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Buffalo Branch,
Federal Reserve Bank of New York
160 Delaware Avenue
Buffalo, NY 14202
Tel: (716)849-5023
Fax: (716) 849-5218

Barbara Walter
Senior Vice President and Branch Manager

Reggie Melson
Community Affairs Representative
reggie.melson@ny.frb.org

Richard Deitz, Ph.D.
Regional Economist
richard.deitz@ny.frb.org

Ramon Garcia
Assistant Economist
ramon.garcia@ny.frb.org

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Upcoming Event

The Office of Regional Community Affairs at the Federal Reserve Bank of New York and its Buffalo Branch will host two luncheon roundtable discussions exploring Equity Capital in rural communities.There will be one in Plattsburgh, NY on December 3 and one in Canandaigua, NY on December 6. To register, please call 212-720-5349 or e-mail carolyn.lee@ny.frb.org

Economic Restructuring in Western New York State

Over the past three decades, Buffalo and Rochester have seen their economies dramatically restructured. In 1969, the two metropolitan areas—the largest in western New York—were both major centers of manufacturing. Buffalo had a relatively diverse manufacturing base with particular strength in steel and automobiles, while Rochester was highly specialized in the production of photographic equipment. In the years that followed, however, the economies of both cities were reshaped by national and international forces: competition from manufacturers abroad, the relocation of factories from the Northeast to the South and West, and the emergence of high-level service industries in which the United States showed a clear competitive advantage. As a consequence, in both cities, manufacturing declined sharply as services rose in importance. By 1999, service industries had thoroughly eclipsed manufacturing as a source of employment (Chart 1).[1]

In this edition of the *Regional Economy*, we explore the distinctive patterns of Buffalo and Rochester's economic restructuring in detail. We compare the broad structural changes in Buffalo's economy with those in Rochester's, and the changes in both metropolitan economies with those in the national economy. We also seek to understand the roots of these changes through an analysis of industry-level data. What industries in each city have experienced significant employment gains and losses, and how have the cities' industry specializations changed?

We find that although Buffalo and Rochester remain highly dependent on goods production and distribution, both cities have followed the national trend away from goods producing industries and toward service industries.[2] Buffalo has progressed further than Rochester in this restructuring of its economy—in large part because its manufacturing industries have suffered more severe job losses. Employment in Buffalo's two largest industries, steel and autos, dropped 70 percent between 1969 and 1997, while employment in Rochester's signature photographic equipment industry dropped only 28 percent over the same period. Our analysis shows that both cities have developed new specializations in consumer services—particularly in the areas of health and education—and in "producer" services targeted to other businesses. Buffalo has established a presence in commercial banking and mortgage brokerage services, while Rochester has excelled in high-growth services such as communications and computer and data-processing.

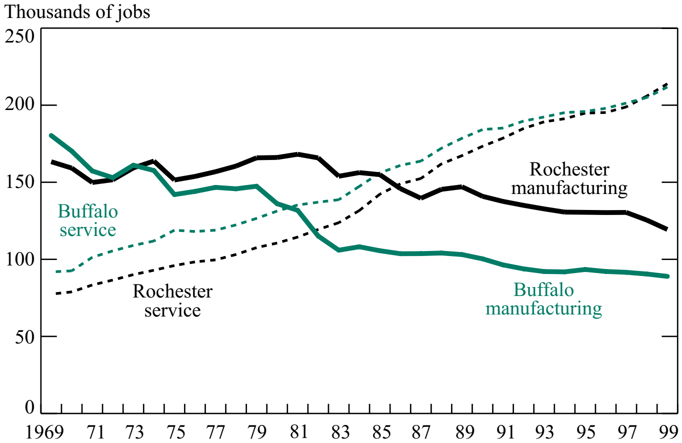
Traded Goods and Services

In tracking structural changes, we focus on the industries that drive local economies: traded goods and services. These industries are able to export their products and thus bring in revenues from outside the region.[3]

The traded goods and services sector can be subdivided into three categories: goods production and distribution (GP&D), producer services, and consumer services. GP&D includes all agricultural, mining, and manufacturing industries, as well as those industries that transport and distribute goods wholesale—freight transport, trucking, warehousing, and wholesale trade. The producer services category encompasses industries that sell primarily to other businesses, providing intermediate inputs in the production of final goods and services. Producer services can be further broken down into financial producer services, such as banking, insurance, and real estate, and nonfinancial producer services, such as computer and data-processing services, legal services, and accounting. The final category, consumer services, consists of services performed by physicians, professors, and other skilled professionals and sold directly to consumers.

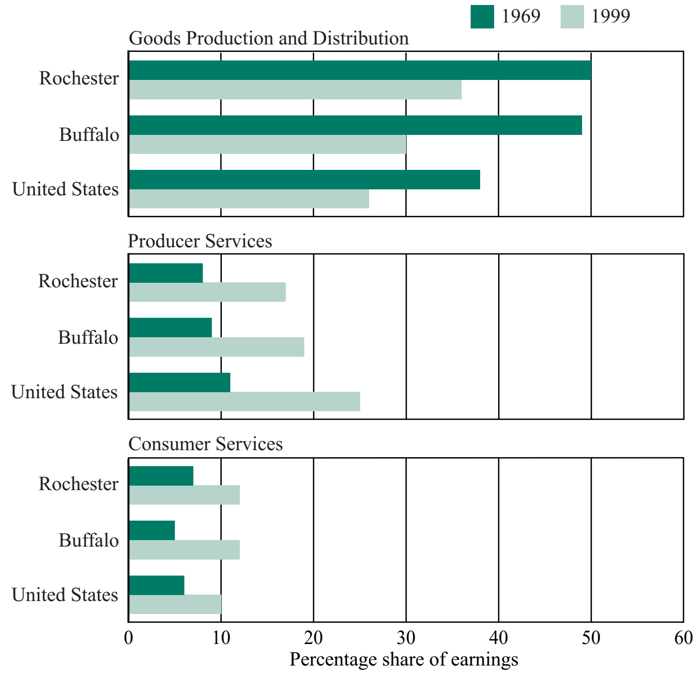
Note that many of the industries within the traded goods and services sector produce for local consumption as well as export, and some serve local markets predominately. A good portion of health, education, and

Chart 1
Manufacturing and Service Employment: Buffalo and Rochester Metro Areas, 1969-99



Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System.

Chart 2
Percentage Share of Earnings by Major Category of Traded Goods and Services: Rochester and Buffalo Metro Areas and the Nation, 1969-99



Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System, authors' calculations.

communications services, for example, are provided to the local community. Nevertheless, the producers of these services also target customers outside the region and can be active in external markets. Note too that in this sector, nonfinancial producer services and consumer services have made a particularly important contribution to U.S. job growth over the past three decades.

The Rise of the Service Economy

Analyzing earnings within the three categories of traded goods and services over time provides a good way to establish the relative importance of each category and to observe broad structural trends. Chart 2 shows the percentage of total earnings attributable to each of the categories in 1969 and 1999 for Buffalo, Rochester, and the United States. Overall, the patterns are largely consistent across both cities and the country as a whole: by undergoing a reduction in the production and distribution of goods and an increase in the provision of traded services, Buffalo and Rochester have followed the national trend.

Nevertheless, GP&D has historically dominated the traded goods and services sector in both metropolitan areas, and it continues to claim a significantly larger share of earnings than either producer or consumer services. In 1969, GP&D was responsible for about 50 percent of earnings in Rochester and Buffalo, compared with 38 percent in the United States as a whole. By 1999, GP&D's share of earnings had dropped to 36 percent in Rochester and 30 percent in Buffalo, while in the United States it had fallen to 26 percent.

Producer services' share of earnings increased significantly between 1969 and 1999 in both Buffalo and Rochester—almost doubling. In the nation as a whole, producer services increased proportionally. However, because the United States has historically been more dependent on producer services than western New York State, the growth in this category raised producer services' share of total U.S. earnings to 25 percent, just shy of the share of U.S. earnings from GP&D. By contrast, in the western New York metropolitan areas, the share of earnings from producer services was still only about half that from GP&D. The share of earnings claimed by consumer services grew at a similar pace in Rochester, Buffalo, and the United States between 1969 and 1999, although the western New York cities were somewhat more dependent on this category than the nation.

Limiting our focus to Buffalo and Rochester, we observe that Buffalo experienced a greater relative decline in GP&D—and a larger relative increase in traded services—than did Rochester. This finding suggests that economic restructuring is further along in Buffalo than in Rochester.

How Have Industry Employment Patterns Shifted?

Industry employment data provide another lens through which to view the structural transformations of the Buffalo and Rochester economies. By analyzing which industries within the traded goods and services sector have experienced significant job gains and losses, we obtain a more precise understanding of the changing makeup of the cities' economies and the shifts in their industry specializations. While we would like to track these changes over the 1969-99 period, we have comparable data for 1969 and 1997 only.[4]

The distribution of employment within the traded goods and services sector for 1969 and 1997 is shown in Table 1. Goods production and distribution is broken down into five industry groups:

- resource-based manufacturing (agriculture, mining, steel, and paper)

Table 1

Distribution of Employment within the Traded Goods and Services Sector: Rochester and Buffalo, 1969 and 1997

	Buffalo					Rochester					United States
	1969		1997		1969-97	1969		1997		1969-97	1969-97
	Employ.	LQ	Employ.	LQ	% Chg.	Employ.	LQ	Employ.	LQ	% Chg.	% Chg.
Goods prod. and dist.	**219,633**	**1.3**	**131,903**	**1.1**	**-40**	**154,788**	**1.5**	**121,768**	**1.4**	**-21**	**11**
Resource-based mfg.	42,999	2.0	10,491	0.8	-76	3,098	0.2	4,354	0.4	41	1
Heavy metal mfg.	56,640	1.7	34,124	1.6	-40	21,124	1.0	18,510	1.2	-12	-6
High-tech mfg.	22,727	1.5	8,116	0.8	-64	72,663	8.1	44,963	6.3	-38	0
All other mfg.	52,742	1.0	34,581	1.1	-34	27,423	0.8	17,032	0.7	-38	-6
Goods distribution	40,936	1.1	40,587	1.1	0	17,091	0.8	21,640	0.8	27	59
Producer services	**41,071**	**1.0**	**79,471**	**0.9**	**93**	**25,464**	**1.0**	**63,384**	**1.0**	**149**	**208**
Financial	19,804	0.9	32,138	1.1	62	11,450	0.8	18,537	0.8	62	108
Nonfinancial	21,267	1.0	47,333	0.8	123	14,014	1.1	44,847	1.1	220	314
Consumer services	**27,183**	**1.0**	**81,569**	**1.3**	**200**	**22,128**	**1.4**	**66,204**	**1.4**	**199**	**275**

Sources: U.S. Bureau of the Census, County Business Patterns; authors' calculations.

Notes: Rochester employment numbers are for Monroe County only. Buffalo employment numbers are for the entire metro area, which includes Erie and Niagara counties. Totals for goods production and distribution include manufacturing administrative & auxiliary employment numbers, which are not published for individual industries at the county level. A location quotient (LQ) is a common measure of employment concentration. An LQ of 1.0 indicates a concentration of employment equal to the U.S. average. LQs greater than 1.2 indicate industry specialization. Employment numbers were estimated from ranges of values in cases where exact totals were not published.

- heavy metal manufacturing (autos, industrial machinery, fabricated metals)
- high-tech manufacturing (instruments, electronic and electrical equipment)
- other manufacturing (food, tobacco, textiles, apparel, furniture, printing, chemicals, petroleum, rubber and plastics, leather, stone/clay and glass, miscellaneous manufacturing)
- goods distribution (rail and water transportation, pipelines, trucking and warehousing, wholesale trade).

We collected job data for the entire Buffalo metropolitan area—both Erie and Niagara Counties—for this study. By contrast, we collected job data solely for the core county of the Rochester metropolitan area, Monroe County. The other five counties in the Rochester metropolitan area are primarily rural, and industry-level job data are not always available.[5] Nevertheless, since Monroe County is responsible for over 80 percent of the area's economic activity, its data are sufficient for this study.

To indicate industry specialization, we use a measure of job concentration known as a location quotient (LQ), calculated by dividing the percentage of a region's employment in an industry by the percentage of total U.S. employment in that industry. For example, if the manufacturing sector provided 30 percent of all jobs in a region, and the U.S. average was 15 percent of all jobs, the location quotient would be 2.0 (30 divided by 15). A location quotient of 1.0 means that a region's concentration of employment in an industry is identical to that of the nation. Location quotients between 0.8 and 1.2 are generally believed to represent average employment in an industry, while location quotients above 1.2 indicate industry specialization.

Industry Specialization in Buffalo

In 1969, Buffalo showed at least an average presence across all industry groups in the traded goods and services sector—service as well as goods-producing industries (Table 1). As expected, the data show specialization in resource manufacturing and heavy metal manufacturing, and—perhaps surprisingly—in high-tech manufacturing as well. The region did not, however, exhibit heavy specialization in any industry group.

By 1997, the structure of Buffalo's traded goods and services sector had changed dramatically. Only heavy metal manufacturing remained a specialty. Over the twenty-eight years since 1969, the region lost almost half of its goods-producing employment, with losses in each of the goods-producing categories. GP&D decreased 40 percent overall, a loss of nearly 90,000 jobs. Over that same period, the nation's goods-producing employment changed little, and GP&D employment rose 11 percent.

Among the specific industries that underlie Buffalo's decline in GP&D, the big loser was steel, which saw a 94 percent employment decline between 1969 and 1997 (Table 2). The obliteration of this industry was quite rapid, as demonstrated in Chart 1 by the steep drop in Buffalo's total manufacturing employment between 1979 and 1983. However, steel's decline was only part of the story. The region also lost about 45 percent of its employment in motor vehicles, its second largest manufacturing industry, and experienced steep declines in fabricated metal products and other heavy metal industries. Even more notable was the decline of other kinds of manufacturing: paper, food, industrial chemicals, and above all, electrical equipment, which saw a decrease of more than 15,000 jobs between 1969 and 1997. Overall, Buffalo lost about half of its manufacturing employment between 1969 and 1997.

During the period, Buffalo's losses in GP&D were more than offset by gains in traded services. The region saw employment in producer services increase by 93 percent between 1969 and 1997. However, this increase was less than half that for the nation as a whole. The traded goods and services component that showed the most job growth in Buffalo was consumer services, which grew by nearly 55,000 jobs between 1969 and 1997, an increase of 200 percent. With an LQ of 1.3, consumer services became a new specialty of the region.

Table 2

Buffalo Industries Showing Significant Growth or Decline between 1969 and 1997

	Buffalo					United States
	1969		1997		1969-97	1969-97
	Employ.	LQ	Employ.	LQ	% Chg.	% Chg.
LOSERS						
Resource-based mfg.						
Steel	28,899	5.5	1,675	1.2	-94	-58
Paper	7,134	1.7	2,475	1.0	-65	-6
Heavy metal mfg.						
Fabricated metals	14,226	1.6	8,884	1.4	-38	10
Motor vehicles	25,520	4.6	14,104	4.2	-45	-6
High-tech mfg.						
Electrical equipment	19,713	1.6	4,638	0.7	-76	-21
All other mfg.						
Food	11,934	1.2	6,753	1.1	-43	-3
Industrial chemicals	8,064	4.9	2,284	2.7	-72	-20
GAINERS						
Financial producer serv.						
Commercial banks	5,575	1.0	9,982	1.6	79	73
Mortgage brokers	0	0	2,172	2.1	N/A	4294
Nonfinancial producer serv.						
Computer & data processing	ND	N/A	3,109	0.5	N/A	N/A
Research & testing	2,604	2.2	3,930	2.0	51	156
Consumer serv.						
Doctors offices & clinics	2,114	0.9	9,195	1.4	335	356
Nursing homes	2,144	0.9	11,434	1.4	433	411
Hospitals	13,467	1.3	29,253	1.4	117	202
Home health care	ND	N/A	7,328	1.9	N/A	N/A
Colleges & universities	1,381	0.5	5,176	1.0	275	192

Sources: U.S. Bureau of the Census, County Business Patterns; authors' calculations.
Note: ND indicates that the industry was either nonexistent or negligible in 1969.

Table 3

Rochester Industries Showing Significant Growth or Decline between 1969 and 1997

	Rochester					United States
	1969		1997		1969-97	1969-97
	Employ.	LQ	Employ.	LQ	% Chg.	% Chg.
LOSERS						
Heavy metal mfg.						
Industrial machinery	13,462	1.8	8,835	1.5	-34	0
High-tech mfg.						
Communications equipment	12,031	6.0	2,722	3.4	-77	-50
Ophthalmic goods	5,734	55.9	3,108	36.2	-46	7
Photographic equipment	43,672	117.8	31,300	160.4	-28	-33
All other mfg.						
Food	6,752	1.1	2,252	0.5	-67	-3
Mens & boys suits	5,477	10.5	825	8.4	-85	-76
GAINERS						
Heavy metal mfg.						
Fabricated metals	4,162	0.8	6,175	1.3	48	10
All other mfg.						
Miscellaneous plastics	941	0.9	3,573	1.5	280	176
Financial producer serv.						
Real estate	1,806	0.7	5,135	1.2	184	101
Nonfinancial producer serv.						
Communications	3,591	0.9	4,856	1.1	35	38
Computer & data processing	ND	N/A	7,260	1.6	N/A	N/A
Consumer serv.						
Nursing homes	1,516	1.0	7,425	1.2	390	411
Hospitals	5,412	0.8	19,273	1.3	256	202
Home health care	ND	N/A	3,934	1.4	N/A	N/A
Colleges & universities	8,350	4.9	15,096	3.8	81	192

Sources: U.S. Bureau of the Census, County Business Patterns; authors' calculations.
Notes: Data are for Monroe County only. ND indicates that the industry was either nonexistent or negligible in 1969

Buffalo's gains in financial producer services were in the banking industry. With commercial banks increasing employment about 80 percent between 1969 and 1997, the Buffalo metropolitan area emerged as a center for regional banking. This development most likely contributed to the growth of mortgage brokerage—also a new specialization.

Buffalo lagged, however, in the development of nonfinancial producer services—many of which have been major job generators nationwide. Buffalo saw growth in the high-paying computer and data- processing industry, but by 1997, the city's concentration of employment in this industry was still only half that of the United States. Buffalo also exhibited gains in research and testing services, a field in which it continues to show specialization.

Within the consumer services sector, Buffalo performed well in health services, where a number of industries achieved job growth rates comparable to those for the nation as a whole. Employment in doctors' offices and clinics, nursing and personal care facilities, hospitals, and home health services grew strongly, giving rise to new regional specializations. It is hard to know, however, what portion of these health services is actually a source of export revenue, because health services are largely for local consumption. Yet they *can* be traded—as when a patient from Rochester visits Roswell Park Cancer Institute in Buffalo. One might suppose that Buffalo's high concentration of employment in health services is due at least in part to an aging population. But the region's substantial medical industry clearly serves patients from outside the area as well, including surrounding rural counties and Canada. Buffalo also added jobs in educational services, particularly at colleges and universities. Note that the 1997 total for colleges and universities does not include education services provided by the metropolitan area's state universities, which at the time generated about 8,400 jobs.

Industry Specialization in Rochester

In 1969, Rochester's traded goods and services sector was markedly less diversified than Buffalo's (Table 1). The region depended heavily on high-tech manufacturing, which showed an LQ of 8.1. Rochester had a presence in other kinds of manufacturing, however, with only resource-based manufacturing exhibiting a low concentration of employment. Also notable was the relative importance of consumer services in 1969. Rochester's strength in the education field helped make consumer services an area of specialization, with an LQ of 1.4. Nevertheless, GP&D was by far the most important component of Rochester's traded goods and services sector in 1969.

By 1997, Rochester showed a significant decline in its GP&D employment, with a net loss of about 33,000 jobs—a 21 percent decrease. To be sure, Rochester—unlike Buffalo—actually saw gains in some components of GP&D, such as resource manufacturing and goods distribution. Nevertheless, the remaining goods-producing industry groups showed substantial job losses, with high-tech manufacturing contracting by 38 percent.

As in Buffalo, much of the GP&D employment loss in Rochester between 1969 and 1997 resulted from the decline of its dominant manufacturing industry. However, the nature of that decline differed in the two cities. While Buffalo's steel and auto industries were shedding jobs throughout the first half of the period, Rochester's photographic equipment industry was expanding employment at a steady rate until its peak in 1982 at about 62,000 workers. Over the same period, Rochester experienced losses in other manufacturing industries, resulting in an essentially constant level of manufacturing employment (see Chart 1). Photographic equipment declined steadily after 1982, pressured by increasing competition from Japanese imports. At the same time, overall job losses in other manufacturing industries began to stabilize. By 1997, photographic equipment employment had declined 28 percent from its 1969 level, and almost 45 percent from its peak (Table 3).

Other high-tech manufacturing industries also contracted over the 1969-97 period (Table 3). Rochester lost over three-fourths of the jobs in its substantial communications equipment industry (much of it defense-related) and nearly half of its employment in ophthalmic goods. Conventional manufacturing industries showed diminished employment as well, with significant declines in men's suits—a specialty of the region—and in food. The industrial machinery industry, traditionally an area of specialization for many upstate cities, remained important in Rochester, but sustained large job cuts.

Overall, Rochester lost about 23 percent of its manufacturing jobs between 1969 and 1997—roughly half the reduction in Buffalo's manufacturing employment over the same period. While Rochester's lighter losses are primarily attributable to the better performance of its dominant industry, they also reflect fewer employment cutbacks in other types of manufacturing. Rochester actually added jobs in two manufacturing industries: fabricated metals and miscellaneous plastics. The region seems to be developing a specialty in plastic products (Table 3)—one of the few manufacturing industries that is growing in the United States.

As in Buffalo, however, the growth of the traded goods and services sector in Rochester stems largely from the expansion of services. Employment grew 199 percent in consumer services and 62 percent in financial producer services between 1969 and 1997—mirroring the gains in Buffalo. Not surprisingly, Rochester maintained its specialization in consumer services. Nonfinancial producer services grew at a significantly faster rate in Rochester than in Buffalo, rising by 220 percent. While this growth rate lagged that of the nation, the increase was similar to that of the United States relative to total job growth. Thus, Rochester retained its concentration of employment in nonfinancial producer services (LQ=1.1).

Rochester's consumer services specialties are in the health and education fields (Table 3). Like Buffalo, Rochester experienced growth in nursing and personal care facilities, hospitals, and home health services—however, the caveat about an aging population also applies. Yet the region's greatest consumer service strength is in colleges and universities, which added more than 6,500 jobs between 1969 and 1997. The region has long specialized in higher education, an industry that remains strong. While the exodus of graduating college students is often lamented in Rochester as well as Buffalo, the fact that many students come from outside the region means that both metropolitan areas are successful exporters of higher education.

While Rochester's growth in financial producer services is similar to Buffalo's, the region's particular strength is in real estate rather than banking. But Rochester's performance in the nonfinancial producer services sector is where it most sets itself apart. Rochester has excelled in both communications services and computer and data- processing services—by 1997 showing signs of specialization in both industries. And it should be noted that this study does not reflect the substantial growth in these industries over the last four years (even if that growth is at a halt). According to the most recent data available from the Bureau of Labor Statistics, Rochester's communications employment grew about 50 percent between 1997 and the present.[6]

Conclusion

Between 1969 and 1999, the traded goods and services sectors in Buffalo and Rochester underwent significant restructuring. Both metropolitan areas moved away from the production and distribution of goods and toward the delivery of high-level services, a transformation seen in cities across the country. Nevertheless, goods production and distribution remained the most important component of traded goods and services for Buffalo and Rochester alike. As gauged by earnings, Buffalo underwent a greater relative decline in goods production and distribution—as well as a larger relative increase in traded services—than did Rochester.

While U.S. manufacturing growth was essentially flat between 1969 and 1997, Rochester and Buffalo experienced a decline in their dominant manufacturing industries as well as a general decline in other kinds of manufacturing—a pattern throughout the Rust Belt states. In both cases, the loss of jobs was more pronounced in Buffalo than in Rochester. Yet, on the positive side, both areas maintained specializations in a number of key manufacturing industries despite diminished employment. Rochester remained highly specialized in photographic equipment and ophthalmic goods, for example, and Buffalo retained strength in auto parts and industrial chemicals.

In response to greater demand for high-level services and changing competitive advantage, Rochester and Buffalo saw significant growth in traded services between 1969 and 1997. While their traded services growth lagged the nation's, both cities managed to develop new specializations. The cities had similar successes in consumer services—particularly health and education. They differed, however, in the performance and specialties of their producer services sector. Buffalo established strength in financial producer services such as commercial banking and mortgage brokerage. Rochester, by contrast, excelled in nonfinancial producer services such as communications and computer and data-processing, and grew faster in producer services overall.

Although the economies of both cities have historically centered on manufacturing, the nature of that manufacturing has differed. Thus, it is no surprise that Buffalo and Rochester have responded differently to the forces transforming their traded goods and services sectors. Because Buffalo's manufacturing base was clearly hit more severely than Rochester's, Buffalo's traded services sector gained a larger share of economic activity and grew in importance. As a result, by 1999, the structure of Buffalo's traded goods and services sector was more in line with that of the nation as a whole. Rochester, however, emerged from the 1969-99 period with a heavier dependence on GP&D than Buffalo. Economic restructuring has proceeded further in Buffalo in this respect, and Rochester could be more vulnerable to future job losses if trends in U.S. manufacturing continue.

Yet Rochester has demonstrated superior performance in producer services, particularly in the high-growth, high-value-added industries. With a share of total earnings now equal to GP&D's, these services have become an extremely important segment of the U.S. economy. And research suggests that producer services play an important role in boosting a region's productivity and per capita income.[7] Thus—despite the performance of its manufacturing sector—Rochester may be laying a firm foundation for future economic growth.

Notes:

[1] According to a recent Federal Reserve Bank of New York study (Anderson and Bram 2001), while much of the manufacturing job loss in New York State can be attributed to the national decline in the importance of manufacturing, the unusually steep nature of the losses stems from the geographic dispersion of manufacturing activity, whereby employment has been shifting from northeastern states that historically had a high density of manufacturing jobs to southern and western states with a low density of such jobs.

[2] The restructuring of the two cities' traded goods and services economies over the 1989-98 period was observed by Matthew Drennan (Drennan 1998). This study expands on his work by applying a similar model over the 1969-99 period.

[3] Nontraded goods and services, by contrast, are produced for local consumption (for example, dry cleaning, groceries, and haircuts). We disregard this sector in our analysis because demand for these goods and services is determined by the size of the local economy, which is in turn dependent upon the level of activity in the traded goods and services sector. Consequently, the performance of the nontraded goods and services sector tends to simply follow the performance of the traded goods and services sector.

[4] In 1998, the federal government replaced the Standard Industrial Classification system with the North American Industry Classification System. The change creates a series break and, for many industries, prevents the observation of trends across the two systems.

[5] A metropolitan area consists of a large population nucleus and its associated county, together with adjacent counties that have a high degree of economic and social integration with that nucleus. The Rochester metropolitan area includes Genesee, Livingston, Monroe, Ontario, Orleans, and Wayne Counties.

[6] Current Employment Statistics, Bureau of Labor Statistics and New York State Department of Labor, August 2001.

[7] See Hansen (1990).

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Richard Deitz and Ramon Garcia