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SECOND DISTRICT HIGHLIGHTS

New Measures of Economic Growth and Productivity in Upstate New York

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Newly available measures of GDP at the metropolitan area level now afford a more comprehensive view of regional economic activity. An analysis of upstate New York's economic performance using these measures points to below-average output growth between 2001 and 2006 along with productivity levels and productivity growth below the U.S. average. The region's performance overall, however, is somewhat better than that of many manufacturing-oriented metro areas in the Great Lakes region.

Gross domestic product—the most comprehensive measure of economic activity—is a key gauge for analysts evaluating an economy's performance. While the U.S. Bureau of Economic Analysis (BEA) has been reporting GDP at the national and state levels for decades, only recently has it made measures of this economic indicator available for metropolitan areas.[1] These new measures improve the ability of analysts to assess regional economic activity, allowing for a fresher, more complete view of an area than had been possible.

In this edition of *Second District Highlights*, we assess the performance of upstate New York's economy using these new measures of metropolitan area GDP. We measure the size of the upstate economy, including the economies of the major metropolitan areas, and examine the pace of growth between 2001 and 2006—the period for which these new data are available. We then combine the BEA's new output measures with existing employment data to construct our own measures of labor productivity for the upstate New York region, which we use to analyze the rate of productivity growth over the period.

Our study reveals that upstate New York's metropolitan areas, like others in the Northeast and in the Midwest, experienced below-average output growth over the 2001-06 period, although growth generally exceeded that in many Great Lakes metropolitan areas. Furthermore, the region's productivity levels and productivity growth were below the U.S. average. Still, it bears mentioning that upstate's below-average performance is fairly consistent overall with that of other manufacturing-oriented areas in the Great Lakes region and the Northeast.

Gauging the Size of Upstate New York's Economy

Because GDP captures the market value of all final goods and services produced in a geographic area within a given period, it is often viewed as the most comprehensive measure of that area's economic activity.[2] For decades, the

[1] See U.S. Bureau of Economic Analysis (2007a, 2008).

[2] National GDP is a measure of the goods and services produced by labor and property located within the United States. Conceptually, it represents the sum of the "value added" at each stage of the production process. GDP can also be measured as the sum of expenditures by final users or, equivalently, as the sum of the incomes earned and costs incurred in production. A key difference between GDP measures and other measures of economic activity, such as personal income, is the inclusion of corporate income.

Bureau of Economic Analysis has produced such measures for the U.S. economy on a quarterly basis and for state economies on an annual basis.

Recently, the BEA began to publish experimental GDP data for 363 metropolitan areas, and these data are now available for the 2001-06 period (see box). Unlike the national figures, however, the metropolitan area data are available only on an annual basis. These new measures of GDP provide a way to ascertain the size of a region's economy. Upstate New York's nine metropolitan areas produced a total of $168.2 billion of goods and services in 2006 (Table 1). Of these areas, Rochester's economy ranks as the largest, with approximately $43.1 billion of output in 2006, followed by Buffalo's $40.6 billion. The next largest metropolitan economy was Albany, which produced $35.9 billion, followed by Syracuse at a significantly smaller $24.4 billion. Each of these four metropolitan areas ranks among the 100 largest nationwide in terms of output—Rochester is fifty-second, Buffalo fifty-fifth, Albany fifty-eighth, and Syracuse eightieth. The remaining metropolitan areas in upstate New York—Utica, Binghamton, Glens Falls, Ithaca, and Elmira—are relatively small, and together constitute less than 15 percent of upstate's metropolitan area GDP.

Gauging the size of the entire upstate New York economy requires additional data on GDP in rural areas, which the BEA currently does not publish. Accordingly, we derive an estimate of this rural economic activity using an approach that is similar to, though less precise than, the one used by the BEA for metropolitan areas. Including this measure with the official metropolitan area GDP figures yields an estimated GDP of approximately $208.8 billion for upstate in 2006.[3] This amount of economic activity represents roughly 1.6 percent of the nation's GDP and would place upstate New York twenty-third among states—just below Wisconsin and Missouri, but above Connecticut and Louisiana.

While relatively large, the amount of economic activity upstate is well below that of downstate New York, which produced about $1.1 trillion of goods and services in 2006—or nearly 9 percent of U.S. GDP.[4] Although roughly two-thirds of New York's population resides downstate, the region generated approximately five times the amount of economic activity

[3] Our estimate of GDP for all of upstate New York aggregates information from the region's nine metropolitan areas; then, following the spirit of the BEA's metropolitan area GDP estimates, it incorporates non-metropolitan counties based on the ratio of earnings in metropolitan counties to those in non-metropolitan counties. Our approach here differs from the BEA's in that we do not disaggregate the earnings ratio by industry.

[4] References to downstate New York represent aggregated information from the New York City, Kingston, and Poughkeepsie metropolitan areas. Because the New York City metropolitan area includes portions of New Jersey and Pennsylvania, our estimate of the size of the downstate economy is somewhat overstated.

How the BEA Estimates Metropolitan Area GDP

The U.S. Bureau of Economic Analysis (BEA) derives metropolitan area GDP figures from the state-level GDP data that it compiles.[a] Earnings measures for each industry in a county, already produced directly by the BEA, are used to compute a ratio of county earnings to state earnings. This ratio is then used as a proxy to allocate the entire state's GDP for that industry to the county, with some adjustments made for certain industry anomalies.[b] Thus, the methodology assumes that a region's patterns of *earnings* by industry closely reflect patterns of *output* by industry. Industries are aggregated by county, and county totals are aggregated by metropolitan area using county-based definitions issued by the Office of Management and Budget. Estimates of real GDP by metropolitan area are derived using national implicit price deflators by industry.

[a] See Panek, Baumgardner, and McCormick (2007) for a more detailed discussion of the methodology used to calculate metropolitan area GDP. See U.S. Bureau of Economic Analysis (2006, 2007b) for more information on the construction of state GDP figures and the calculation of national GDP, respectively.

[b] Specifically, adjustments are made to the air transportation, agriculture, banking, mining, and real estate industries.

Table 1
Gross Domestic Product

	Nominal GDP, in Dollars, 2006	Average Annual Percentage Growth in Real GDP, 2001-06
U.S. total	13.2 trillion	2.7
U.S. metro areas	11.8 trillion	2.7
Upstate metro areas	168.2 billion	1.7
Downstate metro areas	1.1 trillion	2.4
Great Lakes metro areas	1.3 trillion	1.2
Within upstate New York		
Rochester	43.1 billion	1.8
Buffalo	40.6 billion	1.7
Albany	35.9 billion	1.8
Syracuse	24.4 billion	1.2
Utica	8.1 billion	1.4
Binghamton	6.8 billion	1.5
Glens Falls	3.4 billion	2.8
Ithaca	3.4 billion	2.0
Elmira	2.5 billion	1.4

Sources: U.S. Bureau of Economic Analysis; authors' calculations.

Notes: The growth rate for metro area aggregates is calculated as the average annualized percentage change in real GDP between 2001 and 2006 using the previous year's nominal GDP to weight annual changes in each metro area's real GDP. The upstate metro areas are the nine listed in the table; the downstate metro areas are the aggregate of the New York City, Kingston, and Poughkeepsie metropolitan statistical areas; the Great Lakes metro areas are the thirty-seven metropolitan statistical areas that fall within fifty miles of the Great Lakes.

generated upstate. One reason for this disparity is the presence of the financial services sector in New York City, which produces a large volume of high-value-added services. The finance and insurance industries alone, for example, generated nearly $173 billion in GDP in 2006, an amount roughly equivalent to 83 percent of the entire upstate GDP.

Measuring Regional Economic Growth

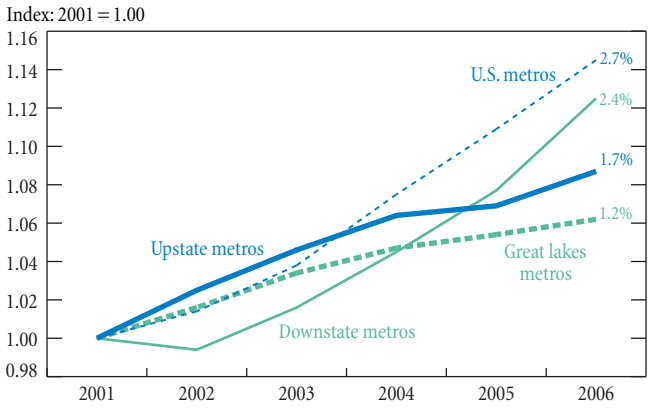
A region's economic vitality is often assessed by analyzing trends in wages, income, and employment. Needless to say, vitality also depends on how rapidly a region's aggregate economic output is growing, a metric that until recently was not available at sub-state levels. Since the market value of goods and services can change over time when prices change, even if the quantity of goods and services produced does not, it is important to hold prices constant when examining the change in GDP over time. While nominal GDP is measured in current prices, *real* GDP controls for changes in prices. Thus, by examining the annualized percentage change in real GDP, one can assess economic growth.[5]

For the U.S. economy as a whole, real GDP grew at an annual average rate of 2.7 percent between 2001 and 2006 (Table 1). Over this period, real GDP across upstate rose 1.7 percent on average, lagging the U.S. economy.[6] Between 2001 and 2006, average growth downstate, at 2.4 percent, was significantly more rapid than growth upstate, although it also lagged the nation. The pattern of growth over this period differed between upstate and downstate (see chart). While the downstate economy declined between 2001 and 2002, owing largely to the economic impact of the September 11 attacks, it rebounded thereafter and grew at a sturdy pace through 2006.[7] The upstate economy grew roughly at the same pace as the national economy between 2001 and 2003; economic growth, however, stalled between 2003 and 2005 before picking up again in 2006, resulting in a below-average growth rate for the region.

Significant variation in average economic growth during this period is apparent among upstate New York's metropolitan areas, where GDP increases ranged from 1.2 percent in Syracuse to 2.8 percent in Glens Falls (Table 1). Each of the four large metropolitan areas upstate grew more slowly than the national average. Among them, Rochester's and Albany's economies grew the most rapidly, each at an average rate of 1.8 percent; Buffalo's economy followed close behind at 1.7 percent, while Syracuse grew at a slower 1.2 percent pace.

Upstate New York has not been alone in experiencing relatively slow economic growth in recent years. Real GDP growth has generally been below average in much of the Northeast and Midwest, while growth has been faster in the South and West (see map). For example, the Las Vegas economy grew at an average rate of 7.5 percent per year and Phoenix grew 5.3 percent; by contrast, the annual growth rate for Boston averaged 1.6 percent, for Cleveland 1.2 percent, and for Detroit just below zero. Despite upstate's slow growth, the area outpaced the Great Lakes region by a significant margin.[8] Combined, the Great Lakes metropolitan areas—areas that share upstate New York's historical concentration in manufacturing—grew at an annual rate of only 1.2 percent, a slower pace than that observed for the three largest upstate New York metropolitan areas. (See the appendix for a discussion of manufacturing and the Buffalo economy.) Only six Great Lakes metro areas had growth rates exceeding the 1.8 percent pace of Rochester and Albany. Four of these grew

Real Gross Domestic Product Growth



Sources: U.S. Bureau of Economic Analysis; authors' calculations.

Notes: Figures are based on 2001-06 real GDP. The growth rate for the metro area aggregates is calculated as the average annualized percentage change in real GDP between 2001 and 2006 using the previous year's nominal GDP to weight annual changes in each metro area's real GDP. The upstate metro areas are Albany, Binghamton, Buffalo, Elmira, Glens Falls, Ithaca, Rochester, Syracuse, and Utica; the downstate metro areas are the aggregate of the New York City, Kingston, and Poughkeepsie metropolitan statistical areas; the Great Lakes metro areas are the thirty-seven metropolitan statistical areas that fall within fifty miles of the Great Lakes.

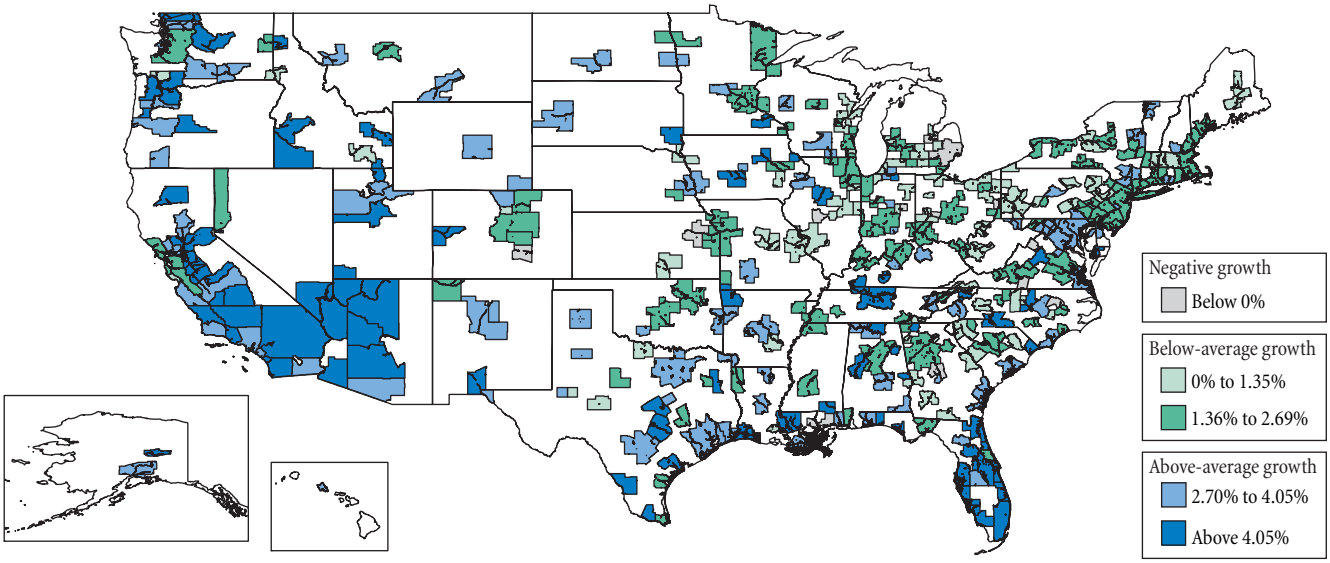
[5] National GDP data are typically used to identify the growth and decline in output on a quarterly basis, and data are released shortly after the end of a quarter so that business cycles can be identified in a timely fashion. However, since metropolitan area GDP data are currently available only on an annual basis and reported with a lag of more than a year, it is not yet feasible to use these data to identify regional business cycles in a similar way. As this data series expands over time, it may assist analysts in identifying regional business cycles, although higher frequency data will ultimately be required.

[6] GDP growth for metropolitan area aggregates is calculated as the average annualized percentage change in real GDP between 2001 and 2006 using the previous year's nominal GDP to weight annual changes in each metropolitan area's real GDP.

[7] See Bram, Orr, and Rapaport (2002) and Bram (2003) for detailed analyses of the economic impact of the September 11 attacks.

[8] We define the Great Lakes region to include all metropolitan areas that fall within a fifty-mile distance of the Great Lakes. Thirty-seven areas meet this criterion. The inclusion of the four upstate New York metropolitan areas that fall into this definition of the Great Lakes region does not affect our results.

Average Annualized Percentage Change in Real GDP, 2001-06



Source: U.S. Bureau of Economic Analysis.

at a pace below the U.S. average of 2.7 percent: Akron, Ohio (2.0 percent); Oshkosh, Wisconsin (2.0 percent); Duluth, Minnesota (2.2 percent); and Monroe, Michigan (2.3 percent); while two outpaced the nation: South Bend, Indiana (3.0 percent), and Elkhart, Indiana (5.4 percent).

In both the upstate New York region and the nation as a whole, growth in output has not been accompanied by parallel growth in employment. This disparity is attributable to productivity growth. The amount of goods and services that a worker produces, on average, has continued to rise in upstate New York and in the United States. Given the importance of productivity to regional activity, we now examine productivity levels of the region's workers—a statistic previously unavailable—and assess the pace of productivity growth between 2001 and 2006.

The Productivity of Upstate New York's Workers

While the growth in a region's output of goods and services is an important indicator of regional economic vitality, productivity levels and productivity growth more directly affect the standard of living for a region's citizens. The reason is that wages tend to reflect the value of an individual's production; thus, the higher an individual's productivity, the higher his earnings. This relationship closely ties productivity growth to wage growth.

Combining the GDP data with employment data yields a broad measure of regional labor productivity. Productivity, or output per worker, is measured as GDP divided by the number of workers in a region. In this context, productivity is interpreted as the average value of output produced by a worker in a metropolitan area.

The variation observed in regional productivity measures derives primarily from two sources. First, differences in the composition of goods and services produced within a region can lead to differences in output per worker. Higher valued (and thus higher priced) goods and services add more to GDP than do lower valued ones. For example, the market value of the services produced by a worker on a stock exchange will likely be quite high compared with the market value generated by a retail worker in a department store. Second, workers performing the same job producing the same goods or services may be more or less efficient for a variety of reasons—including not only the comparative skills of the workers, but also the amount of capital on hand and the organization of the production process—resulting in greater or less output per worker.

Unfortunately, these two determinants of aggregate productivity levels cannot be disentangled from the available data. In total, regional differences in GDP per worker reflect differences in the average market value of what is produced on a per-worker basis. Since the mix of activities differs greatly between regions, productivity levels tend to differentiate regional economies that produce higher value-added goods and services from those that produce lower value-added ones.

Productivity Levels

Productivity levels in upstate New York are for the most part lower than those observed downstate and in the United States

Table 2
Productivity

	GDP per Worker, in Dollars, 2006	Average Annual Percentage Growth in Productivity, 2001-06
U.S. total	73,898	1.4
U.S. metro areas	77,764	1.4
Upstate metro areas	62,092	1.1
Downstate metro areas	102,248	1.4
Great Lakes metro areas	73,826	0.8
Within upstate New York		
Rochester	67,923	1.4
Albany	65,661	0.9
Syracuse	63,219	0.7
Buffalo	62,056	1.2
Elmira	51,639	2.2
Ithaca	50,224	0.6
Glens Falls	49,937	1.2
Utica	49,442	0.8
Binghamton	48,896	1.5

Sources: U.S. Bureau of Economic Analysis; authors' calculations.

Notes: Average annual productivity growth for the metro area aggregates is calculated as the average annualized percentage change in real GDP per worker between 2001 and 2006 using the previous year's employment to weight annual changes in each metro area's real GDP per worker. The upstate metro areas are the nine listed in the table; the downstate metro areas are the aggregate of the New York City, Kingston, and Poughkeepsie metropolitan statistical areas; the Great Lakes metro areas are the thirty-seven metropolitan statistical areas that fall within fifty miles of the Great Lakes.

more generally. Output per worker averaged about $62,100 in upstate New York's metropolitan areas in 2006, some 16 percent below the nation as a whole and nearly 40 percent below downstate New York (Table 2). Among upstate's metropolitan areas, productivity was highest in Rochester, at $67,900, followed by Albany and Syracuse, at roughly $65,700 and $63,200, respectively. Buffalo's output per worker, at around $62,100, was lowest among the four largest metropolitan areas upstate. Not surprisingly, the region's smaller metropolitan areas had productivity levels well below these figures, averaging roughly $50,000. Smaller metropolitan areas in general tend to have lower productivity levels than larger ones.[9] For U.S. metropolitan areas of comparable size—populations under 300,000—output per worker averaged around $58,000. The gap between the productivity levels of smaller metro areas in upstate New York and smaller metro areas in the nation roughly parallels the 16 percent gap between the productivity levels of all upstate metro areas and the nation as a whole.

[9] A number of urban scholars have documented the productivity-enhancing effects of agglomeration economies that result from city size. See, for example, Segal (1976) and Glaeser and Maré (2001).

Productivity Growth

Between 2001 and 2006, the average rate of productivity growth for upstate New York fell short of the national average. Productivity growth among the region's metropolitan areas was 1.1 percent, moderately lower than the U.S. rate of 1.4 percent (Table 2).[10] Elmira's average productivity growth rate of 2.2 percent outpaced the nation's, despite the metro area's lower productivity level. Among the region's four large metropolitan areas, only Rochester did not fall below the nation in productivity growth, matching the U.S. pace of 1.4 percent. Among the region's smaller metropolitan areas, Binghamton posted productivity growth slightly above the nation's, at 1.5 percent; Buffalo and Glens Falls posted productivity growth just shy of the national rate, at 1.2 percent; and Albany and Syracuse came in at a relatively low 0.9 and 0.7 percent, respectively. As a whole, upstate New York's relatively low productivity growth exceeds that experienced in the Great Lakes region more generally. In fact, the average rate of productivity growth among the Great Lakes metropolitan areas was 0.8 percent, well below the upstate New York aggregate.

Conclusion

The availability of metropolitan area GDP measures now allows analysts to obtain a new and more complete view of economic activity in upstate New York. In 2006—the last year for which new data are available—the upstate economy produced more than $200 billion in goods and services, a figure rivaling the output of many states. Like other metropolitan areas in the Northeast and Midwest, however, upstate New York experienced below-average growth in output between 2001 and 2006. It also generally had lower levels of productivity and productivity growth over the period. However, upstate exceeded many of its peers in the Great Lakes region in real GDP growth and productivity growth.

The fastest-growing and highest-valued segments of the U.S. economy in recent decades have been in the information technology and services sectors, particularly business and professional services. However, many of the metro areas within the Great Lakes and Northeast regions developed and boomed early in the twentieth century around concentrations in manufacturing activity. During the past several decades, manufacturing-oriented regions—including upstate New York—have tended to experience slower growth, especially as the manufacturing industry has shed jobs. Thus, upstate New York's economic performance, while generally sluggish, is not unusual compared with that of other metropolitan areas in the Great Lakes region and in the Northeast more broadly.

[10] Productivity growth for metropolitan area aggregates is the average annualized percentage change in real GDP per worker between 2001 and 2006 using the previous year's employment to weight annual changes in each metropolitan area's real GDP per worker.

Appendix: The Buffalo Metropolitan Area

Among its many releases, the U.S. Bureau of Economic Analysis (BEA) publishes metropolitan area GDP data by industry group. However, to avoid disclosing confidential information—particularly for small metropolitan areas, where company-specific activity could be inferred—the BEA makes complete industry data available only sparsely. Within upstate New York, the most complete industry-level GDP data are available for the Buffalo metropolitan area. We use these industry-level data to obtain a more detailed view of this regional economy.

The composition of goods and services produced in the Buffalo metropolitan area differs from the nation's in several ways. Most notably, manufacturing represents a larger share of output in the Buffalo area, according to 2006 data. Specifically, manufacturing accounted for 17.7 percent of the value of all goods and services produced in Buffalo, significantly more than the 11.3 percent U.S. share (see table).

Employment shares for manufacturing are lower than these output shares. In 2006, manufacturing accounted for only about 10 percent of employment in the Buffalo area, slightly more than the 8 percent share for the nation as a whole. This divergence between manufacturing's share of output and its share of employment in the region reflects the fact that output per worker in the manufacturing sector is relatively high in upstate New York. Thus, while manufacturing employment has been declining in recent decades, and its employment share is now relatively close to the nation's share, the industry remains significant in the Buffalo economy.

Industry Shares of Metropolitan Area Gross Domestic Product

Percent

	Buffalo Metro Area	U.S. Metro Areas
Manufacturing	17.7	11.3
Government	14.7	11.7
Finance and insurance	10.1	9.0
Health care and social services	8.8	7.0
Real estate	6.8	13.6
Retail trade	6.7	6.4
Wholesale trade	5.8	6.2
Professional and technical	5.6	7.7
Construction	3.6	4.9
Administration and waste services	3.3	3.2
Information	2.7	5.0
Accommodation and food services	2.6	2.7
Transport and warehousing	2.5	2.9
Management	2.5	2.0
Other services	2.2	2.3
Utilities	1.9	2.0
Education	1.1	1.0
Arts and entertainment	1.2	1.0

Sources: U.S. Bureau of Economic Analysis; authors' calculations.

Notes: Figures are based on 2006 nominal GDP. Data for agriculture and mining are not included.

Another large industry in the Buffalo metropolitan area is government, which accounted for a larger share of GDP than in the nation: 14.7 percent compared with 11.7 percent. Some of this difference is attributable to the strong presence of state universities in the region, which are included in the government category. The area also had a higher share of output in finance and insurance, health care and social services, retail trade, and management, but a lower-than-average share of output in real estate, wholesale trade, professional and technical services, construction, information, and transportation and warehousing.[a] The remaining industries are close to the national average.

Over the 2001-06 period, real GDP grew at an average rate of 1.7 percent per year in the Buffalo metropolitan area, although there were significant differences in growth rates by industry (see chart). Despite the slower growth in Buffalo than for the nation overall, the growth in output for some industries in the area exceeded U.S. averages. The fastest-growing industries in the Buffalo area were finance and insurance, information, arts and entertainment, management, professional and technical services, and education. The area outpaced the nation in all of these industries except information and professional services.

Buffalo saw output declines in construction, which also declined nationally over the period, as well as in other services and utilities. With the exception of government, the remaining industries grew more slowly in Buffalo than they did nationwide. Notably, manufacturing grew more slowly than it did nationally, a trend that has broadly held for much of the Northeast for several decades.[b]

Since the size of these industries can be large or small, each may be a large or small contributor to Buffalo's 1.7 percent GDP growth rate. For example, information expanded at a rapid 4.0 percent annual rate, but because this industry accounted for less than 3 percent of all output in the area, it did not contribute significantly to total output growth. In contrast, the area's manufacturing industry, which expanded at a relatively modest 1.4 percent, contributed more to overall growth because it represents nearly 18 percent of the area's economic activity.

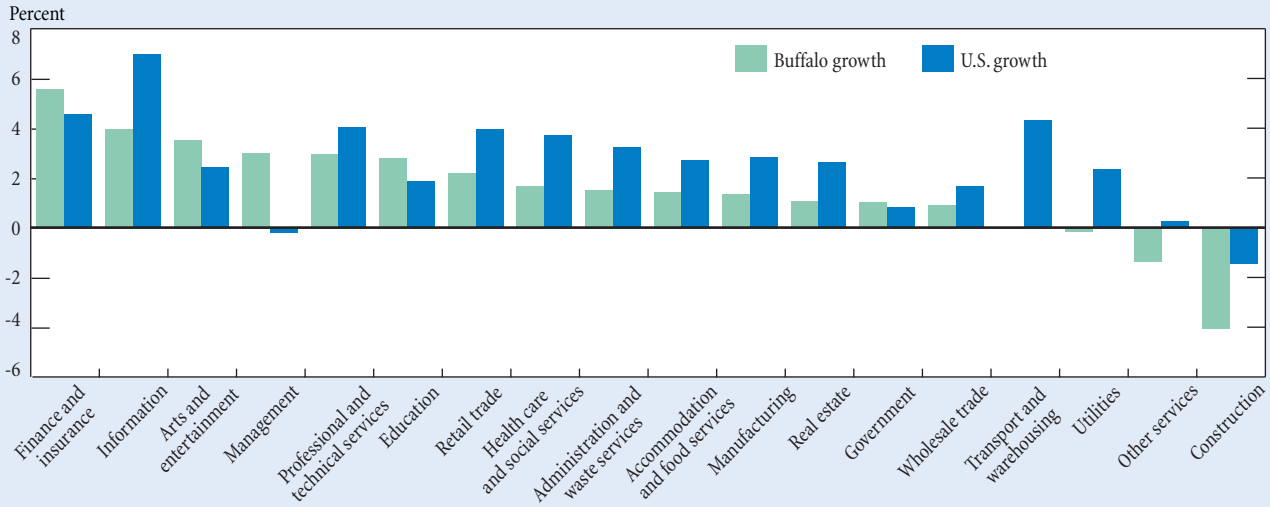
[a] The real estate share is relatively low in the Buffalo metropolitan area, most likely reflecting the relatively low rental rates on property.

[b] See Crandall (1993) for an in-depth examination of the pattern of industrial migration within the United States.

Appendix: The Buffalo Metropolitan Area (*Continued*)

When each industry's growth rate is weighted by size, the largest contributor to Buffalo's economic growth over the period was finance and insurance, followed closely by manufacturing. Together, these two industries accounted for about half of the area's observed growth—or approximately 0.8 percentage point of the 1.7 percent growth in area GDP. The next largest contributors were professional services, government, retail trade, and health care, which together contributed another 0.6 percentage point to the area's total growth.

Industry GDP Growth in the Buffalo Metropolitan Area and the United States



Sources: U.S. Bureau of Economic Analysis; authors' calculations.

Notes: Figures are based on the 2001-06 real GDP annualized growth rate. Data for agriculture and mining are not included.

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