for job quality are affected by the cost of living, it would be misleading to fully adjust the average wage figures for living costs even if reliable cost-of-living indexes were available by state, since geographic variations in living costs are not the only factor causing the average wage figures to vary by state. Dumond et. al. (1999) suggested that 40 percent of the variation in average wage can be attributed to the cost of living.

In 38 states, job quality accounts for a portion of the average wage differential from the national average, whether the differential is positive or negative. The portion explained by job quality varies widely, but the median percentage was 48. For example, in Mississippi, the average wage was 25.5 percent less than the national average, but only 12.3 percent below average after adjusting for job quality. In seven states, the differential from the national average changed sign after adjusting for job quality, though the adjusted differential was barely different from zero in some of the states. The most extreme examples were Nevada — whose average wage was 6.8 percent *below* average but whose adjusted average wage was 12.1 percent *above* average — and Hawaii, whose differential switched from –6.4 to 7.4. In six states, the difference from the national average in the average wage was larger after adjusting the average wage for job quality. Texas was the most extreme example, with its differential rising from 4.0 to 5.5 percent.

Substantial differences in the average wage exist across states even after controlling for the effects of job quality (see the "other" column in Table 19). Given the lack of state-level data for each of the factors affecting the adjusted average wage and the interrelated nature of each of these factors, it is not possible to provide much insight into the reasons for the geographic variations in the average wage after adjustment for job quality.

Only 14 states had an average wage greater than the national average after adjusting for job quality in 2003. However, the value was more than 10 percent higher than average in five states, including the populous states of New York, New Jersey, and California. Most of the states with positive values are located along the Pacific or Atlantic coasts. The largest negative values were in the northern Rocky Mountains/Great Plains region, followed by the South.

Relative to the national average, the 2000-to-2003 change in average wage after adjusting for job quality was positive in 25 states. Other than New Hampshire, none of these states had an increase of 2 or more percentage points greater than the national average. Alaska, Hawaii and Idaho had declines of this magnitude. All of the southwestern states had a gain greater than the national average, but otherwise regional patterns were not strong.

TABLE 19
AVERAGE WAGE AND JOB QUALITY BY STATE

	2003				2000-to-2003 Change			
	Wage@	Ind Mix*	Occ Mix^	Other#	Wage@	Ind Mix*	Occ Mix^	Other#
Alabama	-14.4	-2.0	-3.3	-9.1	0.9	0.9	-1.3	1.3
Alaska	6.1	-2.5	4.4	4.1	-1.7	1.6	1.3	-4.6
Arizona	-7.0	-1.5	-0.1	-5.4	-0.1	-0.4	0.1	0.2
Arkansas	-22.4	-2.8	-6.3	-13.4	1.4	-0.5	0.2	1.7
California	12.5	1.3	0.7	10.5	-1.1	-1.9	0.0	0.8
Colorado	4.5	2.0	2.8	-0.3	-0.9	-1.7	-0.4	1.3
Connecticut	23.4	4.2	3.6	15.6	0.8	0.8	0.9	-0.8
Delaware	6.9	5.2	2.5	-0.7	2.2	0.8	0.0	1.4
District of Columbia	55.8	20.4	30.7	4.6	9.8	4.4	7.2	-1.8
Florida	-10.5	-4.9	-3.6	-2.0	0.8	1.3	-1.2	0.7
Georgia	-3.3	0.4	0.4	-4.1	0.4	-0.3	1.3	-0.6
Hawaii	-6.4	-8.8	-4.9	7.4	1.6	2.4	1.7	-2.5
Idaho	-18.2	-4.1	1.4	-15.6	-2.2	-1.2	1.6	-2.6
Illinois	5.4	1.7	4.0	-0.3	0.3	-0.0	1.2	-0.9
Indiana	-10.4	-2.4	-4.3	-3.7	0.1	-0.4	0.5	0.0
Iowa	-16.8	-4.5	-4.8	-7.5	0.2	1.6	-1.8	0.4
Kansas	-13.0	-0.3	-1.4	-11.4	-0.0	1.0	-0.7	-0.3
Kentucky	-14.4	-2.4	-3.4	-8.6	0.8	0.9	0.5	-0.6
Louisiana	-17.2	-1.6	-2.2	-13.4	1.0	1.9	-1.0	0.1
Maine	-14.9	-5.0	-2.0	-7.9	1.3	1.0	-0.8	1.1
Maryland	8.5	1.5	6.8	0.3	3.4	1.0	1.2	1.2
Massachusetts	21.3	6.5	7.4	7.3	0.3	-2.7	1.2	1.7
Michigan	5.1	-0.2	-0.0	5.3	-0.9	-0.9	0.5	-0.5
Minnesota	3.7	1.4	1.2	1.1	1.7	-0.8	1.4	1.1
Mississippi	-25.5	-6.4	-6.7	-12.3	0.1	1.1	0.1	-1.0
Missouri	-8.9	-1.1	-1.5	-6.3	-0.1	0.5	-0.9	0.3
Montana	-24.3	-7.4	-2.3	-14.6	1.1	2.0	-0.2	-0.7
Nebraska	-15.7	-2.9	-2.7	-10.1	1.8	1.2	-0.9	1.6
Nevada	-6.8	-9.0	-9.9	12.1	1.7	1.3	-0.0	0.5
New Hampshire	-1.2	-1.2	1.4	-1.4	1.3	-2.1	0.1	3.3
New Jersey	18.2	5.0	0.7	12.6	-1.8	-1.6	-0.4	0.2
New Mexico	-15.7	-3.7	-0.1	-11.9	0.9	0.7	-1.0	1.2
New York	20.6	4.5	1.4	14.7	-1.0	-1.6	0.7	-0.1
North Carolina	-9.6	-2.6	-1.8	-5.1	0.5	1.0	-0.2	-0.3
North Dakota	-22.9	-2.2	-5.0	-15.7	1.8	1.8	-0.7	0.6
Ohio	-5.4	-1.5	-1.5	-2.4	0.3	0.9	-0.5	-0.1
Oklahoma	-18.8	-1.5	-0.9	-16.5	0.8	1.5	0.5	-1.2
Oregon	-5.1	-3.0	-0.8	-1.2	-1.1	-1.0	1.2	-1.3
Pennsylvania	-2.8	-0.3	0.3	-2.7	0.2	0.7	-0.2	-0.3
Rhode Island	-0.6	-2.1	-0.8	2.3	3.5	1.8	1.7	-0.0
South Carolina	-16.4	-5.2	-3.2	-8.0	0.6	1.3	0.4	-1.2
South Dakota	-24.9	-4.7	-7.1	-13.2	0.7	1.4	-0.0	-0.6
Tennessee	-11.5	-2.4	-2.3	-6.8	0.9	1.1	0.7	-0.9
Texas	-4.0	1.2	0.3	-5.5	-1.2	-0.5	-1.9	1.2
Utah	-12.8	1.1	-0.2	-13.7	0.5	-0.4	0.8	0.1
Vermont	-11.4	-5.9	-4.0	-1.6	2.4	0.2	1.1	1.1
Virginia	2.2	3.1	3.4	-4.3	1.9	0.1	0.1	1.8
Washington	6.3	-0.9	0.3	6.9	-1.7	-0.2	-1.2	-0.4
West Virginia	-20.4	-2.6	-2.8	-15.0	0.7	1.5	-0.3	-0.6
Wisconsin	-8.6	-2.9	-4.1	-1.6	0.8	1.5	0.1	-0.8
Wyoming	-17.2	-3.3	-2.5	-11.4	2.4	2.5	0.7	-0.8

(continued on next page)

TABLE 19 (continued)
AVERAGE WAGE AND JOB QUALITY BY STATE

@ The percentage difference in the average wage from the national average, calculated as the mean of the differences from the industrial and occupational databases.

* Industrial mix: Sum over all industries of (state – U.S. employment share) * (ratio of average wage to overall U.S. average wage – 1) * 100.

^ Occupational Mix: Sum over all occupations of (state – U.S. employment share) * (ratio of average wage to overall U.S. average wage – 1) * 100.

Average wage minus the industrial mix minus the occupational mix. Reflects factors such as productivity, quality of life, and cost of living.

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

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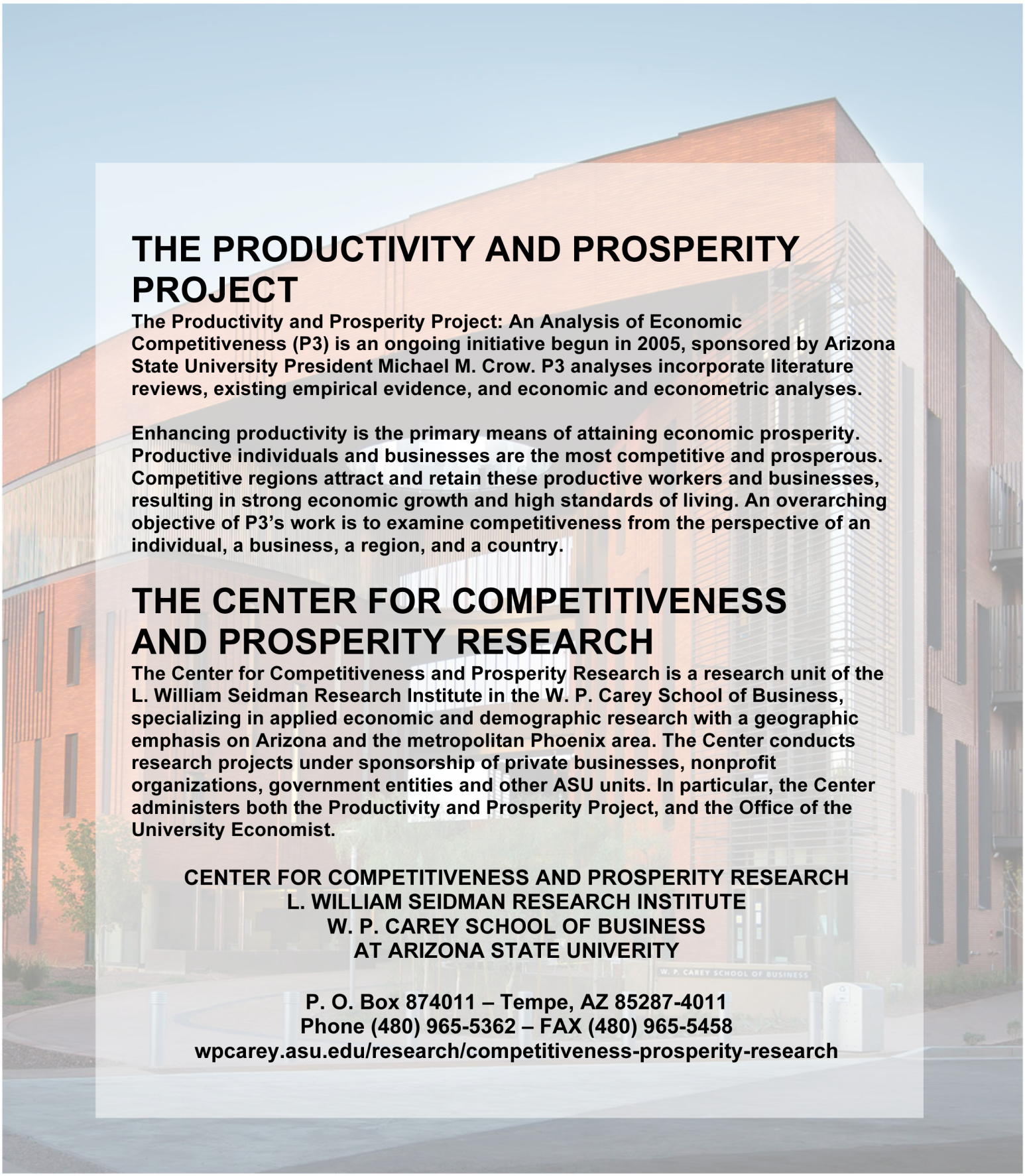

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CENTER FOR COMPETITIVENESS AND PROSPERITY RESEARCH
L. WILLIAM SEIDMAN RESEARCH INSTITUTE
W. P. CAREY SCHOOL OF BUSINESS
AT ARIZONA STATE UNIVERITY

P. O. Box 874011 – Tempe, AZ 85287-4011
Phone (480) 965-5362 – FAX (480) 965-5458
wpcarey.asu.edu/research/competitiveness-prosperity-research

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