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THE REGIONAL ECONOMY

OF UPSTATE NEW YORK

The Changing Composition of Upstate New York's Workforce

In recent decades, the economy of upstate New York has undergone significant structural changes—permanent shifts in the composition of economic activity. Industry employment trends are one indicator of these changes: job losses in industries like steel and automobiles, paired with job gains in services such as education and commercial banking, point to the decline of manufacturing and the attendant rise of a service economy in the region. Another important indicator of structural change, however, is a shift in the occupational makeup of the region. While workers can transfer their skills from one industry to another—moving, say, from a clerical position in a hospital to a similar position in a university—they cannot change occupations without undergoing considerable retraining. Given the difficulty of making such a change, pronounced shifts in a region's occupational composition provide strong evidence that a fundamental restructuring of the workforce is under way.

In this issue of *The Regional Economy of Upstate New York*, we use newly available data from the 2000 census to assess the occupational composition of the upstate New York workforce and to analyze how it has changed since the 1990 census. We also compare the evolving mix of occupations in our region with that of the nation as a whole, an approach that allows us to identify upstate New York's areas of specialization and some unique features of the changes in the region's labor market.

Our analysis reveals that the largest occupations in the region—as in the nation—are office and administrative support, retail and sales, management, and production. Compared with the nation, upstate New York has particularly high concentrations of workers in production, education, healthcare, and community and social services. We also find that regional workers in the occupations of management, construction, community and social services, protection, and farming tend to earn higher wages than workers in those occupations on a national level, while regional

wages in retail and sales and in computer and mathematical occupations tend to be lower than the nation's.

Our comparison of the 1990 and 2000 census data on occupations indicates that while upstate New York's overall employment growth fell far short of the nation's, some smaller occupations—education, healthcare, and community and social services—grew at roughly the same pace in the region as they did in the nation. However, the larger occupations of office and administrative support, construction, and retail and sales actually shrank in upstate New York while they grew—albeit slowly—nationwide.

Generally, upstate New York gained jobs in high-paying occupations, as did the nation. But while employment in low-paying occupations grew very slowly nationwide, it contracted in upstate New York. Despite this difference, the region and the nation were alike in experiencing an increase in the share of jobs in high-wage occupations and a decrease in the share of jobs in low-wage occupations over the 1990-2000 period.

The Occupational Data Advantage

Regional economic research tends to focus on industry employment trends. The newly implemented North American Industry Classification System (NAICS) has made such analysis more precise by refining and updating industry categories.¹ Industry employment statistics group workers according to the industries in which they work, but do not identify the type of work performed by individual workers. For example, managers in a manufacturing plant are included under the same industry code as the plant's production and office workers despite vast differences in their skills and wages. Furthermore, industry-level data fail to capture changes in the type of work performed within an industry. A firm may, for example, reduce its production workers but increase its research and development staff. While this change may cause little net change in industry-level employment, it represents a significant change in the nature and makeup of the workforce.

Table 1

Occupation Employment Shares (percent)

SOC Group	U.S.	Buffalo	Rochester	Albany	Syracuse	Utica	Binghamton
Office and administrative support	15.5	16.6	14.9	17.9	15.7	17.0	15.3
Retail and Sales	11.3	11.2	10.4	10.0	11.3	9.7	11.0
Management	8.6	7.8	8.5	8.5	7.6	6.4	7.4
Production occupations	8.5	9.4	10.3	5.7	9.1	10.0	9.7
Transportation and material moving	6.2	6.0	5.1	5.6	5.9	5.9	5.9
Education, training, and library	5.7	6.9	7.0	6.9	7.4	6.6	6.8
Construction and extraction	5.5	3.5	3.7	4.2	4.1	3.9	4.2
Food preparation and serving	4.8	5.6	5.0	4.7	5.2	5.2	5.3
Healthcare practitioners & technicians	4.6	6.0	5.3	5.7	5.6	6.1	5.2
Business and financial operations	4.3	4.0	3.9	5.1	3.7	3.7	3.6
Installation, maintenance, & repair	3.9	3.7	3.5	3.5	4.1	3.9	3.2
Cleaning & maintenance	3.3	2.8	2.6	2.7	3.2	3.3	3.2
Personal care and service	2.5	2.4	3.0	2.5	2.6	3.0	2.6
Computer and mathematical	2.4	1.6	3.0	2.8	1.7	1.1	3.5
Architecture and engineering	2.1	1.9	3.2	2.5	2.1	1.6	3.2
Healthcare support	2.0	2.6	2.3	2.3	2.2	3.4	2.8
Protective services	2.0	2.3	1.7	2.0	2.1	3.1	1.8
Arts, entertainment, sports, and media	1.9	1.4	1.8	1.7	1.7	1.3	1.3
Community and social services	1.5	1.8	1.8	2.1	1.9	2.2	1.8
Legal	1.1	1.2	0.8	1.6	1.0	0.7	0.7
Life, physical, and social sciences	0.9	0.8	1.2	1.3	0.7	0.5	0.6
Farming, fishing, and forestry	0.7	0.2	0.4	0.3	0.6	0.7	0.5
Farmers and farm managers	0.6	0.2	0.4	0.4	0.6	0.8	0.4
High wage (> \$50,000)	14.2	12.5	15.6	15.4	12.4	9.8	14.8
Mid-high wage (\$40,000 - \$50,000)	9.9	10.8	10.4	12.1	10.0	10.2	9.4
Mid wage (\$30,000 - \$40,000)	18.6	17.3	17.9	18.4	19.1	17.8	17.3
Mid-low wage (\$20,000 - \$30,000)	45.4	48.2	44.8	43.5	46.4	49.1	46.5
Low wage (< \$20,000)	11.4	11.0	10.9	10.3	11.5	12.2	11.6

Sources: U.S. Bureau of the Census, *Summary File 3 (2000)*; U.S. Department of Labor, *Occupational Employment Survey (2001)*.

Notes: The figures in bold represent employment shares that are approximately 20 percent higher than the corresponding U.S. shares. Wage groups are based on the median U.S. wage and aggregated from the twenty-three SOC occupation groups. Farmers and farm managers are not included in wage aggregations because median wage data are not available for this group.

Occupation-level data group workers with similar education, skills, and wages. For example, office and administrative support workers are classed together, regardless of whether they work in education or business. As a consequence, occupational data can tell us much about the basic composition of the labor force. While industry employment data reveal general shifts in the relative importance of different industries, occupational data allow us to identify changes in the type of work that is actually being done and the skills that the economy demands. Thus, the occupational data can provide a much more precise characterization of restructuring in the labor force.

To analyze data at the occupation level, we draw on the Standard Occupation Classification (SOC) system, which is currently used by all federal statistical agencies to categorize workers by occupation. Like the industrial classification system, the SOC has recently been modernized. The updated version is now being implemented by most data collection agencies.²

Upstate New York’s Occupational Distribution

By applying the SOC’s breakdown of occupations to the 2000 census data, we can assess the size and importance of individual occupations (Table 1). We find that in both upstate New York and the nation, the largest occupation—that is, the occupation commanding the largest share of employment—is office and administrative support. The employment share of this occupation in all upstate metropolitan areas is near the national average of 15 percent. Albany has an especially large share—nearly 18 percent—reflecting the fact that many of its workers directly or indirectly provide services for the state government. The next largest occupation in upstate New York and the nation is retail and sales, with employment shares ranging between roughly 10 and 11 percent. Management and production work also figure in the top four occupations in the nation and most upstate metro areas.

Employment shares for some occupations are markedly larger in the region than in the nation, suggesting that upstate metro

Table 2

Median Annual Wage by Occupation Group

SOC Group	U.S.	Buffalo	Rochester	Albany	Syracuse	Utica	Binghamton
Management	64,220	66,370	73,250	71,090	67,760	59,510	65,460
Computer and mathematical	57,650	47,970	58,150	51,840	50,460	46,340	58,840
Legal	56,220	44,610	75,180	62,430	58,850	51,070	44,980
Architecture and engineering	53,630	49,220	56,280	53,610	50,720	49,470	57,140
Business and financial operations	45,720	42,460	45,640	45,800	43,760	36,010	44,580
Life, physical, and social sciences	44,770	43,810	46,720	46,210	43,820	37,550	42,010
Healthcare practitioners & technicians	42,770	39,340	40,330	41,370	39,810	38,860	36,840
Education, training, and library	36,210	35,660	37,040	40,680	40,050	38,930	34,240
Arts, entertainment, sports, and media	33,670	27,910	33,180	31,100	27,490	26,200	27,440
Installation, maintenance, & repair	33,110	33,230	36,880	33,810	32,870	29,550	30,340
Construction and extraction	32,390	37,670	34,680	36,550	34,600	32,110	32,000
Community and social services	31,440	31,320	33,010	35,730	34,280	27,820	32,730
Protective services	28,410	35,830	35,830	39,580	32,210	38,480	31,400
Office and administrative support	25,050	24,200	24,700	26,570	24,660	22,610	22,020
Production	24,570	27,650	27,170	26,520	25,280	21,820	23,240
Transportation	22,800	23,770	22,180	24,830	23,330	20,830	21,100
Healthcare support	20,490	21,730	20,960	20,390	20,610	18,940	19,970
Retail and Sales	20,040	17,880	17,860	18,860	17,940	17,650	17,130
Cleaning & maintenance	18,120	17,980	17,590	19,600	18,000	17,630	18,270
Personal care and service	17,230	15,840	16,640	18,030	17,570	15,010	15,550
Farming, fishing, and forestry	16,140	19,760	19,040	16,590	19,690	20,890	18,190
Food preparation and serving	14,820	14,050	14,010	15,500	14,280	13,740	14,290

Source: U.S. Department of Labor, *Occupational Employment Survey (2001)*.

Note: Median wage data are not available for the farmers and farm managers occupation group.

* This figure is the average of the 1999 and 2000 wage figures because 2001 data were unavailable.

areas have certain areas of specialization. With the exception of Albany, upstate metro areas have a high concentration of production workers – nearly 10 percent, compared with 8.5 percent nationwide. Education and training also account for an above-average share of employment in upstate New York—roughly 7 percent or more compared with the national share of 5.7 percent. A third area of specialization is healthcare, where two occupation groups—practitioners and healthcare support—have combined employment shares that are 1 to 2 percentage points higher in the region than in the nation. In addition, community and social services account for a larger share of employment in every upstate metro area than in the nation. Also notable are the relatively high concentrations of some occupations in particular upstate metro areas: architects and engineers in Rochester, Albany, and Binghamton; the life, physical, and social sciences in Rochester and Albany; and business and financial operations in Albany.

Some occupations are, however, less well represented in upstate New York than in the nation as a whole. Construction accounts for a markedly lower share of employment in all of the region's metro areas than in the nation. Moreover, computer and mathematical occupations have a relatively low employment share in Buffalo, Syracuse, and Utica.

Earnings by Occupation

A review of annual earnings in the various SOC occupational groups reveals that upstate workers' wages are broadly comparable

to those of workers nationwide, but with some differences (Table 2). According to the U.S. Department of Labor's Occupational Employment Survey, the highest paid occupations in both the region and the United States are management, computer and mathematical work, law, and architecture and engineering. Nationwide, wages are lowest in farming, food preparation, and personal care; upstate, these occupations are also among the most modestly compensated.

In general, upstate workers in management, construction, social services, protection, and farming tend to earn higher wages than workers in these same occupations nationwide, while the region's wages tend to be below the nation's in computer and mathematical work and in retail and sales. Production workers earn relatively high wages in Buffalo, Rochester, and Albany. Wages in almost every occupation group in Rochester and Albany tend to roughly equal or exceed the corresponding national wages, and Rochester's median wage in legal occupations is particularly high. Workers in most occupation groups in Utica and Binghamton earn less than workers nationwide, although three of the four most highly compensated occupations pay more in Binghamton than in the nation. Buffalo and Syracuse present a mixed picture: wages for managers in both metropolitan areas exceed the national median, while wages in many of the remaining high-wage occupations tend to fall below the national median.

We also stratified occupations into five wage groups, from high-paying occupations to low-paying occupations, to compare

Table 3

Percentage Employment Growth by Occupation Group: 1990 - 2000

SOC Group	U.S.	Buffalo	Rochester	Albany	Syracuse	Utica	Binghamton
Computer and mathematical	113.4	19.4	102.4	90.8	21.2	-15.3	89.9
Community and social services	43.4	42.2	34.0	56.9	40.2	73.2	17.5
Legal	33.6	22.5	-20.2	51.2	-2.1	-26.8	-43.5
Healthcare practitioners & technicians	30.1	43.7	15.2	24.5	25.0	48.5	-5.5
Management	29.6	15.6	18.2	5.5	6.6	6.5	-1.2
Education, training, and library	29.0	31.0	25.1	21.8	31.7	26.3	7.4
Business and financial operations	25.2	13.1	5.5	21.0	-1.0	15.4	-5.6
Personal care and service	24.7	-0.8	36.9	21.5	12.7	17.8	1.3
Protective services	23.9	6.7	11.5	12.1	7.3	17.9	19.3
Installation, maintenance, & repair	21.0	2.3	-3.7	13.2	11.6	5.4	-15.3
Healthcare support	20.7	24.7	24.8	26.4	14.7	56.4	21.7
Food preparation and serving	13.6	3.0	5.7	3.3	5.6	-7.2	-7.2
Arts, entertainment, sports, and media	13.3	-32.3	-17.4	-21.7	-23.3	-34.4	-48.4
Transportation	10.5	-1.8	-0.8	0.8	-3.6	9.5	2.4
Construction and extraction	7.2	-38.1	-32.2	-11.9	-28.3	-32.0	-25.9
Retail and Sales	4.1	-13.9	-3.8	-11.5	-8.8	-13.1	-6.0
Office and administrative support	2.5	-5.2	-8.6	-13.0	-12.7	-4.4	-6.9
Cleaning & maintenance	0.4	-20.2	-21.2	-13.5	-9.6	-19.2	-17.7
Life, physical, and social sciences	-0.4	-27.6	-4.9	5.3	-40.1	-57.6	-60.8
Production occupations	-7.1	-10.9	-8.6	-19.9	-6.7	-10.5	-7.0
Farming, fishing, and forestry	-8.9	-38.7	-24.3	-38.8	-10.4	-22.9	-18.4
Architecture and engineering	-10.6	-29.0	8.4	-16.8	-26.6	-37.9	-12.8
Farmers and farm managers	-22.2	-48.0	-22.4	-23.4	-11.8	0.4	-30.4
High wage (> \$50,000)	30.2	6.5	22.6	13.5	-0.1	-9.7	3.9
Mid-high wage (\$40,000 - \$50,000)	24.4	22.6	8.9	20.7	6.5	22.3	-13.1
Mid wage (\$30,000 - \$40,000)	19.4	-3.3	-2.2	8.0	3.5	-0.1	-12.8
Mid-low wage (\$20,000 - \$30,000)	0.4	-6.3	-7.6	-13.2	-9.4	-4.7	-5.6
Low wage (< \$20,000)	8.4	-6.4	0.8	-2.7	-2.7	-2.1	-3.8
Total	11.8	-2.0	1.2	0.5	-2.4	-1.3	-6.0

Sources: U.S. Bureau of the Census, *Summary File 3 (2000)*; U.S. Department of Labor, *Occupational Employment Survey (2001)*.

Notes: Wage groups are based on the median U.S. wage and aggregated from the twenty-three SOC occupation groups. Farmers and farm managers are not included in wage aggregations because median wage data are not available for this group.

the percentage of workers employed in each group in upstate New York and the nation (Table 1, bottom five rows). Despite differences between the region and the nation in the employment shares for individual occupations, differences in employment shares for the five broad wage groups are nominal.³ About 24 percent of workers nationwide work in the two highest wage aggregations, while 57 percent work in the two lowest paying groups. The percentage of workers in high-wage occupations is slightly higher in Rochester and Albany than in the nation, with the employment share of the mid-high-wage group in Albany exceeding the share of the same group in the nation by more than two percentage points. Accordingly, the employment shares of the mid- and low-wage occupation groups are slightly lower in the Rochester and the Albany metro areas than in the nation as a whole. The percentage of workers in high-wage occupations is slightly smaller in Buffalo and Syracuse than in the nation, and significantly smaller in Utica. And Syracuse, Utica, and Binghamton all have slightly higher shares of the two lowest paying groups.

Occupational Changes over the 1990s

While the 2000 census gives a current snapshot of the occupational landscape, we show how this landscape has changed by comparing data from the 1990 and 2000 censuses. Using comparability tables created by the U.S. Bureau of the Census to adjust for differences between the SOC occupation categories used in 1990 and those used in 2000,⁴ we find that education, healthcare, and community and social services—areas of specialization upstate—are among the fastest growing occupations, both nationally and regionally (Table 3). Education and training occupations achieved a rate of expansion in Buffalo and Syracuse that exceeded the nation's already rapid rate. These occupations expanded somewhat more slowly in Rochester, Albany, and Utica than in the nation, and much more slowly in Binghamton. The highly paid healthcare practitioners occupation was the fastest growing occupation in Buffalo, and grew considerably faster in Buffalo and Utica than in the nation, but grew more slowly in remaining upstate areas and shrank in Binghamton. The relatively low-paying healthcare support occupation group was a top growth occupation upstate,

Table 4

Percentage Point Change in Share of Employment by Occupation Group: 1990 - 2000

SOC Wage Aggregation	U.S.	Buffalo	Rochester	Albany	Syracuse	Utica	Binghamton
High wage (> \$50,000)	2.0	1.0	2.7	1.8	0.3	-0.9	1.4
Mid-high wage (\$40,000 - \$50,000)	1.0	2.2	0.7	2.0	0.8	2.0	-0.8
Mid wage (\$30,000 - \$40,000)	1.2	-0.2	-0.6	1.3	1.1	0.2	-1.3
Mid-low wage (\$20,000 - \$30,000)	-2.9	-1.3	-2.6	-4.0	-2.1	-1.1	0.1
Low wage (< \$20,000)	-1.0	-1.5	-0.1	-0.9	-0.1	-0.2	0.7

Sources: U.S. Bureau of the Census, *Summary File 3 (2000)*; U.S. Department of Labor, *Occupational Employment Survey (2001)*.

Notes: The percentage point change in shares is calculated as the difference between the share of employment in the wage category in 2000 and the share in 1990. Wage groups are based on the median U.S. wage and aggregated from the twenty-three SOC occupation groups.

with a rate of expansion in all metro areas except Syracuse that exceeded the nation’s. Community and social services work was also among the region’s fastest growing occupations, outpacing the national growth rate in Albany and Utica.

By far, the most rapidly growing group nationwide is computer and mathematical occupations, which more than doubled in size between 1990 and 2000. A relatively high-paying occupation, it is a relatively small group, employing only 2.4 percent of the workforce. This occupation grew much more slowly in Buffalo and Syracuse and shrank in Utica, but grew close to the national rate in Rochester, Albany, and Binghamton. Another small occupation that grew rapidly nationwide was legal work. This highly paid occupation grew even faster in Albany than in the nation, but it shrank in Rochester, Syracuse, Utica, and Binghamton.

Office and administrative support and retail and sales—the two largest occupation groups, both relatively low-paying—are growing very slowly nationwide and shrinking in all upstate metro areas. Also losing ground both nationally and regionally are production and farming occupations, as well as architecture and engineering occupations. Other occupations that contracted significantly in upstate New York were construction, arts, design and entertainment, cleaning and maintenance, and the life, physical, and social sciences occupations.

Coupling employment gains and losses with each occupation’s employment shares, we find that the most significant causes of job loss in upstate New York were contractions in office and administrative support, construction, production, and retail and sales occupations. The largest contributors to employment gains were management, education, food preparation, and healthcare occupations. Since job gains tended to be outweighed by losses, employment in most upstate metros contracted between 1990 and 2000.

We also examined occupational changes across our five wage groupings. The national pattern clearly indicates significant growth in mid- and high-wage occupations, with little growth in the lowest two wage groups. Upstate metro areas are undergoing more significant and complex changes. With few exceptions, upstate metro areas, like the nation, are experiencing growth in

high-wage occupations, albeit at a slower pace. However, these metro areas are losing employment in lower paying occupations – something that the nation as a whole is not experiencing. Only Rochester and Albany experienced significant growth in the highest wage group; Buffalo and Binghamton saw small growth in the highest wage group, while Syracuse and Utica experienced a decline. The mid-high-wage group grew significantly and close to the U.S. rate in Buffalo, Albany, and Utica, but grew much more modestly in Rochester and Syracuse. Employment fell in the two low-wage groups in every metro area, with the exception of a small gain in Rochester’s lowest wage group.

These growth patterns are altering the occupational structure of the workforce. The change is reflected in the rise or decline of the employment shares held by each of the five wage groups between 1990 and 2000 (Table 4). Because higher wage groups are growing more rapidly than lower wage groups in the United States, the three highest wage occupation groups are gaining shares of employment, while the remaining two low-wage groups are losing shares. As a result of these developments, more of the country’s workforce was employed in high-wage occupations in 2000 than in 1990. The same redistribution of the workforce toward higher wage occupations has occurred in much of upstate New York, although the underlying developments have been somewhat different: negative—not slow—growth in the lower wage groups, paired with merely modest growth in the higher wage groups. In Buffalo, Rochester, Albany, and Syracuse, the two high-wage occupation groups are gaining shares of employment, while the two lowest wage groups are losing shares. Utica and Binghamton, however, exhibit somewhat different patterns: Utica is seeing an increase in the employment share of mid-wage occupations and a reduction in the shares at the upper and lower ends of the wage spectrum. In Binghamton, the shares of the wage groups at the upper and lower ends are growing, while the shares of the mid-wage and mid-high-wage groups are declining.

While the United States experienced significant growth in total employment during the 1990s, upstate New York experienced very little. However, the pattern of employment growth and decline across occupations, although different for the region than for the nation, has had a similar impact on the shares of employment by occupational wage groups.

Conclusion

While job gains and losses in particular industries are an important measure of structural change, shifts in the occupational composition of an economy may be a better measure of underlying workforce restructuring. Sluggish employment growth in upstate New York during the 1990s was largely the result of a loss of jobs in office and administrative support work, retail and sales, construction, and production. These jobs tend to be on the lower end of the wage spectrum. Upstate New York is gaining jobs in healthcare, education, management, and food preparation. These gains, however, have not been enough to offset employment losses in other occupations for much of the region.

Our findings indicate that the structure of the upstate New York workforce is indeed undergoing significant change. While increases in mid- and high-wage occupations largely drove the expansion of the nation's employment base during the 1990s, upstate New York experienced much more modest growth in these occupations. Moreover, that modest growth was coupled with a reduction in the number of workers in low-wage occupations. Together, these forces produced a significant structural shift in the labor force – a redistribution of employment that has increased the share of jobs in high-paying occupations and decreased the share of jobs in low-paying occupations. While the region's economic

performance was well below the nation's in the 1990s, economic restructuring is creating a mix of occupations that, in terms of the distribution of employment in the occupational wage structure, resembles that of the nation.

Notes:

¹ See "The Upstate Economy under the New NAICS Classification System," *Regional Economy of Upstate New York*, Federal Reserve Bank of New York, Buffalo Branch, summer 2003.

² See Office of Management and Budget, *Standard Occupational Classification Manual* (Bernan Press, 2000).

³ This does not imply that the wage structure is equivalent, but that relative shares of employment in wage categories roughly correspond.

⁴ These tables provide estimates of the proportion of employment from the earlier SOC categories that fall into the new SOC categories (see http://www.census.gov/hhes/www/sf30cccross_menu.html). These estimates are, of course, inexact, and are only available at the national level. Proportions are likely to differ among regions and applying them to local areas introduces further inaccuracy. Nevertheless, this method of comparing occupations between the two censuses is the only one currently available, and it can provide a rough guide to regional occupational changes.

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