

**A BRIEFING PAPER
MANUFACTURING LOCATIONS IN OHIO:
SHIFTS IN EMPLOYMENT AND
AVERAGE EARNINGS AMONG CENTRAL,
SUBURBAN, AND RURAL COUNTIES**

Prepared for:
ECONOMIC DEVELOPMENT ADMINISTRATION

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INTRODUCTION

Over the past two decades, there is some evidence suggesting that manufacturing jobs have moved away from central counties and into suburban and rural counties.¹ In addition, there is an assumption that many of these jobs now pay lower average earnings than were formerly paid in central counties.

Outward migration reduces tax revenues to urban areas and redistributes it to suburban and rural areas. Reduced revenues hurt central counties, which are typically plagued by aging infrastructure and increasing concentration of low-income households. In addition to the problems associated with a shifting tax base, this outward movement may cause a shortage of both entry level and incumbent workers that manufacturing employers require. Until the recent economic downturn, inner city minorities were seen by many as the last untapped resource for filling manufacturing job vacancies created by an aging workforce.² Commuting to a plant in a far-out suburban or rural county is very difficult, if not impossible, for many urban residents.

This briefing paper examines the geographic shift in manufacturing jobs, and investigates average earnings disparity between central counties and suburban or rural counties.

¹Parker, E. and Rogers, J. (1996). *The Wisconsin Regional Training Partnership: Lessons for national policy*. Institute of Industrial Relations, University of California, Berkeley.

²Siekman, P. (2000). Tapping the last big labor pool. *Fortune*, September 4, 2000, 326[C] – 326[V].

DATA AND METHODOLOGY

This report examines changes in employment levels and average earnings for each durable and nondurable manufacturing industry within Ohio's central, suburban, and rural counties. It focuses on the time period from the first quarter of 1989 to the first quarter of 2000. All 1989 average earnings have been inflated to 2000 levels. Information presented in Tables 1 through 12 is derived from ES202 data estimates. Employment statistics related to specific companies found in the text is taken from the *Ohio Industrial Directory*, published by Harris InfoSource.

ES202 data are based on quarterly unemployment compensation reports collected by each state under federal mandate. Nearly all employers with paid employees are required to file unemployment reports to their respective states. The data includes quarterly information on each company's name, address, zip code, county, industrial classification, employment, and earnings. Estimates for employment levels, average earnings, and number of establishments by zip code are developed from this data.

Confidentiality restrictions limit data presentation. If an industry has less than three companies within the geographic area of interest, or a single company employs 80 percent or more of personnel within an industry in the geographic area of interest, then the data must be suppressed to protect the company's identity. N/a designates suppressed entries in the report tables.

For this analysis, industries are aggregated into two groups: nondurable manufacturers and durable manufacturers (see Tables A-1 and A-2 in Appendix A). In addition, three geographic economic regions are considered: central, suburban, and rural counties. Central counties are those in which the central city of a metropolitan area is located. Suburban counties are all counties associated with a metropolitan area except the central county. Rural counties are those that are not considered part of a metropolitan area. A designation of each of Ohio's counties as central, suburban, or rural is included in Table A-3, Appendix A.

ANALYSIS

DURABLE GOODS: EMPLOYMENT

Across the State of Ohio, durable goods manufacturing lost employment during the study period. A net reduction of just over 25,000 jobs, or 3.4 percent of the total, was seen. Job losses in central counties were only partially offset by gains in suburban and rural counties.

Durable goods saw a significant shifting of employment from central to suburban and rural counties as evidenced in Tables 1 through 3. Central counties lost almost 73,000 jobs, or 17 percent of their total workforce. By contrast, suburban counties gained 24,042 jobs (13.6 percent) and rural counties saw an employment increase of 23,383 jobs, or 15.2 percent.

The transportation equipment industry (SIC 37) dominates employment shifting within durable goods. Across the state, a net loss of 1,562 jobs (1.1 percent) was experienced. Central counties saw an employment reduction of 21,766 jobs, which represents 30 percent of the entire loss across all durable manufacturers. During the same time period, suburban counties gained 6,254 jobs, or 26 percent of the total, across all durable manufacturers. Rural counties saw an employment gain of 13,951 jobs in the transportation industry, or 60 percent of the total within their geographic area. Honda of America played a key role in rural job growth by creating several thousand new jobs. Citing specific reasons for transportation-related employment reduction in central counties is speculative at best. However, they may range from the use of robotics on production lines to the high cost of retooling aging plants. Many of these older plants use multi-story configurations that do not easily lend themselves to modern production systems.

Primary metal industries (SIC 33), which include steel-related processing, saw employment reductions across all geographic areas. Hardest hit were central counties where a 22.7 percent employment loss, or 12,903 jobs, was recorded. Suburban and rural counties saw a combined total reduction of 2,340 jobs. Problems within the steel industry are well documented in the literature and by the media.

Other industries that saw significant job reductions in central counties include fabricated metal products (SIC 34), industrial machinery and equipment (SIC 35), and electric and electronic equipment (SIC 36). These three industries had a combined loss of 36,061 jobs. These same industries saw a combined employment gain of 9,495 in suburban counties and a net gain of 1,443 jobs in rural counties. All three industries are typical of those that employ highly skilled tradesmen, many of whom are close to retirement. Studies³ have shown that young people, including those in urban areas, are reluctant to enter these jobs because they are viewed as dirty and dead-ended.

In contrast to other durable manufacturing in the state, lumber and wood products (SIC 24) realized a significant net employment increase of almost 10,000 jobs, or 46.3 percent. Minor losses were seen in central counties while suburban and rural counties recorded a combined employment gain of over 11,000 workers, or 75 percent, in suburban counties and 78 percent in rural counties. Kraftmaid Cabinetry, located in suburban Geauga County, is one of the main contributors to the employment increase by adding over 1,500 employees.

Furniture and fixtures (SIC 25) experienced a net increase of 2,900 jobs (18.5 percent) across the state. Job growth was seen exclusively in suburban counties where 4,186 workers were added, representing an increase of 113 percent. Sauder Woodworking, in Fulton County, is responsible for almost half the net increase. Rural counties recorded a very small employment decline in the industry, and central counties lost 1,275 employees or 15.7 percent of the workforce.

³ Ibid., 1.

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Table 1. Durable Manufacturing: Employment in Central Counties

SIC	Description	1989:1Q	2000:1Q	Change	% Change
24	Lumber & Wood	7,033	5,875	-1,158	-16.5%
25	Furniture & Fixtures	8,110	6,835	-1,275	-15.7%
32	Stone, Clay & Glass	17,390	16,667	-723	-4.2%
33	Primary Metals	56,830	43,927	-12,903	-22.7%
34	Fabricated Metals	84,811	72,946	-11,865	-14.0%
35	Industrial Machinery	97,724	83,026	-14,698	-15.0%
36	Electric & Electronic Equipment	40,644	31,145	-9,498	-23.4%
37	Transportation Equipment	82,991	61,225	-21,766	-26.2%
38	Instruments	16,120	17,020	899	5.6%
39	Miscellaneous Manufacturing	9,354	9,427	73	0.8%
	Total	421,008	348,094	-72,914	-17.3%

Table 2. Durable Manufacturing: Employment in Suburban Counties

SIC	Description	1989:1Q	2000:1Q	Change	% Change
24	Lumber & Wood	3,548	6,196	2,648	74.6%
25	Furniture & Fixtures	3,710	7,897	4,186	112.8%
32	Stone, Clay & Glass	14,631	14,357	-274	-1.9%
33	Primary Metals	28,299	26,961	-1,338	-4.7%
34	Fabricated Metals	29,009	31,551	2,542	8.8%
35	Industrial Machinery	38,848	42,239	3,391	8.7%
36	Electric & Electronic Equipment	14,950	18,512	3,562	23.8%
37	Transportation Equipment	35,222	41,476	6,254	17.8%
38	Instruments	5,894	7,626	1,732	29.4%
39	Miscellaneous Manufacturing	2,420	3,758	1,338	55.3%
	Total	176,532	200,574	24,042	13.6%

Table 3. Durable Manufacturing: Employment in Rural Counties

SIC	Description	1989:1Q	2000:1Q	Change	% Change
24	Lumber & Wood	10,756	19,154	8,398	78.1%
25	Furniture & Fixtures	3,834	3,821	-13	-0.3%
32	Stone, Clay & Glass	12,545	12,833	288	2.3%
33	Primary Metals	17,477	16,475	-1,002	-5.7%
34	Fabricated Metals	22,917	27,356	4,439	19.4%
35	Industrial Machinery	30,589	29,202	-1,387	-4.5%
36	Electric & Electronic Equipment	23,941	22,332	-1,609	-6.7%
37	Transportation Equipment	24,719	38,669	13,951	56.4%
38	Instruments	4,059	3,072	-987	-24.3%
39	Miscellaneous Manufacturing	2,941	4,247	1,306	44.4%
	Total	153,778	177,161	23,383	15.2%

NONDURABLE GOODS: EMPLOYMENT

Ohio experienced a small reduction in nondurable manufacturing employment during the study period. A net reduction of just over 9,000 jobs, or 2.5 percent, was recorded. Employment gains in suburban and rural counties offset part of the losses experienced in central counties. Changes in industry-specific employment levels in nondurables, as seen in Tables 4 through 6, are not as significant as those in durables.

Overall, nondurable manufacturing saw an employment reduction of 18,022 workers, or 8.3 percent, in central counties. Suburban and rural counties saw employment growth of 5,803 and 3,065 jobs respectively. These represent growth rates of 9.2 percent and 3.8 percent.

The most significant employment shift within central counties occurred in petroleum and coal products (SIC 29). Here, an employment reduction of 4,053 workers, or 50.5 percent, is recorded. One reason for the decline is the move by BP America to Chicago after their merger with Amoco. The move included all corporate and research functions. Employment gains by this industry in suburban and rural counties were minimal.

The paper and allied products industry (SIC 26) also saw a significant employment shift. Central counties recorded a 22 percent decrease in employment, or 4,782 workers. Three companies account for 66 percent of the employment reduction. Two paper mills in southwestern Ohio had a combined employment reduction in excess of 1,700 workers. A third paper products company located in southwest Ohio transitioned itself into an organization that produces printing machines. Its workforce of over 1,000 persons now falls under a different industry classification, industrial machinery (SIC 35). By contrast, suburban county employment increased by 2,264 people, or 42 percent. In this case, incremental growth by all companies within the industry is responsible for employment gains. Rural counties experienced a minimal change in paper product employment.

Across the State of Ohio, the rubber and plastics industry (SIC 30) experienced a net increase of over 3,200 employees, or 3.5 percent. As seen in other industries, losses in central counties were

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offset by gains in suburban and rural counties. A loss of 3,324 employees was recorded across all central counties, with Northeast Ohio being hit hardest with an estimated employment reduction of 4,600 jobs specifically in the rubber industry. Southwestern Ohio saw the loss of over 3,000 plastic-related jobs primarily associated with a major automaker and its subsidiaries. Suburban and rural counties recorded a combined employment gain of 6,582 persons. Gains of 14 percent and 10 percent in rural and suburban counties respectively are evenly distributed across all industries within SIC 30.

The one industry in which central counties saw an employment increase is chemicals and allied products (SIC 28). Here, a gain of over 3,600 employees or eight percent was realized. One of the biggest contributors to the employment rise was Cincinnati-based Procter & Gamble, which saw a net gain of 3,000 employees. Only minimal employment changes were seen in suburban and rural counties.

Table 4. Nondurable Manufacturing: Employment in Central Counties

SIC	Description	1989:1Q	2000:1Q	Change	% Change
20	Food & Kindred Products	36,374	33,789	-2,585	-7.1%
21	Tobacco Products	N/a	N/a	N/a	N/a
22	Textile Mill Products	2,382	1,677	-705	-29.6%
23	Apparel & Other Textile Products	8,696	5,845	-2,851	-32.8%
26	Paper & Allied Products	21,924	17,142	-4,782	-21.8%
27	Printing & Publishing	53,355	51,081	-2,274	-4.3%
28	Chemicals & Allied Products	45,274	48,941	3,667	8.1%
29	Petroleum & Coal Products	8,017	3,965	-4,053	-50.5%
30	Rubber & Plastic Products	39,179	35,856	-3,324	-8.5%
31	Leather Products	N/a	N/a	N/a	N/a
	Total	216,543	198,521	-18,022	-8.3%

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Table 5. Nondurable Manufacturing: Employment in Suburban Counties

SIC	Description	1989:1Q	2000:1Q	Change	% Change
20	Food & Kindred Products	7,229	6,983	-246	-3.4%
21	Tobacco Products	N/a	N/a	N/a	N/a
22	Textile Mill Products	601	451	-150	-25%
23	Apparel & Other Textile Products	1,631	1,389	-242	-14.8%
26	Paper & Allied Products	5,381	7,645	2,264	42.1%
27	Printing & Publishing	8,454	10,707	2,253	26.6%
28	Chemicals & Allied Products	10,037	9,731	-306	-3.0%
29	Petroleum & Coal Products	N/a	N/a	N/a	N/a
30	Rubber & Plastic Products	27,891	30,712	2,821	10.1%
31	Leather Products	1,394	551	-843	-60.5%
	Total	63,111	68,914	5,803	9.2%

Table 6. Nondurable Manufacturing: Employment in Rural Counties

SIC	Description	1989:1Q	2000:1Q	Change	% Change
20	Food & Kindred Products	17,644	18,104	460	2.6%
21	Tobacco Products	N/a	N/a	N/a	N/a
22	Textile Mill Products	1,623	2,020	397	24.5%
23	Apparel & Other Textile Products	5,183	4,713	-470	-9.1%
26	Paper & Allied Products	9,410	9,261	-150	-1.6%
27	Printing & Publishing	10,142	10,166	24	0.2%
28	Chemicals & Allied Products	8,675	7,905	-769	-8.9%
29	Petroleum & Coal Products	N/a	N/a	N/a	N/a
30	Rubber & Plastic Products	27,302	31,063	3,761	13.8%
31	Leather Products	847	571	-276	-32.6%
	Total	81,353	84,418	3,065	3.8%

DURABLE GOODS: AVERAGE EARNINGS

Average earnings in central counties (see Tables 7 through 9) are significantly higher than those in either suburban or rural counties. In 2000, workers at durable goods businesses in central counties earned an average of 16 percent more than their counterparts in suburban counties and 36 percent higher than those workers in rural counties. The average earnings gap between central and suburban counties in 1989 was \$2,763. This gap increased to \$7,372 in 2000. A far wider gap exists between central and rural counties. In 1989, the earnings gap in favor of central counties was \$8,319 increasing to \$14,011 in 2000.

There are two possible reasons that might help explain the earnings disparity. First is the concentration of capital-intensive metal processing and auto assembly plants in central counties. Most of these plants are unionized and traditionally pay relatively high hourly wages. However, there are exceptions: Honda of America in rural Logan and Union counties and WCI Steel in suburban Trumbull county. Second is the lower cost of living in rural counties.

In central counties, three industries dominate average earnings increases over time: electric and electronic equipment (SIC 36), transportation equipment (SIC 37), and instruments and related products (SIC 38). Transportation equipment experienced the biggest gain over the study period with an average earnings increase of \$17,828, or 33 percent. By contrast, the transportation sector showed only a 4.5 percent average earnings increase in suburban counties. The earnings gap between central and suburban counties for this industry was \$8,745 in 2000. Electric equipment was second in average earnings gains at 30 percent, and instruments was third at 24 percent.

Suburban counties recorded a 31.5 percent average earnings increase, or \$11,484, in the instrumentation industry (SIC 38). This industry has consistently paid more in suburban counties than central counties. In 1989, the gap was \$985, increasing to \$3,885 in 2000. Rural counties exhibited no significant average earnings increases in durable goods.

Table 7. Durable Manufacturing: Average Earnings in Central Counties

SIC	Description	1989:1Q	2000:1Q	Change	% Change
24	Lumber & Wood	\$29,598	\$30,977	\$1,379	4.7%
25	Furniture & Fixtures	\$31,906	\$32,752	\$847	2.7%
32	Stone, Clay & Glass	\$50,380	\$53,847	\$3,467	6.9%
33	Primary Metals	\$49,403	\$53,840	\$4,437	9.0%
34	Fabricated Metals	\$43,189	\$47,619	\$4,429	10.3%
35	Industrial Machinery	\$44,079	\$47,455	\$3,375	7.7%
36	Electric & Electronic Equipment	\$40,218	\$52,287	\$12,069	30.0%
37	Transportation Equipment	\$53,872	\$71,701	\$17,829	33.1%
38	Instruments	\$35,443	\$44,027	\$8,584	24.2%
39	Miscellaneous Manufacturing	\$31,908	\$33,735	\$1,826	5.7%
	Total	\$45,359	\$52,683	\$7,324	16.1%

Table 8. Durable Manufacturing: Average Earnings in Suburban Counties⁴

SIC	Description	1989:1Q	2000:1Q	Change	% Change
24	Lumber & Wood	\$28,463	\$27,789	-\$674	-2.4%
25	Furniture & Fixtures	\$31,380	\$33,813	\$2,433	7.8%
32	Stone, Clay & Glass	\$40,744	\$41,244	\$500	1.2%
33	Primary Metals	\$44,791	\$52,033	\$7,242	16.2%
34	Fabricated Metals	\$36,796	\$34,874	-\$1,923	-5.2%
35	Industrial Machinery	\$37,257	\$40,648	\$3,390	9.1%
36	Electric & Electronic Equipment	\$34,790	\$40,079	\$5,289	15.2%
37	Transportation Equipment	\$60,202	\$62,956	\$2,754	4.5%
38	Instruments	\$36,428	\$47,912	\$11,484	31.5%
39	Miscellaneous Manufacturing	\$28,277	\$31,481	\$3,204	11.3%
	Total	\$42,596	\$45,311	\$2,715	6.4%

⁴1989:2Q earnings are listed for SIC 33 and SIC 37 due to reporting errors in 1989:1Q.

Table 9. Durable Manufacturing: Average Earnings in Rural Counties

SIC	Description	1989:1Q	2000:1Q	Change	% Change
24	Lumber & Wood	\$23,814	\$23,778	-\$36	-0.2%
25	Furniture & Fixtures	\$28,822	\$27,310	-\$1,512	-5.2%
32	Stone, Clay & Glass	\$34,251	\$35,961	\$1,710	5.0%
33	Primary Metals	\$45,873	\$48,939	\$3,066	6.7%
34	Fabricated Metals	\$33,418	\$35,368	\$1,949	5.8%
35	Industrial Machinery	\$39,729	\$41,264	\$1,535	3.9%
36	Electric & Electronic Equipment	\$38,687	\$42,654	\$3,967	10.3%
37	Transportation Equipment	\$39,081	\$43,063	\$3,982	10.2%
38	Instruments	\$34,208	\$39,329	\$5,121	15.0%
39	Miscellaneous Manufacturing	\$29,115	\$26,507	-\$2,609	-9.0%
	Total	\$37,040	\$38,672	\$1,633	4.4%

NONDURABLE GOODS: AVERAGE EARNINGS

Central counties consistently paid higher average earnings in nondurable goods industries than either suburban or rural counties (see Tables 10 through 12). In 1989, central counties paid \$5,905 or 17 percent more in average earnings than suburban counties, increasing to \$13,832 or 36 percent in 2000. The gap is even more significant between central and rural counties. In the first quarter 2000, workers in nondurable goods firms in central counties earned 47 percent more, on average, than similar workers in rural counties. Possible reasons for the disparity are similar to those given in the durable goods discussion. Petrochemical plants (SICs 28 and 29) are predominantly located in central counties. For example, 67 percent of all chemical establishments are in central counties. Many of these plants use union labor, which some believe pay relatively higher hourly wages. In addition, northeast Ohio is home to the corporate headquarters of a large number of chemical-based companies with their associated high salary structures. These two factors may help drive up average earnings in central counties. As mentioned previously, rural counties have a lower cost of living that tends to drive down average earnings.

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Petroleum and coal products (SIC 29) is the one nondurable industry that experienced significant wage increases in all three geographic units. In central counties, average earnings rose by \$26,409, or 48 percent. Suburban counties saw an increase of \$16,428, or 51 percent, and in rural counties, average earnings increased by 37 percent (\$13,383).

In central counties, the only other nondurable industry to record a significant wage increase is chemicals and allied products (SIC 28). Here, average earnings rose by 87 percent or \$35,226. Leather products (SIC 31) showed significant average earnings increases in suburban and rural counties. In the former, average earnings increased by 39 percent, or \$8,757. Rural average earnings increased by \$4,565, or 29 percent. All other nondurable industries saw nominal annual wage gains (losses) over the 1989 to 2000 time period.

Table 10. Nondurable Manufacturing: Average Earnings in Central Counties

SIC	Description	1989:1Q	2000:1Q	Change	% Change
20	Food & Kindred Products	\$38,979	\$43,092	\$4,113	10.6%
21	Tobacco Products	N/a	N/a	N/a	N/a
22	Textile Mill Products	\$32,495	\$35,142	\$2,647	8.1%
23	Apparel & Other Textile Products	\$22,273	\$23,642	\$1,369	6.1%
26	Paper & Allied Products	\$44,495	\$47,947	\$3,452	7.8%
27	Printing & Publishing	\$36,808	\$41,428	\$4,619	12.5%
28	Chemicals & Allied Products	\$40,375	\$75,601	\$35,226	87.2%
29	Petroleum & Coal Products	\$55,516	\$81,925	\$26,409	47.6%
30	Rubber & Plastic Products	\$45,099	\$45,500	\$401	0.9%
31	Leather Products	\$38,463	\$28,336	-\$10,127	-26.3%
	Total	\$40,269	\$51,650	\$11,382	28.3%

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Table 11. Nondurable Manufacturing: Average Earnings in Suburban Counties

SIC	Description	1989:1Q	2000:1Q	Change	% Change
20	Food & Kindred Products	\$31,086	\$32,871	\$1,785	5.7%
21	Tobacco Products	N/a	N/a	N/a	N/a
22	Textile Mill Products	\$39,730	\$35,978	-\$3,752	-9.4%
23	Apparel & Other Textile Products	\$19,668	\$24,683	\$5,015	25.5%
26	Paper & Allied Products	\$40,634	\$48,342	\$7,708	19.0%
27	Printing & Publishing	\$27,121	\$29,800	\$2,679	9.9%
28	Chemicals & Allied Products	\$53,287	\$61,115	\$7,828	14.7%
29	Petroleum & Coal Products	\$32,436	\$48,864	\$16,428	50.6%
30	Rubber & Plastic Products	\$30,766	\$32,211	\$1,445	4.7%
31	Leather Products	\$22,374	\$31,130	\$8,757	39.1%
	Total	\$34,364	\$37,818	\$3,455	10.1%

Table 12. Nondurable Manufacturing: Average Earnings in Rural Counties

SIC	Description	1989:1Q	2000:1Q	Change	% Change
20	Food & Kindred Products	\$32,218	\$30,650	-\$1,568	-4.9%
21	Tobacco Products	N/a	N/a	N/a	N/a
22	Textile Mill Products	\$31,726	\$34,940	\$3,214	10.1%
23	Apparel & Other Textile Products	\$22,289	\$24,745	\$2,456	11.0%
26	Paper & Allied Products	\$44,878	\$46,021	\$1,144	2.5%
27	Printing & Publishing	\$25,872	\$28,512	\$2,640	10.2%
28	Chemicals & Allied Products	\$46,069	\$54,601	\$8,532	18.5%
29	Petroleum & Coal Products	\$35,893	\$49,277	\$13,383	37.3%
30	Rubber & Plastic Products	\$33,422	\$33,389	-\$32	-0.1%
31	Leather Products	\$15,795	\$20,360	\$4,565	28.9%
	Total	\$33,983	\$35,169	\$1,186	3.5%

CONCLUDING REMARKS

The data clearly supports the evidence regarding manufacturing job movement from central to suburban and rural counties. In Ohio, central counties lost significant employment in both the durable and nondurable manufacturing sectors from 1989 to 2000. During this same time period, suburban and rural counties gained employment in these sectors. However, in both durables and nondurables, central counties experienced greater employment reductions than the combined gains in suburban and rural counties. In durables, central counties lost 73,000 jobs whereas suburban and rural counties recorded a combined employment gain of 47,000. Central counties showed an employment reduction of 18,000 in nondurables compared with a combined increase of 9,000 in suburban and rural counties.

Since this report focuses on industry-wide employment shifts among counties, it is difficult to determine if specific companies moved from a central county to either suburban or rural counties. In fact, tracing the movements of individual businesses over an 11-year period is very difficult for several reasons. First, businesses change their names due to mergers or for marketing purposes. Second, because of economic conditions, businesses frequently transition themselves, sometimes into an entirely different industry. Cleveland headquartered M.A. Hanna, which transformed itself from a provider of coal and iron ore to a compounder and distributor for the plastics and rubber industries and became PolyOne, is a perfect example. Third, parts of a business may be spun-off resulting in a change in the primary SIC. Finally, businesses are bought and sold on a regular basis, sometimes resulting in the closure of a major operation. A study⁵ conducted by Austrian and Wolf attempted to measure inter-county relocations by individual companies in the State of Ohio between 1994 and 1997.

This report also shows that average earnings are higher in central counties than either suburban or rural counties. In fact, higher earnings are seen across the entire time period used in the analysis in both durables and nondurables. Growth rates in earnings are also significantly higher in central counties. Several factors might help contribute to these higher earnings. First, many

⁵Austrian, Z., and Wolf, A. (1998). Ohio Business Establishments Inter-County Relocation Trends During the 1994-1997 Period. Cleveland, Ohio: Levin College of Urban Affairs, Cleveland State University.

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of the very large, integrated manufacturing facilities are located in central counties. Companies have invested heavily in automating sections of these plants leading to higher productivity. Second, corporate headquarters, with their associated high salary structures, are traditionally located in central counties. Finally, rural counties enjoy a lower cost of living. While these factors may be valid, exceptions can always be found. Heavily unionized primary metals and transportation industries have large operations in suburban counties. Examples include Ford Motor Company and USS Kobe Steel in Lorain County and General Motors and WCI Steel in Trumbull County. Therefore, additional research is required to provide an adequate explanation for the average earnings disparity between central counties and other geographic areas within the State of Ohio.

APPENDIX A

Table A-1. Nondurable Manufacturing Industries

SIC Code	Description
20	Food and Kindred Products
21	Tobacco products
22	Textile Mill Products
23	Apparel and Other Textile Products
26	Paper and Allied Products
27	Printing and Publishing
28	Chemical and Allied Products
29	Petroleum and Coal Products
30	Rubber and Plastic Products
31	Leather and Leather Products

Table A-2. Durable Manufacturing Industries

SIC Code	Description
24	Lumber and Wood Products
25	Furniture and Fixtures
32	Stone, Clay and Glass Products
33	Primary Metal Industries
34	Fabricated Metal Products
35	Industrial Machinery and Equipment
36	Electric and Electronic Equipment
37	Transportation Equipment
38	Instruments and Related Products
39	Miscellaneous Manufacturing Industries

Table A-3. Ohio County Designation

Central Counties	Suburban Counties	Rural Counties	Rural Counties
Allen	Ashtabula	Adams	Meigs
Butler	Auglaize	Ashland	Mercer
Cuyahoga	Brown	Athens	Monroe
Franklin	Carroll	Belmont	Morgan
Hamilton	Clark	Champaign	Morrow
Jefferson	Clermont	Clinton	Muskingum
Lucas	Columbiana	Coshocton	Noble
Mahoning	Crawford	Drake	Ottawa
Montgomery	Delaware	Defiance	Paulding
Richland	Fairfield	Erie	Perry
Stark	Fulton	Fayette	Pike
Summit	Geauga	Gallia	Preble
	Green	Guernsey	Putnam
	Lake	Hancock	Ross
	Licking	Hardin	Sandusky
	Lorain	Harrison	Scioto
	Madison	Henry	Seneca
	Medina	Highland	Shelby
	Miami	Hocking	Tuscarawas
	Pickaway	Holmes	Union
	Portage	Huron	Van Wert
	Trumbull	Jackson	Vinton
	Warren	Knox	Washington
	Wood	Lawrence	Wayne
		Logan	Williams
		Marion	Wyandot