A GENERATION OF CHANGE IN WISCONSIN'S ECONOMIC LANDSCAPE

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Over the past 25 years, we have heard about the dispersion of manufacturing jobs to various parts of the U.S. and overseas, the emergence of a service based economy, a "rural Renaissance" in the 1970s, and a farm crisis in the 1980s. All of these refer to the location of economic activity and the performance of various economic sectors. The type of industry and distribution of employment opportunities are issues of central concern to state and local policy makers and citizens of Wisconsin communities.

This paper examines trends in the geographic movement of economic activity in Wisconsin between 1967 and 1987. In particular, it presents data useful in determining whether economic activities are concentrating in metropolitan areas or dispersing to suburban or rural areas. Three sectors (manufacturing, retail and service) are examined. Unlike farming, forestry and mining, these sectors are not generally tied to a specific location.

The trends discussed in this paper deal with the aggregate pattern of movement for the entire sector. The location decisions of individual businesses, or the economic activity within individual communities and counties may not conform to these patterns. The overall trends, however, give policy makers and development practitioners insight into what may be more effective strategies for achieving economic growth.

Literature Review

For many years, researchers used export base theory to explain the spatial distribution of economic activity. This conception suggests that exporting industries attract an inflow of money sufficient to support a diverse array of local economic activities. Historically, manufacturing, agriculture and mining were seen as the primary basic industries. Trade and service industries were generally considered to be tied to the location of these basic activities.

More recently, it has been recognized that other sectors are now performing the same functions that manufacturing, mining and agriculture historically performed. For example, retirees who draw on pensions and transfer payments such as Social Security and Medicare attract significant amounts of money to a community. Tourism, health care, insurance, transportation services, corporate headquarters, R & D spending, and government spending are all means by which communities bring money from outside the community to support local jobs and services. Under certain conditions, retail and other service businesses, often thought of as the quintessential non-basic industries, may also act as magnets for income from outside the community.

The traditional basic-nonbasic conception is no longer adequate to explain the location choices nonbasic firms make. It is less true today that one economic sector drives the location decisions of another. Other forces are involved in the spatial distribution of economic activity. Firms of both types make locational decisions based on their individual needs with minimal acknowledgement of the traditional basic-nonbasic relationship.

Manufacturing, for instance, can be classified as non-routine (innovative or high technology-based) or as routine (low skill or labor intensive). Each group responds to different locational dynamics based on their unique needs [Malecki 1983; Deavers 1991]. Innovative industries may need a highly skilled labor force or access to a university. Routine manufacturers may seek the lowest labor and facility costs.

In the 1960s and 1970s, rural areas were competitive in attracting routine manufacturers to replace the natural resource based (agriculture, forest, fishing, mining) jobs they were losing [Bluestone and Daberkow 1985; Bloomquist 1987; Deavers 1991]. Rural areas lower costs and wage rates were competitive in meeting the needs of this manufacturing group [Blackley 1986].

Technological enhancements, such as in communication, improved rural area competitiveness [Abdallah and Leven 1989].

Routine manufacturing, however, is susceptible to foreign competition [Bloomquist 1988]. During the 1980s many of the manufacturing job losses in rural areas have not been replaced by other manufacturers [Bluestone and Long 1989].

Non-routine (high technology) manufacturing is more closely tied to metropolitan areas because of it's need for a highly educated workforce and specialized support activities [Barkley 1988; Bluestone and Long 1989]. However, even high tech manufacturing has been relocating, but not far from its metro base. Much of the research related to the relocation of non-routine manufacturing has shown that a high percentage of metro area manufacturers have relocated to small metro and adjacent-to-metro counties [Barkley 1988; Bloomquist 1988; Bluestone and Long 1989; Deavers 1991].

A large amount of research has focused on the location of service industries. That service industries hold the greatest growth prospects for urban and rural areas has been well established [Bluestone and Miller 1988; U.S. Department of Labor 1990; Porterfield 1990; Beyers 1991]. However, an interesting line of research related to the location of services suggests that service based industries are at least partially "decoupling" from the manufacturing sector [Beyers, Alvine and Johnson 1985; Kirn 1987; Beyers 1991].

According to neoclassical economic concepts, manufacturing and natural resource based industries have served as the primary export (basic) industries. Service industries were seen as tied to the performance and, in large measure, to the location of basic industries. Thus, if manufacturing moved, services (both business and consumer) would be in tow.

More recent research has shown that service growth is not tied to manufacturing performance [Beyers, Alvine and Johnson 1985; Kirn 1987; ÓhUallacháin 1989], that service industries show clustering tendencies [Noyelle and Stanback 1983; Clark 1985], that service industries themselves generate an amount of manufacturing activity [Silverstein 1985], and that certain service sectors are beginning to demonstrate a locational dynamic unique to themselves [Beyers 1991; ÓhUallacháin 1989].

Service industries seem to be asserting an economic force independent of the traditionally conceived manufacturing-service relationship. At a critical mass within urban centers, the service sector can demonstrate basic tendencies, serving as the nucleus for a cluster of support businesses similar to manufacturing firms of previous decades.

As with manufacturing, there appears to be urban-rural differences in the performance of service employment. Service business in rural areas tend to respond in what might be a traditionally predicted pattern, i.e. the rural service sector is more closely tied to manufacturing and extractive industry performance [Miller and Bluestone 1987; Bluestone and Miller 1988]. The neoclassic location relationship may be more applicable in rural economies even as components of urban service industries decouple from the traditional relationship.

The location of retail activity has also been studied. In the 1970s, the trend was toward the deconcentration of retail trade away from large metro cities, with smaller metro and nonmetro areas gaining [Morill 1982]. Rural retail activity tended to concentrate in regional growth centers [Walzer and Stablein 1981]. More recently, however, the trend in the 1980s has been for retail concentration in larger central places [Henderson and Wallace 1992].

In summary, it appears industry sectors are spatially shifting and decoupling. Traditional export base theory held that non-basic sectors were tied to the performance and location of export industries. Thus, service and retail activity were spatially linked to manufacturing and natural resource industries. Increasingly, however, industry sectors are making location decisions based on considerations internal to the sector and less on the performance and location of other industry sectors.

Method

A common classification method for research related to the location of economic activity uses the Census Bureau's designation of metropolitan areas and groups all other counties as nonmetro-adjacent or nonmetro-nonadjacent. (See for example Barkley 1988; Bluestone and Miller 1988; Bluestone and Long 1989; Parker 1991.) The resulting designation can mask spatial relations between counties. In reality, many adjacent counties are more rural than suburban in character. The adjacency status might erroneously characterize economic movement from metro counties to adjacent counties as "suburbanization." This research modifies this classification method.

The method employed here can be considered a "sensitivity analysis" for the metro-adjacent-nonadjacent method of county classification. Wisconsin's 71 counties (excluding the Menominee Indian Nation) were designated as metropolitan (n=16), suburban (n=17) or rural (n=38). Beginning with the U.S. Census Bureau's identification of metropolitan statistical areas in 1987, the state was divided into metro counties, adjacent-to-metro counties and non-adjacent counties. Economic profiles were created for each county, including data from the manufacturing, service and retail business censuses, personal income, commuting patterns and urban-rural population. Final designation was based on the similarity between county economic profiles and the authors' knowledge of the state. The resulting classification[1] is shown in Figure 1.

So that others may confirm the reasonableness of the authors judgements, the data used to adjust the county classifications is attached in the appendix.

Economic activity data was classified according to their 1987 metro, suburban or rural county designation. This allowed the data to be viewed with a sense of the county status today.

Three general economic sectors were examined over twenty years. Twenty years provides sufficient time for indications of spatial shifts to occur. These years also represent roughly the same point in the national business cycle. While limited to three "snap shots" of activity, the Census data provides relatively detailed and commonly accepted information related to economic activity. Measures of economic activity were taken from the Census of Manufacturing, Retail Trade and Service Industries for 1967, 1977 and 1987.

Economic data were compiled for manufacturing, retail and service industries. Eight measures of manufacturing activity were selected: total establishments, total employment, payroll, number of production workers, wages, value added, value of shipments and new capital expenditures. These measures provide a relatively detailed picture of manufacturing activity. Information about new capital expenditures, for example, may hint of future economic prospects.

Sales and number of establishments measure economic activity for retail and service industries.[2] Census data is relatively less detailed for these economic sectors, reflecting an historical interpretation of the roles and mobility of these sectors.

Two measures of the overall change in the location of economic activity were generated. For each county group (metro, suburban and rural) their share of state total was calculated for 1967, 1977 and 1987. This provides a general indication of the proportion of total state economic activity for that sector occurring within that county group. Shifts in the proportions provide an indication of whether that economic sector is growing or declining in a given geographic setting relative to other county groups. Gains or losses in share imply that economic activity is shifting toward or from that area.

A second measure of economic activity is annual average rate of change for economic parameters. For each economic parameter within the three county groups, the 10 year average annual rate of change is calculated for the period 1967-77 and 1977-87.[3] The 20 year average annual rate of change is also reported. This method converts the three available data points into a more dynamic indication of economic growth or decline in a county.

Results: County Group Comparisons

Metro Wisconsin

Within metro counties, the share of state manufacturing activity follows a declining trend for seven of eight indicators. Table 1 shows that in only the number of establishments have metro counties share of the state total increased. This increase may indicate a higher rate of new business formation and/or an increase in small business activity. If small manufacturing establishments represent an emerging potential for metro areas, the increasing share represents a positive indicator. However, employment, payroll and new capital expenditures all show declines ranging from 7% to 10% of total state share between 1967 and 1987. The general trend related to manufacturing activity is a shifting out of metro counties.

Retail and service activity have moved contrary to manufacturing trends by increasing their concentration in metro counties. Table 1 shows clear trends toward increasing concentration in the number of establishments. Share of sales activity is generally stable. This suggests a relative higher level of small firm formation in metro areas.

Table 1

Metro Areas Share of Wisconsin[4]

	1967	1977	1987
Manufacturing			
Establishments	61.5%	63.3%	63.9%
Total Employment	76.6	73.8	70.1
Total Payroll	80.5	77.9	74.8
Production Workers	74.5	71.6	66.7
Prod. Wkrs. Wages	78.7	76.5	71.5
Value Added	79.6	76.9	71.0
Value of Shipments	77.5	74.8	70.0
New Capital Expend.	76.0	71.7	66.3
Retail			
Establishments	54.6	55.8	57.7
Sales	67.1	68.9	68.0
Services			
Establishments	59.4	62.1	66.1
Sales	77.4	76.7	79.0

Table 2 provides more detail regarding change in metro counties. Over the 20 year period 1967-87, metro counties have experienced a 1.0% average annual increase in number of manufacturing establishments. This growth rate has allowed metro counties to increase their share of total manufacturing establishments in the state. The halving of the establishment growth rate between 1977-87 may be a barometer of future trends.

Metro counties have shown absolute declines in employment categories - total employment and production workers. In the categories of payroll, wages, value added, value of shipments and new capital expenditures, metro counties rate of growth has been insufficient to maintain share compared to other county groupings.

Table 2

Metro Counties Average Annual Rate of Change in Percentage Between Decades

	By Decade		Overall
	1967-77	1977-87	1967-87
Manufacturing			
Establishments	1.3	0.6	1.0
Total Employment	0.1	-0.9	-0.4
Total Payroll	6.8	5.2	6.0
Production Workers	-0.2	-1.6	-0.9
Prod. Wkrs. Wages	6.7	4.2	5.4
Value Added	8.3	5.7	7.0
Value of Shipments	8.8	5.2	7.0
New Capital Expend.	7.9	4.6	6.3
Retail			
Establishments	-0.3	1.9	0.8
Sales	8.4	6.3	7.4
Services			
Establishments	4.7	10.5	7.6
Sales	11.2	14.9	13.0

The rate of growth in metro county retail establishments has allowed them to increase their share of Wisconsin's retail business establishments (Table 1). Service establishment growth has been even stronger. Growth in sales for both retail and service have allowed metro counties to gain relative to other county groups.

It is apparent that overall economic conditions were more favorable to metro county manufacturers in the 1967-77 period versus the 1977-87 decade. The lingering effects of the 1980-81 recession contribute to this. The growth rate in the number of manufacturing establishments during the period 1967-77 was over twice the rate for the 1977-87 period. In all manufacturing indicators, the growth rates were greater or the declines less during the 1967-77 period versus the 1977-87 period.

Conversely, retail and service activity picked up in the second decade. The question is whether retail and service performance is lagging behind manufacturing activity, or whether retail and service sectors are at least partially responding to stimulation independent of manufacturing.

Suburban Counties

Much of metro counties' manufacturing loss appears to have been suburban counties gain. Table 3 shows that while suburban counties' share of establishments has remained relatively stable during 1967-87, other indicators suggest an increasing share of manufacturing activity. While suburban counties had just 17% of the total manufacturing establishments in the state in 1987, they captured over 23% of the new capital expenditures.

Trends related to retail and service activity have not followed manufacturing. While suburban counties are increasing their share of manufacturing activity, their share of retail activity has held steady and their share of service activity has eroded slightly.

Table 3

Suburban Areas Share of Wisconsin[4]

	1967	1977	1987
Manufacturing			
Establishments	17.8%	17.3%	17.9%
Total Employment	15.5	16.7	18.9
Total Payroll	13.6	14.8	17.1
Production Workers	16.5	17.4	20.7
Prod. Wkrs. Wages	14.5	15.1	19.1
Value Added	14.0	15.4	18.2
Value of Shipments	13.8	16.0	19.5
New Capital Expend.	17.0	14.7	23.5
Retail			
Establishments	21.0	20.1	20.3
Sales	17.3	16.5	16.8
Services			
Establishments	18.5	17.7	17.2
Sales	13.3	14.1	12.9

Examination of suburban counties average annual growth rates shows robust increases in manufacturing payroll and wages, in value added, value of shipments and new capital expenditures. Table 4 shows growth in employment categories has been more modest. This may indicate that productivity enhancing investments are being made in suburban counties. The 0.6% annual growth in manufacturing establishments from 1967-87 caused suburban counties to lose share to metro counties (Table 1).

The rate of growth in number of retail establishments has been modest over the 20 year period. Growth in sales were roughly comparable to retail sales growth in metro counties (Table 2).

Contrary to metro counties, there appears only a modest decline in manufacturing industries' growth between the two decades. Growth rates decreased in nearly all categories. Moderate decreases are seen in the rate of growth in total employment and production workers. Only the new capital expenditures category shows a growth rate increase.

Table 4

Suburban Counties Average Annual Rate of Change in Percentage Between Decades

	By Decade		Overall
	1967-77	1977-87	1967-87
Manufacturing			
Establishments	0.7	0.5	0.6
Total Employment	1.1	0.3	0.7
Total Payroll	8.0	6.5	7.3
Production Workers	0.7	0.3	0.5
Prod. Wkrs. Wages	7.4	6.5	7.0
Value Added	9.6	8.2	8.9
Value of Shipments	10.6	7.3	9.0
New Capital Expend.	7.0	9.8	8.4
Retail			
Establishments	-1.0	1.7	0.4
Sales	7.6	6.7	7.1
Services			
Establishments	3.9	9.6	6.7
Sales	11.8	13.7	12.7

The growth in new retail and service establishments in the second decade was significantly improved. After contracting in the 1967-77 decade the number of retail establishments increased. The rate of growth in number of service establishments increased by nearly two and one-half times. Retail sales growth declined slightly while service sales growth increased.

Rural Counties

In 1987, rural counties had about 18% of Wisconsin's manufacturing establishments, down nearly 2% over the previous 20 years. Table 5 shows that while rural counties share of total number of establishments declined, its share of most other manufacturing indicators increased. Noteworthy are increases in total employment and production workers.

Considering capital expenditures, rural counties received 7.2% of new capital investment in 1987. However, they had 18% of manufacturing establishments. This represents a smaller share of investment from a decade earlier. Coupled with the increase in share of production workers, this supports the view that rural manufacturing gains have been in labor intensive activities. Thus, rural areas may have increased manufacturing production functions if not manufacturing control functions.

Rural counties have shown the largest decrease in state share of retail and service establishments and sales. Decreases in share of service establishments has been especially dramatic.

Annual rates of growth in rural counties' manufacturing indicators seems to be a good news-bad news story. Table 6 shows a 20 year rate of growth trend that out-paces even suburban counties (Table 4). However, the difference in growth rates in new capital expenditures between 1967-77 and 1977-87 is striking, virtually disappearing in the latter decade.

Table 5

Rural Areas Share of Wisconsin[4]

	1967	1977	1987
Manufacturing			
Establishments	19.9%	18.7%	18.0%
Total Employment	7.0	8.5	10.8
Total Payroll	5.1	6.4	7.9
Production Workers	8.0	9.8	12.3
Prod. Wkrs. Wages	5.9	7.2	9.2
Value Added	5.6	6.9	9.2
Value of Shipments	7.0	8.1	10.1
New Capital Expend.	5.4	9.8	7.2
Retail			
Establishments	23.7	23.5	22.0
Sales	15.1	14.1	13.5
Services			
Establishments	21.6	19.7	16.7
Sales	9.4	8.7	8.1

Table 6

Rural Counties Average Annual Rate of Change in Percentage Between Decades

	By Decade		Overall
	1967-77	1977-87	1967-87
Manufacturing			
Establishments	0.4	0.2	0.3
Total Employment	2.4	2.0	2.2
Total Payroll	9.3	7.7	8.5
Production Workers	2.1	1.4	1.8
Prod. Wkrs. Wages	9.1	7.2	8.1
Value Added	10.7	9.4	10.1
Value of Shipments	10.6	8.0	9.3
New Capital Expend.	14.5	2.3	8.4
Retail			
Establishments	-0.6	0.9	0.2
Sales	7.4	6.0	6.7
Services			
Establishments	3.3	8.3	5.8
Sales	10.5	13.9	12.2

The number of retail establishments in rural areas has remained nearly constant over the study period. The increases in both sectors average annual sales are only slightly behind metro and suburban counties (Tables 2 and 4). The 1977-87 decade represented a positive turn around for rural counties retail and service trade as measured by annual change in number of establishments. Rural counties gained retail establishments between 1977 and 1987, and growth in service establishments accelerated.

Results: Intercounty Comparisons

Data related to counties average annual rates of change in economic activity have been rearranged to enhance comparison of rural, suburban, and metro counties. Table 7 shows the rates of change by county group for the decade 1967-77.

Table 7

Counties Average Annual Rate of Change in Percentage from 1967 to 1977 Between County Groups

	Rural	Suburban	Metro
Manufacturing			
Establishments	0.4	0.7	1.3
Total Employment	2.4	1.1	0.1
Total Payroll	9.3	8.0	6.8
Production Workers	2.1	0.7	-0.2
Prod. Wkrs. Wages	9.1	7.4	6.7
Value Added	10.7	9.6	8.3
Value of Shipment	10.6	10.6	8.8
New Capital Expend.	14.5	7.0	7.9
Retail			
Establishments	-0.6	-1.0	-0.3
Sales	7.4	7.6	8.4
Services			
Establishments	3.3	3.9	4.7
Sales	10.5	11.8	11.2

Manufacturing activity shows a relatively small rate of growth for number of establishments in rural areas. However, in all other categories of manufacturing activity, rural counties growth exceeded both suburban and metro counties. New capital expenditures in rural counties were particularly strong during this decade.

All county groups experienced an overall decline in the number of retail establishments during this decade. Trends in both retail and service activity favored metro areas.

For the decade 1977-87, trends in economic activity between county groups continued about the same as in the previous decade. However, rates of growth in manufacturing slowed considerably while retail and service activity improved. Table 8 shows the rate of growth in rural manufacturing establishments remained below suburban and metro counties. New capital expenditures in rural areas plunged relative to strong growth in suburban counties and moderate growth in metro counties.

Table 8

Counties Average Annual Rate of Change in Percentage from 1977 to 1987 Between County Groups

	Rural	Suburban	Metro
Manufacturing			
Establishments	0.2	0.5	0.6
Total Employment	2.0	0.3	-0.9
Total Payroll	7.7	6.5	5.2
Production Workers	1.4	0.3	-1.6
Prod. Wkrs. Wages	7.2	6.5	4.2
Value Added	9.4	8.2	5.7
Value of Shipments	8.0	7.3	5.2
New Capital Expend.	2.3	9.8	4.6
Retail			
Establishments	0.9	1.7	1.9
Sales	6.0	6.7	6.3
Services			
Establishments	8.3	9.6	10.5
Sales	13.9	13.7	14.9

Metro counties lost manufacturing employment during this decade while growth in suburban manufacturing employment was modest and rural manufacturing employment was relatively strong. Suburban counties experienced relatively strong growth in new capital expenditures. In spite of the difficult economic conditions during this decade (1980-81 recession), productivity enhancing investments were increasingly targeted to suburban counties.

Rural counties retail and service growth lagged behind metro and suburban counties during the decade. Metro counties growth in number of establishments was relatively the best. The rate of service establishment and sales growth was robust in all county groups. Establishment growth in all county groups was greater in 1977-87 than the previous decade.

Table 9 shows the rates of change over the entire 20 year study period. The advantage of viewing rates of change over this time is that it represents several complete national business cycles.[5] These figures provide a better indication of long-term trends rather than phases of the business cycle.

Table 9

Counties Average Annual Rate of Change in Percentage from 1967 to 1987 Between County Groups

	Rural	Suburban	Metro
Manufacturing			
Establishments	0.3	0.6	1.0
Total Employment	2.2	0.7	-0.4
Total Payroll	8.5	7.3	6.0
Production Workers	1.8	0.5	-0.9
Prod. Wkrs. Wages	8.1	7.0	5.4
Value Added	10.1	8.9	7.0
Value of Shipments	9.3	9.0	7.0
New Capital Expend.	8.4	8.4	6.3
Retail			
Establishments	0.2	0.4	0.8
Sales	6.7	7.1	7.4
Services			
Establishments	5.8	6.7	7.6
Sales	12.2	12.7	13.0

Employment gains in rural manufacturing exceed both suburban and metro counties. In all but one indicator of manufacturing activity (number of establishments), rural counties outperformed both suburban and metro counties. For what may be considered wealth generating indicators (wage and payroll growth, value added) rural county gains are even better than suburban counties. It should be noted, however, this performance was buoyed by what most consider a temporary turnaround during the 1960s-70s from otherwise longer term trends toward rural decline. Still, within the last 20 years, rural counties have performed quite well.

Conversely, the manufacturing trends in metro counties are not so favorable. For both indicators of employment, metro counties lost workers. New capital expenditures lag behind rural and suburban counties. The notable exception for metro counties is in the number of manufacturing establishments. The 1.0% annual increase indicates a relatively greater level of new firm formation in metro areas. Nearly all comparisons of metro-rural and metro-suburban performance show lower growth rates.

Retail activity grew in all areas of the state. Contrary to what many believe, the number of retail establishments in rural counties was about the same in 1987 as it was in 1967. Metro counties have done relatively best in gaining retail establishments.

Metro areas increase in service establishments and sales exceeds rural and suburban counties, allowing them to increase their share of total state establishments.

Discussion

The data presented provides a picture of Wisconsin's changing economic landscape. Manufacturing, while predominately located in metro areas, is increasingly shifting to suburban and rural locations. In share of Wisconsin total, metro counties have been losing position relative to both suburban and rural counties over the 20 years from 1967 to 1987.

Suburban counties are increasingly the location of choice for manufacturers in Wisconsin. Their share of total activity is steadily increasing and their annual growth rates have remained relatively strong throughout the study period. The trend for new capital investment in suburban areas is accelerating.

These results are generally consistent with others who have tracked manufacturing employment growth from metro to adjacent-to-metro counties [Haynes and Machunda 1987; Barkley 1988; Deavers 1991]. Suburban locations may provide the compromise between the competitive, low costs of rural areas [Blackley 1986], yet remain close enough to urban areas to maintain easy access to the skilled labor force and specialized support services [Barkley 1988; Bluestone and Long 1989; Deavers 1991].

Several researchers have offered explanations for industry location patterns in line with the product life cycle theory [Barkley 1988; ÓhUallacháin 1989]. The theory states that when a product is in the innovation/start up phase, it needs close proximity to the entrepreneurial incubation environment of metropolitan areas. As a product/business matures and its processes become more routinized, the tendency is to migrate toward lower cost locations in suburban or rural areas.

This may provide an explanation for the anomalous finding related to metro share of manufacturing establishments (Table 1). Metro counties appear to be increasing their share of manufacturing establishments while suburban counties hold steady and rural counties lose share. Metro counties may provide the entrepreneurial breeding ground needed to create new manufacturing businesses. However, when it is time expand (e.g. make new capital investments or increase employment and payroll) many manufacturing businesses look to suburban or rural counties. It needs to be recognized, however, that the data presented here provides no indication whether suburban/rural growth is a matter of relocation from metro areas or expansion of existing firms.

Rural counties have experienced positive gains in manufacturing employment in excess of the proportional increase in other indicators of manufacturing activity such as value added, value of shipments and new capital expenditures. This also supports the product life cycle conception which suggests that as production processes become routinized, manufacturers seek the advantage of lower cost rural locations and labor pools.

It also becomes possible to speculate about the changing organizational structure of business. In manufacturing, metro counties' rate of change in number of establishments is exceeding the rate of change in total employment and production workers. This may indicate an increase of small business activity.

This would be consistent with what Testa [1992, 1993] calls a trend toward "flexible manufacturing." Manufacturers are increasingly operating with smaller production runs, faster changeover to new product lines, smaller supply networks and just-in-time delivery of supplies. Metro areas may be favored in such a manufacturing environment providing relatively easier access to suppliers and more convenient delivery networks.

Testa [1993] also points out that manufacturers are increasingly performing dual roles as both goods producers and service providers. In addition to production, manufacturers are engaged in research and development activities, management and control, sales and distribution. To the extent these service activities are important, manufacturers have incentive to respond to the same location factors as other service industries. This may help tie some manufacturing firms to metro locations.

It may also be the case that given the capacity for excellent production control via computer and telecommunications networks, production and service

functions may increasingly split. Just as conglomerates and multi-national companies are able to manage far flung economic activities from a central location, smaller firms may increasingly exhibit spatially independent activities. Each function would select a location to maximize its advantage. Thus a manufacturer may have its service components located in a metro area while its production moves to a suburban or rural area.

In rural areas, the rate of growth in manufacturing employment was greater than the rate of growth in establishments indicating a decrease in small business activity. This could be a source of problems for many rural areas. Rural areas appeared to be more dependent on fewer labor intensive manufacturing employers. Overall, however, rural areas manufacturing performance was positive over the study period.

Retail activity also provides interesting trends. Metropolitan counties seem to be increasing their share of retail activity. Examination of the annual rates of change in number of establishments shows strongest growth in metro areas.

This finding supports the observation that the trend is for increased clustering of retail businesses [Henderson and Wallace 1992]. Henderson and Wallace attribute this to an enhanced ability of retail businesses in large and medium sized communities to adjust to changing consumer patterns. There may also be benefit to collocating with a large number of different retail businesses to create a "destination" for shoppers.

In all types of counties, the rate of growth in retail sales outpaces growth in number of establishments. This may show the influence of the large retail discounters that have displaced many of the small retail shops. Metro areas have the advantage in their ability to support malls and large shopping centers that can attract a large volume of business. Rural retailers, however, tend to operate individually rather than collectively.

The number of retail establishments in rural counties remained stable over the study period. While individual rural communities experience may differ, there were actually a larger number of retail establishments in 1987 than there were in 1967. This finding may surprise some who believed rural areas have had a large decline in retail activity.

In the case of service businesses, there is also a clear trend toward clustering in metro counties. The divergence of service and manufacturing industries spatial shifts supports the contention that service industries have assumed characteristics of an export activity [Beyers, Alvine and Johnson 1985; Kirn 1987; Bluestone and Miller 1988; ÓhUallacháin 1989; Beyers 1991].

It may also be the case that given the current state of technology related to communication and transportation systems, the distance between a metro and suburban county is negligible for most interindustry relations. Unquestionably, interindustry linkages between major sectors of the economy remain strong. The necessity for services and manufacturing to collocate, however, may have little consequence in an era of fast, convenient transportation and sophisticated communication systems.

There may be two economic functions working to facilitate the export role of service industries in urban areas. The first is where service businesses achieve economies of urbanization. Businesses gain access to a large client base in metro areas. The large cluster of service businesses spur the establishment of other businesses to support the cluster. Thus, a second and third tier of businesses are created to support the cluster of service industries that initially sought the advantages of proximity to metro markets.

Similarly, once a critical mass of service industries congregate, they are able to establish what is termed localization economies. In areas where

numerous specialized service businesses collocate they are able reap advantages associated with sharing a trained labor pool and specialized support services. Knowledge spillovers help to generate a synergistic effect and new business spinoff.

Several policy implications related to the locational changes in state business activity are immediately apparent. Manufacturing activity is shifting away from urban areas, while retail and service business is shifting toward them. Formerly employed in better paying manufacturing jobs, metro residents may now have access only to lower paying retail and service jobs [Porterfield 1990; Deavers 1991]. This may mean slowing growth of income in the metropolitan economy. There may also be an increasing discrepancy between those in professional jobs (higher wage) and those displaced.

If the organizational transformation Testa [1993] discusses is underway, the future for metro manufacturing may not be as bleak as economic activity trends make it appear. The locational preferences of the service component of a manufacturing firm may help to hold it in the metro location. If these firms are to be successful producing goods in a metro setting, however, workers will need to be flexible as well. This suggests the need for continuing skills training and possibly the transformation of institutionalized labor relations to keep pace with the evolving manufacturing environment.

The future for rural areas will also present challenges. The increasing importance of manufacturing in rural areas is apparent from the data. Relative to other counties, overall manufacturing activity has generally been strong during the past 20 years. However, this period includes what some have termed the "rural renaissance," a period when federal policies and economic conditions favored rural areas.

Others have noted longer term trends toward rural decline [Johansen and Fuguitt, 1984; Drabenstott, 1991; Gillis, 1991]. Economic performance observed in the latter half of the study period may be more indicative of future rural prospects and a harbinger of difficulties ahead. The 1992 economic censuses will provide additional insight.

Economic trends such as the movement toward flexible manufacturing systems may favor urban areas. Similarly, the North American Free Trade Agreement (NAFTA) which, if the product life cycle theory holds, would suggest that many rural manufacturers might seek the competitive advantage of substantially lower labor costs in Mexico [Testa 1992, 1993].

Not all researchers, however, believe the locational movement of manufacturing activity works as simply as the product life cycle theory might suggest [Smith and Barkley 1987]. And Testa does not see the trends toward flexible manufacturing or NAFTA necessarily spelling doom for rural manufacturing. He points to many rural advantages that cannot be discounted:

- transportation systems and transportation services are generally good in rural areas;
- advances in telecommunications can still allow manufacturing branch plants to take advantage of traditional rural competitive strengths;
- less formalized work relations generally found in rural areas allow for the type of flexible labor activity of new manufacturing systems;
- rural area's high school graduation rates are roughly comparable to urban areas. Where opportunity exists, a skilled labor force is generally available;
- in spite of low labor costs, certain production skills may not be available in Mexico, and the cost of transportation will be an important consideration of a Mexican location.

What remains uncertain in rural areas is not so much the

economic trends, but what the response of rural communities will be to these trends. Many believe that rural communities have the capacity to respond positively to broader economic trends [Shaffer and Summers, 1989; Wade and Pulver, 1991].

Overall, rural areas can remain viable, but rural communities will have to work hard to maintain a competitive business environment. They will have to shoulder greater responsibility to help themselves and demonstrate creativity. Some of their opportunities may lie in establishing cooperative inter-community relations to approximate some of the economies of agglomeration metro areas enjoy [Korsching, Borich and Stewart, 1992]. Certainly, rural communities need to take care of their home grown business opportunities. Many communities can broaden the base of their efforts to make their community attractive to visitors and keep their retirees. Communities also need to assist manufacturers to be active in exporting and creating products for specialized "niche" markets.

It becomes obvious in looking at the trends of the past 20 years that conditions are changing in all types of Wisconsin counties. Along with changing conditions comes the need to adjust local strategies to maximize the likelihood of a maintaining a favorable economic position. Local officials and practitioners would do well to reflect on these trends and make applications to their home county. One thing the trends suggest it is that we cannot assume continuation of historic economic structures nor rely on the efficacy of traditional development strategies.

Notes

1. A comparison of two county classification methods are shown in Appendix Table 1. The first comparison shows Wisconsin counties following a strict metro, adjacent-to-metro, and nonadjacent classification scheme. The second comparison shows the author's modification based on county economic profiles and personal discretion. The complete economic data profiles follow in Appendix Tables 2, 3 and 4.

2. Procedures used by the Bureau of the Census to conduct the economic censuses have changed over time to reflect changing industry conditions, altered survey procedures and budget constraints. The implication is that comparison of counts from one period to the next may not be exactly equivalent. In most cases, the changes are evenly distributed over all counties in this analysis, or affected categories other than those considered in this analysis.

   The 1987 census, however, represents a significant change in the way retail and service industries data is presented. In prior censuses, all establishments were grouped together in the total summaries. The 1987 censuses for retail and service industries splits establishments with payrolls and establishments without payrolls into separate reports. In other words, all of the service and retail businesses that simply employ the owner are not included in the totals reported in the 1987 Geographic Area Series reports that many have come to identify as the census. Information related to nonemployers are now found in a new Nonemployer Statistics Series.

   For some statistics of interest to researchers and practitioners, this new reporting format is extremely important. While nonemployers represent roughly 10% of total sales in both the retail and service categories, they may represent up to 80% of the establishments within a given county. For those who are interested in the total level of economic activity for a place reported in the census, it is necessary to obtain both reports and independently add the reported totals together.

   The Census of Manufacturers has not been changed. This census continues to include only those establishments with payrolls.

3. The method used to calculate annual average rates of change is the continuous compounding method: $r = \ln(P_2/P_1)/t$, where r is the rate of change, ln stands for the natural logarithm, P_2 is the value of the economic parameter at time 2 (P_1 = time 1), and t is the time in years between P_1 and P_2.

4. The percentages shown in the share of state total tables may not sum to 100% across rural, suburban and metro counties. This is due to rounding error and because Wisconsin totals were used as the denominator in calculating county group share. State totals include data that may have been suppressed at the county level and data for the Menominee Indian Nation. The suppressed county data would therefore not be included in the numerator of the proportion calculating share of state total. It is infeasible to deduct Menominee from state totals because most of that data is also suppressed.

5. Between 1967 and 1987, the U.S. economy experienced four recessions of various duration and severity. Cyclical comparisons of these recessionary periods are found in The 1992 Economic Report of the President. Washington, D.C.: U.S. Government Printing Office, 1992.

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Insert Wisconsin Map Here

Appendix Table 1

Comparison of Wisconsin County Classification Using Census and Study Designations

County Name	Census County Classification	Modified Study Classification
Adams	Nonmet	Rural
Ashland	Nonmet	Rural
Barron	Nonadj	Rural
Bayfield	Nonadj	Rural
Brown	Metro	Metro
Buffalo	Nonadj	Rural
Burnett	Nonadj	Rural
Calumet	Metro	Suburban
Chippewa	Metro	Metro
Clark	Nonadj	Rural
Columbia	Nonadj	Suburban
Crawford	Nonmet	Rural
Dane	Metro	Metro
Dodge	Nonadj	Suburban
Door	Nonmet	Suburban
Douglas	Urban	Suburban
Dunn	Nonadj	Rural
Eau Claire	Metro	Metro
Florence	Nonmet	Rural
Fond du Lac	Nonadj	Suburban
Forest	Nonmet	Rural
Grant	Nonmet	Rural
Green	Nonadj	Suburban
Green Lake	Nonadj	Rural
Iowa	Nonadj	Rural
Iron	Nonmet	Rural
Jackson	Nonadj	Rural
Jefferson	Nonadj	Suburban
Juneau	Nonmet	Rural
Kenosha	Metro	Metro

County Name	Census County Classification	Modified Study Classification
Adams	Nonmet	Rural
Kewaunee	Nonadj	Suburban
La Crosse	Metro	Metro
Lafayette	Nonmet	Rural
Langlade	Nonadj	Rural
Lincoln	Nonadj	Suburban
Manitowoc	Nonadj	Suburban
Marathon	Metro	Metro
Marinette	Nonmet	Rural
Marquette	Nonmet	Rural
Menominee	Nonmet	Excluded
Milwaukee	Metro	Metro
Monroe	Nonadj	Rural
Oconto	Nonadj	Rural
Oneida	Nonmet	Rural
Outagamie	Metro	Metro
Ozaukee	Metro	Metro
Pepin	Nonadj	Rural
Pierce	Nonadj	Rural
Polk	Nonadj	Rural
Portage	Nonadj	Suburban
Price	Nonmet	Rural
Racine	Metro	Metro
Richland	Nonmet	Rural
Rock	Metro	Metro
Rusk	Nonadj	Rural
Sauk	Nonadj	Suburban
Sawyer	Nonmet	Rural
Shawano	Nonadj	Rural
Sheboygan	Metro	Metro
St. Croix	Metro	Suburban
Taylor	Nonadj	Rural
Trempealeau	Nonadj	Rural

County Name	Census County Classification	Modified Study Classification
Adams	Nonmet	Rural
Vernon	Nonadj	Rural
Vilas	Nonmet	Rural
Walworth	Nonadj	Suburban
Washburn	Nonadj	Rural
Washington	Nonadj	Suburban
Waukesha	Metro	Metro
Waupaca	Nonadj	Suburban
Waushara	Nonadj	Rural
Winnebago	Metro	Metro
Wood	Nonadj	Suburban

Source: U.S. Department of Commerce 1987 Economic Census Designation. Modified classification is based on author's calculations using U.S. Department of Commerce, Wisconsin Department of Administration and University of Wisconsin data.

Appendix Table 2

Manufacturing Activity by County, 1987

1987 Class[a]	County Name	MFG Estab. (no.)	1987 Empl. (000)	Payrl. (mil.)	Prod. Wkrs. (000)	Wages (mil.)	Value Added (mil.)	Value Shipmnt. (mil.)	Capital Expend. (mil.)
1	Adams	14	0	9	0	6	19	52	D
1	Ashland	50	2	29	1	22	61	110	5
1	Barron	89	5	76	4	52	206	550	19
1	Bayfield	31	0	4	0	3	9	26	0
3	Brown	315	24	618	16	373	1,611	4,538	79
1	Buffalo	15	0	5	0	4	18	71	1
1	Burnett	33	1	16	1	11	44	89	2
2	Calumet	59	5	113	4	88	304	762	14
3	Chippewa	99	5	123	4	63	548	1,003	36
1	Clark	91	2	29	1	20	70	319	4
2	Columbia	87	4	75	3	50	215	618	14
1	Crawford	21	D	D	D	D	D	D	D
3	Dane	517	22	526	13	254	1,209	2,605	66
2	Dodge	137	9	210	7	142	901	1,847	74
2	Door	42	3	67	3	49	116	252	3
2	Douglas	54	1	28	1	19	90	346	D
1	Dunn	40	1	24	1	14	95	178	D
3	Eau Claire	93	5	121	4	86	253	614	17
1	Florence	14	0	2	0	1	5	14	0
2	Fond du Lac	129	12	287	8	176	804	1,615	53
1	Forest	51	0	5	0	4	11	22	1
1	Grant	65	3	44	3	35	204	437	6
2	Green	69	3	56	2	40	249	617	12
1	Green Lake	50	2	33	2	23	94	176	3
1	Iowa	33	1	11	1	7	22	111	1
1	Iron	13	0	2	0	2	6	9	D
1	Jackson	22	0	6	0	4	13	47	1
2	Jefferson	152	11	230	7	136	609	1,426	45
1	Juneau	36	2	38	2	25	105	229	6
3	Kenosha	160	13	376	10	268	795	2,361	21

1987 Class[a]	County Name	MFG Estab. (no.)	1987 Empl. (000)	Payrl. (mil.)	Prod. Wkrs. (000)	Wages (mil.)	Value Added (mil.)	Value Shipmnt. (mil.)	Capital Expend. (mil.)
1	Adams	14	0	9	0	6	19	52	D
1	Ashland	50	2	29	1	22	61	110	5
2	Kewaunee	35	2	31	1	22	62	135	3
3	La Crosse	138	10	226	7	125	494	1,027	30
1	Lafayette	26	1	8	1	5	72	203	1
1	Langlade	44	1	23	1	17	69	137	2
2	Lincoln	73	3	69	3	50	205	377	12
2	Manitowoc	150	11	234	8	151	474	985	36
3	Marathon	190	11	277	8	183	628	1,843	58
1	Marinette	97	7	165	6	118	477	977	26
1	Marquette	23	1	9	0	7	23	42	2
3	Milwaukee	1,683	107	2,995	67	1,705	6,027	12,145	325
1	Monroe	48	3	44	2	27	173	422	5
1	Oconto	70	3	51	2	39	141	321	12
1	Oneida	54	2	38	1	27	79	191	8
3	Outagamie	206	17	440	12	281	1,110	2,715	121
3	Ozaukee	194	9	228	6	132	534	1,201	27
1	Pepin	10	0	3	0	2	10	37	0
1	Pierce	35	1	20	1	13	51	150	3
1	Polk	69	2	38	2	25	117	294	8
2	Portage	67	4	96	3	69	379	697	32
1	Price	64	3	56	2	36	110	251	D
3	Racine	384	26	718	14	298	1,943	3,072	127
1	Richland	27	1	23	1	14	62	201	3
3	Rock	200	18	485	13	324	1,603	4,289	43
1	Rusk	36	1	25	1	20	70	153	2
2	Sauk	102	5	90	4	61	226	559	21
1	Sawyer	39	0	8	0	6	37	63	D
1	Shawano	85	2	36	2	25	78	218	10
3	Sheboygan	236	19	444	12	263	945	2,077	85
2	St. Croix	91	3	65	2	39	169	359	14
1	Taylor	50	3	52	2	33	171	375	D

1987 Class[a]	County Name	MFG Estab. (no.)	1987 Empl. (000)	Payrl. (mil.)	Prod. Wkrs. (000)	Wages (mil.)	Value Added (mil.)	Value Shipmnt. (mil.)	Capital Expend. (mil.)
1	Adams	14	0	9	0	6	19	52	D
1	Ashland	50	2	29	1	22	61	110	5
1	Trempealeau	53	3	41	2	29	98	342	11
1	Vernon	45	1	11	1	8	42	106	2
1	Vilas	40	1	10	1	6	24	44	2
2	Walworth	192	7	147	5	98	389	814	34
1	Washburn	40	1	8	0	6	19	33	1
3	Washington	208	9	213	7	130	472	980	26
3	Waukesha	938	38	1,006	25	571	2,633	4,779	165
2	Waupaca	102	5	93	4	65	206	517	13
1	Waushara	28	0	6	0	3	14	27	1
3	Winnebago	294	28	750	17	395	1,672	3,463	120
2	Wood	102	10	298	7	198	691	1,677	96
WISCONSIN TOTAL		9,157	514	12,763	350	7,616	31,653	69,596	2,027
WI Average		128.9	7.2	179.4	4.9	107.0	443.4	976.5	27.7
WI Standard Dev.		229.3	14.1	392.2	8.8	221.7	843.3	1,733.5	49.9
RURAL TOTAL		1,651	55	1,005	43	697	2,913	7,024	147
Rural Average		43.4	1.5	26.5	1.1	18.3	76.7	184.8	3.9
Rural Std. Dev.		22.4	1.4	29.2	1.1	20.7	86.0	188.5	5.5
SUBURBAN TOTAL		1,643	97	2,188	72	1,452	6,090	13,601	476
Suburban Average		96.6	5.7	128.7	4.3	85.4	358.3	800.1	28.0
Suburban Std.Dev.		42.1	3.3	86.0	2.3	53.7	246.9	514.2	25.7
METRO TOTAL		5,855	360	9,545	234	5,449	22,477	48,709	1,344
Metro Average		365.9	22.5	596.6	14.6	340.5	1,404.8	3,044.3	84.0
Metro Std. Dev.		394.4	23.5	663.6	14.5	374.5	1,349.7	2,677.9	75.8

[a] County Class: 1 = Rural; 2 = Suburban; 3 = Urban

"D" indicates that the data was suppressed.

Source: U.S. Department of Commerce, 1987 Census of Manufacturing.

Appendix Table 3

Retail and Service Industry Data by County, 1987

1987 Class[a]	County Name	RETAIL		SERVICE	
		Estab. (no.)	Sales (000)	Estab. (no.)	Sales (000)
1	Adams	113	$27,212	143	$6,851
1	Ashland	300	$100,365	328	$31,730
1	Barron	545	$215,735	937	$54,311
1	Bayfield	225	$39,673	290	$9,348
3	Brown	1,843	$1,353,464	3,450	$477,947
1	Buffalo	139	$34,845	271	$23,851
1	Burnett	164	$52,845	294	$10,955
2	Calumet	288	$127,300	405	$25,514
3	Chippewa	565	$324,639	840	$66,120
1	Clark	376	$92,102	536	$23,381
2	Columbia	607	$249,530	1,039	$68,004
1	Crawford	210	$84,722	279	$17,431
3	Dane	3,398	$2,566,777	9,970	$1,253,770
2	Dodge	760	$291,247	1,098	$75,559
2	Door	544	$166,481	828	$65,799
2	Douglas	509	$239,750	760	$51,538
1	Dunn	316	$133,617	680	$35,513
3	Eau Claire	888	$535,203	1,774	$220,758
1	Florence	52	$10,824	47	D
2	Fond du Lac	915	$493,390	1,420	$147,559
1	Forest	152	$23,466	168	$8,729
1	Grant	634	$214,098	950	$41,524
2	Green	369	$308,648	690	$71,077
1	Green Lake	250	$80,111	352	$20,334
1	Iowa	237	$387,215	367	$19,247
1	Iron	128	$34,983	144	$7,973
1	Jackson	226	$73,871	218	$14,108
2	Jefferson	629	$309,729	1,231	$87,559
1	Juneau	306	$92,069	383	$26,151

1987 Class[a]	County Name	RETAIL		SERVICE	
		Estab. (no.)	Sales (000)	Estab. (no.)	Sales (000)
1	Adams	113	$27,212	143	$6,851
3	Kenosha	1,126	$587,353	1,905	$170,902
2	Kewaunee	231	$66,809	312	$17,887
3	La Crosse	985	$681,975	1,840	$261,618
1	Lafayette	177	$42,537	260	$7,566
1	Langlade	288	$111,175	319	$23,255
2	Lincoln	372	$123,099	508	$29,081
2	Manitowoc	813	$341,960	1,167	$117,567
3	Marathon	1,143	$653,329	1,887	$247,650
1	Marinette	559	$197,253	728	$46,537
1	Marquette	171	$32,606	263	$10,815
3	Milwaukee	8,181	$5,941,868	18,370	$3,283,632
1	Monroe	398	$176,097	555	$38,997
1	Oconto	382	$98,923	491	$23,250
1	Oneida	552	$222,474	847	$80,211
3	Outagamie	1,218	$927,705	2,022	$304,651
3	Ozaukee	712	$383,171	1,824	$154,648
1	Pepin	94	$31,745	158	$5,877
1	Pierce	382	$129,801	752	$45,538
1	Polk	445	$145,295	681	$46,501
2	Portage	629	$337,036	991	$90,696
1	Price	261	$62,335	296	$13,671
3	Racine	1,617	$1,062,368	2,965	$379,106
1	Richland	194	$77,525	316	$11,958
3	Rock	1,343	$866,913	2,432	$234,114
1	Rusk	188	$50,782	256	$11,459
2	Sauk	594	$274,940	1,010	$95,208
1	Sawyer	261	$81,811	436	$17,026
1	Shawano	445	$143,543	517	$30,080
3	Sheboygan	957	$541,635	1,674	$205,397
2	St. Croix	452	$239,958	1,032	$65,661
1	Taylor	242	$65,175	287	$17,505

1987 Class[a]	County Name	RETAIL		SERVICE	
		Estab. (no.)	Sales (000)	Estab. (no.)	Sales (000)
1	Adams	113	$27,212	143	$6,851
1	Trempealeau	368	$115,555	518	$23,001
1	Vernon	291	$79,432	445	$14,543
1	Vilas	496	$122,320	761	$41,179
2	Walworth	883	$402,383	1,663	$142,041
1	Washburn	267	$100,046	419	$20,112
3	Washington	860	$434,648	1,722	$124,382
3	Waukesha	2,724	$2,158,644	7,563	$1,032,061
2	Waupaca	640	$215,516	920	$58,829
1	Waushara	227	$69,004	312	$15,616
3	Winnebago	1,457	$379,163	2,949	$323,937
2	Wood	962	$593,877	1,352	$214,637
WISCONSIN TOTAL		50,275	$28,033,695	95,617	$11,061,043
WI Average		708.1	$394,841	1,346.7	$155,789
WI Standard Deviation		1,057.3	$793,265	2,531.0	$424,669
RURAL TOTAL		11,061	$3,853,187	16,004	$896,134
Rural Average		291.1	$101,400	421.2	$23,582
Rural Std. Dev.		139.8	$72,651	226.2	$16,208
SUBURBAN TOTAL		10,197	$4,781,653	16,426	$1,424,216
Suburban Avg.		599.8	$281,274	966.2	$83,777
Suburban Std.Dev.		211.0	$128,917	349.2	$48,167
METRO TOTAL		29,017	$19,398,855	63,187	$8,740,693
Metro Average		1,813.6	$1,212,428	3,949.2	$546,293
Metro Std. Dev.		1,794.2	$1,369,499	4,383.5	$773,091

[a] County Class: 1 = Rural; 2 = Suburban; 3 = Urban

"D" indicates the data has been suppressed.

Source: U.S. Department of Commerce, 1987 Census of Retail Trade; 1987 Census of Service Industries.

Appendix Table 4

Income, Population and Commuting Patterns by County

1987 Class[a]	County Name	1987 Pop. (000)	1987 Per Cap. Farm Income	1987 Per Cap. Non-farm Income	1990 Percent Rural Pop.[b]	1990 % Tot. Pop. in Lrgst. City[c]	1980 Commut. Out/In Ratio[d]
1	Adams	14.3	$1,056	$9,117	100%	10.9%	2.58
1	Ashland	17.1	$190	$10,758	47.4%	53.3%	0.59
1	Barron	41.1	$910	$11,111	73.0%	19.6%	0.69
1	Bayfield	14.2	$344	$10,028	100%	16.3%	2.71
3	Brown	188.3	$172	$14,807	16.8%	49.6%	0.49
1	Buffalo	14.4	$2,096	$10,796	100%	18.3%	2.75
1	Burnett	13.5	$310	$10,638	100%	8.7%	2.95
2	Calumet	33.4	$763	$13,612	42.7%	26.5%	1.41
3	Chippewa	54.1	$656	$11,821	61.9%	24.3%	1.79
1	Clark	33.2	$1,415	$9,509	91.5%	8.5%	1.72
2	Columbia	47.0	$782	$12,695	71.8%	19.2%	2.04
1	Crawford	16.8	$832	$9,459	64.5%	35.6%	1.64
3	Dane	346.9	$196	$16,813	20.1%	52.1%	0.53
2	Dodge	76.3	$601	$12,604	54.7%	18.5%	2.55
2	Door	26.9	$543	$13,505	64.3%	35.7%	0.51
2	Douglas	41.8	$52	$11,913	33.9%	65.0%	1.27
1	Dunn	35.1	$1,050	$10,068	62.3%	37.7%	2.65
3	Eau Claire	83.4	$177	$12,807	25.5%	64.8%	3.05
1	Florence	4.1	$311	$10,296	100%	45.7%	1.64
2	Fond du Lac	89.7	$503	$13,740	42.3%	41.9%	0.56
1	Forest	9.1	$209	$8,570	100%	22.3%	1.60
1	Grant	51.2	$1,105	$11,355	66.3%	19.7%	2.10
2	Green	30.9	$1,346	$13,657	55.8%	33.8%	1.29
1	Green Lake	19.0	$1,052	$12,135	71.6%	28.4%	1.15
1	Iowa	20.5	$1,604	$10,398	80.7%	14.3%	1.90
1	Iron	6.3	$115	$9,993	100%	29.0%	1.80
1	Jackson	16.3	$1,154	$10,332	79.0%	21.0%	2.01
2	Jefferson	68.0	$490	$13,202	43.9%	18.3%	1.29
1	Juneau	21.6	$921	$10,766	84.1%	15.9%	1.54

1987 Class[a]	County Name	1987 Pop. (000)	1987 Per Cap. Farm Income	1987 Per Cap. Non-farm Income	1990 Percent Rural Pop.[b]	1990 % Tot. Pop. in Lrgst. City[c]	1980 Commut. Out/In Ratio[d]
1	Adams	14.3	$1,056	$9,117	100%	10.9%	2.58
1	Ashland	17.1	$190	$10,758	47.4%	53.3%	0.59
1	Barron	41.1	$910	$11,111	73.0%	19.6%	0.69
3	Kenosha	120.3	$100	$15,390	21.2%	62.7%	2.36
2	Kewaunee	20.2	$1,260	$11,499	67.7%	14.6%	3.12
3	La Crosse	94.9	$161	$14,232	20.5%	52.1%	0.26
1	Lafayette	16.7	$2,467	$10,185	100%	13.9%	4.49
1	Langlade	19.7	$765	$10,419	57.6%	42.4%	1.60
2	Lincoln	28.4	$326	$10,610	51.1%	36.5%	1.20
2	Manitowoc	80.9	$529	$13,338	40.2%	40.4%	2.49
3	Marathon	111.8	$603	$12,807	43.7%	32.1%	1.34
1	Marinette	42.1	$319	$11,476	63.0%	29.2%	0.94
1	Marquette	13.1	$1,018	$10,021	100%	10.8%	3.01
3	Milwaukee	929.0	$9	$15,987	0.0%	65.5%	0.38
1	Monroe	36.9	$931	$10,325	58.1%	21.3%	1.04
1	Oconto	30.7	$790	$10,511	100%	8.5%	6.79
1	Oneida	31.5	$141	$12,657	76.6%	23.4%	0.76
3	Outagamie	138.2	$360	$13,956	27.2%	40.0%	0.70
3	Ozaukee	70.7	$212	$19,877	24.3%	25.9%	2.18
1	Pepin	7.3	$1,474	$10,750	100%	28.2%	1.50
1	Pierce	34.7	$776	$12,655	54.9%	27.0%	8.15
1	Polk	35.0	$697	$11,708	92.4%	7.6%	3.53
2	Portage	59.2	$575	$12,673	49.2%	37.5%	1.48
1	Price	16.5	$365	$11,976	80.1%	19.9%	0.95
3	Racine	171.7	$147	$15,424	20.6%	48.2%	1.16
1	Richland	17.3	$1,114	$9,801	71.4%	28.6%	2.72
3	Rock	135.2	$316	$13,975	22.9%	37.4%	1.37
1	Rusk	15.7	$591	$10,321	73.9%	26.1%	1.61
2	Sauk	46.1	$765	$12,583	61.6%	12.7%	2.66
1	Sawyer	14.2	$421	$9,640	100%	19.6%	0.79
1	Shawano	40.9	$989	$9,941	79.6%	13.4%	0.86

1987 Class[a]	County Name	1987 Pop. (000)	1987 Per Cap. Farm Income	1987 Per Cap. Non-farm Income	1990 Percent Rural Pop.[b]	1990 % Tot. Pop. in Lrgst. City[c]	1980 Commut. Out/In Ratio[d]
1	Adams	14.3	$1,056	$9,117	100%	10.9%	2.58
1	Ashland	17.1	$190	$10,758	47.4%	53.3%	0.59
1	Barron	41.1	$910	$11,111	73.0%	19.6%	0.69
3	Sheboygan	102.4	$238	$14,868	34.7%	20.4%	4.83
2	St. Croix	48.1	$769	$15,519	67.5%	12.7%	1.10
1	Taylor	19.1	$1,027	$10,749	77.3%	22.7%	1.12
1	Trempealeau	26.2	$1,590	$10,698	100%	5.9%	1.34
1	Vernon	26.6	$1,112	$9,933	84.7%	15.3%	1.95
1	Vilas	17.6	$113	$11,783	100%	7.8%	1.31
2	Walworth	72.9	$501	$14,013	59.7%	13.6%	1.83
1	Washburn	13.9	$485	$10,291	100%	17.9%	1.22
3	Washington	90.9	$237	$15,565	49.2%	25.1%	2.34
3	Waukesha	295.1	$77	$18,515	21.9%	18.7%	1.56
2	Waupaca	45.4	$773	$12,351	68.3%	10.8%	1.11
1	Waushara	19.7	$1,096	$11,086	99.7%	9.2%	5.90
3	Winnebago	136.7	$144	$14,694	18.3%	39.2%	0.68
2	Wood	78.8	$332	$13,832	46.1%	25.6%	0.28
WISCONSIN TOTAL		4,806.8	--	--	--	--	--
WI Average		67.7	$671	$12,185	63.9%	26.0%	1.90
WI Standard Dev.		119.5	$494	$2,247	27.7%	15.0%	1.41
RURAL TOTAL		843.2	--	--	--	--	--
Rural Average		22.2	$867	$10,586	83.9%	21.2%	2.20
Rural Std. Dev.		11.1	$532	$896	16.3%	11.0%	1.64
SUBURBAN TOTAL		894.0	--	--	--	--	--
Suburban Avg.		52.6	$642	$13,020	54.2%	22.7%	1.54
Suburban Std. Dev.		21.0	$306	$1,082	11.2%	13.0%	0.78
METRO TOTAL		3,069.6	--	--	--	--	--
Metro Average		191.9	$238	$15,096	26.8%	41.1%	1.56
Metro Std. Dev.		205.0	$169	$1,992	14.1%	15.4%	1.16

Footnotes to Appendix Table 4.

[a] County Class: 1 = Rural; 2 = Suburban; 3 = Urban.

[b] Rural population refers to the 1990 U.S. Census designation of the percentage of county population living in rural places.

[c] The 1990 population of the county's largest city is shown as a percent of total county population.

[d] The ratio of people who commute out of the county versus people who commute into the county to work.

Source: 1987 population is from the WI Department of Administration, Official Population Estimates, 1988; Income is from the U.S. Bureau of Economic Analysis, 1990; 1990 population information is from the 1990 U.S. Census; Commuting patterns are from the Applied Population Laboratory, University of Wisconsin, 1984.