



Cyclical Patterns and Structural Changes in the Louisville Area Economy Since 1990

Paul Coomes and Nan-Ting Chou

In this paper, the authors examine several data sets to better understand the growth patterns in the Louisville area economy since 1990. They find that the regional economy has closely tracked the national economy, in terms of growth in jobs, payroll, and housing. However, changes in job-based location quotients suggest that the structure of the Louisville economy has actually diverged from the national economy over the period. Manufacturing overall has declined in the Louisville area as it has nationally, but the local motor vehicle and related parts manufacturing subsector has doubled in relative importance due to the southward movement of the automobile and truck industries. Also rising in relative importance are Louisville's distribution, recreation, and health services industries. The authors examine these growth patterns and structural changes and also investigate the false signals about the local economy sent by the U.S. Bureau of Labor Statistics data before and during the recession of 2001.

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If you think of Fed Chairman Greenspan as having access to a fire hydrant of data on the U.S. economy, then think of regional economists as having access to a slow and leaky garden hose. Data arrive in dribbles long after events transpire, and there is never enough. For example, it often takes two years for estimates of monthly job growth to settle down, and revisions are particularly large around cyclical turning points in the economy. Current labor force estimates, except for heavily populated metro areas, are subject to large measurement errors. And there are generally no data at all on such key economic variables as regional investment, prices, industrial output, retail sales, trade, wealth, and consumer spending. Hence, analysts are left to sort out the structural changes and cyclical behavior of their regional economy retrospectively using the best data available, however skimpy and noisy.

In this paper, we examine several data sets to better understand the growth patterns in the Louisville area economy since 1990. We find that the regional economy has closely tracked the national economy, in terms of growth in jobs, payroll, and housing. Overall manufacturing employment has declined, and distribution, recreation, and health services jobs have risen in importance. Job growth has recently picked up in Louisville, but, similar to the nation as a whole, nonagricultural wage and salary employment has not yet reached its pre-recession peak (Lloyd and Mueller, 2005). Wages and salaries have also grown in synch with payrolls nationally. Similarly, new home construction was relatively strong throughout the recession and recovery, both locally and nationally. However, changes in industrial location quotients suggest that the structure of the Louisville economy has actually diverged somewhat from the national economy. We examine these growth patterns and structural changes and

Paul Coomes is professor of economics at the University of Louisville and the National City research fellow. Nan-Ting Chou is an associate professor of economics at the University of Louisville. The authors thank Barry Kornstein and Margaret Maginnis for data, mapping, and analytical support.

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Table 1
Growth in Macro Variables, the Louisville MSA vs. the U.S.

	1990	2004	Growth (percent)
Jobs, nonagricultural wage and salary (000)			
Louisville MSA	512	599	17.0
U.S.	109,487	131,480	20.1
Population, July 1			
Louisville MSA	1,058,425	1,200,063	13.4
U.S.	249,622,814	293,871,612	17.7
Single-family building permits/starts			
Louisville MSA—permits	3,680	6,184	68.0
U.S.—starts (000)	895	1,613	80.2

NOTE: The Louisville MSA refers to the new 13-county definition, except for building permits, which are based on the pre-2004 7-county definition.

SOURCE: Job data are from the U.S. Bureau of Labor Statistics. Population data are from the U.S. Bureau of Economic Analysis, with estimates for 2004 based on extrapolation of 2003 data. Building permit data are from the U.S. Census Bureau.

also investigate the false signals about the local economy sent by U.S. Bureau of Labor Statistics (BLS) data before and during the recession of 2001.

DEFINITION AND GEOGRAPHIC SCOPE OF LOUISVILLE ECONOMY

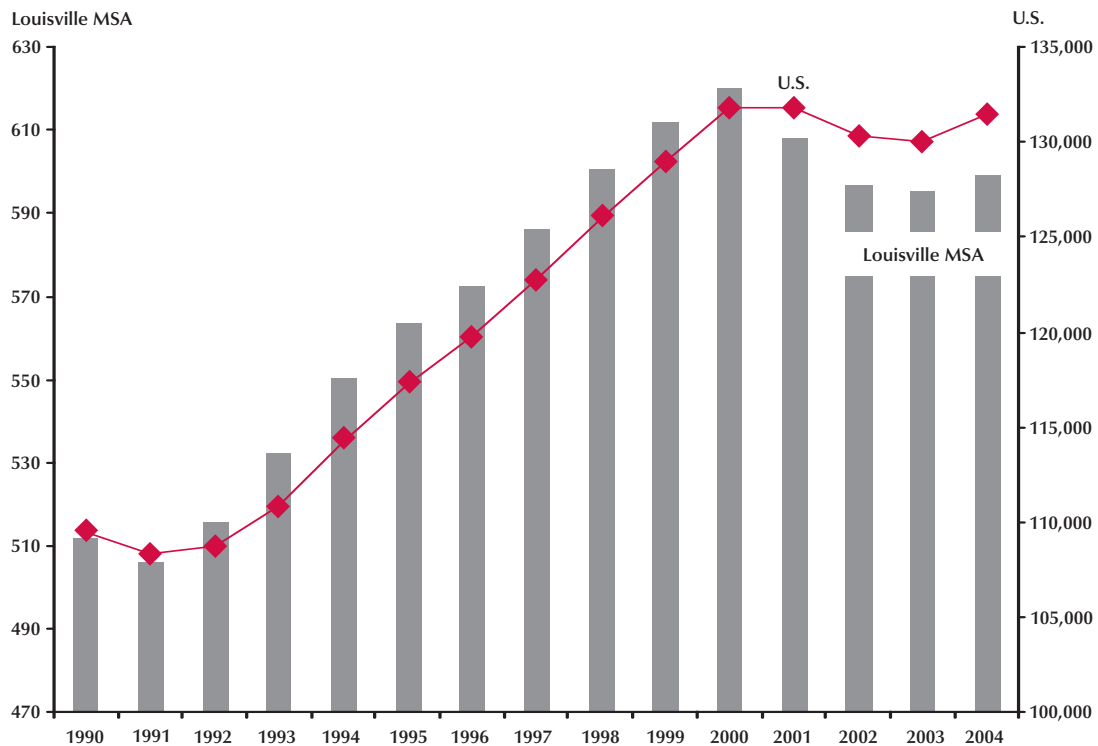
The Louisville metropolitan statistical area (MSA) was redefined in 2003 to include 13 counties in Kentucky and southern Indiana. The total MSA population is about 1.2 million. Commuting patterns revealed by the 2000 Census led to the geographic expansion of the MSA, from its former 7-county definition.

The Louisville MSA, as well as the newly defined Elizabethtown MSA, is part of the wider 25-county Louisville economic area. The economic area classification was developed by the U.S. Bureau of Economic Analysis and assigns all U.S. counties to some regional economy. This broader definition is very useful in analyzing the markets for labor, major retail purchases, television and print media, air transportation, higher education, and major medical and professional services. In fact, in previous studies we have found the MSA geography to be too small to account for the labor force growth occurring on a place-of-work basis

in the MSA (Coomes et al., 2000). Low interest rates, combined with the relatively recent real estate developments around outlying interstate highway interchanges, the raising of the speed limit in the early 1990s, low real gas prices, improved automobile efficiency, and the demand for inexpensive modern homes have all caused people to live further and further from their work-places. In terms of population, the fastest growing counties in the Louisville economic area have been in the first and second rings around the central county—Jefferson County, Kentucky. Under the broader economic area definition, the Louisville economic area is bounded by the Indianapolis, Cincinnati, Lexington, Nashville, and Evansville economic areas. However, because much more economic data are available for MSAs than for economic areas, the rest of the paper focuses on the economy of the Louisville MSA.

AGGREGATE ECONOMIC MEASURES

The economy of the Louisville MSA was relatively strong in the 1990s, particularly compared with its growth during the previous two

Figure 1**Total Jobs, the Louisville MSA vs. the U.S.**

NOTE: Jobs are in thousands. Louisville MSA refers to the 13-county definition, as of 2004.

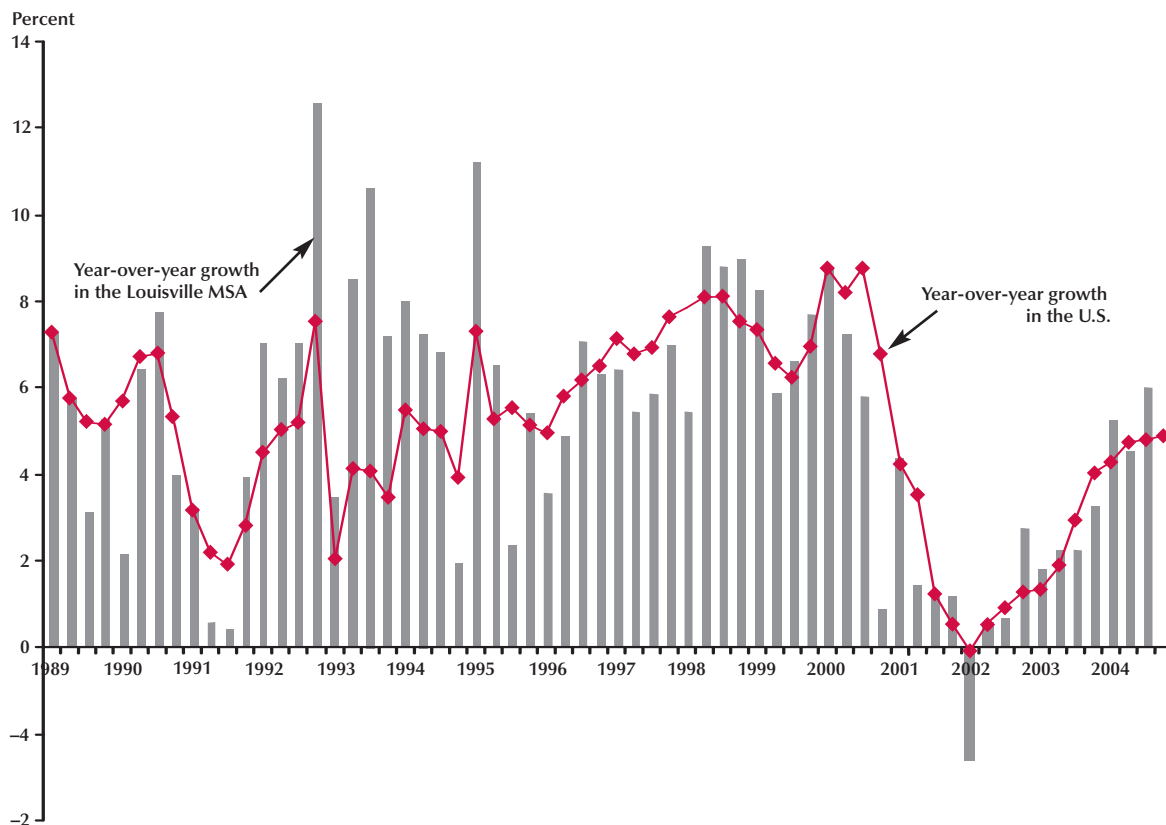
SOURCE: BLS, Current Employment Survey; nonagricultural wage and salary jobs only, in thousands.

decades. The continued expansion of the international air freight hub of United Parcel Service was a key driver, and the region added thousands of jobs in distribution, warehousing, logistics, and related transportation industries. The MSA also benefited from the southward movement of the U.S. automobile industry, seeing job growth at its two large Ford assembly plants and at many parts plants around the region. This good job growth induced an acceleration of population growth. The population and income growth, combined with interest rates at generational lows, stimulated the housing market. Of course, the 1990s were a bullish time for the national economy as well. Yet, the Louisville MSA's growth since 1990 was slightly below the national average for key aggregate economic measures. See Table 1.

The 13-county Louisville MSA gained 87,000 jobs between 1990 and 2004, with all the net growth occurring between 1992 and 2000. Indeed, according to the BLS, the economy of the Louisville MSA now supports 20,000 fewer jobs than it did at the end of the previous decade. Over the entire 14-year period, Louisville's net growth was 17 percent, compared with national growth of 20 percent. Figure 1 shows the nearly contemporaneous growth in jobs for the Louisville MSA and the United States over the expansion period. However, the MSA apparently suffered a greater percentage loss of jobs during the recession than did the United States as a whole. The slight uptick in jobs shown for the Louisville MSA in 2004 is based on preliminary estimates, and we have learned to be suspicious about early job

Figure 2

Quarterly Growth in Wages and Salaries Paid, the Louisville MSA vs. the U.S.



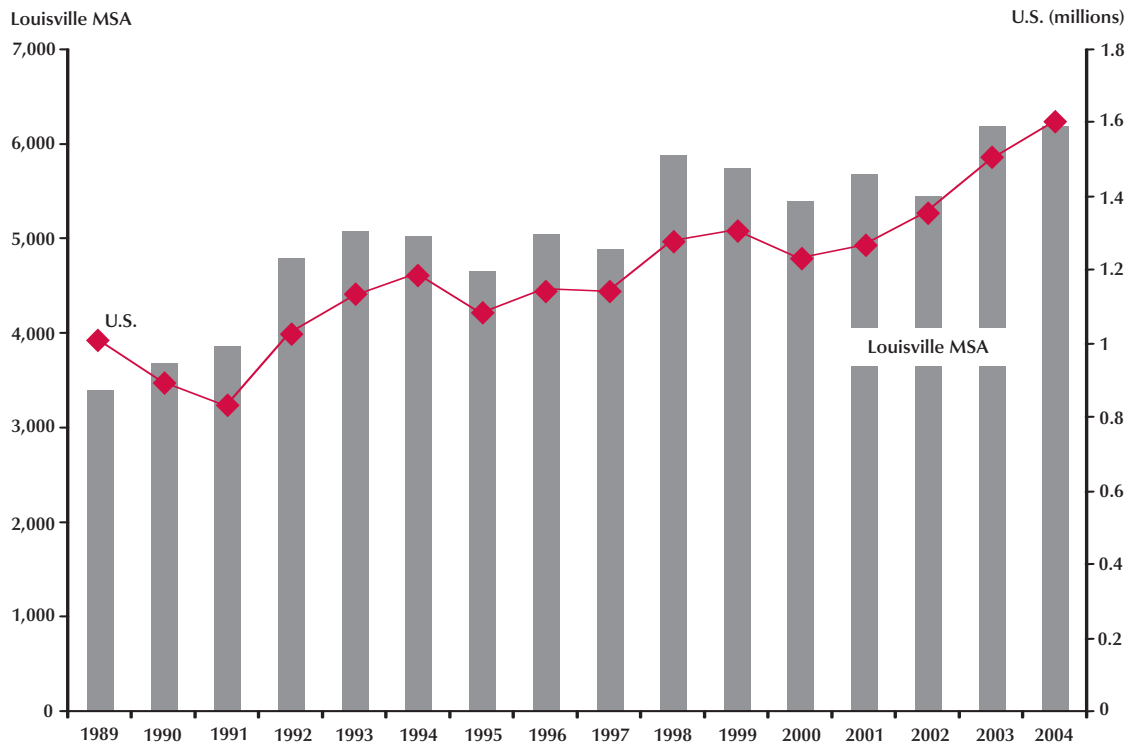
SOURCE: BLS, wages and salaries covered by unemployment insurance; both series are seasonally adjusted.

estimates for the local economy. Revisions to the MSA’s job data for 2004 (perhaps upward) are likely to be much greater than revisions for the nation as a whole. We discuss revisions to job data later in the paper.

Conventional wisdom among economic development and civic leaders in the Louisville MSA is that the economy lags the national economy. If this were ever true, it is certainly no longer. Consider data on payroll growth at a quarterly frequency. The BLS compiles data on wages and salaries covered by the unemployment insurance system. We compare the year-over-year quarterly growth rates of payrolls in the Louisville MSA (old 7-county definition) with those of the nation, as shown in Figure 2. The data are seasonally

adjusted so that the underlying pattern is easier to detect. It is clear from the chart that the growth in wages and salaries paid in the Louisville MSA tracks closely with that of the nation, especially over the past few years. This makes us wonder if there has been a structural convergence, wherein the Louisville MSA has become statistically more like the nation.

Like the nation as a whole, the Louisville MSA’s housing market continued to thrive throughout the previous recession. Figure 3 illustrates growth in single-family home building permits issued in the Louisville MSA versus housing starts in the United States over the past 15 years. The reasons for the growth are now well-known, though few forecast such a strong housing sector

Figure 3**Louisville MSA Single-Family Home Building Permits vs. U.S. Housing Starts**

SOURCE: U.S. Census Bureau.

during the cyclical downturn. The most common explanations include a mixture of very low interest rates for both developers and home buyers, an expanding base of retired persons seeking new homes, declining household size due to divorces and double income earners deciding to have fewer children, and the low expected return on alternative forms of investment like equities and money-market instruments. Interestingly, the growth in single-family homes nationally exceeded the growth in the Louisville MSA by about the same ratio as that for jobs and population.

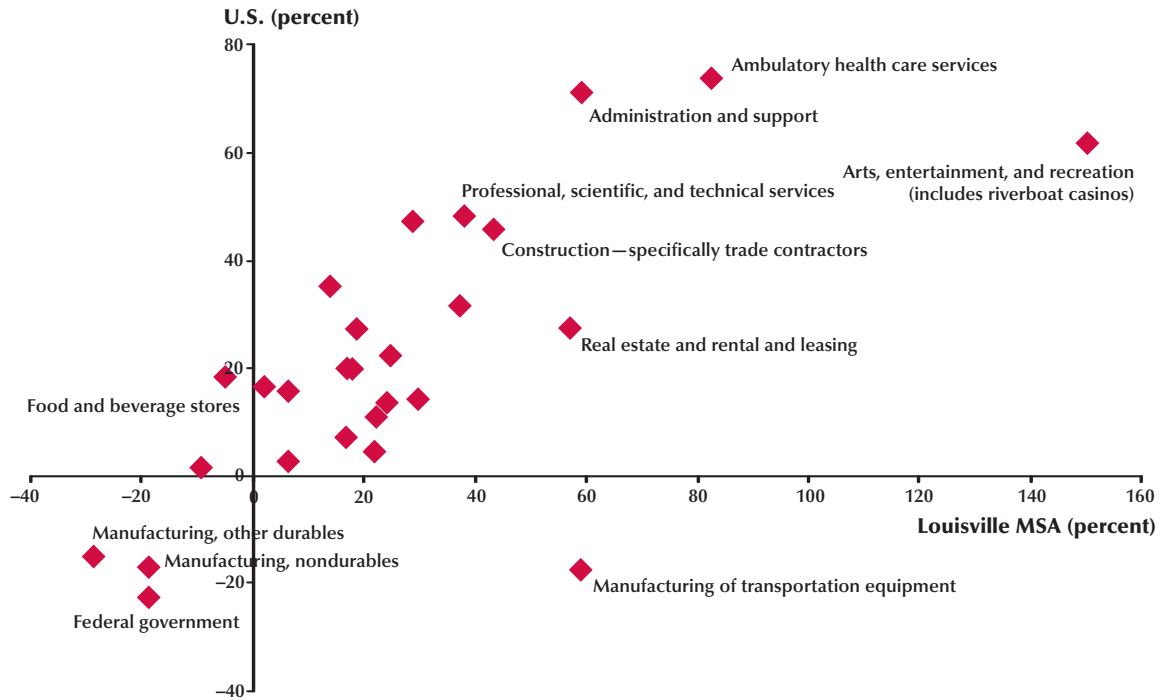
JOB GROWTH BY INDUSTRY SINCE 1990

At the aggregate economic level, we see a remarkable similarity between the growth in the

Louisville MSA and the United States over the past 14 years. We now investigate this further, using job data on 26 industries. We calculate location quotients, using detailed job data to learn which local industries have gained and lost in importance compared with the same measures nationally. We find that the variation in location quotients actually increased since 1990, suggesting that the structure of the Louisville economy has actually diverged somewhat from the national economy. Given the very similar growth paths revealed by aggregate data on jobs and payrolls, these structural changes must have offsetting effects on employment and payrolls at the aggregate level.

In-depth analyses of regional economies are hampered by the break in most time series due to the introduction of the North American Industrial

Figure 4
Job Growth Rates by Industry, the Louisville MSA vs. the U.S., 1990 to 2004



SOURCE: BLS.

Classification System (NAICS), which has replaced the old Standard Industrial Classification (SIC) system. The NAICS conventions have cleaned up past misclassifications, such as treating corner bakeries and copying shops as manufacturers. However, because of the lack of sufficiently detailed historical data, NAICS-based estimates have been published only retroactively to 1990 for MSA-level jobs and to 2001 for earnings by industry. The recent changes to MSA definitions, aligned with the commuting patterns data from the 2000 Census, also create some comparability problems in public data sets. Hence, in this paper, we blend data from different sources using different definitions, to tease out stories about the recent path of the Louisville economy.

Figure 4 provides a scatter plot of job growth by industry for the Louisville MSA and the United States. These are the data, released in March 2005, that provide retroactive estimates using for the

first time the NAICS, and which also correspond with the 2004 geographic redefinitions of MSAs. Appendix Table A1 provides reference data. We are limited in how much industrial detail we can analyze because the BLS provides job estimates for only 26 industries in Louisville. Yet, this is enough detail to reveal several interesting patterns. First, the growth rates of most local industries are in line with national rates. The slope of a regression line through the scatter plot is 0.98, and the correlation coefficient between the growth rates is 0.70. The two fastest growth industries nationally—ambulatory health care services and administrative support—were also among the fastest growing locally. Ambulatory health care primarily refers to outpatient care facilities and offices of physicians, dentists, optometrists, psychologists, physical therapists, and labs. The administrative and support sector refers to a large collection of industries that do “office administration, hiring

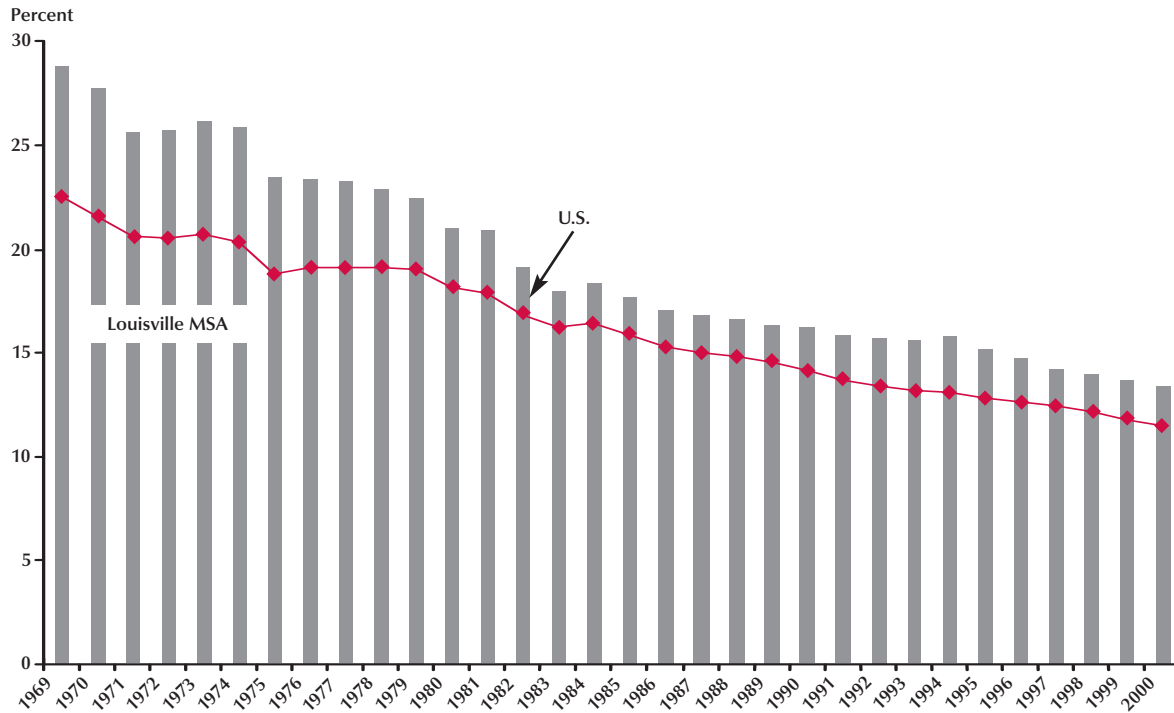
and placing of personnel, document preparation and similar clerical services, solicitation, collection, security and surveillance services, cleaning, and waste disposal services,”¹ services that are sometimes performed in-house by companies and households. The three industrial categories that lost jobs nationally—federal government, non-durable manufacturing, and durable manufacturing (less transportation equipment)—lost jobs locally as well. Louisville also lost jobs in the food and beverage retail-store category, though this industry posted a slight gain nationally. Retail, the second fastest-growing sector (after services) in terms of jobs over the past two decades, is evidently undergoing a technological revolution, because there has been no net job growth for the past few years even though retail sales continue to advance.

One expects to see more variation locally than at the national level because the national economy has a much greater number and variety of firms in each industry, which tends to generate offsetting effects. No MSA economy perfectly mirrors the national economy, because the particular climate, history, industrial structure, demographic characteristics, and policies of a place will favor certain industries and disfavor others relative to the national average. In this regard, there are two obvious outliers in the Louisville MSA data. The MSA posted much higher job growth than the nation in the arts, entertainment, and recreation industry and in the manufacturing of transportation equipment industry. Although published BLS data do not reveal this, we know from other information that the growth in arts, entertainment, and recreation was really due to the opening of a large riverboat casino in Harrison County, Indiana, part of the Louisville MSA, and a few miles west of downtown Louisville. The Caesar’s casino opened in late 1998 and its hotel in 2001; combined they have about 2,000 employees, over one-fifth of the MSA’s jobs in the entire arts, entertainment, and recreation industry. Louisville’s new relative specialization in this industry shows up in the change in location quotients over the period. In 1990, the industry’s location quotient was 0.72 (net importer). By 2004, the location quotient was 1.14 (net exporter).

The other local industry to significantly outperform the nation was the manufacturing of transportation equipment. The Louisville MSA has benefited from its central location along the north-south automobile and truck production corridor. The area has two major Ford assembly plants, with total employment of about 9,000. One makes the popular Ford Explorer and other SUVs; the other makes heavy-duty trucks, F-250s through F-550s. Although sales have been soft during the past few months, over the past few years the plants have gained business as Ford has shifted production from Cleveland, St. Louis, and other markets to Louisville. The area also has many auto-related parts plants, including a ThyssenKrupp Budd body-stamping plant in Shelbyville that employs 1,100 and a Tower Automotive frame plant in Corydon that employs 800. The transportation equipment manufacturing sector as a whole grew in employment locally from 11,000 to 17,000 jobs between 1990 and 2004, with only a slight dip during the previous recession. Note that this strong growth occurred against a backdrop of declining national employment in the industry. Kentucky in general and the Louisville area in particular now boast the lowest industrial electricity rates in the country, thanks to the California-driven spikes in power prices in the northwestern United States in the late 1990s and early part of this decade. Perhaps more important than energy costs, though, is the location advantage. Our deceased colleague Mark Berger of the University of Kentucky used geographic information system tools to calculate the geographic center of the United States population east of the Rocky Mountains. He found that it is near Danville, Kentucky, just south of Louisville. This means that if one needs to ship heavy, expensive products to major consumer markets, there is no better way to minimize transportation costs than to locate your plant in central Kentucky. Two major north-south interstates, I-65 and I-75, pass through this area and connect the traditional auto-production heartland of Michigan, Ohio, and Indiana to the emerging areas of Kentucky, Tennessee, and Alabama. Indeed, half of all manufacturing jobs created in Kentucky during the past decade were in a handful of counties in the center of the state.

¹ See www.census.gov/epcd/naics02/def/NDEF56.HTM#N56.

Figure 5
Manufacturing’s Share of Total Jobs, the Louisville MSA vs. the U.S.



NOTE: Manufacturing industries are classified on the old SIC basis. Louisville MSA refers to the 13-county definition. Jobs include both labor and proprietors.

SOURCE: U.S. Bureau of Economic Analysis.

We previously noted here the decreasing reliance on manufacturing employment in the Louisville MSA, commensurate with a similar decline nationally. Figure 5 shows the declining share of manufacturing jobs over the last one-third of the century. Manufacturing’s share of all jobs in the Louisville MSA fell from 29 to 13 percent, while the share nationally fell from 23 to 12 percent. This longer time series is available only on an SIC basis and only through 2000; nevertheless, the convergence of Louisville to the national average is evident in the trend for manufacturing, at least at this aggregate level. This observation and the concurrence of growth patterns for total jobs and total payrolls led us to the investigation of jobs by industry.

While in general the same sectors grew (shrank) in Louisville as in the United States,

we do not find a movement toward the U.S. distribution of jobs across industries. Of the 26 industries examined, 11 moved closer to the national share and 15 moved away from the national share. Of course, these share calculations are unweighted, so that industries with relatively few employees are counted the same as those with many employees.

We next calculated location quotients for the 26 local industries, for both 1990 and 2004. The standard deviation of the location quotients rose from 0.21 in 1990 to 0.31 in 2004. Thus, the descriptive evidence suggests that the industrial structure of the Louisville MSA has diverged statistically from that of the nation. Given that the aggregate measures of job and payroll growth in the MSA track the national paths so closely, this suggests that although the industrial structure of

the MSA changed, the impacts on overall employment and payrolls tended to cancel each other out. That is, the gains in jobs and payrolls for the MSA relative to those for the nation in sectors such as transportation equipment manufacturing, wholesale trade, and entertainment were offset by the decreasing competitiveness of sectors such as information, professional and business services, retail trade, other educational and health services, and federal and state governments.

MEASUREMENT ERROR: JOBS AND UNEMPLOYMENT

Finally, we examine the job-data revisions that occurred during and after the 2001 recession, to learn more about the false signals that often occur in regional economies during turning point. We also look at local unemployment rates published at the time of the previous decennial census and see how they had exaggerated the degree of tightness in the local labor market.

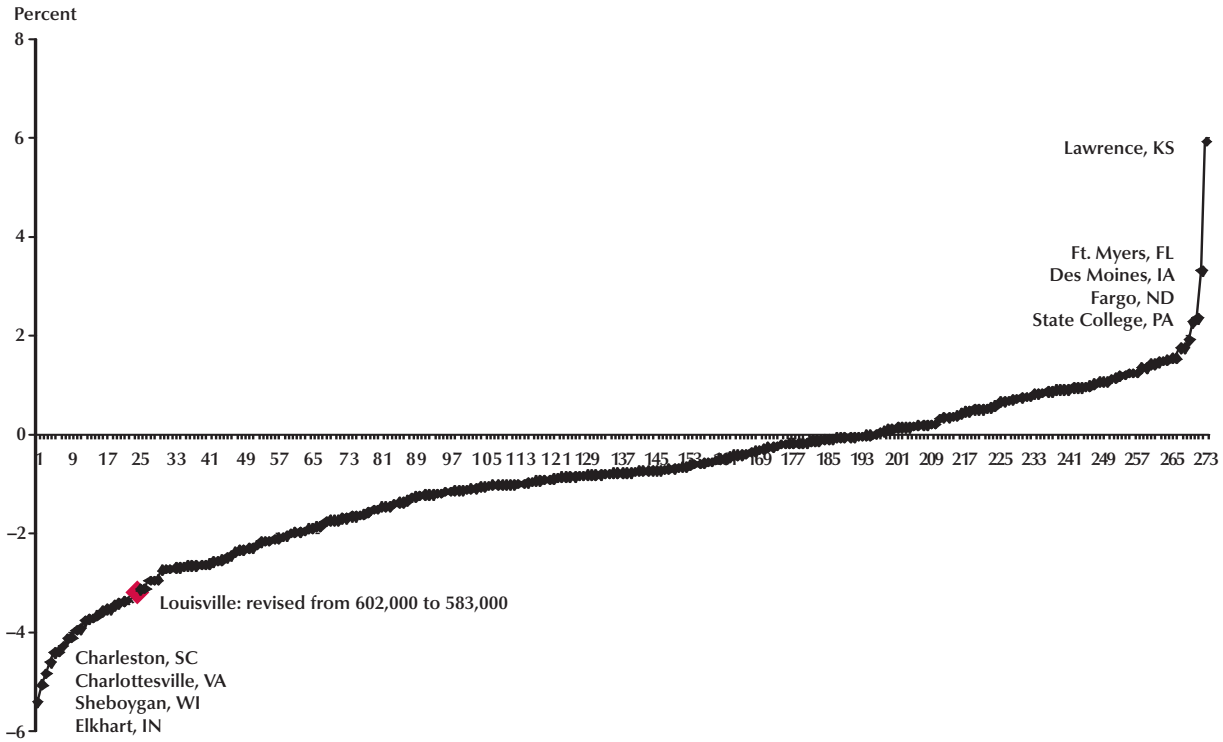
The previous recession has been officially dated to begin in March 2001 and to end in November 2001. This is roughly contemporaneous with the pattern of growth in the national payroll series for nonagricultural wage and salary jobs, as generated by the Current Employment Statistics program of the BLS (2004). Payroll job growth peaked in March 2001 at 132.5 million (seasonally adjusted). Payroll job growth troughed in February of 2002 at 130.4 million. These data, because they are based on such a large sample of establishments from all over the country, are not subject to great revision when the BLS benchmarks to the unemployment insurance data (administered at the state level). The BLS reports that the average benchmark revision for total nonfarm employment over the past 10 years was just 0.3 percent (BLS, 2004). However, the revisions can be great at the local level, where monthly survey sample sizes are smaller, and particularly large at turning points. The signals during a recession can be very noisy, and unfortunately this was true for the Louisville MSA in 2001. To highlight this, we have organized data for the third quarter of 2001 and compared the preliminary BLS estimates with the final benchmarked estimates.

In late 2001, the BLS published its initial estimates for the July to September quarter, showing an average of 602,000 total nonagricultural wage and salary jobs in the seven-county Louisville MSA. This implied that, in the heart of the recession, the economy was still creating jobs—a total of 8,000 more than in the third quarter of 2000. The BLS ultimately revised the job estimate for that quarter to be 582,000, representing a net loss of 12,000 jobs from the prior year. The “interbenchmark” revisions of monthly employment, covering the period April 2001–February 2002, were released by the BLS in February 2003. By that time, the recession was over and the recovery phase was a year old. Yet, throughout the recession, local media used the BLS data to report that the Louisville MSA continued to add jobs, confusing the business community and government leaders who were seeing clear signs of a downturn in their enterprises.

Unfortunately, early job estimates for the Louisville MSA were among the noisiest in the nation. Revisions of job estimates for all 273 MSAs are shown in percentage terms in Figure 6. At –3.2 percent, Louisville’s downward revisions were the twenty-fourth greatest among the MSAs. The revisions ranged from –5.4 percent (Elkhart, Indiana) to 5.9 percent (Lawrence, Kansas). It is clear, however, that most (197) MSAs saw a downward revision. The median revision among the metros was –0.8 percent, and the average revision was –0.9 percent.

Revisions varied widely by industry. Table 2 shows both the mean and median revisions for finance, insurance, and real estate (FIRE) and government were positive across the 273 MSAs. As in previous recessions, the construction industry was subject to the highest revision among MSAs (Coomes, 1992). Given the strong growth in single-family housing during this period, we presume the downward revision was due to an overestimate of nonresidential construction growth. The wholesale and retail trade sector, particularly retail trade, is very difficult to track during turning points in the economy. There are many small establishments, but they account for a large portion of total employment in the economy. The BLS surveys a very small fraction of

Figure 6
Revisions to Job Estimates for All 273 U.S. MSAs, 2001:Q3

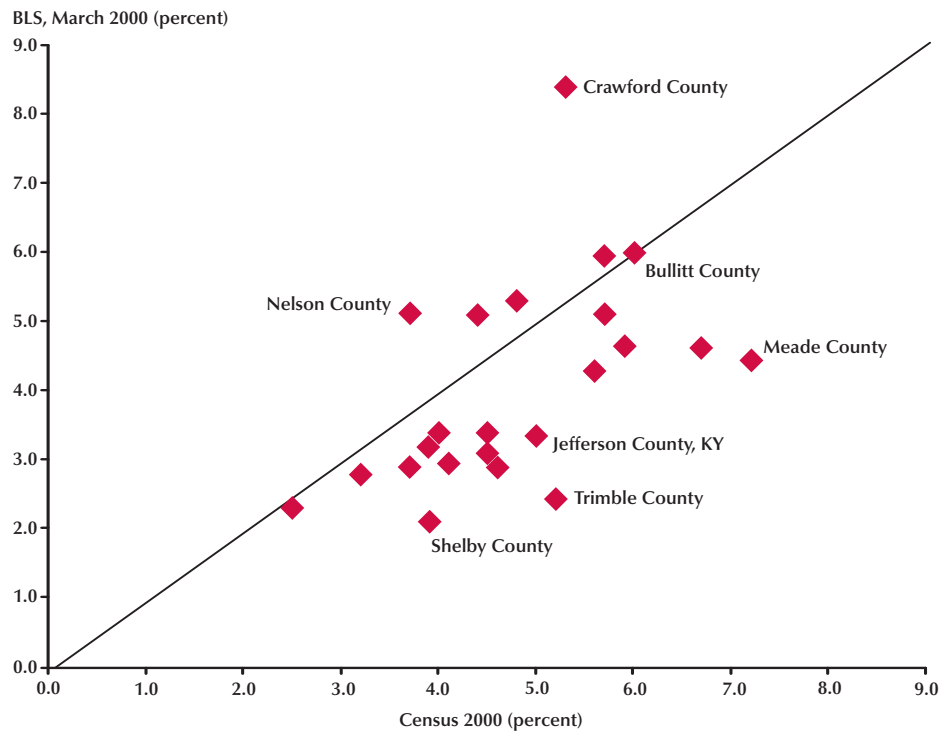


SOURCE: BLS.

Table 2
Revisions to Job Estimates, 2001:Q3

	Louisville MSA (percent)	273 MSAs	
		Mean (percent)	Median (percent)
Construction and mining	-1.02	-1.85	-1.92
Manufacturing	-0.20	-0.95	-1.27
Transportation, communications, and utilities	-0.99	-0.44	-0.16
Wholesale and retail trade	-6.98	-1.40	-1.50
Finance, insurance, and real estate	-4.34	0.84	0.41
Services	-3.05	-0.74	-0.72
Government	-1.09	0.31	0.21
Total nonagricultural	-3.19	-0.85	-0.78

SOURCE: Raw data are from the BLS, SIC basis, pre-2003 MSA definitions. Calculations are by the authors.

Figure 7**Unemployment Rate Estimates: Louisville Economic Area, BLS vs. Census 2000**

NOTE: For the total 23-county area, BLS (3.6%) vs. Census (4.8%).

retail establishments and uses the reported employment levels to infer employment for the entire industry. Retail has been undergoing great technology-induced structural change, and hence correcting for sample bias is difficult. Only during the annual benchmarking process, when the census counts of all establishments and employees are compared with survey-based estimates, does one reveal the extent of the bias. We suspect that during the previous downturn, firms accelerated their substitution of labor with information technology equipment and systems. Moreover, less-flexible firms went out of business and were replaced by more innovative and flexible firms. The former were represented in the Current Employment Statistics survey, the latter were not. If so, that would explain the upward bias in retail employment estimates during the recession.

For Louisville, the initial employment estimates were too high for every industry. The greatest error was in the wholesale and retail trade sector, consistent with the national pattern, though much larger. The large revision in the service industry is presumably due to the same factor as retail trade—the industry is characterized by many small establishments that collectively support 30 percent of all jobs. We do not have insights into the source of the large error in the estimate for jobs in Louisville’s FIRE sector. In summary, when looking for signs of recessions and upturns, analysts need to be very careful when referring to initial job estimates for MSAs.

We turn now briefly to a discussion of measurement error for local unemployment estimates. Published unemployment rates for MSAs and counties are treated with more suspicion than the current job estimates just discussed, but newspa-

pers continue to highlight local unemployment data. Economic development leaders and elected officials continue to cite these statistics as if they accurately reflect local labor market conditions. Perhaps this is because there are so few opportunities to compare the BLS-produced estimates to the results of a large survey of households. The decennial census presents such an opportunity. During the U.S. Census 2000, conducted in the spring of that year, one in six households was asked to fill out the long-form questionnaire that probes for socioeconomic details. The Census questionnaire has a script that conforms closely to the employment and unemployment concepts used by the BLS.

At the time, there was great concern locally about an emerging labor market shortage and how that would strangle the steady growth the region had been witnessing for the prior eight years. The BLS estimated that there were only 18,200 unemployed persons in the Louisville MSA during the spring of 2000, reflecting an unemployment rate of 3.2 percent. When the Census results were released late the next year, we learned that in fact there were 24,400 unemployed persons in that period, reflecting an unemployment rate of 4.6 percent. The BLS had underestimated the number of unemployed persons by 6,000 (and overestimated the number of employed persons by 42,000). In Jefferson County, by far the most populous county in the region, the BLS had estimated the unemployment rate to be 3.4 percent for March 2000, whereas the Census estimate for the same period was 5.0 percent. This represents a difference of 5,000 people looking for work. Figure 7 shows the measurement error for all the counties in the Louisville economic area, as defined at the time by the U.S. Bureau of Economic Analysis. The larger economic area is a better geographic scope for the regional labor market than the (former) 7-county MSA (Coomes et al., 2003). According to the Census, there were 7,200 more unemployed persons in the region than had been estimated by the BLS. This implies that there was actually plenty of labor capacity to support economic growth locally, rather than the labor shortage widely perceived at the time.

CONCLUSION

Over the past 15 years, the Louisville MSA economy has experienced a growth path similar to that of the United States as a whole. At the aggregate level, the data on employment, payrolls, population, and housing starts for the MSA show similar economic trends and fluctuations as those for the nation. However, despite the evident convergence at the aggregate level, an examination of detailed industrial developments suggests increasing divergence from the national economy. This is indicated by the increasing standard deviation of Louisville MSA location quotients, using data on jobs in 26 industries, over the past decade. Finally, local economic data are subject to larger revisions. Although Louisville's job growth during the recent recovery was not as strong as national growth, it is possible that future data revisions will narrow the measured difference.

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Appendix Table A1
Nonagricultural Wage and Salary Jobs, by Available NAICS Industry Detail, 1990-2004

	Growth in jobs (percent)		Share of total jobs, 1990 (percent)		Share of total jobs, 2004 (percent)		Louisville location quotients	
	Louisville MSA	U.S.	Louisville MSA	U.S.	Louisville MSA	U.S.	1990	2004
Total nonfarm	17.0	20.1	100.0	100.0	100.0	100.0		
Specialty trade contractors	43.2	45.8	3.0	2.8	3.7	3.4	1.09	1.10
Other construction and mining	21.6	4.5	1.9	2.7	2.0	2.4	0.69	0.83
Manufacturing of transportation equipment	58.9	-17.3	2.1	1.9	2.8	1.3	1.07	2.12
Manufacturing of other durable goods	-18.9	-16.8	7.9	7.9	5.5	5.4	1.01	1.01
Manufacturing of nondurable goods	-19.0	-22.3	7.1	6.4	4.9	4.1	1.12	1.20
Wholesale trade	16.5	7.3	5.0	4.8	4.9	4.3	1.03	1.15
Food and beverage stores	-9.6	1.7	2.4	2.5	1.9	2.1	0.96	0.88
General merchandise stores	23.9	13.7	2.1	2.3	2.3	2.2	0.93	1.04
Other retail trade	-5.1	18.5	8.4	7.2	6.8	7.1	1.16	0.95
Transportation and utilities	29.5	14.3	5.6	3.9	6.2	3.7	1.45	1.68
Information	1.9	16.7	2.1	2.5	1.8	2.4	0.84	0.75
Finance and insurance	17.5	19.8	5.3	4.5	5.3	4.5	1.16	1.16
Real estate and rental and leasing	57.1	27.6	1.0	1.5	1.3	1.6	0.64	0.81
Professional, scientific, and technical services	37.9	48.4	3.4	4.2	4.0	5.1	0.82	0.78
Management of companies and enterprises	6.1	3.0	1.3	1.5	1.2	1.3	0.85	0.89
Administration and support, waste management and remediation services	58.9	71.6	4.3	4.2	5.8	6.0	1.01	0.96
Ambulatory health care services	82.5	74.1	2.5	2.6	3.8	3.8	0.95	1.02
Other educational and health services	28.5	47.5	7.8	7.4	8.6	9.1	1.05	0.94
Arts, entertainment, and recreation	150.0	61.9	0.7	1.0	1.6	1.4	0.72	1.14
Food services and drinking places	13.8	35.3	7.4	6.0	7.2	6.7	1.24	1.07
Other accommodation and food services	22.0	11.1	0.8	1.5	0.8	1.4	0.54	0.61
Other services	18.5	27.5	4.8	3.9	4.9	4.1	1.24	1.19
Federal government	-28.9	-14.6	2.5	2.9	1.5	2.1	0.86	0.73
State government	6.1	15.8	3.5	3.9	3.2	3.8	0.89	0.84
Local government educational services	36.9	31.5	4.0	5.4	4.6	5.9	0.74	0.79
Other local government	24.6	22.6	3.3	4.6	3.5	4.7	0.71	0.74

SOURCE: BLS, using the NAICS industrial classification system and new 13-county Louisville MSA definition.