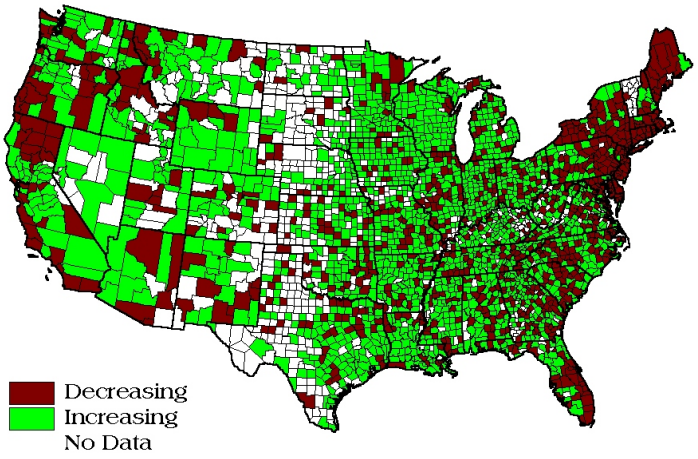
The Relocation of Industry

by

Frederick M. Zimmerman



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About the Investigator:

Dr. Fred Zimmerman is Professor of the Manufacturing Systems Engineering and International Management at the University of St. Thomas in St. Paul, Minnesota. Prior to returning to academia in 1985, Dr. Zimmerman had spent over 25 years in industry as an engineer, manager, vice president and president and he has served on the boards of directors of 15 corporations. He is the author of numerous professional and technical articles plus the McGraw--Hill book entitled THE TURNAROUND EXPERIENCE: REAL WORLD LESSONS IN REVITALIZING CORPORATIONS and MEASUREMENT OF THE INDUSTRIAL ECONOMY published in 1995 by the St. Thomas Technology Press. His is now completing a new book to be titled THE RELOCATION OF INDUSTRY which will discuss the gradual migration of industry throughout the US. He has taught at Universidad Catolica in Montevideo, Uruguay and at the Czech Management Center in Celovice, Czech Republic. Dr. Zimmerman resides in Minnetonka with his wife, Joanell. The Zimmermans have five children and have housed over seventy foster children.

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INTRODUCTION

Within the framework of a robust and prosperous economy is the undeniable fact that industry is gradually relocating. Sometimes it is relocating to suburban areas surrounding major cities, sometimes to smaller towns and sometimes overseas. Often, it is relocating in search of lower costs - whether they be real or perceived, or because of proximity to emerging customers but quality of life issues and the availability of dependable labor also influence industrial location. The movement of manufacturing is gradual and not constant. Manufacturing employment increases during times of recession and expands during periods of economic expansion. Importantly, these fluctuations are not cyclical aberrations of the same trend. There are many gradual, inconsistent, slow moving and discernibly separate trends, each with something to say about how we understand our industrial future. Yet, there are two very noticeable trends that have relevance to our social policies - the gradual movement away from core cities and the gradual expansion to smaller communities with specific attributes in selected rural and suburban sections of the United States.

It is fruitful to examine industrial relocation as consisting of these two distinct trends: the gradual decline of manufacturing within cities and gradual build up of manufacturing in hinterland regions. Some states are participating in both of these trends. Wisconsin is a good example. Wisconsin gained 32,000 manufacturing jobs from 1987 to 1992 while Milwaukee County lost 8,400 jobs. Other states, such as Tennessee and Kentucky, were able to enjoy more-or-less continual outstate expansion without severe losses in major core cities. Still other states, such as New Jersey, experienced the decline in core city manufacturing jobs with no appreciable offsetting outstate expansion.

The average life of a manufacturing plant is long - probably about 70 years. Hence, the term «relocation» does not exactly describe what is happening in manufacturing. It isn't always that major employers are actually picking up stakes and moving from core cities to small towns, though some of that is happening. Within the core cities, there is widespread death and shrinkage. In outstate areas, there is selective birth and expansion. The actual amount of true relocation is not trivial yet it is quite small.

The ramifications to public policy resulting from these two distinct trends are substantial, yet their importance is perhaps disguised by the fact that our economy has been so healthy for the last few years. It is true that a core city can continue for a few years after its industry declines by selective expansion into services; but ultimately, the services follow industry. Major law and accounting firms may keep their downtown addresses for several years after their clients gradually move away; but over time, these industries also follow markets. The welfare to work programs enacted by Congress and state legislatures during the 1990s may be especially affected by industrial

relocation in ways unnoticed because the economy of 1994 to 1997 has been so robust. However, the decline of metropolitan transit systems, the escalating cost of real estate in areas where industry might like to expand, and the gradual aging of manufacturing establishments within core cities might make welfare to work difficult to achieve in the next serious recession. Heaped upon these conditions are the endemic problems of the US education system which overly emphasizes but does not achieve preparation for college while simultaneously failing to provide large segments of the population with even the most necessary basic skills.

The purpose of this report is to describe industrial relocation and explore it for its impact on community economics and public policy. Is there much movement? What characteristics represent attractions to industry? What are the repelling forces? Does it matter if industry leaves or stays? What might we do to improve our situation? These are some of the questions we will attempt to answer in our report.

The report is divided into ten sections. Section I provides a brief overview of how manufacturing is measured. Section II discusses how manufacturing location is changing the industrial, social and economic landscapes of the United States. In some ways, it is an encouraging picture for there are clearly instances where highly vibrant new industrial communities are emerging. Section III discusses Minnesota as a sample case. Section IV discusses some of the causes of industrial change. Section V contrasts some of the industrial winners and industrial losers. It describes characteristics of the communities most successful in expanding their industries and compares them to the characteristics of other communities. Section VI evaluates the relationship between prosperity and the presence or absence of individual industries. Section VII probes some of the problems that might evolve from the crisis in foreign financial markets. Section VIII critiques commonly held beliefs about our economy and the way it operates. Section IX examines the social dimension of manufacturing. Section X probes some of the policy initiatives that may be helpful or harmful in attracting and retaining industry. The appendix provides a review of research methods.

SECTION I -- HOW MANUFACTURING IS MEASURED

For most of the 1990s, the health of US manufacturing has been good. However, this good fortune is not universal. Some industries are faring better than others and those that are faring well are not guaranteed to last. Some communities see their industries shrink while others witness robust expansion. And, things change quickly. The prosperity we experience is, to some degree, a function of highly variable exchange rates over which we have only limited control and how to exercise even that control is a subject of great debate. Manufacturing is fluid, varied, cyclical and technically dynamic. It is interspersed with a variety of social as well as business considerations. Any study of industrial progress or shrinkage, by its very nature, must embrace manufacturing technology, investment, sociology, engineering, business management, finance and governmental operations. The success of US manufacturing is important to the welfare of all of us.

Ways of Measuring Manufacturing Expansion and Contraction

In general, manufacturing is becoming more geographically dispersed. The nation's most successful steel company has plants in several predominantly rural states, but none in Pittsburgh. The latest and most modernized auto plants are no longer in Detroit, but are in places like Georgetown and Louisville, Kentucky, and Smyrna, Tennessee. Computer manufacturing, once concentrated in a few urban centers, has now spread out to some of the most rural sections of the United States such as South Dakota, as well as many locations overseas. In general, these changes are gradual; but for some communities, they are precipitous.

Fortunately for elected officials, there are many ways to measure manufacturing expansion and contraction. It is possible to select a favorable indicator for nearly every state and community in the country. The wide variety of available statistics provides policy makers with the opportunity to see what they want to see and for them to convey these images to their constituencies. Yet, the available statistics contain some contradictions and some importantly subtle nuances and we should examine these measures so that we might understand the shortcomings and advantages of each.

Manufacturing Employment

Manufacturing employment is a useful measure that <u>should</u> provide us information about manufacturing expansion and contraction under usual conditions. However, there are problems with this measure, especially in view of the long-term US trend from higher-paid industries to lower-paid industries. In some cases, overall manufacturing employment has grown while a downturn in employment has taken place in higher-paying industries. In some cases,

the shift to lower value-added industries cancels out the gains apparent in employment statistics. Another problem with the manufacturing employment measure is that the distinction between full and part-time employment is not statistically concrete. What many state departments of economic security are actually measuring is the number of jobs, not full-time employment. That many of these jobs have recently become temporary or part time is not apparent in the statistics. If manufacturing employment is used as a measure, it is especially important to consider it at the industry level. Even then, we should examine it with caution.

Manufacturing Payroll Dollars

Manufacturing payroll dollars is a much more useful measure for examining industrial expansion or contraction. This measure irons out the problems in labor and industry classifications endemic in manufacturing employment figures. The disadvantage of the manufacturing payroll dollar measure is that it improves almost every year because of even modest inflation in our economy. We can compensate for some of the inflationary increase in manufacturing dollars by using some of the deflators made available to us by the U.S. Department of Commerce but the use of these deflators does add some confusion. The complaint has been made that some of the cost of living indices and other price indices overstate the real rate of US inflation. Nonetheless, manufacturing payroll dollars is a measure that is useful in comparing one community to another -- particularly to examine relative rates of change over time. If correction for inflation can be approximated, it is one of our most useful measures in assessing long-term performance.

Manufacturing Value-added

Manufacturing value-added is one of the most useful measures of industrial output. Value-added is the basis of most European tax systems, and it is a concept that can be useful in analyzing industrial trends in the United States. In its simplest form, value-added is revenue minus the cost of materials and a few specific outside purchases directly associated with production. No labor expense is included in manufacturing value-added. It is, therefore, an excellent measure of the true value of industrial activities achieved through the application of land, labor and capital. Unfortunately, the Census of Manufacturers, which is the main source of manufacturing value-added data , is conducted only every five years in the US and the processing time is quite long so we are frequently using data that is a bit old. It is still a highly useful measure, however.

One characteristic of manufacturing value-added is that it varies greatly from industry to industry. Industries like aircraft, instruments and medical devices generate huge amounts of value-added while industries such as textiles and apparel typically generate little. This money generated from value-adding activities is then available for salaries, investments, to pay dividends to investors, and to make other purchases not directly associated with production. Manufacturing value-added is especially important because it provides the ultimate ceiling on the summation of wages, salaries, outside purchases, dividends and reinvestments.

Manufacturing Value-added Per Employee.

Manufacturing value-added per employee is a useful method of examining the true productivity improvements taking place within an industry or community. It is still not adjusted for inflation, but the measure remains useful both to track productivity improvements and to

compare levels of current productivity between communities and between industries.The growth rates in manufacturing value-added per employee in different communities can provide helpful comparative indications of industrial expansion or contraction.

Average Compensation Per Employee

Average compensation per employee is interesting, but is less helpful in examining competitive issues than it is in measuring industrial prowess. It is not particularly useful in examining trends other than to provide insights on a community's or a company's cost structure. Younger, thriving industries tend to have lower wages initially even if they emerge as high value-added industries later on. Often, large older cities tend to exhibit higher average wages as very small numbers of new hires fail to balance the higher wages of more senior workers. To some extent, then, average compensation per employee can be a coincident indicator of industrial shrinkage.

Compensation varies greatly between industries, however. Indeed, it can be argued that the alleged decline in the average real wage is primarily a shift from higher value-added to lower value-added industries. Though this interpretation does not mesh as well with some of the politically charged have and have-not arguments, it is useful to consider the decline in real wages from an arithmetic perspective. The differences in prosperity, from industry to industry, are very substantial (See section VI).

Financial Strength of Manufacturing Companies

The competitive position of the United States may be impacted some by public policy but it is no doubt influenced much more by the strengths, weaknesses and capabilities of individual firms operating in the international marketplace. Too often, we gloss over the capabilities of individual firms and attempt to assess the nation's competitive position on the basis of the aggregate data presented in official government statistics. That approach will not work. It is impossible to see how we can have a positive trade balance if we have an insufficient number of capable firms operating in key strategic industries. Hence, the study of the performance of individual firms is essential both to our appraisal of present economic conditions and to the formulation of policy. The integration of company data with government data has been common in Europe for many years but it is less common in the United States.

Unfortunately, we cannot be overjoyed when we examine the strengths, weaknesses and attributes of US firms participating in international trade. Some firms are both capable and strong financially but many are quite marginal -- surprisingly so considering the strength of the US economy in recent years. Our investigation will include an analysis of profit margins and balance sheet measurements of individual companies by geographic area and SIC code.

Capital Investment

Capital investment varies greatly by firm, by county and by SIC Code. Yet capital investment is a meaningful indicator of the resolve to compete effectively in the years ahead. Capital investment per employee per year varies from under $1000 to $57,000 at the 2 digit SIC Code level and it varies from $2400 to $20,000 from state to state. Understandably, value-added increases with capital investment and average pay increases with value-added so capital investment is a prosperity enabling activity.

Manufacturing Shipments

The value of manufacturing shipments does provide a proxy indicator of manufacturing activity but there are many exposures to using it as a primary measure. At this time, during an age of escalating outsourcing, shipments (or revenue levels) do not distinguish between real manufacturing activity and mere pass-through transactions. It is rather surprising, and in some cases alarming, that so many well-known branded products are never created or built by the company owning the brand. Some outsourcing is prudent management but the extent of it at this time seems to be creating what *Business Week* called "the hollow corporation". It is for these reasons that manufacturing shipments is most effective as a measure when blended with other measures.

Manufacturing shipments does tell us something about cost structures, however. In particular, it is useful for examining the importance of labor cost and materials to the ultimate selling price of the product. As with value-added, a main source of these data is the Census of Manufacturers which is useful but not published very often.

Subjective Data and Plant Visits

The analysis of something as important as the strength of the industrial sector of the world's most prosperous nation cannot rely on government data alone. Field work and personal observation is required. The quality and capability of manufacturing establishments varies greatly. Some manufacturing establishments have the same square footage and the same number of employees as others but they are neither well-managed nor well-equipped. Methods may be world-class or antiquated and ineffective. People may be motivated or turned off. Hundreds of plants in many states and several countries were visited by those of us who were working on the study during the time this study was in progress. The subjective information gained as a result of these visits was very useful in interpreting narrative information and in providing information that is not in the officially published data. In some cases, the subjective information was the most valuable information of all.

Other Measures

Other measures, together with narrative information and special studies,will be discussed in this manuscript, but the above five will be referred to often in our examination of manufacturing.

SECTION II -- HOW INDUSTRIAL LOCATION IS CHANGING

In general, manufacturing is becoming more geographically dispersed. The nation's most successful steel company has plants in several predominantly rural states, but none in Pittsburgh. The latest and most modernized auto plants are no longer in Detroit, but are in places like Georgetown and Louisville, Kentucky, and Smyrna, Tennessee. Computer manufacturing, once concentrated in a few urban centers, has now spread out to some of the most rural sections of the United States such as South Dakota, as well as many locations overseas. In general, these changes are gradual; but for some communities, they are precipitous.

The Long Gradual Migration

Industry is gradually migrating away from the urban centers of our nation to more rural settings. In 1979, the 24 largest manufacturing counties in the United States accounted for approximately 30 percent of the nation’s manufacturing payroll. By 1993, the percentage had dropped to 26 percent (Figure I-1). Conversely, in 1979 the smallest 2,085 counties accounted for only 15 percent of manufacturing payroll, but this expanded to 18 percent by 1993. The condition, by group, was general; the larger community groups declined -- the smaller the community groups grew in their fractions of the nation’s total manufacturing payroll.

Figure III 1

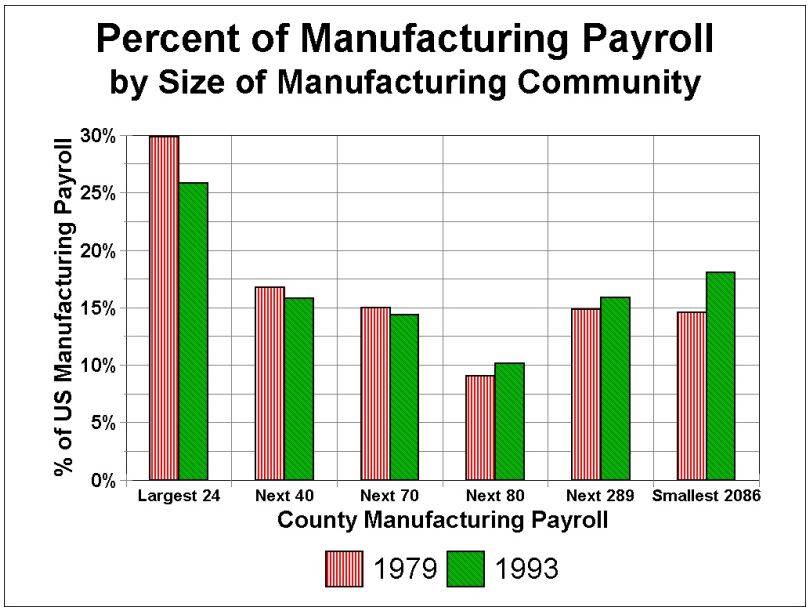
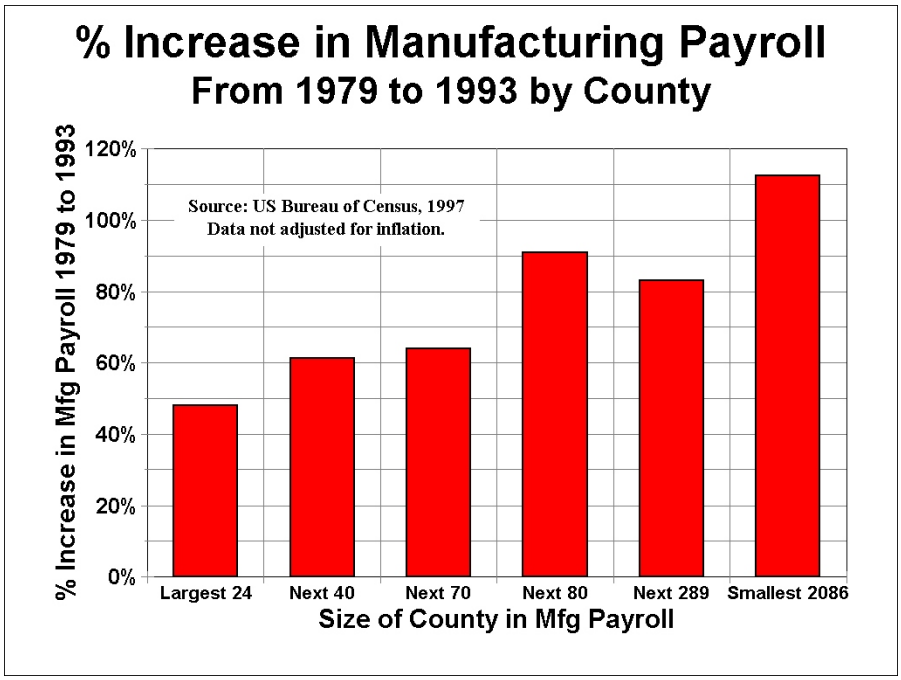


Figure II-2 provides a better way of looking at the same data. During the 14 years from 1979 to 1993, manufacturing payroll increased by 45 percent (not adjusted for inflation) in the 24 largest manufacturing counties, but grew by 112 percent in the smallest, with the other groups falling in between exactly in the inverse of their size positions. The largest communities grew less, and the smallest communities grew more. Of course, adjusted for inflation, the larger communities suffered real declines because actual inflation increases during the 1979 to 1993 period should have seen wages rise by 74.5 percent. Real manufacturing payroll declined by about 18 percent in the largest manufacturing counties and rose by about 21 percent in the group representing the smallest communities.

Figure II-2



The huge declines in the manufacturing employment of core cities have been evident for many years. What has not been adequately covered is the magnitude of these declines and the nature of the shifts in manufacturing employment. It is a much more complicated movement than simply a shift from core city to suburb, for many of the suburbs are losing as well. In addition, there is considerable evidence that strong correlations exist between the viability of local industry and the strength of the service sector -- which has not proven to be as much of a savior as people might wish to believe. Still, a review of the actual changes will be of interest to us.

From 1980 to 1990, manufacturing employment decreased substantially in major core cities across the United States. Cook County, Ill. (Chicago), lost 162,000 manufacturing jobs. Wayne County, Mich. (Detroit), lost 77,000 and Cuyahoga County, Ohio (Cleveland), lost 62,000. Table II-1 shows changes in both manufacturing employment and manufacturing establishments in some of the larger manufacturing counties during the 1980s.

Trends in the loss of manufacturing employment in major cities have continued in more recent years. From 1988 to 1995, similar losses took place in major cities during what was a generally upbeat economic period. During this economically healthy era, Cook County, Illinois (Chicago) lost 74,282 manufacturing jobs or 14.7 percent. Philadelphia lost 34 percent, Baltimore 31 percent, Brooklyn 33 percent, and Union County, New Jersey 27 percent. The data for 1988 to 1995 is more recent than the data from 1979 to 1993 but it does show a continuation of the major trends evident in the earlier data. Major cities are losing ground in manufacturing employment to the degree that the social fabric of these communities will be further impacted -- particularly if a recession should develop.

Table II-1
Changes in Manufacturing Establishments and Employment during the 1980s

County	Mfg. Establishments 1977	Mfg. Establishments 1987	% Increase Mfg Estab 1977 to 1987	Mfg. Employment 1980	Mfg. Employment 1990	% Incr. Mfg. Emp 1980-1990
Cook, IL	11,303	9,450	-16.39%	612,828	450,897	-26.42%
Wayne, MI	3,480	2,843	-18.30%	277,858	200,359	-27.89%
Cuyahoga, OH	3,643	3,079	-15.48%	189,034	127,403	-32.60%
Allegheny, PA	1,736	1,627	-6.28%	131,717	73,852	-43.93%
Kings, NY	4,201	3,002	-28.54%	153,811	108,538	-29.43%
Philadelphia,PA	2,816	1,887	-32.99%	130,373	88,466	-32.14%
Milwaukee, WI	1,792	1,683	-6.08%	140,534	98,715	-29.76%
Queens, NY	2,710	2,415	-10.89%	152,046	111,480	-26.68%
Fairfield, CT	1,978	1,796	-9.20%	125,291	87,788	-29.93%
Harris, TX	3,707	4,078	10.01%	221,613	186,780	-15.72%
Erie, NY	1,405	1,310	-6.76%	108,541	76,375	-29.63%
Hartford, CT	1,676	1,733	3.40%	114,011	82,521	-27.62%
Middlesex, MA	2,741	2,793	1.90%	171,513	141,253	-17.64%
New York, NY	13,289	8,270	-37.77%	118,373	91,854	-22.40%
Hamilton, OH	1,709	1,675	-1.99%	100,702	74,952	-25.57%
New Haven, CT	1,629	1,795	10.19%	108,879	85,770	-21.22%
Los Angeles, CA	21,119	19,753	-6.47%	884,139	861,337	-2.58%
Worcester, MA	1,505	1,469	-2.39%	102,288	82,397	-19.45%
Monroe, NY	968	1,029	6.30%	117,634	98,050	-16.65%

The patterns of industrial movement are often better displayed on a national scale which we have portrayed on the next few pages. Here, again, we has used the county as the principal unit of analysis because it is at that level that the most interesting changes are taking place. Alaska and Hawaii have been excluded from our maps to simplify the presentation of data. Although some manufacturing does take place in each of these states, their inclusion does make the lower 48 state maps more difficult to read. The counties, particularly the eastern counties, are small enough already. The key points we would like to make are the following:

- Manufacturing still provides a big payroll
- Payroll increases are more broadly distributed
- Percent increases in manufacturing payroll vary greatly
- The decline in manufacturing establishments is severe in some areas
- Average pay is still high in the traditional manufacturing regions
- The patterns within states are similar to national patterns

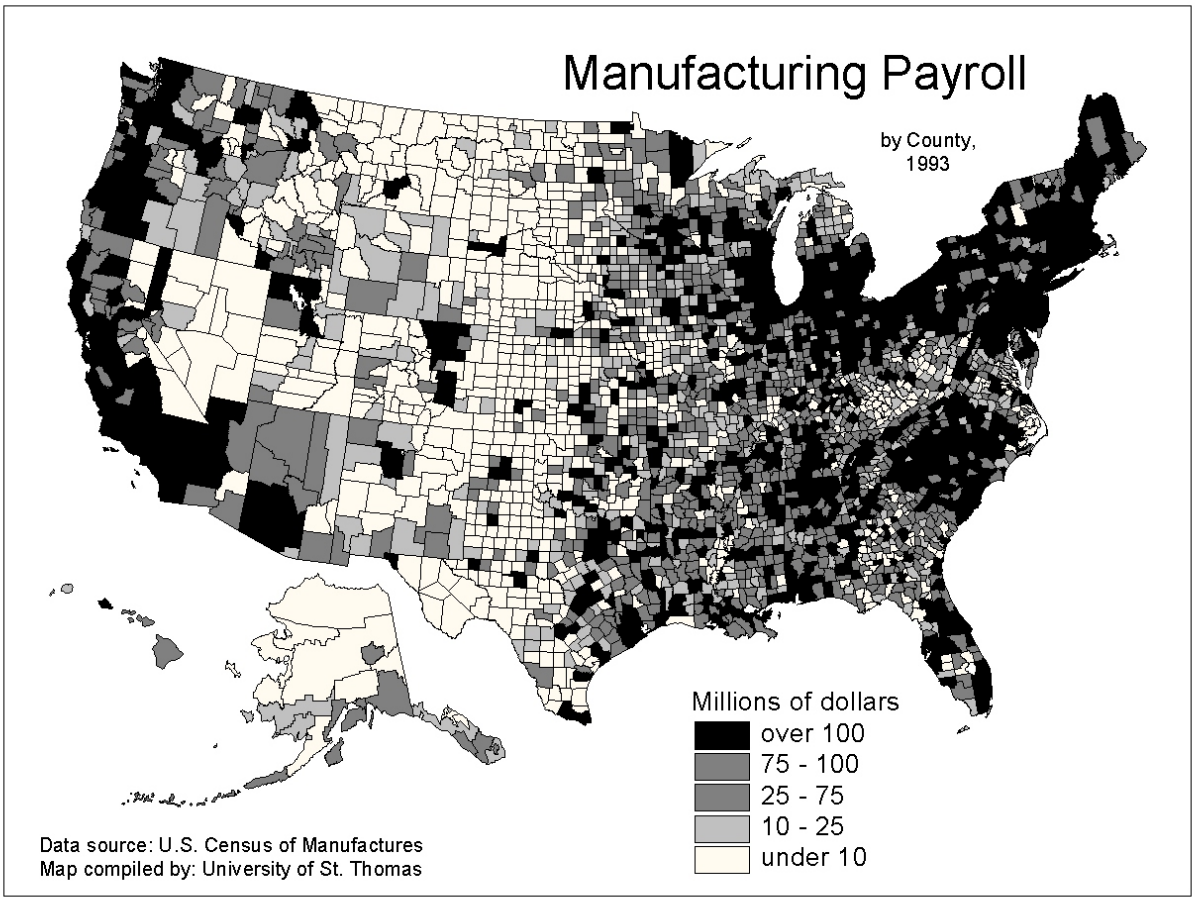
Manufacturing still provides a big payroll

It is difficult to comprehend how major cities can sustain the losses in manufacturing employment that they have been experiencing in the past 20 years. Perhaps they can, but the loss in employment dollars is substantial, and the social impact of these losses will have to be tested through the next recession. However, we must recognize that manufacturing has

been a large share of the economies of major cities for many years. Manufacturing is still significant in its ability to provide both jobs and moneys to core communities. Though the payrolls are shrinking, they are still big. The question that arises is what will happen when they shrink more.

Figure II-3 shows the distribution of manufacturing payroll by county throughout the United States. The map requires interpretation because the western counties are far larger than most eastern counties. For instance, San Bernadino County, Calif., is approximately 20 times the size of Rhode Island. Still we can see that the manufacturing payroll is substantial east of the Mississippi and north of the Ohio rivers. However, this industrial region is now being joined by new industrial concentrations in the South, the Southwest and the Pacific Northwest.

Figure II-3



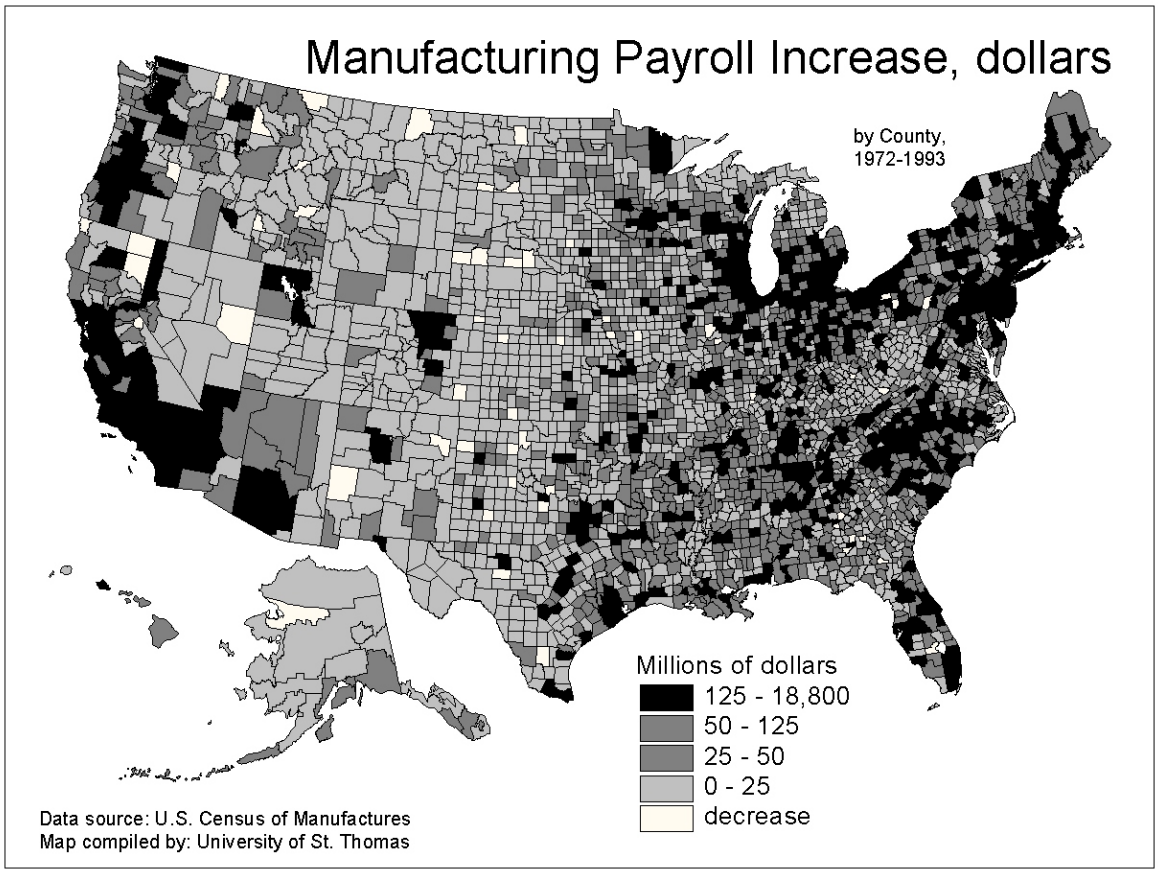
Payroll increases are more broadly distributed

Percent increases in manufacturing payroll are more broadly distributed than manufacturing payroll dollars. There are concentrations, but Figure II-4 shows how many of the payroll increase dollars from 1979 to 1993 were dispersed into regions not commonly thought of as

heavy manufacturing areas. Areas such as North Carolina, Tennessee, northern Alabama, Oregon and Arizona all enjoyed considerable dollar expansion in their manufacturing payrolls. From 1979 to 1993, manufacturing- oriented Illinois, Michigan and Ohio saw their manufacturing payrolls expand by about $10 to $11 billion dollars. During the same period, North Carolina's manufacturing payroll increased by 11.7 billion, Texas by $14.8 billion and California by $32.1 billion. All three of these emerging states saw greater dollar increases in their manufacturing payrolls than the second largest manufacturing state in 1979, New York.

Still, manufacturing remains an important economic force in many of its historical home communities. New York saw its manufacturing payroll increase by $9.4 billion from 1979 to 1993. Such progress is significant and should be appreciated when it occurs.

Figure II-4



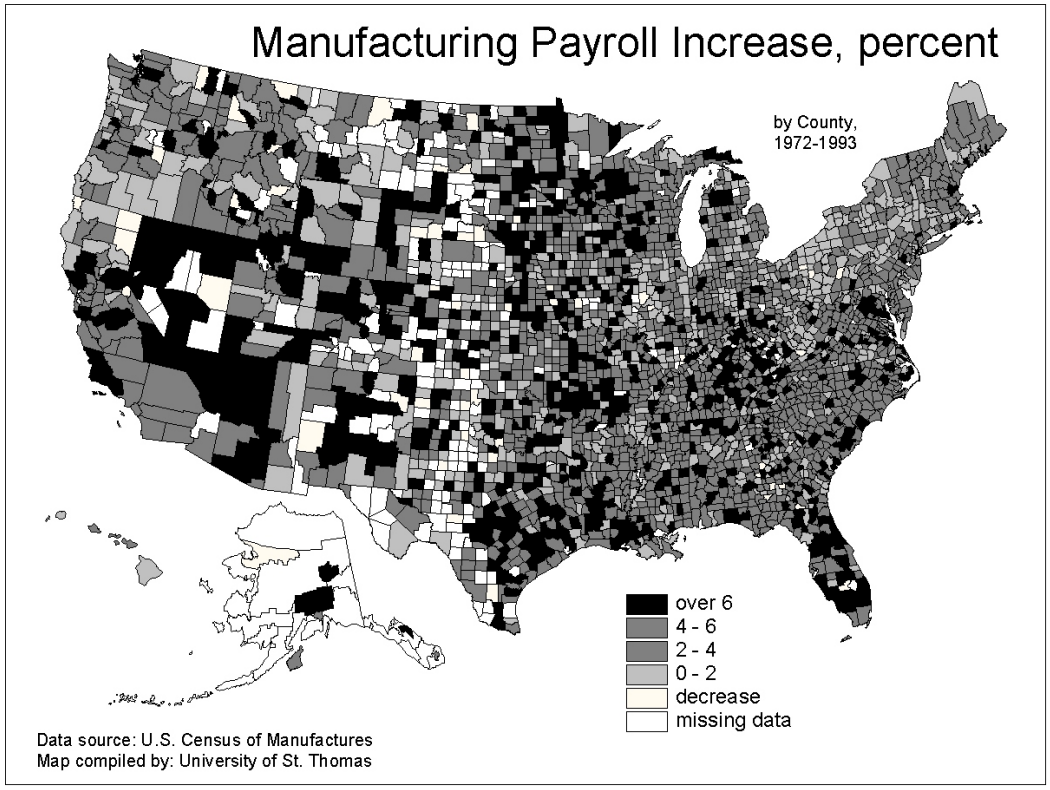
Percent increases in manufacturing payroll vary greatly

Percentage increases in manufacturing payroll vary considerably from state to state and from county to county. From 1979 to 1993, the United States increased its manufacturing payroll by 71 percent, slightly less than the rate of inflation, which was about 75 percent. However, the major industrial states such as New York, Illinois, Ohio and Pennsylvania were low with

percentage increases of 37 percent, 45 percent, 44 percent and 31 percent respectively. In contrast, the manufacturing payrolls of Florida, Georgia, Idaho, Colorado, North Carolina, Virginia, Arkansas and Tennessee all increased by 109 percent or more.

The variation at the county level was much greater, of course. The manufacturing payroll in Allegheny County, Pennsylvania (Pittsburgh), decreased by 16 percent from 1979 to 1993 while Kings County, N.Y. (Brooklyn), and Lake County, Ind., experienced declines of 11 and 18 percent. During the same period, manufacturing pay increased 279 percent in Madison County, Alabama, 175 percent in Winnebago County, Wisconsin, and 478 percent in Gwinnett County, Georgia. In total, the smaller manufacturing communities experienced a 112 percent increase in manufacturing payroll while the major urban counties averaged around 55 percent. These dramatic percentage increases are not the result of small changes on a small base. Madison County, Ala. (Huntsville), now has a manufacturing payroll approximately equal to that of Baltimore -- a major manufacturing center in the East.

Figure II-5



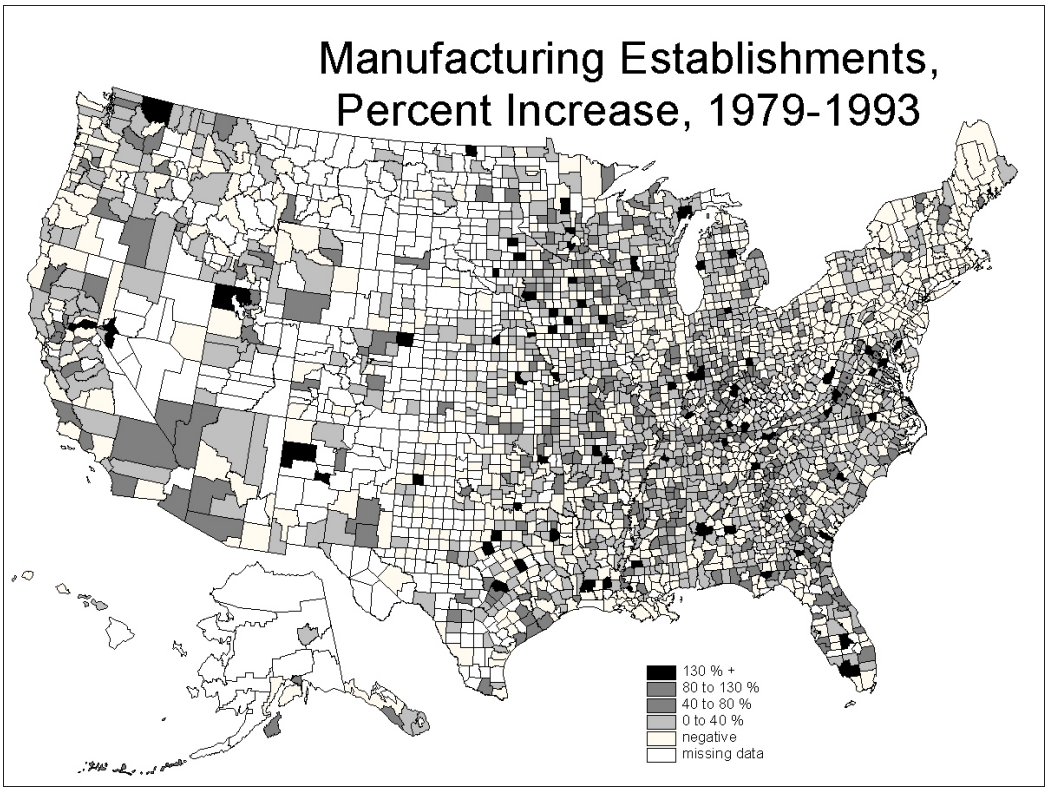
The decline in manufacturing establishments is severe in some areas

Perhaps more alarming than the steep drop-offs that some communities are experiencing in manufacturing employment are the declines in the number of manufacturing establishments. From 1979 to 1993, the number of manufacturing establishments declined by 26 percent in Massachusetts, 30 percent in New Jersey, 24 percent in Pennsylvania and 31 percent in Con-

necticut and New York. Similar but less severe declines took place in Illinois (18 percent), Ohio (12 percent) and Missouri (11 percent) and some other states. But during the same period, the number of manufacturing establishments grew by 6 percent in Indiana, 8 percent in Georgia, Wisconsin and Washington, 9 percent in Colorado, 10 percent in Florida, 20 percent in New Mexico, and 33 percent in Arizona.

Much more dramatic changes have taken place at the county level. The number of manufacturing establishments declined by 35 percent in 20 major manufacturing counties, while increases of 20 percent or more were achieved in many (but by no means all) smaller communities. In general, manufacturing establishments are migrating away from the Middle Atlantic and New England states and California to the more rural areas of the country. Some parts of the Midwest have experienced declines, but not all. Illinois' statewide decline of 18 percent slips to 5.6 percent without Cook County (Chicago). By excluding the declines in a few specifically declining industrial centers, Illinois' manufacturing establishment growth would be positive.

Figure II-6

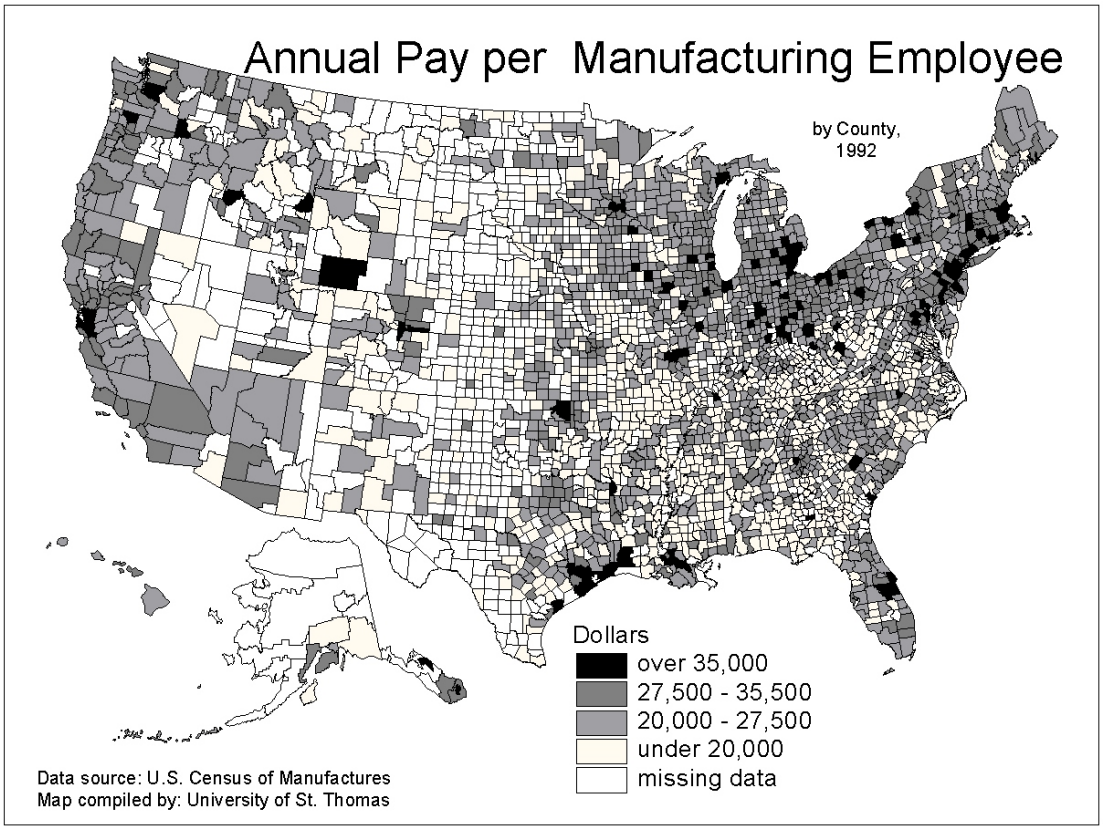


Average pay is still high in the traditional manufacturing regions

Although manufacturing is losing ground in some of the traditional manufacturing regions of the country, manufacturing pay is still positive. New Jersey is an example. New Jersey lost 17 percent of its manufacturing employment from 1987 to 1992, but maintained an average annual pay per employee in manufacturing of $35,918 (in 1992) -- higher than any states but Delaware and Michigan. This decline in manufacturing employment while manufacturing pay increases is not an unusual phenomenon when retrenchments are taking place. Often, the more senior personnel are retained as the company downsizes to meet competition or to prepare for ultimate relocation to another region. Thus, both manufacturing pay and manufacturing employment have to be examined together to gain a proper assessment of what might happen to the industrial economy of the future.

To some extent, this combination of retention of more senior personnel with higher salaries together with attractive opportunities in other communities may make the relocation alternative appear better than it really is. As a practical matter, pay in many professions is related to seniority and experience. If the comparisons are being made between a higher paid older work force in an established community and newer recruits in an emerging community, the cost differences being compared may be reduced over time as the work force in the new location gets older and accrues more experience. Still, the pay differences in 1992 were pronounced as shown in Figure II-7.

Figure II-7

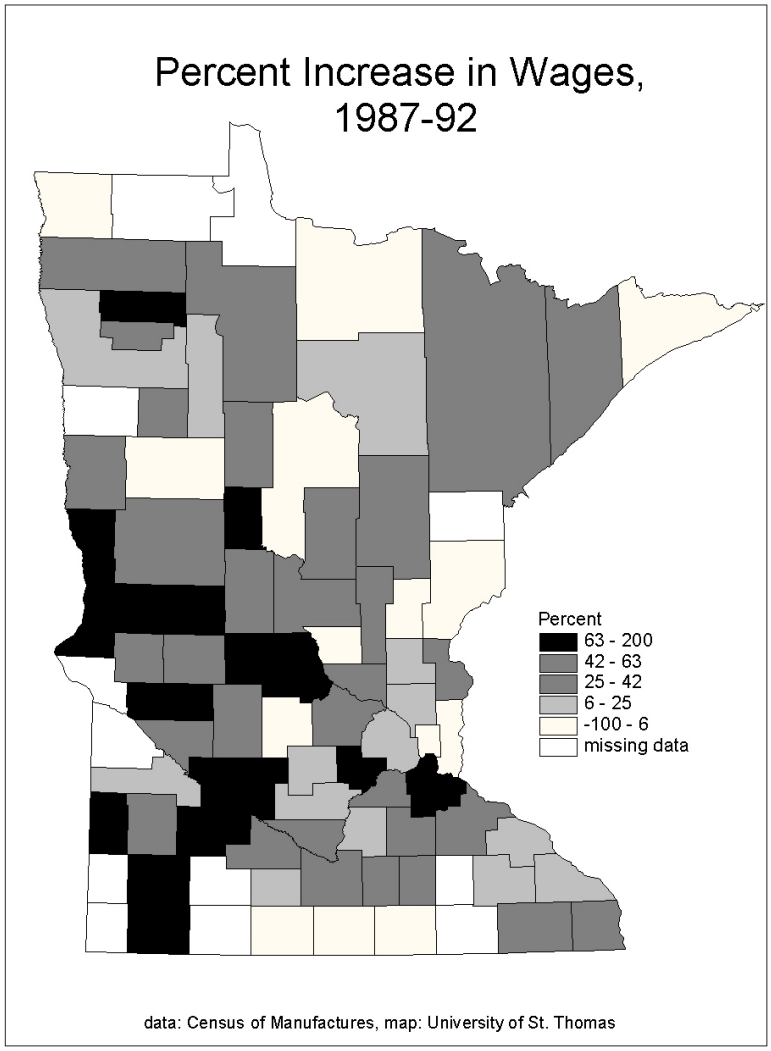


The patterns within states are similar to national patterns

Just as industry is migrating away from cities in the more heavily populated Eastern states, so also is this happening in other regions. As an example, from 1987 to 1992, Minnesota's industrial employment grew by 17,100 employees or 4.6 percent. Ramsey County (St. Paul) lost 4,400 manufacturing jobs or 6.4 percent. Even more interesting were the 6,800 manufacturing jobs lost in Hennepin County, which covers a much larger land area with many industrial enclaves including Minneapolis. But employment surged in nearby Dakota, Scott and Carver counties an average of 53 percent. Further north, Stearns County (St. Cloud) employment increased by 41 percent. Steele County, in the southern part of the state experienced an increase of 31 percent.

Figure II-8 shows Minnesota's percent increase in wages by county from 1987 to 1992.

Figure II-8



Foreign Investment is Important

Whether we prefer the situation or not, the fact of the matter is that foreign investment has played a hugely important role in the resurgence of US manufacturing in the late 1980s and early 90s. Of course, we have to situate this period of prosperity within the appropriate industry. The expansion of the last 12 years has been highly influenced by the relative prosperity and expansion of two major industries, automotive and aircraft. The US auto industry, in particular, has benefited from aggressive foreign investment. The United States has actually lost ground in important industries such as ship building, electrical generation equipment, machine tools, and perhaps even software. But during the past 12 years, this country has sold a lot of automobiles and aircraft and the states and industries that serve these two important end markets have prospered greatly. Indiana, for instance, has enjoyed great prosperity during this period, and that prosperity will no doubt continue if cars continue to sell. Indiana has many manufacturing strengths, however, and so the state will no doubt carry on as an important manufacturing region in any case. It is, for instance, one of the leading suppliers of medical devices. But, if there should be a decline in auto sales, Indiana will no doubt be affected because so much of its industry still serves that important market.

Minnesota, in a manner perhaps unknown to the average citizen, is also tied to both automotive and aircraft. We do not have any major airframe manufacturers in the state of Minnesota but we have a huge number of suppliers in the form of Remmele, Honeywell, Kurt Manufacturing, Rosemount, Hitchcock, and others. Any serious spacing out of aircraft orders due to the slowdown in Asia or to other problems, will no doubt impact Minnesota. We should recognize also that Toyota is building a huge truck plant in Indiana which is quite likely to ultimately compete with the Twin Cities Ford plant built in 1925.

Some of Indiana's strength of the past decade has been its ability to attract foreign investment. Indiana boasts that it is home to 50 investments from the United Kingdom, 47 from Germany, 29 from France, 24 from the Netherlands, 9 from Sweden, 8 from Italy, 7 from Ireland, 5 from Belgium, 34 from Canada, and 190 from Japan. Investments have also been made from Australia, Austria, Brazil, China, Denmark, Finland, Greece, Israel, South Korea, Taiwan and Yugoslavia (Cinergy, 1998). Minnesota has no doubt had foreign investments as well but at this point, we are unsure of the actual count.

Summary - Manufacturing's Gradual Migration

In summary with respect to manufacturing growth, the nation is gradually changing to the degree that social consequences are quite likely for some communities in the future. Older historically important centers of manufacturing are losing their industrial employment at an alarming rate -- even during a period of robust prosperity. The two coasts are faring far worse than the Midwest, selected Western states and the top of the South. Manufacturing is migrating in two ways; from major city to hinterland and from higher value-added to lower value-added industries. The consequences could be substantial. We can gain a better insight by examining Minnesota as a sample case.

SECTION III - MINNESOTA AS A SAMPLE CASE

Minnesota is doing well at the moment, but so is most everyone else. There are states that are not fully sharing in the current US prosperity, but most are. Of course, the economy is not always this robust so it is fruitful to assess the status of the industrial base so essential to Minnesota's prosperity in the future.

Manufacturing directly accounts for only about 18 percent of Minnesota's employment, about 24 percent of the state's wages and probably around 28 to 30 percent of the state's income taxes. Yet these figures, by themselves, greatly understate the true impact of Minnesota manufacturing because manufacturing spawns so many other businesses. Minnesota has about the same percentage of employment in manufacturing as the US in total, 22.36 percent versus 22.02 percent. Professors Cohen and Zysmann, of the University of California at Berkeley, have estimated that between 40 and 60 percent of all US jobs depend upon manufacturing alone. When we consider the number of jobs in finance, wholesale trade, insurance, service and government that are categorically separate but still exist because of manufacturing, it is not hard to believe that the manufacturing sector sponsors around 1.2 million jobs in Minnesota.

Minnesota is not immune, but it has been fortunate

Minnesota has been able to avoid catastrophes such as those that have occurred in several states. Of the 49 U.S. counties with more than 2,000 manufacturing employees that suffered actual manufacturing payroll declines from 1979 to 1993, none was from Minnesota. Our most problematic situation during this period was, of course, the Iron Range -- St. Louis County. St. Louis County experienced a 48 percent decline in the number of manufacturing establishments, and manufacturing payroll increased only 15 percent versus a national average of 71 percent. But with a manufacturing employment base of only 8,000, St. Louis County was not large enough to pull down the entire state. Minnesota has many manufacturing accomplishments often cited by the media and public officials. We will mention only a few new facts.

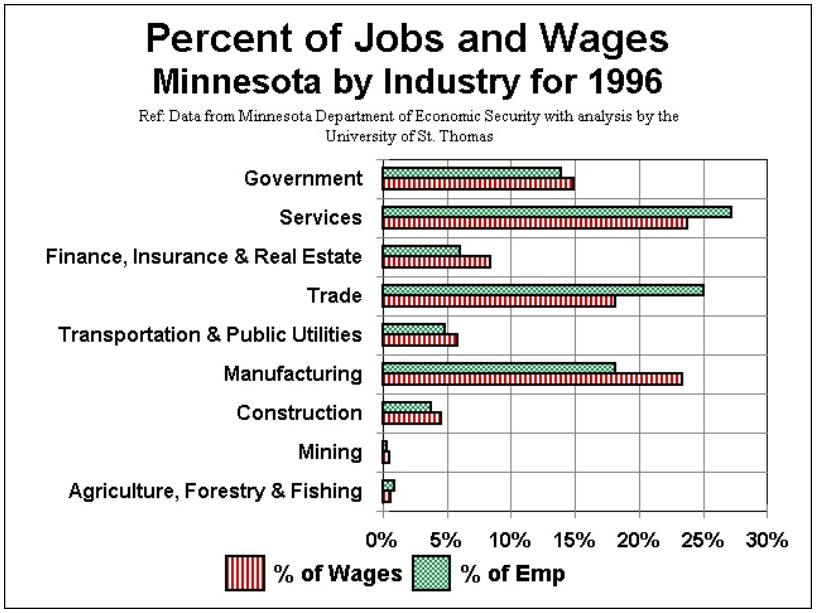
Historical concentration in high wage industries

To the employees and the general community, the variance in economic yield between industrial segments is huge. Consider these facts:

- The 38,600 employees in Minnesota's instrument industry earn a half a billion dollars a year more than the nearly 150,000 Minnesotans employed in the restaurant and bar industry.
- The 74,134 Minnesotans employed in the industrial machinery industry earned more than $3 billion in 1994 -- about half of what 444,069 people earned in retail trade.
- The 31,100 people employed in Minnesota's paper industry earned eight percent more than the 70,600 Minnesotans employed in car dealerships, auto repair and auto services.
- The 31,100 people employed in Minnesota's paper industry earned 11 percent more than all of the 45,530 Minnesotans employed in all banks and nondepository financial institutions.
- The 10,840 people employed in Minnesota's chemical industry earned almost as much as the 24,150 Minnesotans employed in real estate.

Figure III-1 displays the percent of jobs and the percent of payroll for each major industry in Minnesota. Manufacturing is the one major industry where the percentage of Minnesota's wages is much higher than the percentage of jobs. Although finance, insurance and real estate is also a high paid sector, it is not as much of a contributor to the state's payroll as is manufacturing. Nowhere is this variance industries more noticeable that in voluntary fringe benefits, which vary from about $1500 to more than $10,000 per employee per year depending upon the industry -- even within manufacturing. These differences will be discussed in more detail in a later section of our report. Our point here is that Minnesota has been fortunate. It has not only had the advantage of healthy industry, it has also had the advantages of the right industries being healthy. Strong performance on the part of Minnesota's machinery, paper, chemical, fabricated metal, electrical equipment and food industries has brought prosperity to the entire state. Our hope is that these strong performances will continue long into the future.

Figure III-1



Minnesota's hidden advantages

Beyond the most obvious statistically evident achievements, Minnesota also possesses other advantages that are less commonly discussed. Among these are historical manufacturing expertise, established manufacturing infrastructure and perceived trustworthiness.

Historical Manufacturing Expertise

Like many other industrial communities, Minnesota's historical involvement in manufacturing provides momentum for the present. Some of this expertise stems from the learned trades of immigrants who swarmed to Minnesota and other Midwestern states from 1880 through 1950 from Sweden, Germany, Bohemia, Holland, Norway and other industrial countries of Europe. These talented immigrants arrived with the work ethic and the skilled trades that the still-young U.S. economy needed. Even to this day, some of Minnesota's largest manufacturing companies evolved from the dedicated efforts of specific immigrants such as Kurt Kuban (Kurt Manufacturing), Frederick Remmele (Remmele Engineering) or Fred Berdass (Bermo). Other emerging Minnesota companies such as Honeywell and Minneapolis-Moline benefited greatly from an almost clannish attachment to certain immigrant groups and the manufacturing skills they possessed.

The emergence of agricultural equipment companies in the early twentieth century gave rise to supporting industries such as foundries, machine shops and metal suppliers. The formation of Greyhound Lines in Minnesota provided the state with expertise in bus manufacturing just as the arrival of the Twin Cities Ford Assembly Plant in 1925 brought with it state-of-the-art assembly expertise. In like manner, the emergence of prominent defense contractors in Minnesota during World War II provided the technical basis for the development of the computer industry at a later stage. This valuable experience in early computers fostered the electronic and quality expertise that was so helpful to the medical device industry. Food processors such as Land O Lakes, General Mills, Green Giant and Pillsbury provided both process industry expertise and hygiene control that spread to medical devices and other products. The ability to design and develop specialized manufacturing equipment rose in response to needs at 3M, Andersen, Honeywell and others. The major distinction to Minnesota's situation is its interactivity — how we have been able to borrow skills from one industry and apply them in another.

For the purposes of assessing the current status of manufacturing in Minnesota, these historical precedents are meaningful. Because of past expertise, we are able to do well in the present. It isn't so much brain power, it is more a matter of earlier interest and training. Our state was fortunate to have available an influx of new people who understood good machinery and how to use it effectively. In other cases, manufacturing firms rose because people sought productive alternatives to farming — the work ethic came first with the skills assimilated later. We should take care to preserve both our training and interest in manufacturing.

Manufacturing Infrastructure

Many people do not realize the tremendous variety of services, suppliers and technical specialists needed to support manufacturing. Minnesota is well provided in this regard. In order to make something as basic as a computer cabinet, for instance, one needs the availability of high-grade steel and other metals, plating capabilities, painting capabilities, tool and die capabilities, and many other services. We have a vibrant plastic injection molding industry here

in Minnesota not because plastic is more available here in Minnesota, but because we have long had a community of tool and die makers who can make the molds. The profit potential in plastic and injection molding is often related to the capability of making the molds. The actual casting process is quite competitive. Companies like Thermo-Tech, UFE, Phillips Plastics, McCourtny, Lakeland, and many others exist because we have highly capable tool and die making facilities in Minnesota. Some of these mold makers are captive branches of the companies mentioned above. Others are external, such as Custom Mold and Dynamics Engineering, among the country's most respected stand alone producers of precision plastic injection tooling. Within Minnesota, there are tens of thousands of people who understand the important techniques and methods of precision tooling and moldmaking. These capabilities are enormously important to the state because they foster and make possible success in high value-added manufacturing.

Minnesota's infrastructural strengths go well beyond tooling. We have some of the most important precision machine shops in the country here with Kurt Manufacturing, Remmele, Boring Machine Company, and others. Minnesota has one of the nation's premier metal stampers in Bermo and some nationally recognized heat treaters, such as Metallurgical Inc. We have excellent plating houses, and nationally prominent foundries such as Prospect, Progress Castings and Hitchcock. These companies make important castings for the nation's top manufacturers such as Boeing, Caterpillar, Ford, Paccar and Deere. The castings are then machined at the precision machine shops such as Kurt, Remmele or others. The array of manufacturing capabilities available within Minnesota is extensive.

Any discussion of manufacturing infrastructure should include Minnesota's many capable distributors of industrial supplies and equipment. We have top- quality, well- staffed, well-financed and highly capable machine tool distributors such as Productivity, Hegman, Machine Tool Supply and Elison. Midwestern Machinery is the third largest used equipment dealer in the US and has extensive ties to other countries. Vincent Metals is a prominent national distributor of nonferrous metals and stainless steel. Some of these distributors are among the best in the nation and they provide not only machines and supplies, but a constant refreshment of technical knowledge on advanced manufacturing processes.

These highly important infrastructural capabilities, consisting of specialized processors and manufacturers together with capable industrial distributors, have a great deal to do with Minnesota's success in manufacturing. It isn't true that everything is here, but clearly the most important elements are here -- both quantitatively and qualitatively. Quantitatively we have not one but, in most cases, several qualified suppliers or participants. Minnesota is also well provisioned qualitatively because so much of our manufacturing infrastructure is nationally distinctive. Kurt manufacturing is one of the largest precision job shops in the United States. Bermo is one of the most highly regarded metal stampers in the United States and a major supplier of computer chasses. Remmele is not only a respected supplier of precision tooling to companies such as Boeing, and others, it also has some of the largest pieces of machinery in the US and is a leader in both micro-machining and high-speed machining.

The informal networks in the Minnesota manufacturing infrastructure, are personal and extensive. The networks permeate government and education as well as industry. Many of these companies mentioned above support schools like St. Thomas, Dunwoody, the University of Minnesota and the technical colleges. Importantly, for those of us in academia, they draw us into the practical problems of the day and force us to be relevant. The vast array of technical resources is to a great extent an outgrowth of the cooperative nature of Minnesota 's important manufacturing infrastructure.

Trustworthiness

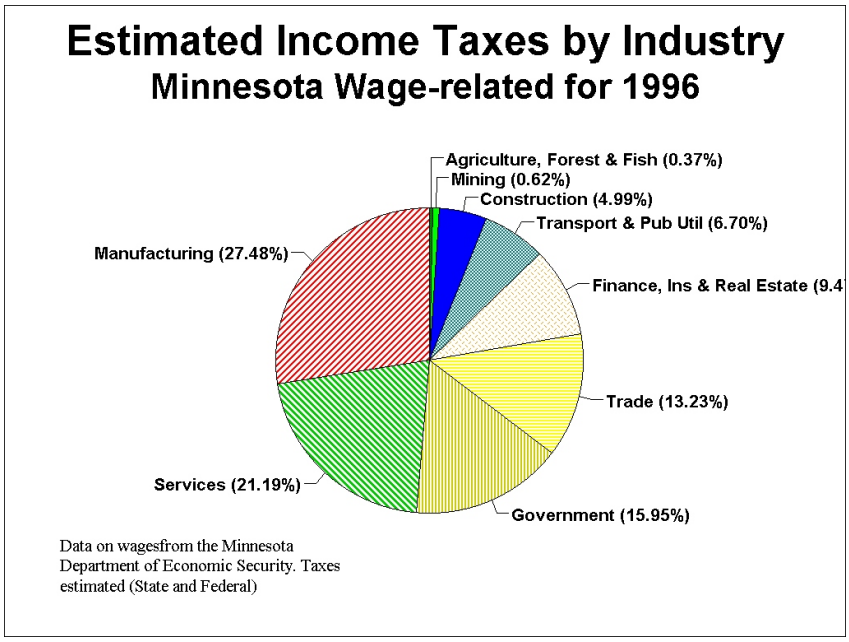
Although trustworthiness is an attribute that does not lend itself well to statistical tabulation, perceived trustworthiness is an important factor in spawning manufacturing activity. A great deal of investment is required to put a plant in place, and even more investment is needed to keep a plant competitive. Manufacturers do not like to make these investments in areas where the work force, the supplier base, the governments or the courts are perceived as being untrustworthy and these considerations provide some indication as to what it is manufacturers might look for in a place to invest. Minnesota has strengths in this area but could improve. An amateurish computation was created by doing a simple matched search using the Wall Street Journal Index where the word "fraud" was matched with the name of each state in the United States. Then the number of matched cases was then divided by the population of each state in millions. What emerged was a sort of "fraud index." Although amateurish, it illustrates differences between states and regions. Generally, the Upper Midwest does not have as many incidences of fraud that make it to the Wall Street Journal as do the Atlantic states, New England, much of the South and Southwest. Minnesota and Wisconsin have about 5 frauds per million people reported in the Wall Street Journal. New Jersey has 13, Mississippi 16, Florida 17, Nevada 18 and Arkansas 38.

Minnesota has thrived and prospered as a manufacturer because it is up and operating and is largely trustworthy. Our situation compares well with the rest of the nation -- though there is more work to do in certain areas. Now we will turn our attention to the impact manufacturing has on the rest of the Minnesota economy.

Manufacturing's Role in Minnesota's Economy

Though there are several important elements of Minnesota's overall economy, a strong case can be made that manufacturing is the single most important element. Manufacturing accounts for about 18.4 percent of Minnesota's overall employment but about 24 percent of the states payroll and an estimated 27.5 percent of state and federal income taxes paid in Minnesota. Figure III-2 shows this approximation for 1996. We estimate that manufacturing employees pay about 30 percent more than services, which has 50 percent more employees (643,000 versus 429,000 in 1996). This disproportionately high percentage of the income taxes is a natural consequence of high manufacturing employment coupled with wages that average 29 percent higher (per employee) than Minnesota as a whole. In 1996, Minnesota's manufacturing employees earned an average or $717 per week, versus $676 for construction employees, $476 for service employees and $401 per trade employee. Mining employees earned the most of any major employee group ($880 per week), and finance, insurance and real estate employees also earned more at $778. But overall, manufacturing provided the largest payroll of any major industry in 1996.

Figure III-2



Yet, even the income tax estimate probably understates the real value of manufacturing to the state's economy. Much of Minnesota's transportation employment is either directly or indirectly linked to manufacturing activity. The same could be said of wholesale trade, utilities, finance, business services, and some construction employment. Even some of Minnesota's government employment exists because of industry. Overall, we are inclined to believe Professors Cohen and Zysmann's estimate that from 40 to 60 percent of all jobs depend upon manufacturing alone.

Minnesota's Public Industrial Companies

Minnesota is headquarters to several important industrial companies and these have long played key roles in the expansion of Minnesota's economy. This advantage should not be over estimated, however, because, in reality, Minnesota's situation in this regard is much like other states.

The Moody's Industrial Database for 1997 lists 3519 publicly held corporations in the industrial sequence (primary SIC codes ranging from 2000 to 3999) of which 150, or 4.3 percent, list their headquarters as Minnesota. That is very impressive considering the fact that Minnesota has about 1.8 percent of the nation's population. However, Minnesota has many publicly held smaller companies that are just big enough to make the Moody's list. When the actual financial figures are examined, industrial companies listed in Moody's giving Minnesota as their home state account for the following percentages of the total US set:

- 1.65 % of total industrial company revenue
- 1.86 % of total industrial company cost of sales
- 2.31% % of total industrial company selling, general and administrative expense
- 2.30 % of total industrial company net income

- 1.90 % of total industrial company shareholders equity
- 2.40 % of total industrial company bankable equity (shareholders equity - intangible assets - half of inventory)

Minnesota's share of US industrial public company earning and equity are greatly benefited by the presence of 3M which has a Minnesota headquarters but operational units throughout the world. Of Minnesota's public industrial companies in 1997, the 3M Company accounted for 25 percent of revenue, 37 percent of earnings and 39 percent of bankable equity. Every state has a major leading company of one type or another, of course. But, Minnesota is a bit unique because one company is so large in proportion to the rest. Without 3M, Minnesota would be below what we might expect based on the state's share of national population.

Still, Minnesota does have other impressive industrial companies. However, many of these have their principal operations outside of Minnesota. General Mills does very little manufacturing here and, in reality, is quite a highly leveraged corporation. Medtronic is very sound financially but is only 20 percent the size of 3M. Though the company is both growing fast and highly respected, most of the manufacturing operations are in Puerto Rico or Holland. Honeywell has sales about half the level of 3M's but only about one fifth the bankable equity. Much of Honeywell's expansion has been out of Minnesota as well. Other Minnesota companies such as ADC, Bemis, Polaris, H.B. Fuller, and Pentair all represent great promise but they are all under $2 billion in sales at this time.

Still, one of Minnesota's chief strengths is its long list of presently strong and promising new companies. Minnesota should be proud of the 150 companies on the Moody's industrial list. In comparison, Wisconsin has 60, Iowa 17, Illinois 146, Ohio 131, and North Carolina 58. Corporate headquarters do tend to be concentrated in certain major cities, of course. New York is home to 331 public industrial companies and California is home to 682.

The key question will be, will these promising companies expand in Minnesota or out of state. Minnesota already has several major companies here that no longer do any appreciable manufacturing in the state where they started. Among these are Donaldson Company, Valspar, Horton and General Mills.

It will be useful to consider the breadth of Minnesota's strength among public corporations. In reality, it is rather concentrated.

Minnesota's Privately Held Manufacturers

Fortunately, Minnesota has many outstanding privately held manufacturers which continue to provide strength and vigor to the state's economy. Although there is far less data available on the privately held companies, many of these capable firms are nationally prominent. Only a few are mentioned below in Table III-1:

Table III-1
A Partial List of Minnesota Private Manufacturers

Andersen Corporation	Windows	3700
Marvin Windows	Windows	3000

Schwans	Dairy products	1500
Kurt Manufacturing	Precision machining	1200
Lucas Varity	Auto parts	1125
Crenlo	Fabricated metal cabs & structures	1100
Red Wing Shoe	Shoe manufacturing	1075
Blandin Paper	Paper	950
Smead Manufacturing	Converted paper	900
Malt 'O Meal	Cereal	750
Starkey Laboratories	Hearing aids	750
Bermo, Inc.	Precision stamping	700
UFE, Inc.	Plastic Injection Molding	700
Cold Spring Granite	Granite processing	700
Crystal Cabinets	Cabinets	600
Remmele Engineering	Precision machining&tooling	600
Wilson Tool	Metalworking machinery	550
Lester Building Systems	Building components	500
Hitchcock Industries	Aluminum Foundry	350
Mate Precision Tooling	Metalworking machinery	350
Peerless Chain	Fabricated metal products	350
Banner Engineering	Sensors	300
Komo Machine	Industrial machinery	250
Plastic Products	Plastic Injection Molding	250
Prospect Foundry	Iron castings	250
Taylor Corporation	Commercial printing	250
Timesavers, Inc.	Finishing machinery	250
Progress Castings (Acrometal)	Aluminum Foundry	235

The above list is not intended to be an exhaustive list but only to identify a few of the nationally prominent names that arise from the activities of Minnesota's private companies. Importantly, many of these private manufacturers are among the most aggressive in modernizing their plants and investing for the future. In some ways they appear to be investing much more per employee than some of the public companies. Perhaps because of their private ownership Minnesota's private companies often do not get as much publicity as their public counterparts but many of the best equipped plants in Minnesota are operated by these highly capable private companies.

Many Exceptions and Variations

It would not be proper to conclude that all communities are responding in similar ways to the pressures of international competition. Indeed, some large communities are seeing their industrial bases shrink while some smaller communities are experiencing growth; but there are may exceptions and variations, which will be covered later in the report. The extent of industrial decline in our major cities should be of concern to us because it is so extensive and widespread. But, there are plenty of examples among smaller communities as well as plants close down or relocate. Jefferson County, Ky., lost 23 percent of its manufacturing employment during the 1980s as did Marion County, Ind. and Oklahoma City. Rock Island County, Ill., lost 47 percent and Beaver County, Pa., lost more than 60 percent. On the other hand, some large communities like Orlando, Florida and Ventura, Calif., did very well.

Much of the country's economic fortune is tied to specific industries, of course, and some industries are much healthier than others. The U.S. chemical, paper, aircraft, automotive and pharmaceutical industries are all strong whereas the shipbuilding, apparel, textiles and electronic industries are weak. Which industry happens to be located in a particular community makes a great deal of difference in how the community progresses. Even more important is the quality of the companies participating in those industries, which will be discussed more fully in Section VI.

Minnesota compared to other states

It is true that manufacturing in Minnesota has fared better than it has in some regions of the country during the past decade. However, clarification is in order. Some regions of the country, in particular New England and the Middle Atlantic states are experiencing severe declines. California is not doing very well either. Because of the vast size of these economies, they do tend to bring down the US average. Hence it is not difficult for thirty-two states to compare favorably to the US average on one measure or another. Minnesota is one of these but so are thirty-one others.

Minnesota does compare favorably to most of the traditional manufacturing states, but there are exceptions here, as well. The nearly 7 percent increase in manufacturing employment from 1988 to 1995 is certainly better than the 2 percent losses in Illinois and Ohio and the precipitous declines in California and the East Coast. In general, the Midwest has held up better than the East Coast and California -- in part because so much of the nation's current prosperity is related to robust sales of two major products -- automobiles and aircraft. Minnesota was also about in the middle in manufacturing payroll growth (Figure III-3). Minnesota's manufacturing payroll increased 31 percent from 1988 to 1995 which ranked 25th among the 50 states -- well above the increases recorded in Ohio, Pennsylvania, California and most Eastern states, but behind the 35 percent increase recorded in Indiana, the 38 percent increase in Wisconsin and the forty plus rates of payroll increase experienced by many states.

It is interesting to contrast Minnesota with Indiana and Wisconsin. Minnesota has done well over the years but it could also be argued that Indiana and Wisconsin have done the best of the traditional manufacturing oriented states in retaining manufacturing payroll and employment. Minnesota's manufacturing employment increased 6.82 percent from 1988 to 1995 -- certainly a respectable performance. However, during the same period, Wisconsin's manufacturing employment increased by 12.54 percent while Indiana's increased by 8.47 percent. In Indiana's case, one possible reason might be the large influx of foreign companies that have flocked to the state because of its relatively low cost and its proximity to large markets. Another might be the general interest in manufacturing that has permeated Indiana's public policies. In Wisconsin's case, a possible reason might be the state's historical reliance on basic manufacturing, as opposed to more faddish "high-tech" manufacturing, along with a friendly attitude toward manufacturing on the part of state officials. A third reason might be the most convincing. Both Indiana and Wisconsin are good manufacturing states which are generally lower cost than other nearby states.

Table III-2
Employment Changes in Major Manufacturing States

State	1988 Mfg Employment	1995 Mfg Employment	Change	% Change
Wisconsin	530,138	596,622	+66,494	+12.54%
Indiana	620,193	672,734	+52,541	+8.47%
Minnesota	387,642	414,087	+26,445	+6.82%
Michigan	948,943	960,243	+11,300	+1.19%
Illinois	1,033,272	1,011,741	-21,531	-2.08%
Ohio	1,119,170	1,093,560	-25,610	-2.29%
Pennsylvania	1,051,180	935,945	-115,235	-10.96%
California	2,140,959	1,842,438	-298,521	-13.94%
Maryland	231,375	187,771	-43,604	-18.85%
New Jersey	684,408	546,357	-138,051	-20.17%
New York	1,249,626	963,231	-286,395	-22.92%
Massachusetts	600,730	457,310	-143,420	-23.87%
Connecticut	383,455	288,198	-95,257	-24.84%
Rhode Island	114,087	84,782	-29.305	-25.69%

The changes in manufacturing employment from 1988 to 1995 offer an interesting contrast between the traditional manufacturing states displayed in Table III-2 and the emerging manufacturing states shown in Table III-3. What is of interest in this chart is the geographic dispersion of manufacturing from east of the Mississippi River and north of the Ohio River to many regions across the United States. From 1988 to 1995, during one of the healthiest periods in US history and during a period particularly favorable to auto sales, Michigan added 11,300 jobs -- not many more than Nevada or New Mexico. Kentucky created four times as many manufacturing jobs on a base that was 30 percent that of Michigan. Texas created 74,000 jobs, Alabama and Tennessee 40,000 each, Utah 27,000 and Mississippi 24,000. From 1988 to 1995, Nebraska saw its manufacturing payroll increase by more dollars than did New York. Industrially smaller South Carolina had manufacturing payroll increases about equal to all of New England. Clearly, the set of manufacturing competitors is enlarging.

This widespread dispersion of capable manufacturing has ramifications to Minnesota and some implications for policy initiatives. We are doing well but we are most assuredly not alone. Others, sometimes others whom we may not have suspected, are also doing well. Some of these newly emerging manufacturing communities are developing strengths that, in former years, were distinctive to Minnesota. With its major research university, its excellent network of private colleges and its established technical colleges, Minnesota is certainly capable of continuing its robust manufacturing performance. But, we should recognize that other regions will be developing their capabilities as well.

Table III-3
Employment Changes in Emerging Manufacturing States

State	1988 Mfg Employment	1995 Mfg Employment	Change	% Change
South Dakota	29,408	45,222	+15,814	+53.77%
Nevada	26,243	35,526	+9,283	+35.37%
North Dakota	16,269	22,188	+5,919	+36.38%
Idaho	54,316	72,066	+17,750	+32.68%
Utah	94,934	121,960	+27,026	+28.47%
New Mexico	35,841	43,895	+8,054	+22.47%
Nebraska	94,558	112,951	+18,393	+19.45%
Arkansas	212,363	250,755	+38,392	+18.08%
Kentucky	262,052	305,321	+43,269	+16.51%
Iowa	219,610	248,812	+29,202	+13.30%
Alabama	353,712	393,859	+40,147	+11.35%
Mississippi	224,900	249,760	+24,860	+11.05%
Louisiana	163,435	178,627	+15,192	+9.30%
Oregon	208,623	227,601	+18,978	+9.10%
Arizona	183,427	199,783	+16,356	+8.92%
Tennessee	496,633	537,213	+40,580	+8.17%
Texas	938,491	1,012,788	+74,297	+7.92%
Georgia	580,809	+598,223	+10,236	+3.00%
North Carolina	862,766	870,344	+12,217	+.88%

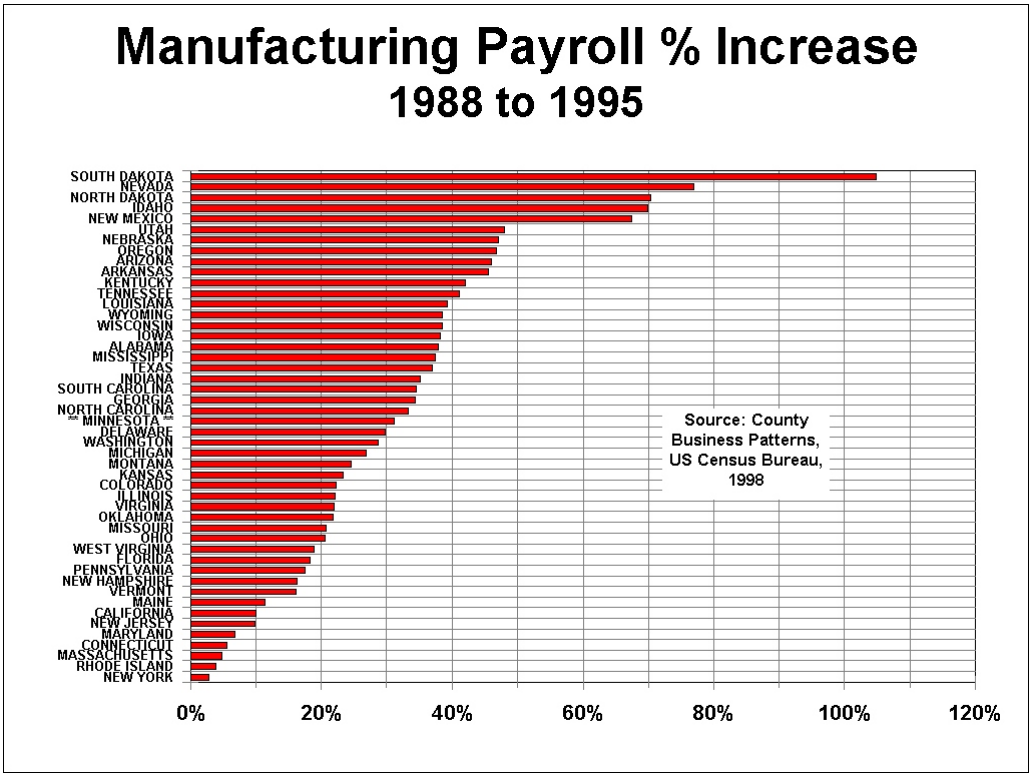
Assessing Minnesota's Performance

In general, the status of manufacturing in Minnesota is medium. We do have some excellent companies and, in general, the states economy has been healthy in recent years. But, the economies of other surrounding states have also been healthy, and in some cases healthier. It is true that Minnesota shows up as being statistically better than the nation in total as measured by growth in manufacturing employment but the nation is very uneven. New England and the Middle Atlantic States have been losing ground at very substantial rates in very recent years, as has California. When we take these poorly performing regions out of the picture, Minnesota's growth rates have been very usual and maybe even a little behind some important neighboring states.

It is not entirely constructive to look at manufacturing on a state by state basis, however. County by county comparisons are far more interesting. Most states have some growing and prospering counties and many of these same states have one or two counties that are losing ground. Minnesota is blessed by not having any really large counties that are suffering the loss in manufacturing employment we are seeing in some regions of the country. St. Louis County in Northeastern Minnesota has been losing ground for several decades but, relative

to other more prosperous counties, it is not particularly large, so it has been unable to drag the entire state. The statistical distribution of Minnesota's manufacturing health does work to its advantage. Minnesota does not have pockets of devastating manufacturing shrinkage as have plagued some industrial states. It does have a few pockets of manufacturing exuberance, such as McLeod County, Winona County, Carver County, and Dakota County, but there not the fabulous growth experienced by some counties in Indiana, Tennessee, South Dakota, and a few Western states (California not among them).

Figure III-3



The relative mediocrity of Minnesota's manufacturing growth should be of concern to us. It is true that we are adding manufacturing jobs at a reasonable rate, though not as rapidly as a few other states, but our growth in high value added manufacturing has been exceedingly modest. It is true that medical device manufacturing certainly adds a great deal to the economy of Minnesota, but it is also true that much of the expansion of this industry has taken place outside of the state boundaries, often overseas. There can be no question that the loss of the mainframe computer business, and its associated clustering industries, has cost Minnesota. The big employers of the 1960s and 70s were Control Data, UNISYS, Honeywell, and of course 3M. The 3M Company is still a large employer in Minnesota, of course, and is still doing well. But Honeywell has shrunk and UNISYS and Control Data are minuscule in comparison to comparison to their earlier employment levels. It is to Minnesota's credit that it was able to field a quite robust economy while still losing this important industry.

Minnesota has added to its manufacturing employment during the past decade but it ranks only fair in adding high value-added jobs. More specifically, Minnesota did well in most areas except main frame computers where employment declined substantially in an important high paying industry. Minnesota is a good manufacturing state, but we have to be realistic

about what is happening elsewhere. The most detailed recent data we have on manufacturing is the U.S. Census of Manufacturers conducted in 1987 and 1992. This data suggests that Minnesota was one of only 26 states to increase its manufacturing employment during this period. Minnesota's manufacturing employment increased 4.6 percent when the nation as a whole lost 3.9 percent. However, as we examine these figures more closely, we can see that a few big eastern states and California lost the most. Manufacturing employment was up 6.2 percent in Wisconsin, 9.1 percent in Alabama, 9.6 percent in Washington, 9.7 percent in Kentucky and 10.3 percent in Iowa. Some smaller states like Idaho and South Dakota were up even more. But the best indicator of real manufacturing growth is not manufacturing employment but a composite of three other measures that receive little attention: increases in manufacturing value-added, value-added per employee, and capital expenses per employee.

From 1987 to 1992, Minnesota's **manufacturing value-added** increased by 17.2 percent. Since this is a figure that is not inflation adjusted, we should compare it to the U.S. increase, which was up 22.2 percent. Manufacturing value-added is an especially meaningful figure that represents the actual value added to products through manufacturing. Here again, many states saw large increases: Ohio's manufacturing value-added grew 20.5 percent, Indiana 26.8 percent, Wisconsin 31.8 percent, North Carolina 39 percent, Iowa 40.9 percent and Kentucky 42.9 percent.

Our second measure, **manufacturing value-added per employee**, provides a reliable estimate of raw productivity in manufacturing. Historically, Minnesota has had relatively high manufacturing value-added per employee, but the State lost a little of that edge since the mid-1980s in part because of the decline of several major computer companies. Minnesota's manufacturing value-added per employee was $69,831 in 1992 versus $78,259 for the United States as a whole. From 1987 to 1992, we slipped from being above the national average to below it on this important measure. In comparison, manufacturing value-added per employee in 1992 was $76,384 in Wisconsin, $78,627 in North Carolina, $80,287 in Indiana, $89,682 in Iowa and $93,661 in Kentucky. All were well above Minnesota, as were many other states. Louisiana's manufacturing value-added per employee was the highest because of its heavy investment in oil refining and other process industries.

Not surprisingly, manufacturing value-added per employee increases with our third measure, **capital expenditures per employee**. The United States had capital expenditures amounting to $5,668 per employee in 1992, about 4 percent higher than the $5,437 registered in Minnesota. That is not bad, but it is below the figures for New Mexico ($8,601), Idaho ($8,434), Washington ($8,928), Texas ($9,656) and Kentucky ($7,511) were all much higher. More investment is going to other states and these states are increasing their value-added faster than Minnesota. The prosperity gained through more efficient and higher value-added manufacturing is helping the economies of these other states in much the same way as productive agriculture is helping Minnesota. But, we should not be too sanguine about our situation here. We have done well in the past but the manufacturer of this day has many options as to where production might be located. Manufacturing expansion has, of course, increased at much faster rate in certain foreign locations as well.

Figure III-3 shows the payroll increases by state from 1988 to 1995. Minnesota did well during these years, in spite of the above mentioned decline in main frame computers. Some states are doing a little better -- some are doing less well. Minnesota's overall performance as a manufacturer general ranks in the middle third of all states. Sometimes it is on the top of the middle third and sometimes it ranks a bit lower. Minnesota is performing adequately but cannot afford complacency. Again, many of the eastern states and California lag severely.

Minnesota by SIC

Minnesota's employment changes by industry within manufacturing illustrates the dilemma facing Minnesota manufacturing at this time. From 1988 to 1995, Minnesota added 26,445 jobs in manufacturing, an increase of 6.82 percent in seven years. This was the slowest rate of increase of any major employment category in Minnesota. During the same period, wholesale trade employment increased 17.1 percent, retail trade 17.6 percent, construction 10.5 percent, FIRE 16.3 percent, and services 43.9 percent. Even mining employment outstripped that of manufacturing with a 10.5 percent increase. Given the higher than average salaries available in manufacturing, this reduced employment share experienced in manufacturing should be of concern to Minnesota officials. Even with slower increased in manufacturing versus other sectors, Minnesota's manufacturing payroll increased by $3.5 billion from 1988 to 1995 — more than the payroll increases experienced by any other major sector and about 43 percent of the payroll increases experienced in the services even though there were 8.3 service jobs created for every manufacturing job. In 1995, the average annual pay of people involved in manufacturing was 56 percent higher than it was in services ($35,600 versus $22,800).

Emerging employment patterns are also of concern within manufacturing itself. From 1988 to 1995, the most manufacturing jobs (within the 2 digit industries) were created in the lumber and wood products industry (6,029 new jobs) but at an annual average compensation of $28,200 -- only 76 percent of the annual average compensation in the industrial machinery and equipment industry where we lost 5,017 jobs. In this respect, Minnesota is not dissimilar from the US in general -- much of the job growth has been in the lower value-added (and hence lower paying) industries.

Business Births and Deaths

The Minnesota Department of Economic Security routinely provides in-depth analyses of business births and deaths in Minnesota which should be referred to here. Several key points mentioned in the Department's 1993 to 1995 study should be of interest to us, however. During the three year period of 1993-95, a total of 30,133 businesses were created in Minnesota of which 1656, or 5.5 percent were manufacturing businesses. During this same period, 877 manufacturing firms ceased operations in Minnesota leaving net births of 779 firms. This compares to net new firms of 1558 in construction, 1804 in wholesale trade, 1328 in retail trade, 1868 in finance, insurance and real estate and 9824 in services. Of the total 14,285 net new births in Minnesota during the 1993 to 1995 period, 5.4 percent were manufacturing firms. It is true that manufacturing firms, when they are established, tend to employ more people -- perhaps three times as many as the average firm. Still, it is unclear whether some states, including Minnesota are creating new manufacturing businesses that will sustain Minnesota's manufacturing prowess. In Fairness to Minnesota, the state is doing better than most of our surrounding states in manufacturing establishment growth as Figure III-4 depicts.

Minnesota's Borderline Condition

Minnesota does have general strength in its economy within its setting in the prosperous Midwest. However, manufacturing is growing slightly faster on the non-Minnesota side of the State's border. Yet, manufacturing grew at a rate faster than the state average on the Min-

nesota side. From 1988 to 1995, manufacturing jobs were up 20.3 percent, payroll up 33.5 percent and establishments up 25.6 percent. On the non-Minnesota side, jobs were up 32.5 percent, payroll up 64.7 percent and establishments up 27.4 percent. All four neighboring states did well in their counties bordering Minnesota. Manufacturing payroll was up 50.8 percent in the Wisconsin bordering counties, up 61.9 percent in the bordering South Dakota counties, up 88.5 percent in the North Dakota bordering counties and up 100.3 percent in those from Iowa. Importantly, most of Minnesota's border growth came from one county, Dakota. Table III-4 summarizes this comparison.

Figure III-4

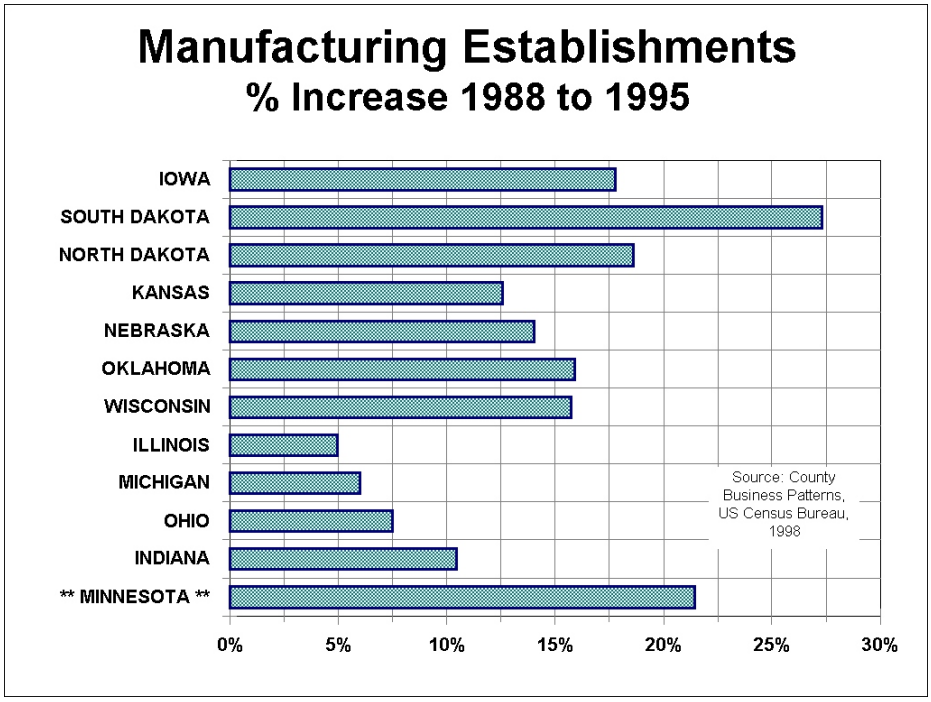


Table III-4

Situation	Special condition	Jobs	Payroll	Establishments
Minnesota counties bordering other states	None	+12,216 +20.3%	+$578,830,000 +33.5%	+342 +25.6%
Other state counties bordering Minnesota	None	+15,817 +32.5%	+$636,109,000 +64.7%	+296 +27.4%
Minnesota Dakota County		+8,420 +55.0%	+$407,719,000 +90.8%	+113 +33.7%
Minnesota counties bordering other states	Dakota County excluded	+3,796 +8.1%	+$170,016,000 +13.3%	+229 22.9%

In fairness to Minnesota, the largest cities in two neighboring states directly border Minnesota and that may have some influence on these statistics. Also, Wisconsin is a very healthy manufacturing state generally. Still, in recent years, manufacturing growth has been more rapid on the neighboring state side of Minnesota's borders. Figure III-5 shows the 1988 to 1995 changes in employment for Minnesota and surrounding counties.

Minnesota's major cities have fared a little better from 1988 to 1995 than some other major cities, but not much. Ramsey County lost 17.4 percent of its manufacturing employment during this period while geographically larger Hennepin County lost 7 percent. Both of these major metropolitan counties roughly doubled the manufacturing employment losses reported for the 1980 to 1990 period. St. Louis County's manufacturing employment decline was actually a bit less severe; a 13.5 percent decline from 1980 to 1990 and a 3.4 percent decline from 1988 to 1993 -- still a decline but less substantial. Other major manufacturing counties in Minnesota gained employment during the 1988 to 1993 period. Table III-2 shows these changes for Minnesota Counties with more than 4,000 manufacturing employees in 1988.

Minnesota compares favorably to several other states, particularly older Eastern states, but is not remarkable. Minnesota is better at creating establishments and jobs than it is at creating and retaining manufacturing payroll. In general, Minnesota compares less favorable than it did fifteen years ago when the mainframe computer companies were substantial employers here. Some of these high value-added jobs have been recreated in the emerging medical device industry but much of the manufacturing in this precious industry is gradually moving to other locations. Minnesotans can be pleased, but not sanguine, about manufacturing expansion during the past ten years.

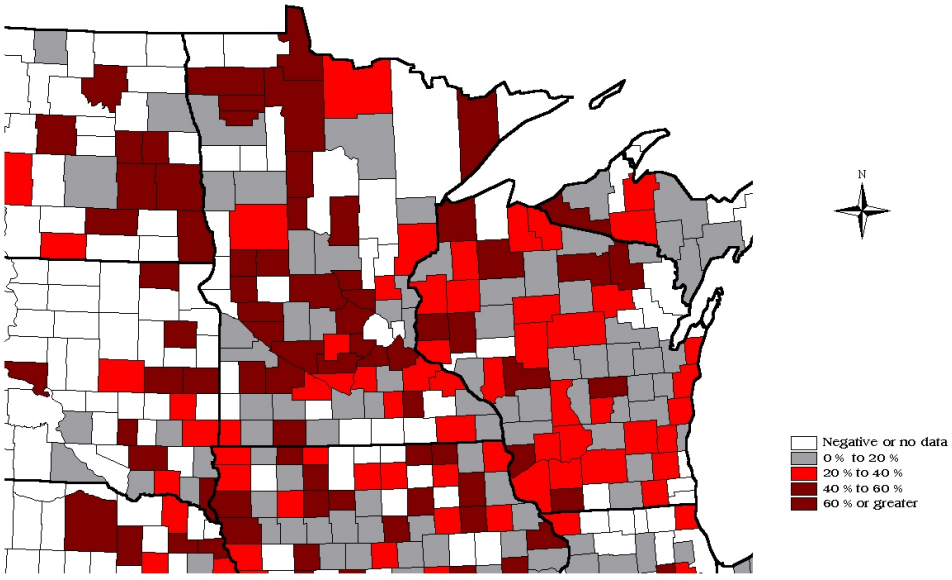
Table III-5
Changes in Minnesota Manufacturing Establishments and Employment from 1988 to 1995

County	Mfg. Employment 1988	Mfg. Employment 1995	% Increase Mfg Emp 1988 to 1995	% Increase Mfg Emp 1980 to 1990	% Increase Mfg Payroll 1988 to 1995	% Incr. Mfg. Estab 1988-1995
Hennepin	129,419	120,243	-7.09%	-4.91%	+17.35%	+13.45%
Ramsey	72,427	59,549	-17.78%	-8.33%	+16.34%	+8.96%
Anoka	20,497	23,213	+13.25%	+10.81%	+43.54%	+33.57%
Dakota	15,322	23,742	+54.95%	+24.61%	+90.77%	+33.73%
Olmstead	10,384	9,583	-7.71%	-47.41%	+5.94%	+18.46%
Stearns	8,731	12,788	+46.47%	+24.86%	+96.47%	+37.97%
Washington	8,017	9,257	+15.47%	+22.80%	-17.60%	+43.18%
Winona	7,233	8,060	+11.43%	+35.40%	+39.71%	+20.21%
McLeod	7,025	8,451	+20.30%	+27.10%	+52.96%	+41.67%
St. Louis	5,991	5,785	-3.44%	-13.52%	+20.94%	+25.00%
Carver	5,764	10,719	+85.96%	+23.72%	+136.95%	+38.14%
Steele	4,748	6,448	+35.80%	+15.58%	+67.97%	+24.53%
Freeborn	4,340	3,214	-25.94%	-21.96%	-17.18%	+3.28%
Nicollet	4,210	5,131	+21.88%	-10.10%	+47.87%	

Repelling Forces

Figure III-5

Percent Increase in Manufacturing Employment 1988 to 1995
Minnesota and Surrounding Counties



Source: County Business Patterns for 1988 and 1995,
US Bureau of the Census, 1998
Compiled by the Manufacturing Systems Engineering Department of the University of St. Thomas

SECTION IV — CAUSES OF INDUSTRIAL CHANGE

Relocation: A Combination of Attracting and Repelling Forces

Whether industry is being attracted by new and ideal circumstances in other communities or repelled by conditions in their home communities is an interesting and difficult question. In reality, there are both repelling and attracting forces. In this study, a combination of economic data, company data, industry data and field analysis has been employed to examine these attracting and repelling forces. It is doubtful that any one of these forces is influential enough to serve as a primary cause of industry relocating from one community to another. However, many forces are influential.

Repelling Forces

Repelling forces do exist, particularly in major core cities and elsewhere. Among the repelling forces most influential to businesses are the following:

1. Shortage of land

Expanding and thriving businesses almost inevitably need additional space. Although any company can almost always better use its available space, if the company is growing, additional land is often required. Most cities are densely occupied, and significant amounts of land are only rarely available to companies who need it.

2. Land is expensive

If land is available, it is likely to be six or eight times more expensive than similar land in a greenfield environment. Importantly, additional heavy cleanup costs are often associated with readying older industrial land for a new industrial use. Though our environmental laws have favorable aspects, they can impede the reuse of previously polluted industrial land even if neither the buyer nor the seller had anything to do with the polluting. Some states and communities have passed legislation to reduce this problem, but the cost of procuring and preparing industrial land may still represent a repelling force.

3. Local residents might object to industrial expansion.

Sometimes even the noblest companies fall prey to citizen resistance to industrial expansion. In some cases resistance is overcome quickly. In many cases, the citizen objection results in prolonged reviews and hearings that drive up costs and drive away companies who might otherwise be perfectly suitable industrial residents.

4. Labor markets may be perceived as potentially problematic.

Major cities have excellent workers, but many of these excellent workers may already be employed. Those that are not employed may lack the technical and employee skills needed for manufacturing. In some situations, employers perceive employment relationships as potentially contentious and legalistic -- particularly if high-risk populations are being hired. Employers may be willing to hire members of high-risk applicant groups, especially when labor markets are tight, but they may be concerned about potential liabilities arising from the personal behavior of high risk employees.

5. Building codes may prohibit modernization.

Building codes serve useful purposes, but applying overly stringent codes to older buildings in core cities may mean that expansion and modernization are impossible financially.

6. Labor groups may be unresponsive.

In many cases, organized labor has put forth a highly enlightened and capable cadre of leaders who work well with industry. In a few cases, local union leaders (or the rank and file) may refuse to consider work rule changes or other necessary to keep the industry competitive.

7. Company management may be incapable.

Just as there can be intransigent labor leaders, there can be intransigent managers in companies. It would be hard to argue persuasively that one is more of a problem than the other. Good companies and good unions seem to work well together, but some companies seem to have more problems than they should have and management may be part of the problem.

8. City services may be perceived as high cost and ineffective.

Taxes and crime are often simultaneously perceived as high at the same time that school systems are seen as ineffective and high cost. Regulatory agencies often exhibit a marked tendency to footdrag on important regulatory approvals. Other problems develop. If it is not well-administered and careful, a city can achieve a reputation for ineffectiveness that becomes an especially powerful repelling force.

9. The company is acquired and the plant is shut down.

It is likely that much of the industrial movement within the United States is traceable to the large number of mergers, acquisitions and amalgamations that have taken place during the past 20 years. If the amalgamation is a successful one, the amalgamated plant may survive and prosper. However, amalgamations that are highly leveraged transactions often result in starving the operating units of capital to such a degree that competitiveness becomes increasingly difficult.

10. Transportation arteries may no longer be adequate.

Much of the nation's industrial structure has been in its present location for several decades, during which time traffic patterns, transportation systems, areas of congestion and ease of access may all have changed. What might have been an excellent location with efficient access to primary suppliers and customers in 1950 may today be a highly congested area surrounded by slow-moving heavy traffic. The local railroad may no longer be reliable as a mode of transportation if it even exists.

11. The company may have completed its useful life.

There is nothing written in the economic code to suggest that companies have to last forever. Indeed, it is quite possible that even well-run companies overtly decide to cease operation at a point in time. The reasons may be many. Perhaps the founder wishes to retire and no replacement is forthcoming. Perhaps the founder sees in the future harsher economic times to the degree that the resolve to continue is lacking. Perhaps there are health problems on the part of key principals. Perhaps the property is more valuable than the business itself.

While none of these repelling forces may be individually sufficient to cause relocation, they may become meaningful factors in long term trends. The average life of a manufacturing plant is long -- perhaps seventy years. When a plant reaches advanced age, almost everything surrounding it has also changed markedly from the conditions that existed at the time the plant was sited. This combination of age, changing conditions, and preferences on the part of contemporary managers can all influence the decision to continue in a present location, liquidate the business or move to a new location. Within this framework of ages, changes and preferences, the above repelling factors may be influential -- not necessarily constantly. Perhaps they only surface when other attracting forces become evident.

Attracting Forces

Legitimate attracting forces influence industries considering relocation. Some companies have good geographic locations — perhaps on an interstate network near the center of a large market. Some communities are generally lower in cost -- not only labor rates but other cost items as well. Some may be in better climates. A few attracting forces are enumerated below:

1. Major customers or suppliers may be near the new location.

One of the most significant attracting forces is proximity to major customers or suppliers. Since both customer and supplier lists are dynamic outgrowths of emerging industries and businesses, we can expect some industrial relocation merely because of the shifting geographical patterns of emerging industries. Beyond these more general trends, we have the major phenomenon of end-product companies trying to reduce their suppliers to a smaller and more trusted number. Especially attentive service is often required to achieve the status of a preferred supplier, and this may involve the relocation of industrial facilities to better accomplish this special level of service.

2. Perceived favorable work ethic on the part of employees.

The perception of a favorable work ethic can be related to the existence of a well-developed educational system, which may be unrelated to educational costs, or because there is little competition from high-paying, capable employers. Informal conversations with many employers have led the author to believe that the perceived work ethic is a more powerful attracting force than lower wages. In any case, it is certainly a meaningful attracting force.

3. Satisfactory or exemplary records of quality experienced by other employers

Contrary to some suggestions, there is strong evidence that low-cost operators can, and often do, achieve exemplary levels of product quality. Interestingly, high quality and lower cost often move hand-in-hand. The achievement of high quality can be an important attracting force.

4. Legislative and court systems perceived to be evenhanded.

Some communities have labor legislation or court systems of interest to employers. Employers generally do not prefer confrontational events and certainly do not prefer court systems and legislatures that are commonly perceived as anti-employer. Occasionally, newer greenfield communities may legal or regulatory characteristics that may seem more evenhanded than those of the home community.

5. Industrial swarming develops systems of attracting forces.

Often, highly capable suppliers, with special technical skills, are invited to new locations by their customers. Some of these invitations have been extended to suppliers to the computer and electronics industries as these industries have increasingly moved offshore. Minnesota, as an example, has capable suppliers to the aircraft industry. These high technology foundries, machine shops, heat treaters, plating shops and metal stampers work together to provide an efficient and capable infrastructure that supports present industries and nurtures others.

6. Attractive economic incentives

Attractive economic incentives may be available in new locations perhaps in part because industry is healthy and taxes are therefor quite low. However, there is so much competition for industrial employment that reasonably attractive incentive packages are available in many locations.

7. The company is acquired and the plant is expanded.

Many companies are changing owners. While some business combinations may be highly leveraged, poorly-thought-out ventures with little added-value, others may be quite well-developed strategic initiatives. Some of these combinations, such as those consummated by Minnesota based Pentair, do result in significant investment at the acquired site.

8. Attractive wage rates

Low wage rates are of interest to employers, but probably not at the expense of other important attracting forces.

These attracting forces can offer a rosy alternative to the manufacturer wishing to expand. But many locations have these attributes. Some communities succeed and their industrial base grows, but most do not. So the combination of these repelling and attracting forces, together with the individual situations, are often superimposed on another important variable, the quality of the company itself.

Emotionalism as a Locating Force

Although basic consideration of revenue and cost play a role in decisions about industrial location and relocation, these important decisions are not always based entirely on rational appraisals. Emotionalism creeps into decisions about where companies should be, or should not be. In some cases, companies may seek new surroundings largely because management is incapable of running the business properly in its current location. Top officers of poorly performing companies often rationalize their mistakes. Occasionally, managers become introspective and recognize that modifications in their own behavior may be important remedial steps in restoring the health of the firm. Often, however, executives in charge of troubled enterprises blame everything else, including their location or its business climate. This mentality leads to company relocations that may not be entirely necessary.

Personal factors, including personality clashes between management and unions, between management and city officials, or between management and landlords, affect company relocation decisions. It is by no means certain that rational managers, prudent labor leaders and statesmanlike public officials will coexist in the same town simultaneously. Industrial relocation is often influenced by noneconomic factors and, often, one incompetence feeds upon another. Emotionalism, perceptions, views of the future and a variety of other not-very-quantifiable factors influence industrial location -- particularly the magnitude of the repelling forces. The forces affecting industrial location cannot be reduced to strict economic terms. Emotion and attitudes do play a role in where companies choose to expand or contract.

We should recognize, however, that the general reputation of a state regarding its business climate is considered -- whether this reputation is deserved or undeserved. Most companies contemplating expansion, contraction or relocation are well supplied with comparative information about the regions being considered and they feel quite free to contact company executives with personal experience. Mathematical models, which incorporate tax, operating costs and other factors, are quite common and most companies reviewing locational options are very well informed. Certain states do have reputations and, in some cases, it is in their best interest to preserve or improve them.

The Labor Shortage Revisited

Lately, there has been considerable media coverage concerning the general shortage of skilled workers in many parts of the US. It is true that many manufacturers are frustrated with the shortage of skilled workers and many do see the unavailability of qualified workers as a constraint on their businesses. It is also factual that the number of new labor force entrants is unlikely to be as substantial during the next few decades as it has been in the past. Further, new labor force entrants are not likely to have the same off-the-farm work readiness skills as the people responsible for building industry during the past eighty years. The documentation of the labor shortage has been extensive in some regions of the country. In this report, we would like to offer an additional, somewhat disparate, perspective.

The economy has been unusually robust.

From 1994 to 1998, the US economy operated in as robust a manner as it has at any time in its history. Perhaps these unusually good times will continue well into the future. If they do, we should all be thankful. If they do not, we should not be surprised. If the economy does slow, the employment picture could change substantially. Many of us can remember the early

1980s when more than twelve million people were unemployed.

Prolonged robust economies depend upon maintaining strong competitive positions. The US economy is competitive in many ways but competitive positions are also influenced by practical factors like exchange rates. In spite of our immense talents and resources, part of our prosperity is impacted by world events. Some of the most potentially influential world events are volatile and unpredictable.

Beyond concerns for the cyclical nature of the US economy, some additional concerns might be raised about its structure. The mid-nineties boom was extensively fueled by two important industries, automobiles and computers, and greatly helped by chemicals, aircraft and medical devices. Even with strong performance on the part of these several industries, manufacturing employment actually declined by 525,000 from 1988 to 1998. In order for the economy to remain robust, these industries will have to remain strong. Yet, there are discernible signs of slowing in each of these industries.

The US economy is generally healthy in many respects. However, there is little evidence that our expertise has reached the point that we can forget about cyclical downturns and the gradual erosion of our competitive position -- in part due to currency or other changes brought on by world events.

The US trade deficit is growing markedly.

The U.S. Trade deficit recently reached a record $15.7 billion in a single month. Ironically, this huge trade deficit was accumulated during a time when the price of oil had been dropping. The non-oil trade deficit is by far the worst we have ever experienced. Some people estimate that the US trade deficit may reach $300 billion in future years. It is hard to understand how it is that our economy can remain robust coincident with burgeoning trade deficits of this magnitude.

The economic problems of Asia and Russia will impact US companies.In spite of turmoil in these regions, the modern production equipment and trained workers are still in place -- particularly in Asia. Many of the Asian industrial companies remain vigorous competitors. The recent changes in exchange rates will allow them to more aggressively compete on price and some U.S. companies are not positioned for this onslaught.

The US burgeoning trade deficit could fuel another potential, yet rarely discussed, problem. The deficit could reduce the attractiveness of US bonds. The US remains the worlds largest debtor -- still with a ravenous appetite for borrowed funds. The trade deficit, a huge debt and continued borrowing could combine to diminish the luster of US investments in general. While it is quite probable that we will be able to avoid these problems, there is not much evidence that our wise policies have been as influential as our good fortune. Demographics suggest that labor scarcity will continue but tougher times on currency and financial markets could loosen the tight labor market in the future.

Pockets of disguised, endemic and part-time employment continue to exist.

Although labor is scarce in many less urban areas, there still exist many core cities that have not solved the problem of the lack of opportunity for many citizens. So much has been written about the limited opportunities available to people in the inner cities that there is no

need to belabor the point here. Even during the boom period of the mid 1990s, layoffs and downsizing plagued many families and communities and unemployment rates among minorities remain high. Because qualified people are less readily available in some communities, it does not mean we have provided opportunity for all. The current concern over the lack of availability of health insurance provides evidence that the quantity of good jobs with good benefits is not equally matched to the aspirations of citizens. There may not be a shortage of workers. There may be an enormous mismatch between what is required and what people are available and equipped to do.

An interesting question emerges from the recent expansion patterns of two of the country's most lucrative industries, medical devices and pharmaceuticals. These high paying industries could easily attract employees here in the United States where many companies began their operations. As a practical matter, however, much of the expansion has been in Puerto Rico where quality is perceived to be better and employee loyalty is considered to be very high. Minnesota products like pacemakers are no exception. There are probably fewer than 5,000 pacemakers manufactured each year in Minnesota versus probably well over 100,000 in Puerto Rico. If, as this author believes, much of the expansion to offshore sites is triggered not by cost advantages but by quality advantages, then our principal concern should not the quantitative availability of workers but their preparation for useful employment. This interpretation might put more pressure on those of us involved in education to improve the quality of our services so that our students can better attain the opportunities before them.

Our use of our labor force is far from optimal.

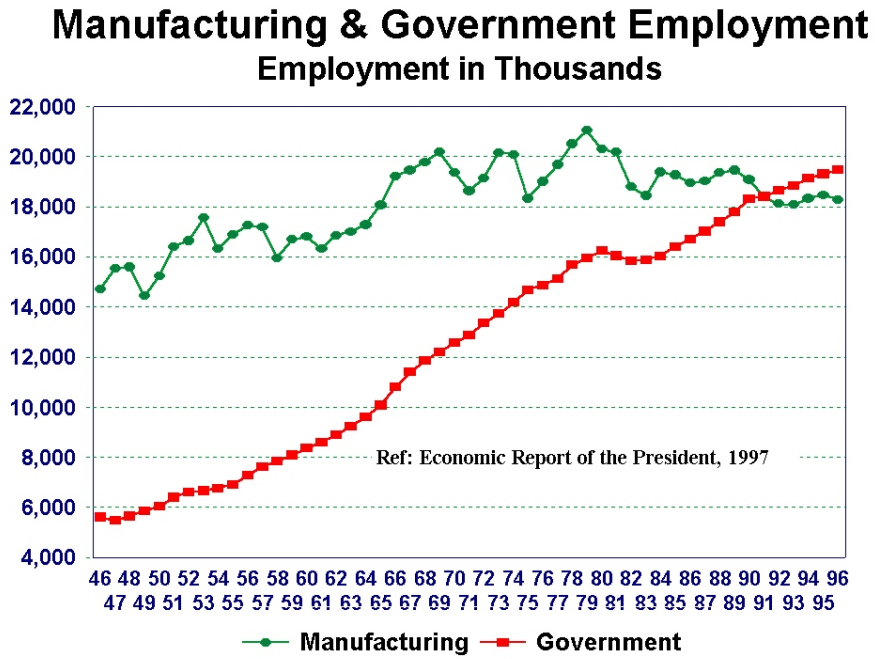
From the standpoint of numerical requirements to support manufacturing, the labor shortage is a great myth. In all of the United States in manufacturing, construction, mining and agriculture, we employ only about 16 million people in direct labor out of a total population of 268 billion. Furthermore, the number of people actually employed in manufacturing has declined by 524,000 in the past ten years (1988 to 1998). Meanwhile, employment in government has increased by 2.6 million, transportation and public utilities grew by one million, wholesale trade by 850 thousand, retail trade by 3.6 million and services by 11.5 million. It is interesting to note that employment in these industries has mushroomed even though the wages and benefits are usually lower than in manufacturing. This anomaly of mushrooming employment in lower paid industries should be considered when evaluating the worker shortage as it applies to manufacturing. Most employers will say that there is a shortage of job applicants with skills relevant to manufacturing, but it is not clear to this author that the crux of the problem rests with numerical supply. The problem seems more related to the development of qualifications and to our misapplication of the human resource to activities that may not need to be done.

Manufacturing now accounts for 15 percent of US jobs, as opposed to more than one-third of the jobs in 1950. Meanwhile, we have almost recklessly expanded employment in government, retail trade and services. Some of these jobs are valuable and needed, of course. However, we seldom give our employment patterns the scrutiny they deserve. Behind waning disposable real income, an increasing share of U.S. earnings are being devoted to the delivery of services, not all of which are voluntarily sought but instead are forced requirements for existing and working in the United States. Higher aggregate expenses for legal services, child care, financial services and insurance have all increased the living costs of those people whose incomes may be declining in real terms. The cost of services has grown from 42 percent of disposable personal income in the late 1950s to 51 percent in the 1990s, more than $4,000 more

per capita in constant 1987 dollars. As our economy displayed statistical advancement, much of what was being purchased was either involuntary or of minimal long-term benefit.

The result of these shifts in national income generation patterns has been that our economy is more dependent upon a different set of major employers, the vast majority of whom are not industrial employers. In state after state, the largest employers ceased to be industrial companies and became, instead, units of government, financial companies, hospitals, school districts, retailers (with part-time workers) and public utilities. By 1992, only five industrial companies were numbered among Minnesota's largest 25 employers and none of them were expanding in Minnesota. The year 1991 was a watershed for the United States. For the first time in the history of the nation, civilian government employment exceeded manufacturing employment (Figure IV-1).

Figure IV-1



This constant shift of employment out of production and into services and retail has impacted the prosperity of families. The same trend has been repeated over and over. The wages of the family's principal earner were declining so the nominal gap was made up by members of the family taking on additional work. Sometimes another member of the family became an additional wage earner. Sometimes the principal wage earner took on a part time job or more overtime. Sometimes school-aged youth became wage earners. Since new transactions were involved, this additional work activity reflected favorably in the national economic statistics, but these nominal advancements disguised the fact that people were struggling harder to keep pace with their many obligations. It was a trend not without some cost to the social fabric of our nation.

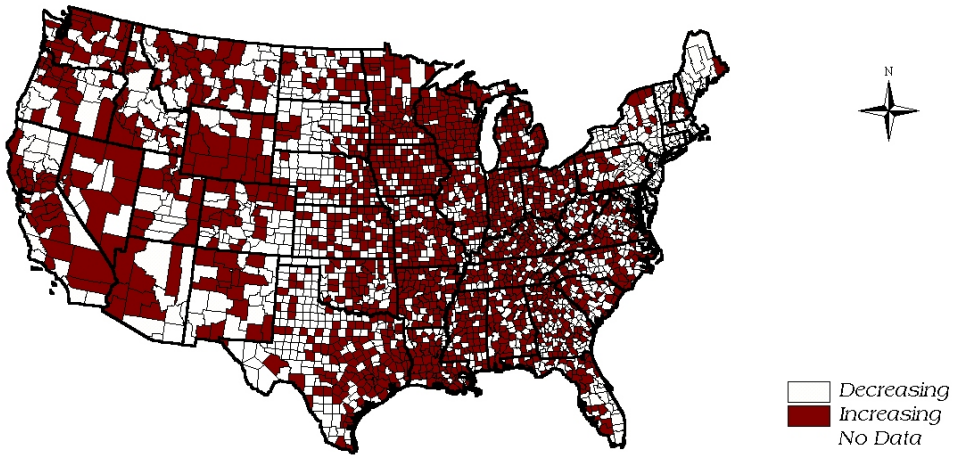
In spite of hard work and productivity gains on the part of America's workers and business people, many of them have not gained much ground economically. This is true of both workers and corporations — perhaps because the fruits of these activities are not accruing

the same way they once were. Lawsuits, mandated costs, irresponsible corporate management, hostile takeovers, and other activities, some of them laudable, have all siphoned money out of the industrial sector of the country at a time when international competition is escalating the need for funds. Governments and other overhead activities have greatly increased their expenditures and hence drawn greater proceeds from the system. Since the 1950s, state, county, local and federal governments have been increasing their expenditures at about twice the rate of the industrial sector but government expansion has not been alone. In more recent years, a variety of overhead activities and retail trade have been expanding even during times when industries have been shrinking.

Good well-run companies can be selective regarding where they expand, of course. Most companies show at least some loyalty to their communities of origin but if the ambiance is not to their liking, future expansion may take place elsewhere.

Figure IV - 2

Manufacturing Employment 1988 to 1995



Source: County Business Patterns for 1988 and 1995,
US Bureau of the Census, 1998
Compiled by the University of St. Thomas
Department of Manufacturing Systems Engineering

Many people of course suggest that the transition to a higher service content is a predictable characteristic of an economy in the mature stage of development and we have no argument with that premise. The question is one of degree. How much of a transition to the service economy is usual? What are the boundary conditions? Importantly, is there any possibility of diminishing returns regarding the service sector of the economy? In this regard, we are not dealing with categorical problems which can be easily solved with sound-bite remedies. The

problems are deeper and less aligned with political doctrine. In the main, they are arithmetic problems. How much overhead can we have, what is it doing and who will pay for it? And, what are the variances in quality in both the service sector and in manufacturing?

It is within this framework that we examine the question of the scarcity of labor. If everything we are doing is an essential contribution to community well-being, then perhaps there is a labor shortage. If, on the other hand, we are engaging in at least some activities that do not contribute to community well-being then perhaps much of the labor shortage could be solved by the reallocation of resources. Through lower postal rates, we subsidize the distribution of junk mail, which few people want, so we can hire people to collect it, overburden our landfills and reduce the quality of our environment. Through tax increment financing, we subsidize the expansion of shopping centers where the wage rates are among the lowest of any industry. Through a variety of public initiatives, we expand both lotteries and casinos, neither of which produce real wealth, while they add to a growing list of community social problems. There are other examples of how we could reduce our labor shortages if we assessed our valuable human resource to be as precious as it is.

The world's population exceeds five billion, many of whom would like to move here.

One of the most heartening experiences is to visit with the talented, hardworking and eager young people of this world who would like to spend their lives in the United States. Countries like Peru, Iran, Columbia, Kenya, Venezuela, India, Indonesia and others have millions of highly talented young people, many of whom are products of an education system superior to ours and then educated further in foreign or US universities. The nation's experience with immigrants has been very favorable in the past and an even greater potential is in store for us in the future if we choose to accept it. A policy to increase immigration would, of course, have to be selective and well thought out. It would no doubt be controversial. But it would also stimulate demand and the nearly limitless availability of talent.

Immigrants have figured decisively into Minnesota's industrial history in ways not fully understood by policy makers and others. Three of Minnesota's most technically advanced companies, Remmele, Kurt and Bermo were all started by immigrants from Germany, some of them Christian, some of them Jewish. Immigrants from Scandinavia, Czechoslovakia, Hungary, Poland, China, and many other countries have started companies, sold products, provided expertise and served as dependable employees to help provide this section of the United States with the standard of living it now has.

The Myth and Truth to the Labor Shortage

Manufacturing does need more and better employees during this robust economic period. That is a truth. But, since manufacturing employment continues to shrink nationally, there is labor out there some place. With fifteen percent of the nation's employment now in manufacturing, and with much of that labor higher paid than in some other industries, and with highly talented people clamoring to come the United States, and with our use of labor far from optimal, and with the financial problems in many parts of the world threatening our current boom, it is hard to accept the perceived labor shortage as our major long-term constraint. However, as we look toward the future, the replenishment of our current labor force, with respect to both talent and quantity, may become more difficult.

SECTION V - CATEGORIES OF MANUFACTURING EXPANSION

Within the framework of a gradual national retreat from manufacturing are communities that are thriving and prospering with manufacturing as the footing. These communities are growing in population, improving in their social statistics and showing comfortable gains in personal income. Other communities are rapidly losing their industry and experiencing the negative effects much more severely than the nation as a whole. It is helpful for us to structure certain categories so that we can understand these trends, and the effcts, more fully.

Categories of Manufacturing Expansion

In a country as expansive and diverse as the United States, there is no single pattern that typifies manufacturing expansion or even an appreciably high percentage of situations facing the industrial communities of the United States. There are, however, many separately interesting attributes and characteristics that can provide a useful understanding of industrial movements when we consider them as a collective set. There is no single answer to what drives industrial location but we can gain a better understanding by closely studying the winners and losers.

This particular research was primarily organized by county, and to a lesser extent by individual municipalities within those counties, and to an even lesser extent by state. Counties provide a useful unit of analysis for the study of manufacturing. The county unit is large enough to iron out the highs and lows of individual municipalities, and yet the county analysis provides much more specificity than is available if we look at trends by state. Though the analysis we provide will certainly include municipal and state data, as well as industry data, our primary unit of analysis will be by county.

The variation of manufacturing condition between and among counties in the United States is huge. Some counties are growing rapidly while others shrink rapidly. Of course, there are a large number of counties where manufacturing is simply not a significant portion of the economic activity. They may be agricultural counties, seaports or financial centers; or they may simply be small, sparsely populated counties where the economic activity is not particularly substantial in any industry. But there are patterns worth noting. Certain patterns of industrial expansion or contraction are taking place in ways that lend themselves to organization into useful groups. We do not claim that the groupings we have selected are ideal, but we feel they may be useful in starting a more meaningful dialogue on industrial expansion.

All U.S. counties have been grouped here into eight classifications: Hinterland Highspots, Beaten-path Boomtowns, Metro Movers, Gradual Growers, Little Losers, Falling Goliaths, Midrange Minuses, and everything else. Generally speaking, the counties were arranged into

these eight groups on the basis of manufacturing payroll growth, employment growth, relative size, proximity to major transportation centers and whether or not they are a part of a major metropolitan area. Several databases were used to make this determination but the major sets were County Business Patterns in 1979, 1988, 1993 and 1995 and the Census of Manufacturers for 1982, 1987 and 1992. Because of our interest in analyzing ups and downs as well as long term trends, each of these databases were analyzed separately. Private databases such as the Moody's Industrial Database and the Manufacturing News Database were used to accumulate financial, volume of business, employment and square footage information on individual firms.

The sorting of 3144 individual US counties into the eight classifications was both time consuming and iterative. We were reluctant to establish a definitive classification on the basis of any single measurement so several measurements were considered (manufacturing payroll growth, employment growth, relative size, proximity to major transportation centers and metropolitan status) as were several time periods, primarily 1979 to 1993, 1980 to 1990 and 1988 to 1995.

Hinterland Highspots (Class 1 - 21 Counties)

Hinterland Highspots are those counties that have enjoyed, in recent years, significant industrial growth, but are neither part of a metropolitan area nor close to an interstate highway. Many of these are remote communities, such as Lee County, Mississippi, or Noble County, Indiana. Something is driving each of these counties other than urban sprawl and the proximity to major transportation arteries. Within these communities there is often one, but very frequently more than one, high-caliber company with a major manufacturing plant.

From 1979 to 1993, manufacturing payroll increased 132 percent to 495 percent for this class of counties. Manufacturing employment increased from 1 percent to 120 percent and manufacturing payroll increased 26 percent to 156 percent from 1988 to 1995. Manufacturing employment in 1988 ranged from 5,058 to 16,094 employees. There is one Hinterland Highspot in Minnesota; McLeod County.

Table V-1

Hinterland Highspot Counties

AREANAME	Class	Emp 95	Emp Incr 88-95	% Emp Incr 88-95	Payroll 95	Payroll Incr 88-95	% Payroll Incr 88-95
Marshall, AL	1	14,845	3,210	27.59%	$304,753	$106,606	53.80%
Hall, GA	1	16,052	2,975	22.75%	$408,121	$154,342	60.82%
Kosciusko, IN	1	15,130	2,963	24.35%	$525,765	$204,002	63.40%
Marshall, IN	1	8,973	3,176	54.79%	$222,300	$108,820	95.89%
Noble, IN	1	10,885	2,176	24.99%	$280,171	$114,845	69.47%
Grand Traverse, MI	1	5,680	378	7.13%	$152,048	$45,475	42.67%
McLeod, MN	1	8,451	1,426	20.30%	$262,413	$90,856	52.96%
Lee, MS	1	18,493	2,399	14.91%	$439,216	$164,516	59.89%
Lowndes, MS	1	8,482	1,101	14.92%	$233,806	$60,293	34.75%
Monroe, MS	1	6,641	686	11.52%	$133,313	$32,468	32.20%
Pontotoc, MS	1	5,091	33	0.65%	$96,916	$20,361	26.60%
Beaufort, NC	1	5,858	234	4.16%	$134,322	$29,679	28.36%

Lee, NC	1	12,392	5,433	78.07%	$279,580	$145,888	109.12%
Union, OH	1	9,028	1,088	13.70%	$414,187	$130,222	45.86%
Benton, OR	1	8,330	2,359	39.51%	$388,975	$221,146	131.77%
Adams, PA	1	9,169	1,809	24.58%	$214,493	$84,647	65.19%
Chesterfield, SC	1	7,203	415	6.11%	$158,641	$32,764	26.03%
Lawrence, TN	1	7,060	1,126	18.98%	$145,622	$43,580	42.71%
Cache, UT	1	13,062	7,130	120.20%	$266,370	$162,634	156.78%
Walworth, WI	1	10,840	2,755	34.08%	$278,106	$119,889	75.78%
Waupaca, WI	1	5,663	451	8.65%	$165,386	$49,156	42.29%

Metro Movers (Class 2 - 48 Counties)

Metro Movers are high industrial growth communities within a major metropolitan area. Many of these metropolitan area counties are parts of huge metropolitan areas such as Ventura County, Calif. (Los Angeles), or Snohomish County, Wash. (Seattle). But others are moderate in size, such as Madison, Wis., or Boise, Idaho. Often, industrial swarming takes place in these counties in ways that aren't usually present in either the Hinterland Highspots or the Beaten-path Boomtowns. To some extent, these communities probably do benefit from urban sprawl. However, only a small fraction of the metropolitan counties fit into this category. They are distinctive because industrial growth is substantially above the U.S. norm.

From 1979 to 1993, manufacturing payroll increased 119 percent to 966 percent for this class of counties. Manufacturing employment increased from break-even to 109 percent and manufacturing payroll increased 18 percent to 167 percent from 1988 to 1995. Manufacturing employment in 1988 ranged from 5,042 to 49,906 employees. There are two Metro Movers in Minnesota; Dakota and Carver Counties.

Table V-2

Metro Mover Counties

AREANAME	Class	Emp 95	Emp Incr 88-95	% Emp Incr 88-95	Payroll 95	Payroll Incr 88-95	% Payroll Incr 88-95
Lauderdale, AL	2	9,019	2,699	42.71%	$177,063	$69,541	64.68%
Limestone, AL	2	6,642	(47)	-0.70%	$289,431	$83,892	40.82%
Madison, AL	2	30,438	5,250	20.84%	$1,164,471	$395,319	51.40%
Benton, AR	2	16,273	4,459	37.74%	$369,187	$142,752	63.04%
Washington, AR	2	15,928	5,727	56.14%	$365,225	$186,669	104.54%
Napa, CA	2	7,990	2,948	58.47%	$249,567	$118,329	90.16%
Placer, CA	2	8,517	2,631	44.70%	$352,309	$191,480	119.06%
Sonoma, CA	2	21,438	2,499	13.20%	$782,242	$288,934	58.57%
Ventura, CA	2	33,584	336	1.01%	$1,279,320	$345,407	36.98%
Arapahoe, CO	2	23,503	9,710	70.40%	$1,001,221	$629,387	169.27%
El Paso, CO	2	24,818	2,824	12.84%	$793,736	$214,181	36.96%
Larimer, CO	2	14,831	2,573	20.99%	$597,455	$251,741	72.82%
Manatee, FL	2	10,807	4,613	74.48%	$293,875	$161,761	122.44%
Marion, FL	2	9,368	1,021	12.23%	$220,195	$71,263	47.85%
Bartow, GA	2	10,125	2,530	33.31%	$279,130	$130,953	88.38%
Gwinnett, GA	2	33,046	7,965	31.76%	$1,223,319	$517,373	73.29%
Rockdale, GA	2	7,251	1,379	23.48%	$226,523	$96,348	74.01%
Ada, ID	2	21,941	9,555	77.14%	$945,895	$568,005	150.31%
Canyon, ID	2	10,656	4,082	62.09%	$256,793	$135,957	112.51%
Lake, IL	2	68,930	19,024	38.12%	$2,887,871	$1,264,131	77.85%

De Kalb, IN	2	9,667	2,433	33.63%	$307,627	$133,423	76.59%
Huntington, IN	2	10,265	5,001	95.00%	$353,799	$241,811	215.93%
Allegan, MI	2	17,214	4,997	40.90%	$576,525	$243,134	72.93%
Livingston, MI	2	8,499	1,765	26.21%	$283,999	$108,720	62.03%
Carver, MN	2	10,719	4,955	85.96%	$390,055	$225,441	136.95%
Dakota, MN	2	23,742	8,420	54.95%	$856,921	$407,719	90.77%
DeSoto, MS	2	7,943	1,334	20.18%	$203,610	$74,213	57.35%
Saint Charles, MO	2	10,915	796	7.87%	$406,503	$61,207	17.73%
Clark, NV	2	15,414	6,810	79.15%	$471,520	$274,544	139.38%
Hunterdon, NJ	2	8,976	731	8.87%	$481,670	$261,287	118.56%
Durham, NC	2	39,546	8,981	29.38%	$1,602,646	$598,254	59.56%
Edgecombe, NC	2	10,297	3,808	58.68%	$249,425	$128,609	106.45%
Pitt, NC	2	9,462	585	6.59%	$293,565	$89,133	43.60%
Clermont, OH	2	7,842	696	9.74%	$319,995	$86,982	37.33%
Warren, OH	2	12,158	6,344	109.12%	$347,010	$217,107	167.13%
Washington, OR	2	37,694	6,883	22.34%	$1,607,564	$778,246	93.84%
Rutherford, TN	2	20,892	4,317	26.05%	$738,868	$304,011	69.91%
Sumner, TN	2	12,206	2,580	26.80%	$308,870	$124,710	67.72%
Williamson, TN	2	7,299	1,918	35.64%	$240,212	$118,185	96.85%
Collin, TX	2	20,683	2,120	11.42%	$969,379	$371,490	62.13%
Denton, TX	2	12,596	116	0.93%	$421,954	$96,316	29.58%
Travis, TX	2	54,496	19,872	57.39%	$2,227,194	$1,146,745	106.14%
Williamson, TX	2	7,406	2,596	53.97%	$201,753	$107,194	113.36%
Davis, UT	2	7,621	3,170	71.22%	$192,664	$99,493	106.79%
Weber, UT	2	16,534	7,345	79.93%	$512,370	$297,832	138.82%
Snohomish, WA	2	46,749	8,971	23.75%	$1,844,607	$485,461	35.72%
Dane, WI	2	30,640	8,301	37.16%	$979,057	$394,611	67.52%
Winnebago, WI	2	32,102	3,139	10.84%	$1,160,521	$324,842	38.87%

Beaten-path Boomtowns (Class 3 - 20 Counties)

Beaten-path Boomtowns are counties with significantly higher industrial growth than average counties. Like the Hinterland Highspots, they are not part of a metropolitan area, but are on major transportation corridors. An interstate highway either runs through or very close to the Beaten-path Boomtown counties. Examples of Beaten-path Boomtowns might be Coffee County, Tenn., or Adams County, Pa. As with the Hinterland Highspots, the economic growth is often traceable to the vigor and expansion of a few key industrial companies.

From 1979 to 1993, manufacturing payroll increased 139 percent to 362 percent for this class of counties. Manufacturing employment increased from break-even to 116 percent and manufacturing payroll increased 37 percent to 333 percent from 1988 to 1995. Manufacturing employment in 1988 ranged from 5,075 to 27,556 employees.There is one Beaten-path Boomtown in Minnesota: Winona County

Table V-3

Beaten-path Boomtown Counties

AREANAME	Class	Emp 95	Emp Incr 88-95	% Emp Incr 88-95	Payroll 95	Payroll Incr 88-95	% Payroll Incr 88-95
De Kalb, AL	3	13,604	5,045	58.94%	$238,672	$111,682	87.95%
Mississippi, AR	3	8,572	2,248	35.55%	$239,704	$127,358	113.36%
Laurens, GA	3	6,026	602	11.10%	$141,465	$48,069	51.47%
Whitfield, GA	3	27,573	17	0.06%	$766,771	$254,583	49.71%
Dubois, IN	3	12,831	2,934	29.65%	$327,342	$132,278	67.81%
Montgomery, IN	3	8,264	2,660	47.47%	$269,724	$117,409	77.08%
Steuben, IN	3	7,487	2,432	48.11%	$180,549	$70,574	64.17%
Winona, MN	3	8,060	827	11.43%	$201,751	$57,342	39.71%

Table V-8

Comparative Statistics by Category of Industrial Expansion

	Hinterland Highspots	Metro Movers	Beaten path Boomtowns	Gradual Growers	Little Losers	Mid-range Minuses	Falling Goliaths	Minnesota
Number of Counties	21	48	20	40	30	29	22	87
Population, 1980	1,018,564	7,610,464	821,209	10,235,313	2,978,851	5,946,977	34,535,556	4,075,970
Population, 1995	1,212,616	11,729,956	918,885	15,443,900	2,991,072	6,014,029	35,235,153	4,609,548
Population Increase 1980 to 1995	194,052	4,119,492	97,676	5,208,587	12,221	67,052	699,597	533,578
Percent increases	19.05%	54.13%	11.89%	50.89%	0.41%	1.13%	2.03%	13.09%
Population range (low) in 1995	24,236	36,803	24,900	47,724	47,733	15,924	455,018	n/a
Population range (high) in 1995	108,238	992,593	78,033	2,432,372	233,996	1,187,798	9,138,789	n/a
Non-farm employment, 1993	458,311	3,989,680	385,335	5,227,163	928,460	1,881,209	15,007,629	1,944,630
Manufacturing payroll, 1979 Millions	$1,603	$7,711	$1,559	$11,272	$5,108	$11,434	$73,086	$6,375
Manufacturing payroll, 1993 Millions	$4,815	$27,056	$4,649	$27,902	$5,559	$13,146	$87,787	$12,960
Manufacturing Payroll Increase 79 to 93	$3,212	$19,345	$3,089	$16,630	$451	$1,712	$14,701	$6,585
Percent increase	200.37%	250.87%	198.10%	147.54%	8.83%	14.97%	20.12%	103.30%
Manufacturing payroll, 1988 Millions	$3,382	$18,641	$3,039	$22,251	$5,590	$14,578	$90,767	$11,233
Manufacturing payroll, 1995 Millions	$5,505	$32,305	$5,239	$32,539	$5,634	$13,563	$90,965	$14,731
Manufacturing Payroll Increase 88 to 95	$2,122	$13,664	$2,201	$10,287	$44	($1,016)	$198	$3,498
Percent increase	62.74%	73.30%	72.42%	46.23%	0.78%	-6.97%	0.22%	31.13%
Manufacturing employment, 1988	164,005	673,920	157,050	883,365	210,384	498,916	3,084,729	387,642
Manufacturing employment, 1995	207,327	894,682	196,988	1,013,231	177,005	391,423	2,420,995	414,087
Manufacturing employment Increase	43,322	220,762	39,938	129,866	(33,379)	(107,493)	(663,734)	26,445
Percent increase	26.42%	32.76%	25.43%	14.70%	-15.87%	-21.55%	-21.52%	6.82%
Mfg employment % of total in 1987	43.32%	27.90%	49.00%	25.42%	27.46%	29.44%	20.37%	22.36
% Govt pay as % of manufacturing pay, 1993	45.44%	104.24%	40.65%	149.32%	138.11%	83.46%	127.00%	78.90%
Manufacturing establishments, 1988	2,224	12,501	1,825	18,411	3,763	6,776	65,064	7,003
Manufacturing establishments, 1995	2,688	16,166	2,204	22,399	3,979	6,971	59,378	8,505
Manufacturing establishments Increase	464	3,665	379	3,988	216	195	(5,686)	1,502
Percent increase (decrease)	20.86%	29.32%	20.77%	21.66%	5.74%	2.88%	-8.74%	21.45%
Percent high school diplomas, 1990	70.58%	79.50%	64.81%	78.44%	74.14%	74.73%	73.16%	82.40%
Percent college graduates, 1990	14.76%	21.90%	11.83%	20.43%	14.13%	15.74%	21.71%	21.80%
Per capita income, 1993	$17,154	$20,555	$17,270	$19,898	$17,874	$18,444	$24,190	$20,979
Annual pay per mfg employee, 1995	$26,550	$36,107	$26,597	$32,114	$31,829	$34,649	$37,573	$35,574
Unemployment rate, 1995	4.87%	4.57%	5.24%	5.24%	7.48%	6.78%	6.71%	4.00%
Manufacturing Value-added 1992 ($mil)	$11,667	$66,965	$12,002	$70,970	$15,339	$30,921	$190,201	$27,325
Mfg Value-added per Employee 1992 ($mil)	$67,393	$83,752	$66,368	$79,375	$81,585	$76,336	$75,570	$69,831
Poverty rate, 1979	13.30%	9.87%	14.36%	9.73%	11.16%	10.37%	13.50%	9.47%
Poverty rate, 1989	12.97%	9.28%	13.95%	10.03%	12.72%	12.31%	14.41%	10.22%
Change in percentage points	down 0.33%	down 0.59%	down 0.41%	up 0.30%	up 1.56%	up 1.94%	up 0.91%	up 0.75%
Births to deaths ratio, 1993	1.75	2.37	1.44	2.40	1.33	1.39	1.62	1.77
Marriage to divorce ratio, 1988	2.27	1.91	1.91	4.67	2.21	2.25	2.79	2.79

Scott, MS	3	6,963	1,857	36.37%	$126,203	$59,614	89.53%
Granville, NC	3	6,089	1,014	19.98%	$152,543	$64,548	73.35%
Shelby, OH	3	13,850	3,809	37.93%	$450,474	$189,657	72.72%
Bedford, TN	3	6,276	1,109	21.46%	$155,734	$48,801	45.64%
Coffee, TN	3	5,623	171	3.14%	$138,575	$43,261	45.39%
Hamblen, TN	3	14,499	1,806	14.23%	$396,582	$149,852	60.74%
Marshall, TN	3	7,561	1,513	25.02%	$180,744	$65,583	56.95%
Maury, TN	3	11,695	6,270	115.58%	$507,345	$390,203	333.10%
Putnam, TN	3	10,210	1,938	23.43%	$233,951	$83,400	55.40%
Rockingham, VA	3	8,614	1,596	22.74%	$223,136	$83,773	60.11%
Smyth, VA	3	5,966	537	9.89%	$127,503	$34,573	37.20%
Sauk, WI	3	7,225	1,553	27.38%	$180,553	$68,165	60.65%

Gradual Growers (Class 5 - 40 Counties)

Gradual growers are those counties exhibiting less dramatic but still steady growth over the past two decades.They can be urban, rural or suburban, on interstate highways or not.

From 1979 to 1993, manufacturing payroll increased 84 percent to 296 percent for this class of counties. Manufacturing employment changed from -3 to 116 percent and manufacturing payroll increased 24 percent to 134 percent from 1988 to 1995. Manufacturing employment in 1988 ranged from 5,072 to 133,471 employees. Minnesota's Anoka and Stearns Counties are Gradual Growers.

Table V-4

Gradual Grower Counties

AREANAME	Class	Emp 95	Emp Incr 88-95	% Emp Incr 88-95	Payroll 95	Payroll Incr 88-95	% Payroll Incr 88-95
Maricopa, AZ	5	147,391	13,920	10.43%	$5,392,983	$1,693,218	45.77%
Kern, CA	5	11,504	3,248	39.34%	$336,424	$144,857	75.62%
Riverside, CA	5	41,032	3,671	9.83%	$1,156,518	$281,865	32.23%
Sacramento, CA	5	29,980	1,019	3.52%	$1,141,640	$370,860	48.11%
San Bernardino, CA	5	59,791	5,210	9.55%	$1,687,181	$399,045	30.98%
Solano, CA	5	8,360	1,352	19.29%	$301,948	$110,443	57.67%
Boulder, CO	5	31,577	1,873	6.31%	$1,196,323	$267,225	28.76%
Weld, CO	5	11,443	3,003	35.58%	$363,149	$138,991	62.01%
Clayton, GA	5	6,006	834	16.13%	$179,892	$51,748	40.38%
Elkhart, IN	5	60,695	6,680	12.37%	$1,683,067	$452,623	36.79%
Hamilton, IN	5	7,502	2,012	36.65%	$229,718	$107,142	87.41%
Tippecanoe, IN	5	16,197	4,163	34.59%	$613,620	$255,419	71.31%
Johnson, KS	5	24,960	3,992	19.04%	$822,023	$282,873	52.47%
Boone, KY	5	9,137	3,183	53.46%	$268,269	$132,960	98.26%
Harford, MD	5	5,072	1,019	25.14%	$160,300	$64,104	66.64%
Ottawa, MI	5	36,518	8,156	28.76%	$1,126,657	$381,655	51.23%
Anoka, MN	5	23,213	2,716	13.25%	$885,502	$268,582	43.54%
Stearns, MN	5	12,788	4,057	46.47%	$338,894	$166,403	96.47%
Lancaster, NE	5	17,290	2,615	17.82%	$515,283	$164,063	46.71%
Washoe, NV	5	12,073	2,752	29.52%	$345,944	$123,458	55.49%
Rockingham, NH	5	16,660	420	2.59%	$604,271	$177,486	41.59%
Catawba, NC	5	43,789	2,691	6.55%	$1,056,225	$302,656	40.16%
Henderson, NC	5	7,523	88	1.18%	$226,132	$44,854	24.74%
Iredell, NC	5	17,144	(476)	-2.70%	$440,925	$115,493	35.49%
Mecklenburg, NC	5	55,816	(175)	-0.31%	$1,944,932	$514,601	35.98%

Rutherford, NC	5	12,163	486	4.16%	$292,124	$84,085	40.42%
Wake, NC	5	28,430	1,389	5.14%	$941,156	$281,396	42.65%
Clackamas, OR	5	22,934	6,169	36.80%	$865,439	$414,007	91.71%
Hawkins, TN	5	6,580	651	10.98%	$199,309	$38,351	23.83%
Montgomery, TN	5	6,364	923	16.96%	$162,985	$55,002	50.94%
Fort Bend, TX	5	9,584	3,898	68.55%	$409,001	$234,510	134.40%
Hidalgo, TX	5	12,104	2,073	20.67%	$197,221	$54,007	37.71%
Salt Lake, UT	5	55,972	8,045	16.79%	$1,641,284	$454,447	38.29%
Chesapeake, VA	5	4,328	492	12.83%	$140,976	$53,463	61.09%
Clark, WA	5	20,155	2,630	15.01%	$696,487	$217,971	45.55%
Brown, WI	5	25,660	2,618	11.36%	$896,597	$226,932	33.89%
Dodge, WI	5	12,584	3,229	34.52%	$377,832	$149,977	65.82%
Marathon, WI	5	16,152	4,233	35.51%	$467,032	$161,177	52.70%
Washington, WI	5	14,949	4,084	37.59%	$451,883	$196,025	76.61%
Waukesha, WI	5	51,811	10,923	26.71%	$1,781,421	$653,381	57.92%

Little Losers (Class 7 - 30 Counties)

Little Losers are those counties with manufacturing employment from 5,000 to 10,000 in 1988 that have experienced substantial declines in manufacturing during the past two decades such as Schenectady, New York and Newport, Rhode Island.

From 1979 to 1993, manufacturing payroll changed from -46 percent to +82 percent for this class of counties. Manufacturing employment declined from break-even to 66 percent loss and manufacturing payroll changed from -47 percent to +23 percent from 1988 to 1995. Manufacturing employment in 1988 ranged from 5,061 to 9,623 employees. There is one Little Losers in Minnesota which is St. Louis County (the Minnesota Iron Range).

Table V-5

Little Loser Counties

AREANAME	Class	Emp 95	Emp Incr 88-95	% Emp Incr 88-95	Payroll 95	Payroll Incr 88-95	% Payroll Incr 88-95
Colbert, AL	7	6,207	(458)	-6.87%	$209,098	$30,395	17.01%
Tazewell, IL	7	8,279	(852)	-9.33%	$289,252	($57,113)	-16.49%
Vermilion, IL	7	7,364	(2,109)	-22.26%	$231,092	($35,952)	-13.46%
Vigo, IN	7	8,436	(1,187)	-12.34%	$266,406	($9,277)	-3.37%
Wayne, IN	7	7,678	(295)	-3.70%	$237,899	$44,101	22.76%
Reno, KS	7	5,263	(100)	-1.86%	$145,078	$15,555	12.01%
Boyd, KY	7	5,299	(1,912)	-26.52%	$229,193	($25,349)	-9.96%
Saint Louis, MN	7	5,785	(206)	-3.44%	$154,660	$26,779	20.94%
Atlantic, NJ	7	5,936	(1,393)	-19.01%	$179,132	($9,846)	-5.21%
Salem, NJ	7	3,867	(2,093)	-35.12%	$227,264	$12,632	5.89%
Cattaraugus, NY	7	5,976	(1,875)	-23.88%	$183,477	$8,917	5.11%
Cayuga, NY	7	4,336	(931)	-17.68%	$119,592	($4,306)	-3.48%
Fulton, NY	7	3,966	(1,893)	-32.31%	$89,155	($10,529)	-10.56%
Jefferson, NY	7	4,125	(936)	-18.49%	$127,409	($524)	-0.41%
Oswego, NY	7	5,732	(2,372)	-29.27%	$213,772	($30,708)	-12.56%
Schenectady, NY	7	7,279	(281)	-3.72%	$278,486	$35,152	14.45%
Tioga, NY	7	4,900	(2,823)	-36.55%	$229,917	($25,334)	-9.93%
Ulster, NY	7	6,570	(1,259)	-16.08%	$176,160	$12,868	7.88%

Crawford, OH	7	7,152	(513)	-6.69%	$209,745	$22,196	11.83%
Fairfield, OH	7	6,600	30	0.46%	$182,475	$32,898	21.99%
Seneca, OH	7	6,766	(334)	-4.70%	$219,402	$13,357	6.48%
Douglas, OR	7	7,866	(1,404)	-15.15%	$235,188	$1,249	0.53%
Cambria, PA	7	7,936	(336)	-4.06%	$191,629	$16,584	9.47%
Clearfield, PA	7	5,181	73	1.43%	$114,258	$17,840	18.50%
Fayette, PA	7	4,680	(839)	-15.20%	$117,314	$1,723	1.49%
Lawrence, PA	7	6,239	(742)	-10.63%	$180,439	$14,715	8.88%
Newport, RI	7	2,038	(3,930)	-65.85%	$93,432	($83,659)	-47.24%
Kershaw, SC	7	5,135	(661)	-11.40%	$149,339	$11,330	8.21%
Grays Harbor, WA	7	4,774	(1,549)	-24.50%	$169,529	$2,124	1.27%
Cabell, WV	7	5,640	(199)	-3.41%	$184,179	$15,795	9.38%

Midrange Minuses (Class 8 - 29 Counties)

The Midrange Minuses are those medium- sized (in terms of manufacturing) counties that have suffered some of the most significant reductions in manufacturing employment in recent years. Often these are communities that hosted a major company or two that has not been able to endure international competition -- at least not without significantly reducing its employment. Among the Midrange Minus Communities are Rock Island, Illinois and Kenosha, Wisconsin. Some of these communities have been able to recover by concentrating on other community strengths, such as Kenosha's strategic position on Lake Michigan between Milwaukee and Chicago. In the main, though, the decline of industry has taken its toll and the Midrange Minus communities exhibit declining social as well as economic statistics.

From 1979 to 1993, manufacturing payroll changed from -36 percent to +65 percent for this class of counties. Manufacturing employment declined from 1 percent to 81 percent and manufacturing payroll changed from -82 percent to +32 percent from 1988 to 1995. Manufacturing employment in 1988 ranged from 10,091 to 25,154 employees. There are no Midrange Minuses in Minnesota.

Table V-6

Midrange Minus Counties							
AREANAME	**Class**	**Emp 95**	**Emp Incr 88-95**	**% Emp Incr 88-95**	**Payroll 95**	**Payroll Incr 88-95**	**% Payroll Incr 88-95**
Etowah, AL	8	10,309	(914)	-8.14%	$309,863	$8,213	2.72%
Macon, IL	8	13,896	(741)	-5.06%	$489,398	($22,238)	-4.35%
Rock Island, IL	8	13,083	(145)	-1.10%	$593,205	$142,894	31.73%
Bartholomew, IN	8	14,026	(1,791)	-11.32%	$430,880	($115,166)	-21.09%
Madison, IN	8	11,810	(4,576)	-27.93%	$556,958	($44,503)	-7.40%
Scott, IA	8	13,481	640	4.98%	$525,606	$118,441	29.09%
Penobscot, ME	8	10,284	(3,384)	-24.76%	$297,261	($37,277)	-11.14%
Berkshire, MA	8	10,011	(6,065)	-37.73%	$386,481	($108,668)	-21.95%
Muskegon, MI	8	15,649	(1,727)	-9.94%	$566,802	$57,363	11.26%
Monmouth, NJ	8	19,633	(9,656)	-32.97%	$795,028	($75,811)	-8.71%
Bronx, NY	8	15,695	(6,962)	-30.73%	$421,342	($64,297)	-13.24%
Broome, NY	8	23,401	(5,955)	-20.29%	$787,863	($94,051)	-10.66%
Dutchess, NY	8	12,445	(16,664)	-57.25%	$501,408	($582,216)	-53.73%
Niagara, NY	8	19,227	(3,277)	-14.56%	$813,970	$99,825	13.98%

Oneida, NY	8	16,026	(2,982)	-15.69%	$416,655	($60,535)	-12.69%
Allen, OH	8	10,919	(3,919)	-26.41%	$442,702	($33,300)	-7.00%
Mahoning, OH	8	13,520	87	0.65%	$399,525	$75,961	23.48%
Richland, OH	8	15,297	(3,125)	-16.96%	$482,563	($62,559)	-11.48%
Lebanon, PA	8	9,913	(1,529)	-13.36%	$264,472	$34,084	14.79%
Lycoming, PA	8	13,251	(3,483)	-20.81%	$348,746	($15,994)	-4.39%
Mercer, PA	8	10,884	(565)	-4.93%	$321,537	$26,818	9.10%
Northampton, PA	8	23,084	(1,888)	-7.56%	$748,708	$150,889	25.24%
Westmoreland, PA	8	25,154	(343)	-1.35%	$814,053	$139,246	20.63%
Jefferson, TX	8	15,434	(3,093)	-16.69%	$690,502	$62,035	9.87%
Martinsville, VA	8	10,829	(2,090)	-16.18%	$235,496	$16,531	7.55%
Benton, WA	8	4,567	(7,233)	-61.30%	$164,900	($247,916)	-60.05%
Brooke, WV	8	1,963	(8,128)	-80.55%	$67,319	($305,540)	-81.95%
Wood, WV	8	7,702	(4,001)	-34.19%	$308,786	($22,396)	-6.76%
Kenosha, WI	8	9,930	(3,984)	-28.63%	$380,551	($55,389)	-12.71%

Falling Goliaths (Class 9 - 22 Counties)

The Falling Goliath counties are some of the major urban counties of the United States that have been especially affected by industrial shrinkage. Among these are Kings County, N.Y. (Brooklyn), and Cook County, Ill.(Chicago). Most of these were enormous manufacturing centers at one time and some still have large numbers of people employed in manufacturing today, but the numbers are rapidly shrinking.

From 1979 to 1993, manufacturing payroll changed from -18 percent to +44 percent for this class of counties. Manufacturing employment declined from 1 percent to 34 percent and manufacturing payroll changed from -36 percent to +21 percent from 1988 to 1995. Manufacturing employment in 1988 ranged from 35,201 to 891,105 employees. There are no Falling Goliaths in Minnesota.

Table V-7

Falling Goliath Counties

AREANAME	Class	Emp 95	Emp Incr 88-95	% Emp Incr 88-95	Payroll 95	Payroll Incr 88-95	% Payroll Incr 88-95
Jefferson, AL	9	42,422	(333)	-0.78%	$1,259,717	$220,649	21.24%
Los Angeles, CA	9	656,282	(234,823)	-26.35%	$21,441,761	($3,054,069)	-12.47%
Denver, CO	9	31,273	(3,928)	-11.16%	$976,084	$36,043	3.83%
Cook, IL	9	430,589	(74,282)	-14.71%	$16,033,331	$1,242,901	8.40%
Lake, IN	9	39,585	(5,118)	-11.45%	$1,747,371	$240,076	15.93%
Baltimore, MD	9	38,552	(17,123)	-30.76%	$1,549,434	($162,024)	-9.47%
Baltimore City, MD	9	35,163	(13,627)	-27.93%	$1,214,684	($68,532)	-5.34%
Wayne, MI	9	180,005	(27,657)	-13.32%	$8,954,319	$723,181	8.79%
Essex, NJ	9	47,727	(16,240)	-25.39%	$1,863,145	$38,078	2.09%
Hudson, NJ	9	33,365	(11,792)	-26.11%	$1,070,590	($2,615)	-0.24%
Union, NJ	9	54,307	(20,418)	-27.32%	$2,365,611	($73,538)	-3.01%
Erie, NY	9	72,892	(7,107)	-8.88%	$2,667,711	$407,779	18.04%
Kings, NY	9	49,674	(23,962)	-32.54%	$1,099,683	($294,486)	-21.12%
Nassau, NY	9	46,130	(40,769)	-46.92%	$1,675,094	($924,883)	-35.57%
New York, NY	9	158,433	(68,076)	-30.05%	$7,719,982	$418,626	5.73%
Onondaga, NY	9	36,497	(7,113)	-16.31%	$1,369,950	($9,120)	-0.66%
Queens, NY	9	51,711	(20,010)	-27.90%	$1,437,669	($127,580)	-8.15%
Cuyahoga, OH	9	144,016	(17,506)	-10.84%	$5,853,860	$782,236	15.42%

Lucas, OH	9	38,003	(7,451)	-16.39%	$1,709,955	$83,970	5.16%
Allegheny, PA	9	70,820	(12,085)	-14.58%	$2,949,299	$261,288	9.72%
Philadelphia, PA	9	61,775	(31,713)	-33.92%	$2,346,892	($97,286)	-3.98%
Milwaukee, WI	9	101,774	(2,601)	-2.49%	$3,658,760	$557,602	17.98%

Other Counties and Considerations

As a practical matter, data provided by both government and private sources has to be used with caution and for many practical reasons, some of the data is unusable. Data is simply not disclosed for some smaller counties because of the desire on the part of the collecting authorities to preserve the privacy of major employers. In a small number of other cases, we have avoided including data from some counties in our samples because the data looked peculiar enough to raise questions about its accuracy. The classification of counties into the above groupings is not intended to be inclusive but to provide a convenient structure which might be used in examining some of the more pressing questions surrounding industrial expansion and competitiveness. Table V-8 shows the statistical differences between the major classes and Minnesota as a benchmark state.

Summary of the Differences

Table V-8 summarizes a few of the major differences between the seven categories of industrial expansion and Minnesota as a benchmark state. The variations between the four favorable classifications (Hinterland Highspots, Beaten-path Boomtowns, Metro Movers and Gradual Growers) and the three less favorable classifications (Little Losers, Falling Goliaths and Midrange Minuses) are quite interesting. From 1979 to 1993, the 129 counties classified favorably experienced manufacturing payroll growth of $44.2 billion or 191 percent while the 81 counties classified unfavorably experienced manufacturing payroll growth of $16.8 billion or 19 percent. Inflation alone should have provided about a 75 percent increase during the 1979 to 1993 period.

To cross check the validity of our classification system, we also examined the manufacturing payroll changes during the shorter but more recent time period from 1988 to 1995. From 1988 to 1995, the 129 counties classified favorably experienced manufacturing payroll growth of $28.3 billion or 60 percent while the 81 counties classified unfavorably experienced a combined manufacturing payroll decline of $.8 billion or 1 percent.

With respect to manufacturing employment, the differences were more dramatic. From 1988 to 1995, the 129 counties classified favorably experienced manufacturing employment growth of 433,888 jobs or 23 percent while the 81 counties classified unfavorably experienced combined manufacturing employment declines of 804,606 jobs or 21 percent.

Changes in the reported number of manufacturing establishments followed similar trends. From 1988 to 1995, the 129 counties classified favorably experienced manufacturing employment growth of 8,496 manufacturing establishments or 24 percent while the 81 counties classified unfavorably combined to lose 5,275 manufacturing establishments or 7 percent.

The changes described above also impacted unemployment and poverty rates. In 1995, the favorably classified counties averaged a little under 5 percent unemployment versus 7 percent among the less favorably classified counties. Poverty rates declined slightly among the manufacturing high achievers but increased among the low achievers.

Educational levels, as measured by the percent of the population with college degrees and high school diplomas, were quite similar between the high achiever and the low achievers.

We should underscore the fact that industry is quite dynamic in each of our classified counties and elsewhere. We are confident that the fortunes of many of these counties are changing in way that are not fully captured in the available statistics. Kenosha, Wisconsin, for instance, is enjoying somewhat of a resurgence. Other listed counties may have declined further while others may have peaked with the fortunes of a particular single industry. Although we believe the above classification structure is useful, we are always open to new information.

Classified Counties by State

One of the major questions of this study should be, does public policy influence industrial location. More will be said on that topic later but the short answer is, not as much as the quality of the companies involved. It is significant that nineteen states had both high-achieving (Hinterland Highspots, Metro Movers, Beaten-path Boomtowns or Gradual Growers) and low-achieving (Little Losers, Mid-range Minuses or Falling Goliaths) counties -- all with the same basic laws and tax structures (Table V-9). Policy does matter, as we shall discuss later, but so does the quality of the companies involved. New Jersey is a prime example. New Jersey has 21 counties, 19 of which lost manufacturing employment between 1988 and 1995. The only significant gaining county, Hunterdon, a Metro Mover, is headquarters to Merck.

Table V-9
Classified Counties by State

State	Hinterland Highspots	Metro Movers	Beaten-path Boomtowns	Gradual Growers	Little Losers	Mid-range Minuses	Falling Goliaths
Alabama	1	3	1		1	1	1
Arizona				1			
Arkansas		2	1				
California		4		5			1
Colorado		3		2			1
Florida		2					
Georgia	1	3	2	1			
Idaho		2					
Illinois		1			2	2	1
Indiana	3	2	3	3	2	2	1
Iowa						1	
Kansas				1	1		
Kentucky				1	1		
Maine						1	
Maryland				1			2
Massachusetts						1	

Michigan		2	1	1		1	1
Minnesota	1	2	1	2	1		
Mississippi	4	1	1				
Missouri		1					
Nebraska				1			
Nevada		1		1			
New Hampshire				1			
New Jersey		1			2	1	3
New York					8	5	6
North Carolina	2	3	1	6			
Ohio	1	2	1		3	3	2
Oregon	1	1		1	1		
Pennsylvania	1				4	5	2
Rhode Island					1		
South Carolina	1				1		
Tennessee	1	3	6	2			
Texas		4		2		1	
Utah	1	2		1			
Virginia			2	1		1	
Washington		1		1	1	1	
West Virginia					1	2	
Wisconsin	2	2	1	5		1	1

Classified Counties - Summary

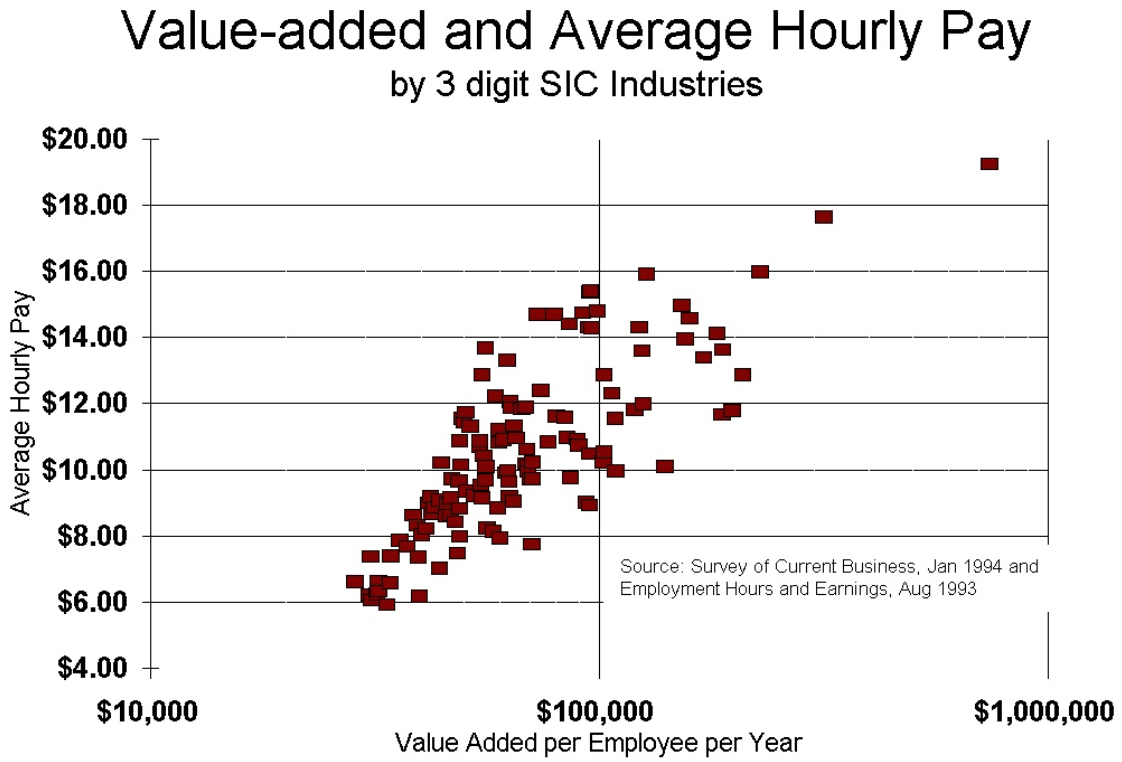
State	Hinterland Highspots	Metro Movers	Beaten-path Boomtowns	Gradual Growers	Little Losers	Mid-range Minuses	Falling Goliaths
Total	**21**	**48**	**20**	**40**	**30**	**29**	**22**

SECTION VI - PROSPERITY AND INDIVIDUAL INDUSTRIES

All industries contribute to community prosperity, but some industries are regarded as more valuable by the buying public. People are willing to pay more for a jetliner or a precision instrument than for informal apparel or advertising inserts. More market value is generated in some industries than in others, and in most cases, this means higher wages per employee.

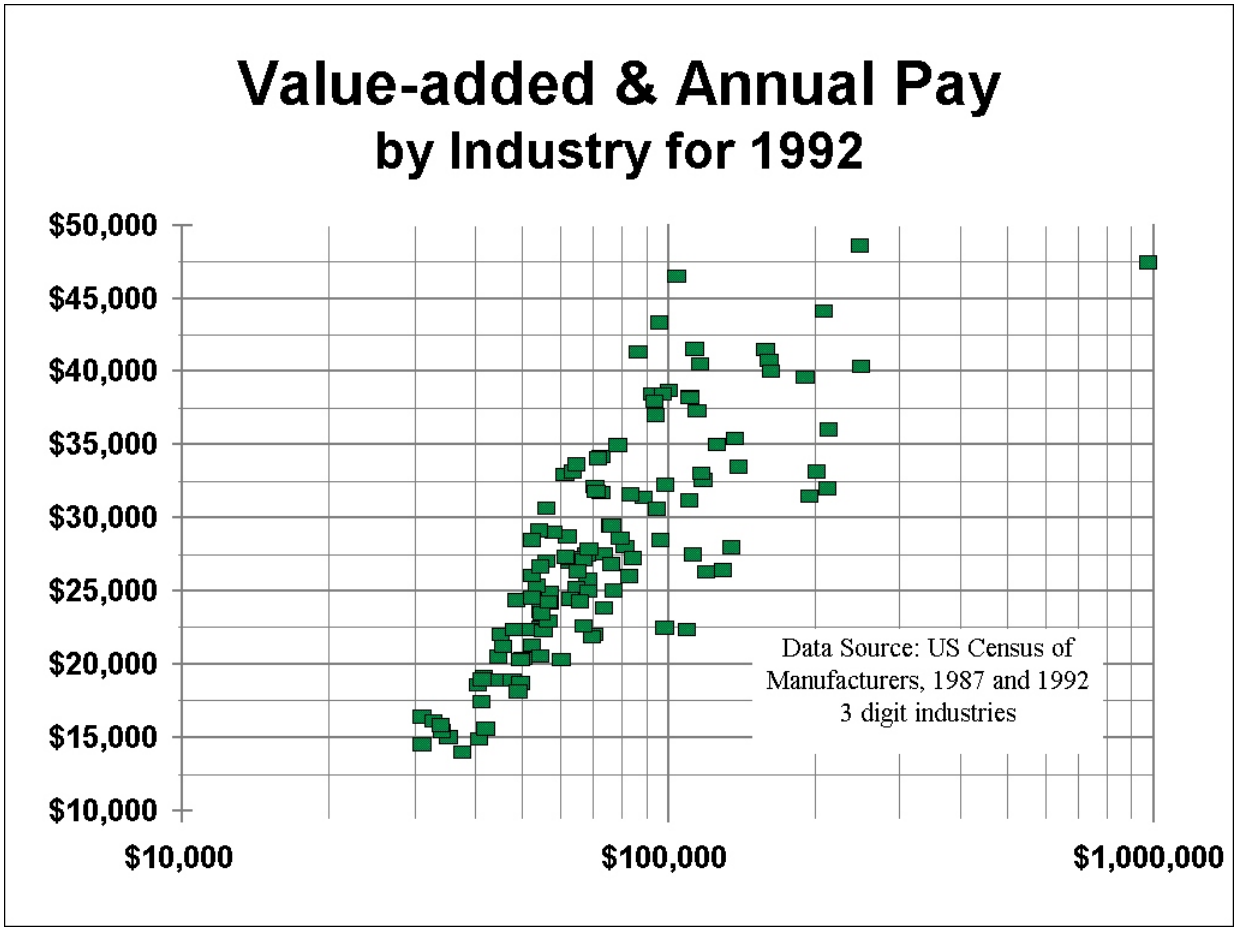
There is a correlation between value-added activities and wages paid. Figure VI-1 shows this relationship for a set of three-digit manufacturing industries, derived by combining data made available for 1990. Note that hourly wages (in 1990 $) were much higher in those industries where the value-added per employee exceeded $80,000 per year.

Figure VI-1



The relationship between value-added and pay was duplicated again with different data with the same result (Figure VI-2). Those industries generating higher value-added per employee pay more. Thus, in terms of employee and community prosperity, it matters a great deal which industries are expanding and contracting. A similar chart can be constructed at the county level. Those counties with higher value-added per employee in manufacturing also show higher average manufacturing pay.

Figure VI-2



The fact that some industries create more value than others has ramifications for the way we consider our industrial economy. If we are gradually shifting employment from higher value-added industries to lower value-added industries, which we appear to be doing, we are altering both the social fabric and the financial underpinnings of our entire nation including future tax receipts. Given our progressive tax system, real tax revenue will drop off exponentially if we shift more of our working population to lower value-added industries, and the general community prosperity is likely to suffer as well.

Much of the shift to lower value-added industries has already begun. Our international competitors are not naive. They understand that there is more money in manufacturing automobiles, instruments or highly sophisticated industrial machinery than in lower value-added activities. They understand both the importance of high value-added industries and the relative

strengths of U.S. firms participating in these essential industries. We have much more international competition in industries where U.S. companies are weak or poorly managed than in other industries, such as appliances or paper, where U.S. companies are strong. Often, the manufacturing processes are similar. What is different is the caliber of our industrial presence.

The differences in wages and benefits between industries is dramatic. Both the paper industry and the textile mill industry have about 630,000 employees in the United States, but the similarities end there. The paper industry generates about $95,000 per year in value-added for each employee (1990 figures) and pays an average of $13.42 per hour (1993). Seven of the world's ten largest paper mill companies are headquartered in the United States and six of these are consistently profitable. The industry has around $33 billion of bankable equity (shareholders equity minus intangible assets and one half of the inventory) or about 9 percent of the U.S. total for industrial companies. Research and development expenses are high, patents are high and the entire industry is one where the U.S. competitive position is strongest.

In contrast, the textile mill industry generates about $42,000 of value-added per employee per year and pays an average of $8.89 per hour or 34 percent less than the paper industry. Of the 204 companies listed with textile mill SIC codes listed in the Moody's Industrial Database, 47 are U.S. companies controlling 45 percent of the listed assets — primarily because of extraordinary U.S. strength in two segments, knitting and carpets. But bankable equity is only $3 billion or 9 percent as much as the paper industry, which has the same number of employees. Profit rates average around two to three percent in the textile mill industry except, again, in knitting and carpets. Overall, this industry is in a weak competitive position.

The degree to which our industries differ in technological prowess, financial strength, wages paid, taxes paid and managerial responsiveness is enormous — enough so that averages or aggregate figures cease to have clear meaning without in-depth understanding of the subsets.

Neither revenue, profits nor employment are sufficient indicators of actual manufacturing activity. A company, or a nation, can have high revenues, and in some cases temporary profits, by importing component parts, whole assemblies or even whole products and then shipping products to customers. Manufacturing operations of this nature were described several years ago by "Business Week" as the "hollow corporation." They show revenue when components are merely shipped even though not much value is created. An alternative explanation exists when the products are simply not of very much value on world markets. Long-term prosperity is highly dependent upon value-added for its relationship to hourly pay and fringe benefits. Voluntary fringe benefits (those not required by law) vary from about $1,500 per worker per year to about $10,000 even within manufacturing (Figure VI-3). This huge range in voluntary benefits again reflects the favorable impact of high value-added production. It also influences major social questions such as the availability of health insurance.

Lower Levels of Reinvestment

During the mid 1960s and late 1970s, U.S. corporations typically operated at about the 8 percent after- tax profit rate and then paid out about 40 percent of these profits in dividends. In the 1990s, corporate profit rates have been closer to 5 percent while dividend payout ratios have risen to 70 percent. This combination of lower profit rates and higher dividend payouts has resulted in a decline in reinvested profits from about 5 percent of revenue in the 1960s to about 1.5 percent today. This reduction in the money available for reinvestment is likely to

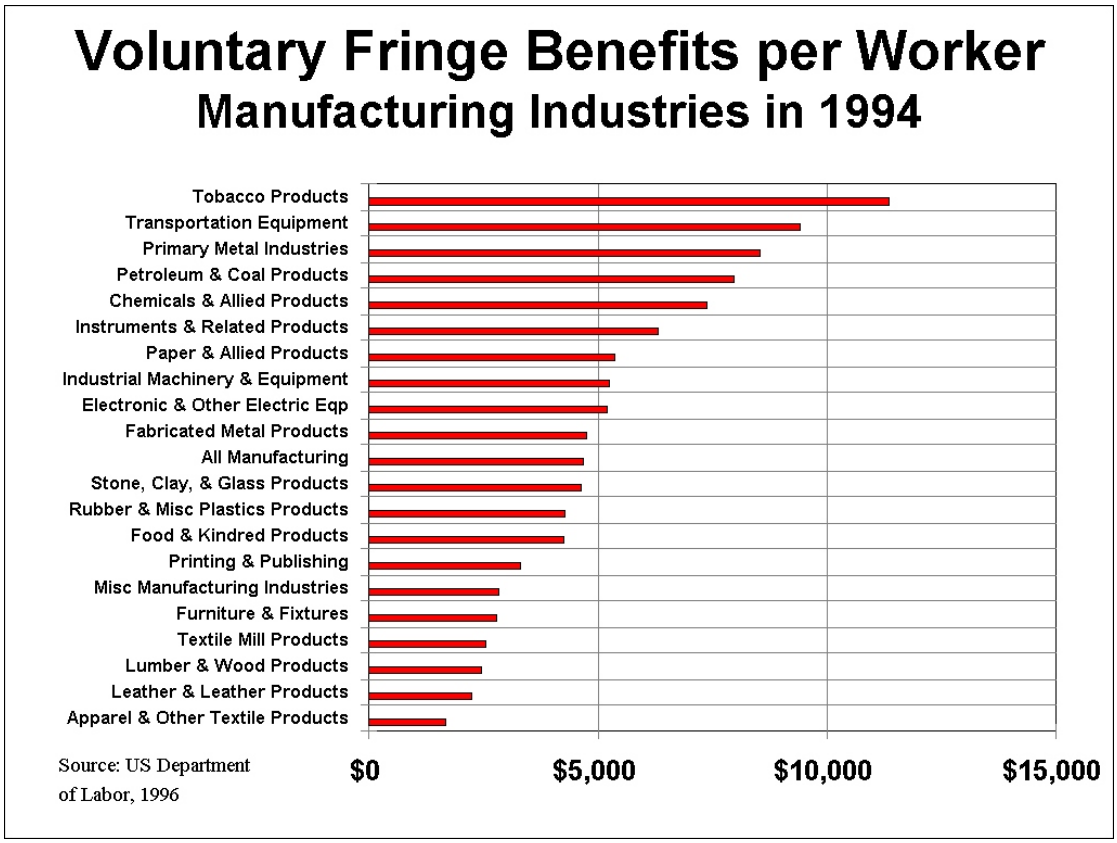
affect our competitive position in the years ahead. The absolute level of reinvested profit dollars declined from about $120 per employee per year in the late 1970s to around $40 today. This change could affect U.S. competitiveness in the future because less money is being made available for investment in plants, equipment and new product development.

The variation among companies is, of course, much greater than it is among industries. Companies such as 3M, Medtronic and Merck are well managed companies with strong technologies and solid financial positions. Other companies are not as strong. The principal question, however, is how much less strong are they?

In Minnesota, industrial companies have a combined total of $12.7 billion of bankable equity, of which 3M has $5.4 billion or 42 percent. 3M usually ranks high in number of patents issued, and a very high fraction of Minnesota's foundation giving stems from 3M- related foundations. The company is an active participant in international business where it routinely gets half of it sales and generates more than 40 percent of Minnesota's industrial profits — 17 times as much as Ceridian Corporation, which (as Control Data) was at one time one of Minnesota's largest employers. 3M's bankable equity is nine times that of Medtronic (another excellent company), five times that of Honeywell (also fine) and 155 times that of Ceridian. Clearly there is an enormous range in these companies with respect to their ability to participate meaningfully in international competition. Minnesota is fortunate to have companies such as 3M, Medtronic, Honeywell, ADC, HB Fuller, Pentair, Tennant, Polaris, Arctco and MTS. By comparison, the bankable equity for all industrial corporations headquartered in Wisconsin is about equal to that of 3M. Iowa has industrial bankable equity a little more than that of Honeywell.

Yet, as a nation, we also have many problems. Companies such as Bell & Howell (Illinois), Black & Decker (Maryland), Rexnord (Wisconsin), Navistar (Illinois), Northrop Grumman (California and New York), Owens Corning Fiberglass (Ohio), Anchor Glass (Florida) and Uniroyal Chemical (Connecticut), collectively with more than a half a billion in sales, have contributed heavily to U.S. industrial expansion in the past. During the mid-1990s, these companies had weak balance sheets and low profit margins — often the result of reckless diversification. Since 1994 through 1997 were excellent years, most companies did fairly well. However, if the economy weakens, especially for a period of three or four years, several major U.S. employers would be in great jeopardy.

Figure VI-3



Weakness in Education

The United States spends vast sums on education, but much of it fails to benefit students. The money goes primarily for higher salaries, more time off and earlier retirements for members of the staff. It does not go for more rigorous programs, school years comparable to those of our competitors or for a more appropriate blending of theoretical and applied knowledge. By international standards, our education system at the elementary and secondary level is weak. Albert Shanker, president of the American Federation of Teachers, said it best: "Eighty-five percent of the people accepted into college in the United States would not get accepted anywhere else in the world."

Even at the college level, our educational initiatives rarely have an industrial tone. Science degrees have not increased much in 30 years, but we have far more people graduating with degrees in the theater arts and political science. We have more graduates in business administration, but our share of world business is lower in many industries. We need technology to remain competitive in world markets, but our engineering programs have survived mainly on the strength of foreign student populations.

Technology is in everything, of course, so we should not suggest that industries such as snack food, public building furniture, burial vaults and greeting cards have no technology. The question is: are these industries' technological positions as defensible as aircraft and flight control systems. In some cases, our expanding industries rely heavily on technology, as is the case with drugs, medical devices and agricultural chemicals. Whether this incremental

need for technology will keep pace with the employment losses we seem to be experiencing in aircraft, navigation equipment, computers, electronic components, steel making, shipbuilding and measuring and controlling devices remains to be seen. Collectively, we have lost 607,000 jobs in these industries since 1988 even though the vast downturns in steel making and shipbuilding occurred earlier. Meanwhile, we added 55,000 jobs in medical devices and drugs.

Low-tech industries have theoretical advantages stemming from transportation costs and other factors, and are important. But more important are the relationships among technology, value-added and pay. From 1988 to 1993, we added 50,000 jobs in the meat products industry at $8.49 per hour (average for the industry in 1993). We added 6,000 in the toy industry at $8.80 and 17,000 jobs in miscellaneous food at $9.51. Dairy products were better. We added 43,000 jobs at $11.66 per hour — still a long way from compensating for the 142,000 jobs we lost in aircraft at $17.24 per hour.

Conventional arguments often suggest that these changes are natural. Industries rise and fall. Industries emerge to replace those that are declining. Perhaps. However, there seems to be evidence that the replacement is taking place in other economic regions. Brazil is now a credible producer of aircraft. Malaysia is a key producer of computer components, and 70 percent of the world's disk drives are built in the tiny country of Singapore. Taiwan is now manufacturing outstanding machine tools, and Korea has developed as one of the world's most technologically advanced producers of flat panel displays. With the rapid growth of scientists and engineers in other countries, we might wonder if the technological basis of U.S. prosperity will continue as it has in the past. (See Section VII - Asia)

Increased Foreign Competition

Although total exports and imports are important at the aggregate level, there is much to be gained by examining trade balance by industry. In reality, the U.S. trade balance would look even less favorable had the price of oil not declined and had we not reduced our use of oil through conservation efforts. Many high-value-added industries have suffered a substantial worsening trade balance. Of concern is the rapidly worsening situation in areas where we formerly did well, such as computers, telecommunications and miscellaneous manufacturing.

Our trade balance is serious enough, but it is more frightening if we examine it by category. The U.S. trade deficit on oil declined from about $70 billion in 1980 to around $50 billion in 1994. Meanwhile, during the same period, the non-oil trade balance worsened from a $50 billion surplus to a $100 billion deficit. The trade deficit on basic manufactures (paper, steel, tires, tools, etc.) mushroomed to more than $30 billion last year. For miscellaneous manufactures, such as precision instruments, apparel, watches, photographic equipment and toys, the trade deficit is $60 billion. The most alarming of these trends is the escalating trade deficit in the high value-added industries where U.S. workers have enjoyed the highest standard of living.

In some industries, such as guided missiles and farm machinery, U.S. producers enjoy worldwide prominence. In others, such as electrical industrial apparatus, shipbuilding (which is an industry that triggers other industrial activity) and metal forgings, U.S. producers are not significant. From the perspective of those interested in wages and benefits, the wrong industries are expanding. Out of a sample of 116 industries followed from 1988 to 1992, declining industries generated about 7 percent more value-added than expanding industries and paid

hourly wages about 9 percent more.

The United States has lost 19.5 percent of its work force in five years in the electrical generation equipment industry — an industry where we recently held a modest, but shrinking, trade surplus. Two of our larger producers, Allis-Chalmers and Westinghouse, went bankrupt or withdrew. Though other U.S. manufacturers operate in the same industry, it is difficult to imagine how we might improve our performance on world trade if there is an insufficient supply of well-run companies capable of effectively competing internationally.

Prosperity is linked to presence of good companies

A close review of industrial relocation patterns suggests this conclusion: prosperity is linked to presence of good companies. The high achieving counties referenced in this report (Hinterland Highspots, Metro Movers, Beaten-path Boomtowns and Gradual Growers) greatly benefited from the presence of futuristic, investment prone, people oriented employers. It is not always true that these noble companies are engaged in high-technology industries. Their activities themselves may be quite ordinary but they perform these tasks with dignity and interest. They embody the battle cry once uttered by Ford executive Lew Veraldi when he headed new car programs for Ford during the development of the highly successful Taurus/Sable and Continental projects; "we must do common things uncommonly well."

Sterling Livingston's landmark Harvard Business Review article "Pygmalion in Management" captured the essential quality so prevalent in the successful companies we have today: Nucor, Merck, Medtronic, Rubbermaid, 3M and so many others. They treat their activities, and the people doing them, with dignity and that tactic seems to generate prosperity for the entire community. Dignity involves training, respect, leadership, investment, fairness, and the nurturing of differentiated products. Some companies have these traits and some do not. When companies have them, communities and the people in them prosper. When companies do not have these traits, communities decline.

The interconnections between individual companies operating in key strategic industries are not lost on our international competitors who readily recognize the preparedness of competing companies as partial determinants of whether they elect to enter certain markets.

There is a relationship between the capabilities of individual companies and the growth or shrinkage of manufacturing employment in particular communities. Demographic, tax, utility, and supplier characteristics are all important determinants of industrial location. The quality and capabilities of individual firms participating in key strategic industries is perhaps the most important variable of all.

SECTION VII - ASIA

One of the most significant variables for any region of the United States in the next few years is likely to be the unfolding of events in Southeast Asia, Russia and a few other regions. These events, which seem so far away, will dramatically influence the economies of the Upper Midwest in particular for these reasons:

1. Exports will decline slightly.

As a practical matter, Asia represents only a fraction of US exports but these are likely to decline -- at least to some degree and perhaps significantly. The actual falloff in US exports could be more extensive if the problems in Asia provide a retarding influence on the economies of other continents, which seems to be the case at this time.

2. Imports will increase greatly -- particularly in high value-added industries.

Exchange rate changes will greatly reduce the price of Asian goods and since these goods are already quite competitive, Asian products may make considerable further inroads in US markets. Importantly, the upsurge in the importation of Asian products could impact US component and machinery manufacturers. US manufacturers already utilize many Asian components in computers, machinery, automobiles, appliances and instruments but we still have many heretofore competitive US suppliers as well. The price differences brought about because of exchange rate differences are likely to make their task of competing more difficult. The market for key industrial components is very competitive already -- to the point that price increases have been unachievable in some industries for several years. Such critical components as bearings, sensors, linear scales, ball screws, actuators, connectors and electrical apparatus are increasingly becoming the domain of offshore suppliers. US products may continue to sell but perhaps not at the same volume and not at the same price. These changes will be significant. In 1997, General Motors made about $3 billion manufacturing about 6 million vehicles or about $500 per vehicle -- hardly equal to an average rebate if sales began to slow or if competitive pressures increase.

3. Asian financial problems may intensify price competition even further.

When times get tight, many Asian producers have a philosophy -- constant volume, flexible prices. Because Asia may be pressed for earnings, they may attempt to restore sagging profits be exporting even more aggressively than in the past. Dumping could become more prevalent. Price competition could intensify even beyond what might be expected from exchange rates alone.

4. Asian cash may seek the US as a haven.

The US has often served as a haven of last resort during past periods of economic trauma in other countries. Currency has flowed into the United States when Argentina invaded the Falklands, when France went socialist, or when a variety of unrelated political or economic calamities unfolded throughout the world. These abnormal currency inflows have helped the US in one way. They have allowed the United States to service a huge debt without saving very much. It has been a great deal for banks because relatively cheaper foreign funds have allowed the spread to increase between the cost of funds and rates paid on loans. But, for manufacturers, there are several potentially less favorable consequences including a stronger dollar and even less favorable exchange rates.

5. Resistance to IMF requirements and other mandates may generate political reaction to the US.

If the United States provides funds for the bailout of troubled economies through the International Monetary Fund or the World Bank, there may be side affects. Some people suggest that if money is provided, it is reasonable to require changes and restrictions on the way business is conducted in these countries so that these same problems do not reoccur in the future. These restrictions may appear to be eminently reasonable from several thousand miles away and they may indeed be quite similar to those that would be imposed on a distressed borrower in this country. However, in the case of Asian and Russian debt, we are dealing with diverse societies involving hundreds of millions of people -- many of whom are ruled in less than democratic ways. Indonesia, alone, is the fourth most populous country on earth and hardly a model of a modern industrial democracy. These restrictions, which may seem appropriate and just to us, might not be imposed in ways that will be most remedial to the Asian economies but instead may be administered and redirected within these societies in ways that could be quite unpredictable. Severe hardship could result among some elements of these societies and reaction could develop against what might be seen as the source of the hardship -- the United States. Our interest in a stable world economy suggests that it would be good if we could help them, but there is no guarantee that it will be either easy or rewarding.

Asia is a very large continent with many diverse interests, talents, problems and economic systems. It will be quite difficult for any of us to make accurate predictions as to how long overseas economic crises will last or how deep will be the impact on the United States. However, some things have already changed and it will be useful for us to examine what these impacts might be.

Exchange rate changes are very dramatic.

The magnitude of the exchange rate changes since 1995 have been exceedingly dramatic -- far greater than is popularly understood. Using 1995 as a base, the following currencies have had these changes per US dollar (Table VII-1):

Table VII-1

Country & Currency	1995 Units per US Dollar	March 1998 Units per US Dollar	Percent Change in Value
Malaysian Ringgit	2.5	3.6	-31%
Taiwan Dollars	26	33	-22%
Indonesian Rupiah	2000	8300	-76%
Singapore Dollars	1.4	1.6	-12%
Thai Baht	25	38	-34%
Indian Rupees	32	39	-18%
Japanese Yen	90	130	-31%
Swiss Franc	1.15	1.50	-24%
French Franc	5.0	6.1	-19%
German Mark	1.45	1.85	-22%
Mexican Peso	6.2	8.5	-29%

These rather abrupt changes in currency values are the result of many currency movements; the US dollar gained strength over European currencies, the currencies of the more solvent Asian countries remained about on par with the major European currencies while the currencies of much of Asia weakened substantially. This leaves the US manufacturers with a greatly altered cost structure vis-à-vis both Asian and European competitors. The labor that was $22 per hour in Germany is now $17.16 -- about the same as it is in the United States. The $17 per hour labor in Japan is now $11.84. The labor that was $4 per hour in Indonesia is now $1. These are dramatic shifts and none of us are sure that our manufacturers will be able to adjust to differences as large as these with the incremental productivity improvements they have achieved during the past fifteen years.

Currencies often fluctuate, of course, and sometimes they help the United States. The resurgence of the US auto companies in the mid 1990's was largely coincident with the exceptionally strong yen in 1994. But, the currencies are not fluctuating in favor of US manufacturers in 1998 and we should be concerned with the possible ramifications.

Asia is Down, but not Out

From an industrial standpoint, Asia is down but not out. The banks and governments are pressed economically but that does not mean that all of the Asian producers are in the same situation. Some Asian producers are no doubt overextended but there are some historical characteristics in the way Asian companies have evolved that we should consider while assessing their future ability to compete. Among the considerations should be these:

Some Asian companies are very large.

As the economist Oskar Morgenstern pointed out years ago, it is always difficult to make comparisons of financial statements originating in different countries. However, a review of the Moody's International Database in 1995 yielded how much the revenue, assets and stockholder equity of some overseas companies have increased in recent years. At that time (and this data should be updated), the following observations could be made.

- Asahi Glass in Japan had about twice the assets of the largest US glass company, PPG.
- Only one US based steel company, Nucor, placed among the world's ten largest in terms of profits.
- Among the ten largest nonferrous rolling and drawing mills, six were Japanese, one was French, one German, one Indian and one from the US (Alcoa).
- Amada's assets (Japan) were six times larger than those of Giddings and Lewis (USA).
- Fujitsu's assets were about half the value of those of IBM.
- Of the largest 29 companies involved in shipbuilding, less than one percent of the assets were held by companies headquartered in the US.
- Canon's assets were nearly twice those of Eastman Kodak.
- Hualon in Taiwan (yarn and thread) had twice as many assets of its largest US competitor.
- One of the ten largest dairy food companies was headquartered in the US.

Asian companies are often well-trained and well-equipped.

Although not universally true, many Asian companies are well-trained and well-equipped. Some impressive physical plants exist in Asia -- sometimes among the largest and best equipped in the world. And, the people are often well-trained. Nonyang University in Singapore and the University of Tokyo in Japan, for instance, are two of the few universities in the entire world to win the prestigious Lead Award from the Society of Manufacturing Engineers. Apprenticeship programs are well established in many Asian countries and the historical interest in quality control has provided a meaningful cadre of managers and workers who know how to make good products. None of these important industrial characteristics have been severely diminished as a result of the financial problems facing the governments and the banks.

Asian companies often have large amounts of stockholder equity.

From a distance, we may get the impression that all of Asia is short of cash. However, the long custom of Asian banks placing equity investments in major industrial companies has left many of these industrial companies with seemingly strong balance sheets. Admittedly, it is difficult to know the reliability of Asian balance sheets (and sometimes US balance sheets) but the stated equity is often very substantial. Additional data from the 1995 Moody's report reveals the following:

- Komatsu's stockholder equity was 68 percent larger than Caterpillar's.
- Matsushita's equity was 12.8 times that of Maytag and Whirlpool combined.
- Toyota's equity was approximately twice that of Ford and four times that of GM.
- The Barito sawmill in Indonesia had about half the assets and equity of Louisiana Pacific.

It may be that the resources are no longer available for the large Asian banks to continue to place equity investments in industrial companies to the degree that they have in the past. However, now that the investments have already been made, it is not clear to this author that

there is reason to believe that the investments will be withdrawn. The investments are there and the equity will probably remain in these very formidable Asian companies. Indeed, another scenario might unfold which could be even more discomforting to US manufacturers.

US companies and investors could funnel cash to Asia.

One possible scenario that could emerge from the Asian financial crisis is that investments might be diverted from the United States to take advantage of bargain prices sought by cash short Asian banks overstocked with equities in Asian industrial companies at a time when the exchange rates are favorable to US investors. In addition, some Asian industrial empires, such as the chaebols in Korea, might individually seek US investment either directly or in joint ventures. Some of the more ominous disincentives for joint venture or foreign investment could be eased in order to attract cash as they were in India a few years back. Thus US manufacturers based here would have the awkward alternative of competing with Asian companies, at unfavorable exchange rates or diverting money from the United States to procure positions in Asia at bargain prices. The excitement of investment could move from the US to overseas. Though the uncertainty of the present Asian financial situation is likely to cause deliberation and delay in the short term, the medium term could brighten the prospects for greater US investment in Asia, which could mean a lessening of investment in the US .

The entire Asian situation could spell trouble for the US -- perhaps even a great deal of trouble -- and it could impact manufacturing in particular. Asia is not going to disappear off the face of the earth as a formidable competitor to US manufacturing. We will need to proceed cautiously and we will need to prepare by investing and becoming more competitive or in the long term or we are quite likely to suffer.

Organized Labor's View

Asian Financial Crisis

AFL/ClO Executive Council Statement January 29, 1998

The financial crisis now roaring through east Asia will have profound consequences for working people all over the world. Deep currency devaluations, in conjunction with austerity programs, will cut wages and purchasing power in South Korea, Indonesia and Thailand. The United States will be pressured to act as importer-of-last-resort, absorbing cheap Asian goods while at the same time Asian markets for our exports dwindle.

In the aftermath of the crisis, the U.S. trade deficit is projected to grow by about $100 billion in 1998, resulting in a loss of approximately 1 million jobs (or potential jobs), most of them in the better-paying manufacturing sector.

Without fundamental changes in the structure of international financial markets and the institutions that regulate these markets, we can expect continued volatility and future crises of growing severity. The present moment of crisis is the time to press for necessary changes in the international financial system, particularly in the conditions imposed by the International Monetary Fund (IMF) in exchange for the "bailouts" it gives to countries that have exhausted all other sources of credit. The United States should condition

further contributions to the IMF on fundamental changes in the IMF's program.

The clout and leverage exercised by the IMF must serve a broader set of social and economic goals. Currently, the IMF defines its mission narrowly, as protecting the interests of international capital. The IMF requires debtor governments to raise interest rates, cut public spending, deregulate financial markets and weaken labor laws to facilitate massive layoffs and deep wage cuts. These terms may solve some short-term credibility problems with foreign investors, but will necessarily exacerbate the tensions, inequality and instability of the global economy. Such policies are shortsighted and must be fundamentally altered.

The United States, which is the single largest contributor to the IMF, must use every means at its disposal, both formal and informal, to change the way the IMF operates. The AFL-CIO will support members of Congress in efforts to assure that IMF programs reflect the following principles:

1. *Commitment to and vigorous enforcement of international labor and human rights. Countries that receive IMF funds must commit themselves, in an enforceable way, to respect internationally recognized worker rights. If necessary, this would involve modification of laws and practice to comply with ILO standards and human rights. These commitments must ensure that governments will protect workers' rights, even during times of crisis. Strong and independent labor unions play a crucial and irreplaceable role in assuring that the benefits of economic expansion are equitably distributed.*

2. *Domestic economic growth and development, not austerity and export-led growth. The model that led to this crisis glorifies export expansion as the preferred development path. This model leads to destructive, low-road international competition and worker impoverishment, and must be reversed. The United States, Europe, and Japan must work together to stimulate domestic demand in the developing economies and avert a dangerous tendency toward global deflation.*

3. *Political and economic democracy. Without a strong and vibrant civil society, there is no counterweight to crony capitalism and no accountability for governments.*

4. *Reduction in the volume of destabilizing capital flows. Policies to regulate short-term borrowing and to dampen speculative flows of capital must be implemented.*

5. *Stabilization of exchange rates at levels closer to their pre-crisis values. The excessive devaluations caused by the loss of confidence in the East Asian currencies should be reversed. This is essential to blunt the negative impact of the crisis on American workers.*

6. *Transparency and broader participation in determining IMF policy. The IMF must consult regularly with labor unions and other broad-based organizations, not just with business and financial institutions, in the development of structural adjustment programs and emergency loan packages. Program documents should be made publicly available. By recognizing that workers must be included in developing a response to economic crisis, the tripartite commission (including representatives of labor, business, and government) established in South Korea is a promising step.*

7. *Ensure that speculators pay their fair share. The banks, corporations and individuals who profited from risky investments during good times must not be shielded from losses during downturns. As banks reschedule their debts, financial losses must fall on those who made poor decisions. Asian and American workers and taxpayers must not be asked to foot the bill for a party to which they were not even invited.*

Even if we move toward reform of the international financial system, concrete steps must be taken to stop the destabilizing flood of cheapened imports which have already been unleashed by this crisis. Steel, autos, electronics, apparel and other threatened industries face an immediate threat which requires specific actions to maintain import shares consistent with pre-crisis levels in order to protect the jobs of these workers.

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Asia, as a manufacturing region, is still in place

No doubt some things have become more difficult for Asia in the past few years but probably not enough to alter the general picture that there are some very large and formidable companies exist in that part of the world. Many of these companies are likely to have more difficult times in the months ahead as they experience erosions of cash and declines in profitability. However, we should remember that while Asian banks and governments may be ineffective and quite broke, the trained people and well equipped factories are quite likely to continue in one form or another.

SECTION VIII — AN ECONOMIC FRAMEWORK FOR INDUSTRY

Labor Cost as an Industrial Location Determinant

As manufacturers struggle to remain competitive in the face of ever-increasing international competition, many are forced to consider the cost of labor as a factor in their location decision. Much has been written about this subject, often with emotion. Some people suggest that it is necessary to locate new facilities where labor cost is low. Others suggest that the wages of labor are stagnant and even decreasing and, if this trend continues, the United States will ultimately compromise its buying power, its standard of living and the viability of supporting service businesses. From the manufacturer's perspective, the principal question is where can dependable labor be found at a reasonable cost. Labor cost indeed has domestic policy overtones and affects industrial competitiveness. A better understanding of labor cost and how it operates is pertinent to all of these perspectives.

Labor cost is a small percentage of total cost.

Generally, labor cost for all U.S. manufacturing was 18.6 percent of shipments in 1992. This is the total labor cost for all people employed in manufacturing including factory labor, sales people, accountants, managers and everybody else. Factory wages consume only about 9.4 percent of total shipments - a percentage much smaller than that of materials, which was 52.3 percent. Looking at the problem another way, the average manufacturer spends about five and a half times as much money on materials as on wages to process those materials into finished products. The average U.S. manufacturer also spends as much money on other salaries as is spent on factory labor. Although factory labor is an important cost , it is not a large enough cost to account in any meaningful way for the trade deficits now being experienced by the United States. These deficits, in a large part, are often caused by other transactions -- some of which are not voluntary. External costs for such things as taxes, litigation, permitting and mandated requirements are all significant enough to be considered factors affecting the competitive position of individual firms, national trade deficits and the long-term employment prospects for individuals.

The impact of external factors on competitive position was recently examined by the renowned European management school IMD in Lausanne, Switzerland, in the recently completed World Competitiveness Report 1994, which ranked 41 nations for their effectiveness in competing internationally. The researchers examined each country on 381 variables. In part because of external factors such agriculture, basic research, the ability to attract talent from overseas, entrepreneurship, foreign investment overseas, scientists and engineers, total value-added and the availability of finance, the United States finished first overall followed

by Singapore, Japan, Hong Kong, Germany and Switzerland. The final tally did not square precisely with the Executive Opinion Survey that was a part of the report that placed the United States in tenth position. Nonetheless, the report described many observable U.S. strengths. The United States also ranked close to the top of the list in other advantages, such as the use of information technology, willingness to delegate, worker motivation and living standards. Clearly, the United States is a nation with many advantages and strengths. We have much to be thankful for.

Labor quality as a factor in trade deficits.

The World Competitiveness Report by IMD also considered other factors where the United States did not fare so well. The United States ranked below the 25th percentile among the 41 countries on several items.

U.S. Rankings in the IMD Competitiveness Report

Item	Absolute Rank	Percentile Rank
Lobbying by Special Interest Groups	32	24%
National Debt	32	24%
International Experience	34	20%
Attitude of the Young People	35	17%
Management Long-term Orientation	36	15%
Aids	39	7%
Managerial Constraints	40	5%
Product Liability	40	5%
Self Sufficiency in Natural Resources	40	5%
Alcohol and Drug Abuse	41	2%
Environmental Infrastructure	41	2%
Justice and Security	41	2%

Neither the United States nor any other developed country has monopoly on high-quality labor. A well-respected multinational firm can recruit capable employees in many locations. Labor, like any other factors of production, must compete; and it is the responsibility of all of us to ensure that members of our society are prepared for the intense international competition that is now upon us. This means that we should strengthen our weak (but expensive) education system, take a tougher stand on alcohol and drug abuse, and do a better job of instilling the character traits necessary for responsible citizenship -- including responsible employment. The above indicators might also be considered for their ability to influence industrial location.

But it is hard to argue that labor costs are the major reason for U.S. trade deficits. Until the abrupt exchange rate changes brought on by the Asian financial crisis, direct labor has not been more costly in the United States than in other industrialized countries. For the most part, it has been much cheaper than it has been in Germany, about the same as in Japan, lower than in the Scandinavian countries, a little higher than in Korea and Singapore, and quite a bit higher than in Mexico. But with respect to most of our competitors, we have been on par in terms of labor cost or in a preferred position. Per hour labor cost is not in and of itself a major reason for the shift to offshore manufacturing. Although labor cost is important, it is not the overriding factor in our nation's inability to compete. In a nation of

more than 268 million people, about 16 million are employed in direct labor in manufacturing, construction and mining with a combined payroll of around $500 billion per year out of a gross domestic product of seven trillion. This is hardly the group to blame for the worsening trade deficits of the United States. As recently as 1993, about 85 percent of our non-oil trade deficit was accumulated with countries having higher production wages than we have in the United States.

The quality of labor is an important variable in industrial location but it is available in many places. Major companies can get high-quality labor in such places as Taiwan, Singapore, Mexico, Malaysia, Puerto Rico or Spain -- in part because respected international companies are often perceived to be attractive employers and therefore have little difficulty attracting the talent they seek. Highly competent people live in many places throughout the world. When plants are transferred to offshore locations, the quality of labor may actually improve.

Variations among industries are substantial.

The cost of labor is much more significant in some industries than others, however. Factory labor does not constitute a major cost in our capital-intensive industries such as petroleum and chemicals where it is usually less than 5 percent of the value of shipments. It is more significant in textiles, apparel, furniture, plastics, glass and fabricated metals where factory wages range from 13.2 to 15.5 percent of shipments. Even here, other cost items are more expensive. Materials average about 49 percent of shipments in these industries -- about three and one half times factory wages. Interestingly, with the exception of plastics, these industries have been experiencing intense pressure from imports and collectively the U.S. lost 480,000 jobs in these industries between 1987 and 1992.

Does this mean that we cannot compete as a nation if factory labor rises above 13 percent? It will be helpful to answer this question if we look more at individual industries and the variation we have among the companies competing in these industries.

The plastics industry is an industry with many capable firms -- often small, but professional ones. Both the plastics industry and the textile industry spend the same percentage of shipment value on factory wages, 13.21 percent. But, the plastics industry spends $1,676 more on capital equipment per year for each employee ($5,285 vs. $3,609 in 1992). The apparel industry spends about 15 percent of the value of shipments on factory labor, but only $969 on capital expenditures per employee -- about 18 percent of what is spent in the plastics industry. We see this same problem repeatedly: when poorly performing firms do not invest, the country suffers an erosion of its competitive position. In industries where capital expenditures per employee are low, in textiles, apparel, miscellaneous manufacturing, electrical equipment, fabricated metals and leather, we have been losing ground. In contrast, capital expenditures have been high in chemical and paper, and we have suffered no significant inroads from foreign competition.

Trade deficits and industrial migration are company related.

One sad conclusion is that much of our unfavorable trade balance is company related. Our trade deficit often accumulates because we have poorly performing and poorly managed companies competing internationally in key strategic industries. Their dominant position in this country usually reflects history -- these companies were better run at other times. But, during the past 20 years or so, substandard companies have been the largest U.S. participants

in most of the industries where the United States has lost ground. It isn't that we cannot make shoes in the United States; it is that we did not have leading shoe companies that understood manufacturing, though Minnesota based Red Wing Shoe and Wisconsin based Mason Shoe may be rare exceptions. It can also be said that Westinghouse played a role in the slipping U.S. position in electrical equipment and that Bethlehem's and LTV both contributed to the shrinkage of the US steel industry. There are other examples.

Shouldn't we wonder what might be possible? Why can't we make more shoes here? Unemployment is still high in some areas. It isn't that we do not know how to make shoes. The shoe industry has been operated with a losing mentality -- practically no capital investment, older plants and outmoded methods. Yet factory labor costs are around $2.70 per pair of shoes. Maybe costs could be cut by $2 per pair by moving production overseas -- maybe. However, if the plastics, chemical or paper industries operated the same way, we would have trade deficits in those industries as well. We do not have deficits in these industries because chemicals, paper and plastics all use methods that are vastly superior to those in use by U.S. shoe manufacturers. We've been losing about 4,000 jobs per year in the U.S. shoe industry because the companies involved have elected not to compete -- in much the same way that Bethlehem and LTV elected not to compete in steel and Westinghouse elected not to compete in electrical equipment.

On the other hand, Nucor Steel, also a U.S. company, is one of the most technologically advanced steel producers in the world. Nucor has modern methods, good teamwork, excellent management and heavy investment. Although the company was historically much smaller than Bethlehem or LTV, it typically earned a great deal more money. What Nucor has done for steel might serve as a role model for other industries. If we had more companies like Nucor, we could build shoes, electrical equipment, television sets, VCRs and a variety of other products in the United States with less concern about imports. However, we will have to fear imports if mediocre companies continue to use archaic methods and invest little to improve.

Within any community, there are companies that are well equipped and modern. They invest heavily in their people and in their physical plants. But there are not enough of these companies to sustain the U.S. standard of living as we know it. We have too many companies that still operate in ways that will not ensure survival in the future. Warner-Swasey cam-operated chuckers were good machines for the 1960s, but they won't make much money for people currently or in the years ahead.

This essential relationship between the capabilities of companies and the destiny of community is of unmistakable importance. Too often, we attempt to achieve community progress through broad policies but broad policies rarely differentiate between poor and excellent companies. Often individual companies are not equipped to face international competition nor are they emotionally prepared to make the improvements necessary to compete effectively. Yet, local officials often provide publicly supported benefits in a last ditch effort to keep the company afloat. In other cases, well-run capable companies with much more potential for community well being are left unconsidered. The evidence suggests that when the companies are healthy, the community and the nation are healthy. When they are not healthy, entire communities suffer.

Recessions as Competitiveness Clarifiers

Recessions seriously affect the financial condition of marginal firms in four ways. First, the actual decline in orders received reduces revenue proportionately (less business). Second, competing firms may reduce prices to attain sufficient business resulting in lower prices for the sales that are made (lower-priced business). Third, the reduced quantities of units produced may result in higher overhead absorption per unit sold (higher-cost business). Fourth, generally pinched financial conditions may impede the willingness or ability to make capital expenditures that will improve quality and lower cost (reduced capability to get business).

This fourfold combination of less business, lower-priced business, higher-cost business and reduced capability to get business always proves lethal if not corrected. The declines may not be apparent, but every moment that goes by, the declining firm becomes marginally weaker. In accordance with Zimmerman's studies of troubled companies (1988 and 1991), the slipping firm usually sustains only modest losses -- perhaps 1 percent per year. But unless the trends are interrupted, recessions bring great distress to the financial statements of less-competitive firms. Allis-Chalmers and International Harvester provide good examples. Both International Harvester and Allis-Chalmers provide sobering examples of how seemingly large vibrant firms can fall prey to competitive pressures in only a few short years. Recessions do not cause industrial failure; they only exacerbate weaknesses that were there all along. Unfortunately, for the communities involved, many individual companies and plant operations are unsuitably prepared for the competitive positions we have before us.

Economies-of-scale Revisited

Much of what is happening to U.S. and foreign manufacturing is a result of changes in the ways we accomplish economies-of-scale, which we are accomplishing differently than we did 50 years ago. Alfred Chandler's great works on this subject, including *Strategy and Structure*, *The Visible Hand*, and *Scale and Scope*, add much to our understanding of how important cost is as a determinant of both business strategy and the evolution of industry. There was a time when the consolidation of operations within an existing firm could reduce or eliminate the implicit supplier profit that was ultimately passed on to the customers in the form of price. But during the last 20 years or so, profit rates in the United States have declined substantially to about five-eighths (5/8) of what they were in the 1970s so there are fewer profits to be concerned about. At the same time, large corporations have found that it is difficult for them to respond quickly to changes in market preferences and the need for process investment. The three major U.S. auto companies provide interesting testimonials to the existence of diseconomies-of-scale. General Motors is by far the most vertically integrated; Ford is second; and Chrysler is third, yet has operated with the highest margins in most recent years. It is GM that has had the most severe profit problems in the past 15 years, although the company has been improving, and the most severe labor problems. One of the ways GM is attempting to improve is to become less vertically integrated -- a matter of concern to the United Auto Workers.

During the past quarter century, there have been many approaches aimed at reducing the cost of manufacturing labor. One approach is to aim directly at organized labor and seek concessions so employers may procure the same activities at lower costs. In the main these efforts have not been successful, although International Harvester and other manufacturers have tried. The reason they have not been successful is in part due to the caliber of management asking for the concessions. It is also due to the inherent difficulty in reducing product cost through the reduction of labor alone. In U.S. manufacturing generally, labor accounts

for about 18.4 percent of the revenue. Direct labor on the production line accounts for about 9 percent. Thus, if all of the direct labor worked for free the maximum savings would be something in the order of 9 percent of revenue. The feasible cost savings achievable with the cost of labor approach are probably limited to a few percentage points of revenue. That is usually not adequate to turn a noncompetitive activity into a competitive one if other steps are not taken.

A much more financially rewarding way of achieving savings has been to gradually outsource an increasing portion of the production of modular components to suppliers who can more effectively manage the process and make the appropriate investments so that the process can be accomplished at the lowest total cost. This doesn't always work either but the fact that it often does work is altering the manufacturing landscape across the country and creating concern among employees and labor groups.

Deere and Company provides an example of how this can be accomplished. Deere has long been one of the most efficient and lower-cost producers in the United States and is perhaps the most efficient in its industry in the world. It could not be argued convincingly that the company has a "cost problem." However, the farm equipment industry is likely to have competition from many sources: from emerging producers in Asia who are likely to be capable in offering products at low cost, from resurrected companies in Eastern Europe, and from reconstituted producers in this country, such as AGCO. What is not a cost problem to Deere today might very well become a serious cost problem 15 or 20 years hence. Yet, Deere has long had a wholesome relationship with its union, the United Auto Workers — an organization certainly informed about the same economic and industrial trends that Deere observes. Unions may need to resist certain initiatives such as outsourcing, but it cannot be assumed that they do not understand them.

In general, it is difficult for the union to accept major and abrupt changes such as the closing of plants and the outsourcing of production on a major scale. But it is not quite so difficult to incrementally agree to a slightly changed formula where the outsourcing of specific components or subassemblies is permitted in return for long-term job stability for the workers who are presently employed. Measured in quarters or years, this trend is almost imperceptible; but measured in decades it is quite pronounced.

A third way of revisiting economies of scale almost always works out and has been employed for many years by better managed companies such as Ford, Winnebago, 3M, Nucor and Chrysler. This third way is achieved through an interesting combination of frugality and process design so that consensus is achieved that the long-term interests of employees and companies are best achieved together. The companies practicing this third way are general quite frugal on anything frivolous but tend not to compromise on investments and worker compensation. They are often thin on overhead and quite decentralized in their decision making. They tend to be technical where labor and management work together to improve processes and increase customer satisfaction. There are fewer executive perquisites but more capable executives. Communications are good to excellent. In general, these companies are more practical and less complicated than many of their less successful counterparts. Hence, in environments such as these, new methods flow naturally so productivity keeps on increasing within the framework of goal integration between management and labor.

Summary

In summary, labor cost is important but, by itself, it does not cause industrial decline. Management, methods, investment, teamwork, labor quality, governmental efficiency and cooperation are all super-important, and it is in these areas where we all have to examine our performance. Many of our companies are out-of-date technically and are reluctant to invest. Our government is too big, in many ways ineffective and, in some cases, a barrier to progress. Our school system has become an international embarrassment. Our young people need to cultivate stronger character traits. Cooperation among management, labor and government can be improved. We should recognize the interconnections between what happens at home, in families, in schools and on the social front, and labor quality. These forces do add to or detract from our reputation as a favorable location for manufacturing.

SECTION IX - THE SOCIAL DIMENSION OF MANUFACTURING

The impact and influence of manufacturing is quite apparent when we closely examine those communities that have lost manufacturing. Here we can benefit by examining the experiences of other states. Rock Island County in Illinois provides an example.

Case Study -- Rock Island County, Illinois

Long home to several agricultural equipment manufacturers, the county began to lose its industrial base in the recession of 1980 to 1982. Even the farm equipment industry's premier manufacturer, Deere & Co., headquartered in Rock Island County, also had to contract as it made efficiency improvements and rationalized some production. The remaining manufacturers, Case, International Harvester, Minneapolis -Moline and Caterpillar, fared far worse. From 1979 to 1993, when inflation alone would have increased payrolls by 75 percent, Rock Island County's manufacturing payroll declined by 8 percent. The number of manufacturing establishments declined by 47 percent. Overall population declined by more than 10 percent from 1980 to 1995. In 1979, the poverty rate in Rock Island County was at 8.4 percent, well below the national average of 12.4 percent. By 1989, the poverty rate had risen to 13.2 percent, above the US average. Instead of 1.76 births for every death, as the US had in 1993, Rock Island County had 1.31. The 1988 marriage to divorce ratio was 1.08 versus a national average of 2.04. Along with Kenosha, Pittsburgh, Gary and Brooklyn, Rock Island County was reeling from the loss of its manufacturing base.

Rock Island County, Illinois and the neighboring Scott County, Iowa together comprise the "Quad Cities" (Moline, East Moline, Rock Island and Davenport). These cities provide a devastating example of what can happen to manufacturing communities when manufacturing loses its competitive edge. Between 1983 and 1989, the Quad Cities, lost more than 20,000 jobs in manufacturing and the industries that supported it. The farming crisis in 1983, and the associated drop in land values, crop prices and the resulting decline in the farm implement industry destroyed some of Rock Island County's best known companies.

Between 1987 and 1989, John Deere laid off one-half of its Quad Cities work force. Case closed two of their three plants in the area. Caterpillar closed the most modern of its plants (it was just nine years old at the time) and 1800 people lost high-paying jobs with good fringe benefits. By late 1987 unemployment in Rock Island County was 18 percent. This decline, and the following relocation of industry to the southern states, tore families apart. The younger generation had to move, which separated grandchildren from grandparents

and, in some cases, spouse from spouse and parents from children. Some people began commuting to Indiana, a drive of more than five hours, so that they could find jobs. These workers would leave work on Friday and drive back to the Quad Cities only to turn around Sunday night in order to start their shifts on Monday morning. Out of fear that it could happen again, some of these people are still afraid to work in the Quad Cities.

The Quad Cities have recovered in a way. The population of the area has rebounded some and unemployment in December of 1997 was 3.2 percent. However, employment is now mainly service based, including such fields as banking, insurance, telemarketing and fast food. These jobs do not pay as well as the lost manufacturing jobs and the economic impact on the community is noticeable.

Industry is still part of the Quad Cities. Deere & Company is still part of the community and has begun to thrive again. Deere could have left the community and moved south or overseas, but demonstrated a commitment to the community, as it has in the past. Deere's reinvestment into the community is incredible. Deere has established new programs with its labor force, including training of engineers and people who work on the factory floor to go out and show customers how the equipment operates. John Deere has also become more productive. The Davenport, Iowa Deere plant now turns out more machinery, with half of the work force, than before. J.I. Case acquired what was left of the agricultural equipment business of International Harvester and the combined Case I.H. Firm is currently backlogged with business. In some locations, management and labor have begun to work as teams instead of opposing each other. Both the companies and the communities have benefited from this new, but perhaps temporary, wave of labor-management cooperation. Still, Rock Island County is not as well off as it was 25 years ago.

Public policy has not played much of a role in the Quad Cities -- one way or other. Even when government agencies tried to aid the industrial economy, responses were usually too little and too late. Few, if any, public initiatives affected outcomes. Companies and communities need to look to the future. When they become too concerned with the present, they forget where they want to go, and this is their downfall.

Note: The above case was written by James Payne, a St. Thomas senior who is a native of Rock Island, Illinois.

Examples in Contrast

One splendid example of a Hinterland Highspot is Kosciusko County, Indiana Population in the county has risen only modestly from 60,000 in 1980 to 69,000 in 1995. But unemployment is low (3.9 percent in 1995) and per-capita income in 1993 was $19,721. Although this is only about 95 percent of the U.S. average, poverty rates have been declining and, at 6.6 percent in 1989, are well below the average of 13.12 percent for the entire United States. Kosciusko is not an especially well-educated county with only a slightly higher-than-average percentage of the population with high school diplomas and a slightly below the national average of people with college degrees. But, with low unemployment and poverty rates, healthy per-capita income and a high ratio of manufacturing employment to total employment, Kosciusko County is coping well economically. Social indicators also appear favorable for Kosciusko County. Births outnumber deaths by a ratio of 1.94 -- again above the average of

1.76 for the United States in total. Marriages outnumber divorces by a ratio of 2.29 versus 1.89 in the state of Indiana and 2.04 for the U.S. overall.The net migration into the county from 1985 to 1990 was 1,096.

Similarly sized Wayne County, Indiana, is only about 80 miles from Kosciusko County, but its situation is less favorable. The annual pay per employee in 1993 was $20,592 or about 15 percent less than Kosciusko County. Per capita income is 13 percent less. Manufacturing jobs declined by 11 percent during the 1980s in Wayne County, but grew by 18 percent in Kosciusko County. The change in manufacturing establishments shows an even greater disparity, down 36 percent and up 30 percent. Wayne County's poverty rate was 34 percent higher in 1979, but was 128 percent higher by 1993. Unemployment rates, birth to death and marriage to divorce ratios and the percentage of births to women under 20 years of age are all less favorable than in Kosciusko County. The net migration out of Wayne County from 1985 to 1990 was 1456.

Table IX-1 illustrates the comparison between these two counties which is striking because they are so similar in so many characteristics and yet so different economically and socially. They are similar in size, region of the country, state tax burdens, percent of land area in farms, climate and the degree to which they have minority populations (4 percent and 7 percent). Yet one appears to be growing and prospering as a Hinterland Highspot while the other is gradually shrinking as a Little Loser — in spite of its preferred position on the interstate highway system. There are other examples of significant growth nearly side by side with significant retrenchment.

In some regions, the retrenchment seems to be gaining the upper hand. New Jersey provides a striking example of how manufacturing retrenchment can be widespread. In five years, from 1987 to 1992, New Jersey manufacturing employment declined by 116,900 employees, from 690,800 to 573,900 -- a decline of 17 percent. More striking was the 24 percent of the decline in production workers, from 394,400 to 302,300. Twenty of 21 counties registered statistical declines in the number of production workers from 1987 to 1992 with the sole exception being a small county of fewer than 1,000 workers. Manufacturing establishments declined by 8 percent, and the hours worked by 21 percent.

Yet, New Jersey manufacturing shipments increased by 5.2 percent from 1987 to 1992, and manufacturing value-added increased by 8.3 percent. The remaining employees were well paid. Manufacturing wages decreased 8.5 percent while average pay per employee increased 33.8 percent. Meanwhile, capital expenditures remained low -- about $4,700 per employee versus about $6,000 in the more rapidly expanding states. In this example, New Jersey illustrates the archetypical declining competitive position:

- Shrinkage in the number of establishments
- Shrinkage in the number of employees and the number of production workers
- Lower capital expenditures per employee
- Wages creeping up as a percentage of value-added activity

Table IX-1

Two Counties in Indiana

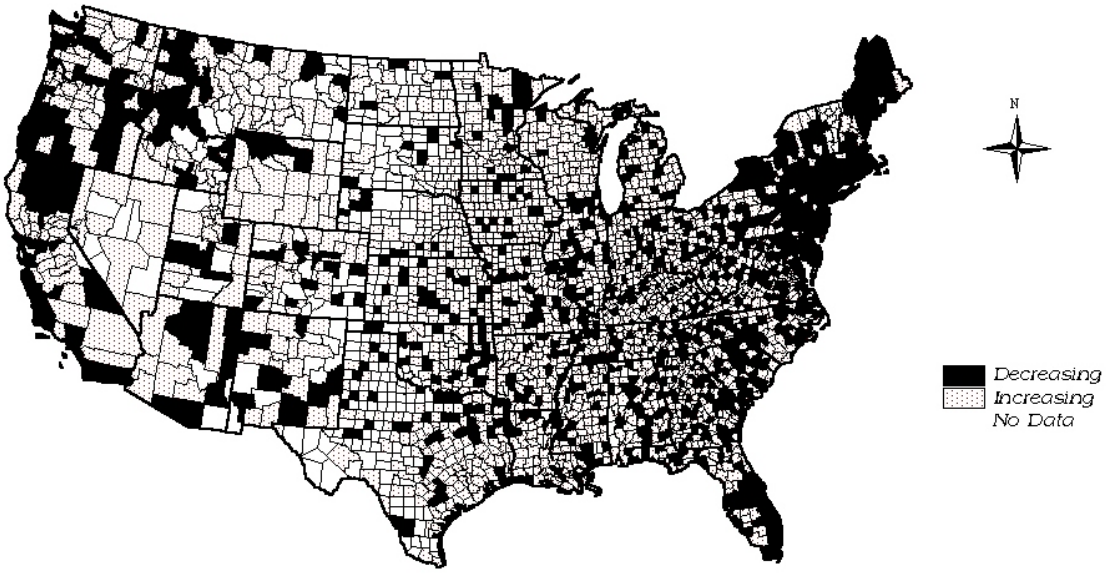
	Wayne County Indiana	Kosciusko County Indiana
Population, 1980	76,058	59,555
Population, 1990	72,802	69,210
Percent increases	-4.3%	16.2 %
Net migration 1985 to 1990	-1,456	+1,096
Civilian labor force, 1994	36,619	36,598
Percent of land area in farms, 1992	73%	73%
Manufacturing payroll, 1979	184,548	146,706
Manufacturing payroll, 1993	205,110	452,685
Percent increase	11.0 %	208.6 %
Manufacturing employment, 1980	10,293	11,695
Manufacturing employment, 1990	9,141	13,830
Percent increase	-11.2 %	+18.3 %
Manufacturing establishments, 1979	28	23
Manufacturing establishments, 1993	18	30
Percent increase (decrease)	-35.7 %	30.43 %
Percent college graduates, 1990	11.3 %	14.4 %
Percent high school diplomas, 1990	71.2 %	77.5 %
Per capita income, 1993	$17,199	$19,721
Annual pay per employee, 1993	$20,592	$24,151
Unemployment rate, 1995	6.2 %	3.9 %
Manufacturing value-added % of shipments	46.4 %	57.6 %
Manufacturing employment % of total, 1987	34.1%	51.6 %
Poverty rate, 1979	11.2 %	8.3 %
Poverty rate, 1989	14.9 %	6.6 %
Change in percentage points	up 3.68	down 1.64
Births to death ratio, 1993	1.31	1.94
% of births to women under 20 years of age, 1993	18.2%	13.1%
Marriage to divorce ratio, 1988	1.57	2.29
Government pay as % of manufacturing pay, 1993	14.2 %	55.9%
Retail sales per capita, 1992	$8,284	$6,806

The Delusion of Prosperity

The problem with a shrinking competitive position is that it tends not to be apparent when the economy is robust. Wages are higher, sales are modestly higher and productivity gains have been achieved through subtraction -- by cutting employees in relation to revenue and work levels. Declining levels of capital expenditures are not immediately apparent and, on the surface, things appear to be going on much as they were. At some point, however, the firms and their communities must grapple with their declining competitive positions. This may not happen until the arrival of a recession or it may not happen at all. Figure IX-1 shows the location and number of counties with declining manufacturing employment during a mostly prosperous period from 1988 to 1995.

Figure IX-1

Counties with Decreasing Manufacturing Employment
1988 to 1995



Source: County Business Patterns for 1988 and 1995,
US Bureau of the Census, 1998
Compiled by the Manufacturing Systems Engineering Department of the University of St. Thomas

Perhaps we can continue to enjoy prosperity with the dramatic shrinkages in industrial output experienced by our historically industrial regions but it is difficult to see how. Poverty rates, divorce rates, the number of children born to women under twenty years of age, per--capita income, city taxes -- all these seem to worsen as manufacturing declines. It is unclear, of course, what is driving these changes. Does the loss of manufacturing spawn social problems or do social problems repel manufacturers? We do not know, but there is considerable

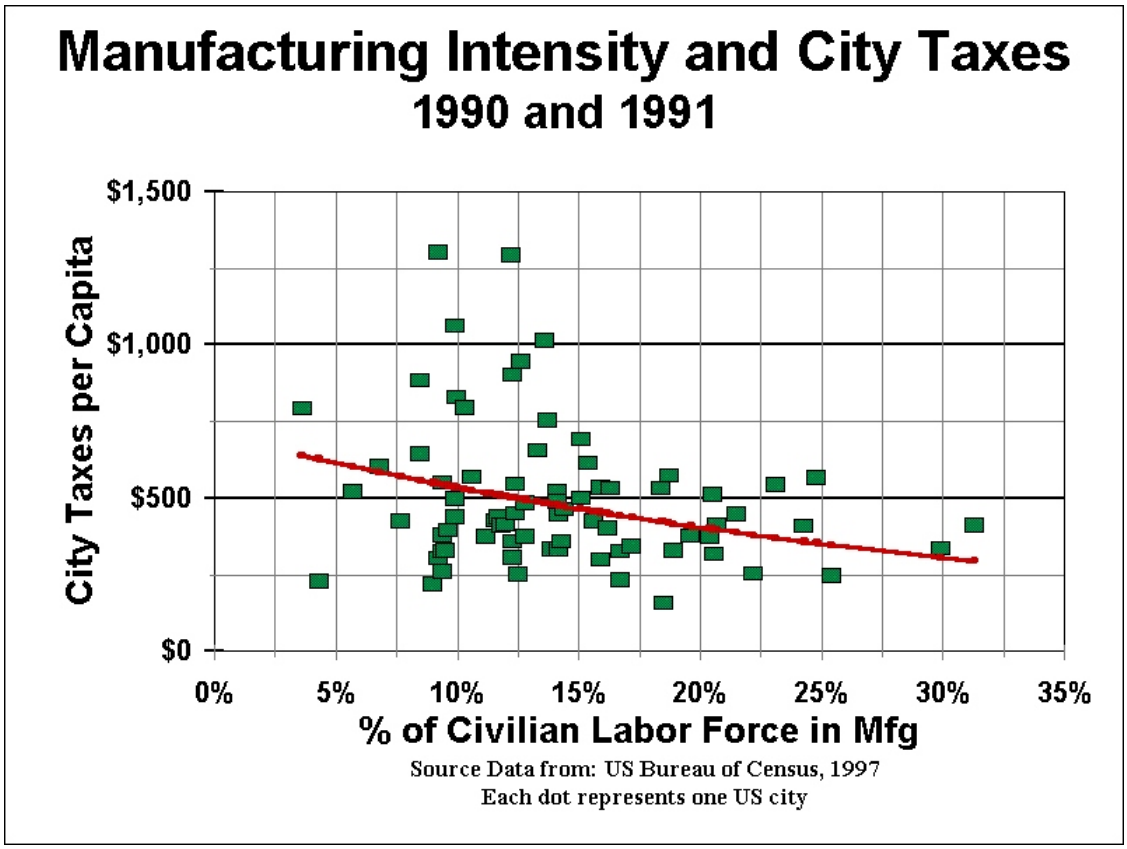
evidence that the two trends are coincident.

Though Minnesota has not yet experienced the full impact of declining manufacturing, we should not conclude that these trends are not on the way. Even within Minnesota, we are witnessing the sharp decline of manufacturing in urban areas -- even suburban areas. Hennepin County, vast as it is and with its modern city of Minneapolis, is losing manufacturing employment. As is the case with any other skill, manufacturing must constantly renew itself. New equipment, new training and other forms of revitalization are constantly needed for any manufacturing center to retain its edge in this highly competitive world.

But, this renewal is not singularly the responsibility of the industrial sector. We all have a stake in it. In order to compete industrially, those of us in education will have to teach better and more cost effectively. Those of us in law will need to incorporate more justice in what we do and less opportunism. Those of us in government will need to become more innovative and find ways to deliver services more efficiently. Those of us in utilities and transpiration must do the same. Manufacturers, of course, must begin it all by operating efficiently and appropriately. We can begin by paying our executives more realistically and less ostentatiously. We are all in this together and we must find ways of working together to improve our competitive position or we will inevitably suffer the same spiraling downturn that is currently plaguing some of the Eastern states.

From a political perspective, there is a great incentive. Good manufacturing helps lower taxes. Perhaps there are higher goals but the arithmetic relationship is quite clear. Taxes become very high when the industrial base disappears, as Figure IX-2 illustrates this relationship with each marker indicating the tax and manufacturing employment situation of a major US city along with the regression line.

Figure IX-2



Industrial Health and Community Prosperity

It remains to be seen if the initiatives emerging from the recent welfare debate will be meaningful over the long term. Half of all U.S. AFDC recipients reside in 72 of the nation's 3,144 counties. About 10 percent are in two counties -- Los Angeles, Calif., and Kings County (Brooklyn), N.Y. These 72 counties lost 480,000 manufacturing jobs in 15 years (from 1972 to 1987) and have suffered more declines in recent years. Brooklyn lost 88,000 manufacturing jobs -- about one third of the total. Cook County (Chicago) lost a quarter of a million jobs. Cuyahoga County (Cleveland) lost 70,800, Wayne County (Detroit) 123,000, and Philadelphia 107,000.

We know from studies conducted by the Economic Policy Institute, the Department of Commerce and other organizations that the multiplier effect of manufacturing jobs is several times higher than it is for jobs in either services or in retail trade. If we gain 50,000 new manufacturing jobs, another 150,000 other jobs are created -- versus 40,000 to 60,000 additional jobs if we add employees in the services or trade. But the multiplier is bi-directional. If we lose 50,000 manufacturing jobs, the decline of support and service industries soon follows.

Some people suggest that we now have an economy so robust that companies cannot find enough workers. In a way, this is true, particularly in more dispersed manufacturing centers like Hutchinson, Minn., Sioux Falls, S.D., or Forest City, Iowa, where sheer population num-

bers limit hiring during high points of the business cycle. But it isn't as true in inner cities where unemployment is still a problem. Unemployment in many urban counties has approached 10 percent during one of the best economic periods in the history of the nation. Unofficial unemployment is, of course, much higher.

Within this framework of a a robust economic period where the United States has, to some degree, benefited from its relative stability compared to some other emerging nations, the US has become the world's largest debtor. Perhaps we can go on for a very long time letting our industry erode while borrowing more money to import what we seem unwilling to produce, but it is hard to see how this situation can be offered as a workable scenario for the long term. Sociologists and others will be better equipped to weigh the advantages and liabilities of a waning industrial base. My purpose here is not to suggest that US manufacturing has disappeared or that it will disappear in the near future. My purpose is to suggest that it is weaker than it might appear, that our industrial presence has lessened in some very important industries, and that these declines are affecting some communities with a vengeance.

Nonetheless, some communities cope and adapt better than others. The primary reason why some of them not only cope but excel is because good companies are located in these communities. The quality, energy and willingness to invest on the part of enlightened companies are the principal strategic attributes of successful communities. Policy initiatives that support the attainment of these important strategic attributes are clearly to the communities' advantage but there may be other policy initiatives worth exploring.

Companies as Prosperity Drivers

The data on company employment is difficult to analyze because company employment data by location is not always available and reliable. For the purposes of this study we did obtain a copy of the *Manufacturing News Database* which lists 358,000 manufacturing employers by location including the minimum and maximum sales, square footage of space and Primary SIC Code. The data is helpful, though it has to be used with some caution for large eastern cities where total company employment might be listed in the location of the company headquarters even though much of the employment may be scattered throughout the country or the world. We are told that some of this problems stems from the regional manner in which the *Manufacturing News Database* was compiled. Nonetheless, even with some regional inaccuracy, the data are useful. Some detailed tables are included in the Appendix.

This data suggest that both large and small firms with good reputations as quality producers of well-known products figure importantly in the employment and prosperity of high achieving counties. Below is a brief list of a few of the companies employing 1000 or more employees in the classified counties:

Hinterland Highspots

Honda Hewlett-Packard Zimmer
Hutchinson Technology 3M Murray
Tecumseh Cooper Tire Sara Lee Bakery

Metro Movers

Merck IBM Foster Wheeler
Intel Abbot Laboratories Nissan
Micron Technology Motorola Kimberley-Clark

Intergraph Lockheed/Martin Chrysler
Oscar Meyer Tropicana Nortel
Advanced Micro Devices Delphi Saginaw Lucen
Amgen Whirlpool Baxter Healthcare

Beaten Path Boomtowns
Saturn Copeland Alladin Mills
Honda RR Donnelley Revlon
Russell Stover Candies American Greetings Mahle

Gradual Growers
Tyco International Honeywell Herman Miller
Intel Standex Motorola
Fisher Scientific Timberland IBM
McDonnell/Douglas Subaru/Isuzu TRW

Declining counties have impressive companies too, of course, sometimes some of the same companies listed above. Still, there are some interesting differences. The Manufacturing News Database lists the "year established" as one of the data elements. Of those employers with 500 or more employees, the following was the average "year established" listed in the database for each of our categories. It is clear from the data that this refers to the establishment of the company rather than the establishment of the plant. Still, there are observable differences:

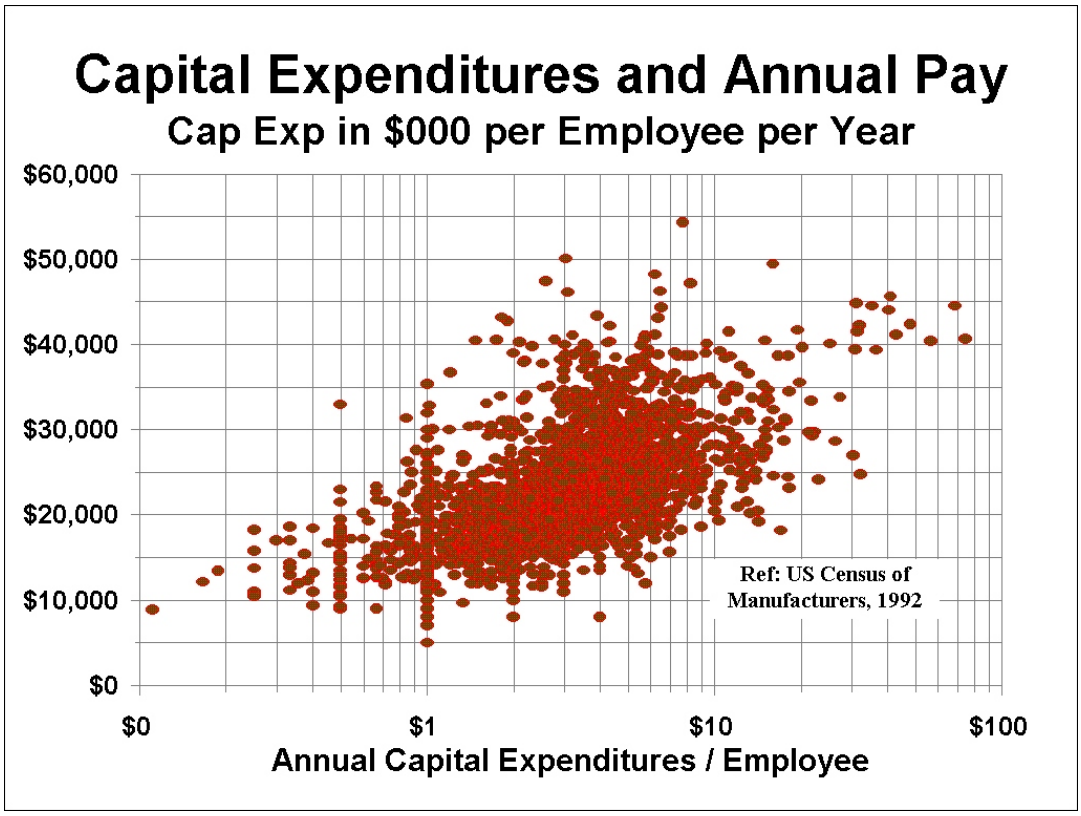
Category	Average Year Established
Hinterland Highspots	1961
Metro Movers	1953
Beaten Path Boomtowns	1960
Gradual Growers	1948
Little Losers	1940
Mid-range Minuses	1922
Falling Goliaths	1933

Whatever the shortcomings of this data and its analysis, it does appear that there is about a 24 year average difference between the favorable and unfavorable categories. Whether this is merely circumstance is difficult to detect from the data provided but it does conform to our field research where we visited several of the companies and communities in question. Declining communities have some very old plants.

Kosciusko County, Indiana again provides an example of how a community can excel with good companies. This county's long history as the world's main supplier of artificial knees, hips and other prosthesis devices has provided lasting prosperity to this Northeastern Indiana community. Zimmer, Biomet and DuPuy are all located here as are several supporting firms. Over the years, these have been forward looking companies that invested heavily in technology and equipment to remain strong in a high margin but competitive industry.

The connection between the company's willingness to invest and the prosperity enjoyed by the community is illustrated in Figure IX-3 below. Each marker represents a US County and it is quite easy to see the relationship. In general, US companies do not invest very much but when they do, workers, the community, and the company all prosper.

Figure IX-3



SECTION X — POLICY RAMIFICATIONS

Does Public Policy Matter?

One of the most pressing questions about the relocation of industry is whether or not it can or should be influenced by public policy. This is not an easy question, in part because the question itself involves value judgments. The question is difficult also because the statistical evidence is not universally conclusive. However, there are interesting observations on the role and effectiveness of public policy that can be made based on the information provided in this study. Importantly, however, public policy has to be evaluated for its effectiveness at different levels within our society. A policy that may benefit a specific community may not be at all effective in the aggregate. These observations have been made cogently by Art Rolnick and others who deplore the "war between the states" on industrial relocation incentives.

When discussing the impact of public policy on industrial relocation, we have to recognize that not all industrial movement can be assigned a probable cause — at least not a probable cause that can be identified scientifically. Industrial location is often influenced by spurious random events that have little to do with economics. The major plant of AgChem, for instance, is located in Jackson, Minn., mostly because a friend of the founder had unused factory capacity there. Over the years, AgChem has grown and prospered in that same location. Jackson is remote from major suppliers, not particularly proximate to major customers, has no major air service, and is not close to a major university which would be of major benefit to such a technologically driven company. Yet, AgChem has survived and prospered in Jackson, and Jackson has survived and prospered because of AgChem. There are countless other examples in communities across the United States.

There are a few examples of how manufacturing has come to be located in communities because of personal preferences on the part of people involved with the company. Some companies have plants in Colorado because people like to ski or plants in Florida because people like warmer weather during the winter. These are exceptions, however, and in the final analysis, the location of manufacturing is usually driven by cost, quality, efficiency and the location of suppliers and customers. Along the way to optimality, however, decades may pass where the location of industry is influenced by a variety of other, sometimes quite unrelated, factors.

Yet, there are credible instances where public policy has affected industrial relocation decisions, and where the relocating industries have stimulated ancillary economic growth for their communities. An example might be the relocation of automotive assembly to communities in Tennessee. Some people may argue that the costs of the incentives provided to the companies were too high. Others may argue that the manufacturing employment merely shifted from another community that may have needed the employment even more. Both of

these arguments need to be considered and each has validity. Nonetheless, the economy of Tennessee is prospering and the manufacturing employment gains experienced in the communities surrounding some of the plants are very substantial.

To deal with the question, does public policy matter, we must first explore to what degree can industry be attracted.

Can Industry be Attracted?

Nobody likes to see local industry decline, and so public officials frequently respond to declining industrial employment in ways that may not be helpful in the long term. Industrial development commissions at the state, community, county, region and metropolitan levels are frequently set up to attract new industry from other areas. Often they are armed with expensive publicly supported programs to train workers, build buildings and provide financing for capital equipment for manufacturers interested in locating in the communities involved. Are these programs effective? Do they make a difference? These considerations get back to the fundamental question of whether or not industry can be attracted.

In some cases, sometimes fairly significant cases, industry can be attracted. Examples include the attraction of the Nissan and Saturn plants to Tennessee, the Toyota plant to Kentucky or the Mercedes-Benz plant to northern Alabama. Investments in North America, particularly on the part of offshore industrial companies, have been growing and indeed it might be argued that US industrial expansion might not amount to very much were it not for the massive foreign investments into states like Kentucky, Tennessee and Indiana. Given that these newcomers are going to locate someplace, industry may be attracted. Whether the industry attracted is worth the cost of the attracting is still a question worthy of analysis and discussion. But there are instances where new industries, moving in from an entirely different geographic area, have added to both local manufacturing employment and local economic vitality. Toyota employs 6600 people in its Georgetown Kentucky plant just as Honda employs over 12,000 people in Ohio and Nissan employs 6600 people in Tennessee. Toyota will soon move into a highly automated truck plant in Evansville, Indiana which will soon compete with older Ford, GM and Chrysler plants in Kansas City, Flint, St. Louis, Pontiac and Norfolk. Mercedes-Benz is now producing vehicles in northern Alabama. Foreign investment in key strategic industries has been very substantial -- especially when compared to offerings by some US producers.

Yet, there are other instances where expansion has taken place without the influence of public policy. Industry grew naturally, sometimes almost as happenstance -- because of where the company started out or because of unrelated connections between the company and a new community. 3M's expansion in Minnesota grew quite independent of public policy. In some cases, given the tax and cost situations in particular communities, expansion in a home community was less advantageous to the firm than selected expansion of some manufacturing operations in new communities. Still, the expansion in home communities took place.

A host of economic factors influence the industrial location decision. Most of these are not influenced by public policy -- at least they are not influenced very much. Examples of compelling, overriding economic factors in the location decision might be a concentration of petroleum processing in Louisiana or the location of auto parts manufacturing east of the Mississippi River and north of the Ohio River. Nucor put a steel plant in Crowfordsville, Indiana largely because 47 percent of the cold-rolled sheet steel is consumed in Indiana and

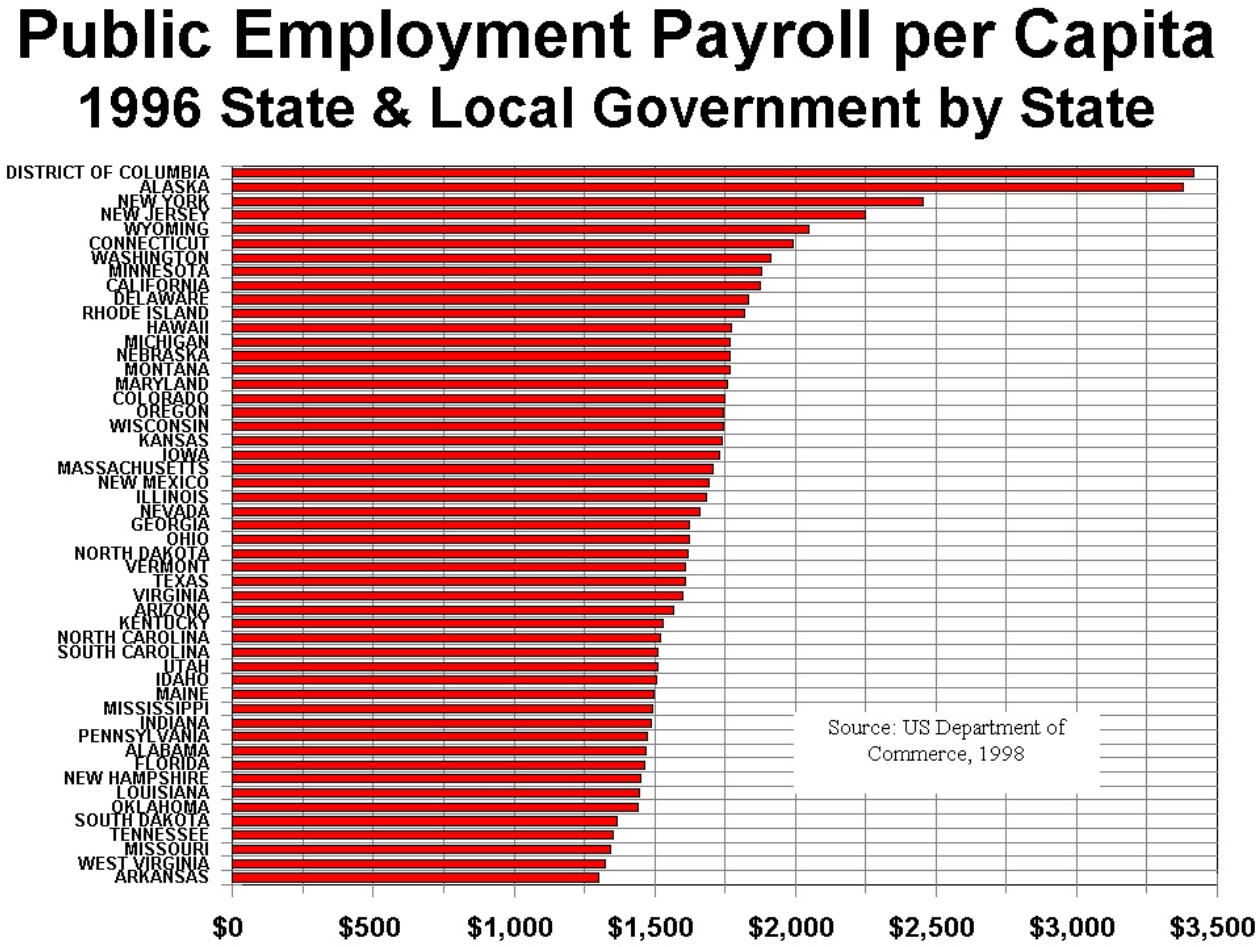
four nearby states. Though taxes and incentives are of interest to companies, this interest does not override other factors more central to the existence of the businesses.

Included in these compelling economic factors influencing location is the phenomenon of complementary process swarming. Complimentary process swarming occurs when industries or companies perform manufacturing processes that are integral and essential to other industries. An example might be Minnesota's relatively strong position as a supplier to the aerospace and aircraft industries. Kurt Manufacturing machines the parts from castings produced by Hitchcock Industries or Progress Castings, which will be installed on planes where the tooling for the composite lay-up is provided by another Minnesota company, Remmele. We may never understand exactly how all of this started and we should not assume that more effective complementary process swarming will not surface at other locations at a different time. In the meantime, the competitive edge provided by the geographic proximity of complementary industrial companies certainly helps communities where it exists. Over the long term, these trends tend to favor individual companies who invest heavily, work groups that are cost effective and of high quality, and personal associations over formal development programs.

Frugality as a Policy Objective

Policy is of interest, however, and one fairly basic question that is often discussed is how much should the public sector spend to perform its functions. This study will not explore this question but we did examine the differences between states in this regard. One measure that is of some interest is public payroll per capita within each state. Minnesota spent $1,881 of public payroll dollars per man, woman and child in the state in 1996. These are only state and local salaries, not federal salaries occurring in the same state. Minnesota is fairly high in this regard, sixth highest of all states excluding DC and Alaska which are special cases. Iowa spent $1731, Wisconsin $1744, Indiana $1487 and Tennessee $1353 (Figure X-1). Iowa and Wisconsin spent 8 percent less than Minnesota, Indiana 21 percent less and Tennessee and South Dakota 28 percent less. In its spending on public payroll, Minnesota ranks with heavily spending eastern states such as New York, New Jersey and Connecticut -- all of which are losing their manufacturing bases at frightening rates.

Figure X-1



Who knows if Minnesota's spending for public payroll is worthwhile. The only thing that this study will suggest is that Minnesota is spending more than states where manufacturing is expanding and about the same as where it is not. The problem with this situation is that everybody knows it. A telling remark was relayed to us by an executive with a highly successful company which considered, but then rejected, the possibility of a manufacturing plant in Minnesota.

> "We pay very little attention to taxes because taxes can change. But, we pay a great deal of attention to spending. We have all of this modeled on our computer."

Nagging Questions about Industrial Relocation

This report on the relocation of industry is intended to be descriptive rather than prescriptive. However, there are some nagging questions which deserve serious further inquiry. Perhaps some of the material presented here will be useful in addressing these question, but

there is much other usable research which might also be helpful.Our intention here is to offer a starting point for further discussion.

Is the economy we are building for the future viable in the long term?

Is the post industrial economy socially doable over long periods? Given the escalating trade deficits and our current position as the world's largest debtor, it is hard to see how. Surely the economy we are building is not helpful to core cities. If there is a way where the post industrial economy can work, those who advocate it have a responsibility to report to the rest of the society exactly how this is all supposed to work and how it will treat certain winning and losing groups. I suppose we could say that markets are at work and that not much can be done to save a Philadelphia or a Brooklyn or, ultimately, a Minneapolis. It may be true that many of these cities, with their high government payrolls, high crime and ineffective systems, have priced themselves out of the modern industrial economy and there is not much that can be done to alter these powerful economic trends. If that is true, then it would seem to make more sense to reduce the available subsidies to hasten the transition to more promising regions, many of which are short of people. We won't answer this question here but we hope this study of industrial relocation will provide material that will be meaningful to the discussion.

Do we have enough people where the industry wants to be?

In a recent meeting, the Vice President of Operations for Artic Cat (snowmobiles & all-terrain vehicles) lamented the fact that there is one percent unemployment in Thief River Falls, Minnesota where the company's main plant is located. Similar feelings were expressed by the CEO of Winnebago Industries in Forest City, Iowa where that company employs 2700 people amidst a town population of 4400. The statistical information in this study mirrors the narrative information gathered on field visits. There are not enough people where industry wants to be. Figure X-1 provides some details on this situation. Manufacturing employment for 1995 was compared to US Census estimates for births, population, international migration and domestic migration for the years 1990 to 1997. The Hinterland Highspots and the Beaten Path Boomtowns, in particular, show very low birth rates as a percentage of manufacturing employment thereby suggesting that labor shortage is unlikely to be eased by natural birthrates. The Metro Movers and Gradual Growers show much higher percentages as do the Little losers, Mid-range Minuses and Falling Goliaths.

International migration is not attracted to the favorably classified county groups either. The rates of international migration are highest with the Falling Goliaths. Immigrants are moving into communities where the opportunities for industrial jobs are thin. Domestic migration does tend to follow industrial opportunities but here, also, the Hinterland Highspots and Beaten-path Boomtowns fare less well that the Metro Movers and the Gradual Growers. The irony in this situation is that there are indeed fewer people in the areas where industry is showing the greatest industrial expansion. There is a mismatch when can be adjusted, in part, over time through domestic migration. This mismatch poses a policy dilemma. Should anything be done or should market forces be trusted to solve the labor mismatch problem over time? It remains another nagging question.

Table X-1

Vital Statistics of Classified Counties

Item	Hinterland Highspots	Metro Movers	Beaten Path Boomtowns	Gradual Growers	Little Losers	Mid-range Minuses	Falling Goliaths
Mfg Employment 1995	207,238	894,682	196,988	1,013,231	177,005	391,423	2,420,995
Human Births 1990 to 1997	129.665	1,285,510	94,976	1,888,349	286,565	651,916	4,473,941
Births as % of Mfg Emp	62.56%	143.68%	48.21%	186.37%	161.90%	166.55%	184.80%
Intn'l Migration 1990-1997	7,898	179,523	4,314	331,882	16,195	138,556	1,755,859
Intn'l Mig % of Mfg Emp	3.81%	20.06%	2.19%	32.75%	9.15%	35.40%	72.53%
Domestic Mig 1990-1997	62,046	1,320,960	37,865	1,020,987	-39,296	-287,354	-4,007,308
Dom Mig % of Mfg Emp	29.94%	147.65%	19.22%	100.77%	-22.20%	-73.42%	-165.53%
Total Migration 1990-1997	69,944	1,500,483	42,179	1,352,869	-23,101	-148,798	-2,251,449
Tot Mig % of Mfg Emp	33.75%	167.71%	21.41%	133.52%	-13.05%	-38.01%	-93.00%

Should we welcome more qualified immigrants?

There is a shortage of qualified manufacturing talent available in Minnesota and, as we look ahead, the availability of qualified workers looks even slimmer. Yet, there are millions of highly qualified and willing people who would like to leave the turmoil in their present countries and move to the United States. The fine people attending graduate and undergraduate schools in the US provide an indication of what talent is available from overseas. Perhaps it would be in our very best interests to encourage immigration more than we do.

Can anything be done to make core cities more attractive to industry?

This question is beyond the scope of this report but it seems to this author to be an imperative question. If for no reason other than fiscal viability, it seems unlikely that the major cites of the United States will be able to survive with the long gradual exodus of manufacturing that so many of them are now experiencing -- even during good times. In order for manufacturers to be attracted core cities so many things would have to change. The attracting forces outlined in Section IV will have to become more compelling than the repelling forces. Whether these major changes can be politically accomplished in large cities remains to be seen. However, if they are not accomplished, the most probable situation for the future will be continual exacerbation of social problems that have developed in major cities over the past several decades because industry, with the job engine that represents, is clearly leaving.

Will the smaller communities be able to progress further?

It depends upon the companies and, to some extent, on labor availability. Perhaps in our formation of policy initiatives, we have ignored the role and importance of the corporation. Perhaps we should appreciate the corporations more and then expect more exemplary citizenry -- as Europe has done. There are many excellent companies and some that are not very well run at all. We should not group them together. We may find it fitting to cooperate effec-

tively with the better companies.

Can the US compete?

You bet. Our study focuses on 129 counties that are competing just fine and then draws contrasts with the 81 that are not. Ironically, many of these successful counties operate with the same state laws, the same taxes and the same regulations as some of the unsuccessful counties in the same state. It seems significant that fully nineteen states had counties in both the successful and unsuccessful groups. Competing internationally is not impossible but it requires the cooperation of enlighten companies working within the framework of sound public policy. Many of the losing counties have neither of these attributes but instead have mediocre or poorly run companies trying to coexist with destructive policies in poorly administered communities that spend too much.

Do we focus enough attention on local expansion?

As an example, a critical review of Minnesota's industrial history suggests that Minnesota is fairly good at fostering new companies but not so good in capturing their expansion as they develop and grow. Minnesota has medium growth but we might wonder what might happen if some of its native companies had a greater propensity to expand within the state. Some other states appear to make state sponsored industrial development and technology assistance programs more available to companies presently in within state boundaries. Still other states appear to target relocating companies for industrial development programs.

This choice between focusing on existing versus relocating companies is a serious question. It could be argued that the amount of actual relocation is quite small during the course of a year and hence economic development programs aimed at these companies will have limited effectiveness. Growth or shrinkage among already existing companies is numerically more important.

Do we concentrate enough on the supplier base?

Perhaps we should aim the few development programs that remain at strengthening the supplier base for existing companies. As an in industrial society, we have given too little attention to the linkages between manufacturing operations. It should be recognized that if our foundries close, the machine shops that finish the castings also are jeopardized, and that a base of strong suppliers is essential in order for our end-product producers to expand. Chrysler Corporation and the Ford Motor Company have emerged as powerful automobile producers in recent years in part because of the competence of their suppliers, but our public programs and economic policies rarely consider what supplier networks are necessary to major producers in order to compete in world markets.

Is there any guarantee that successful counties will continue to do well?

No, there isn't. Constant adaptation is necessary for any company and any community to remain competitive over long periods. Some of the Hinterland Highspots, in particular, have their destinies in the hands of a few major employers -- often in the same industry. Structural changes could impact these industries and hence the companies and the communities.

Changes in the disk drive industry, for instance, could severely impact a Minnesota Hinterland Highspot, McLeod County. But, many of these companies and communities have been able to adapt in the past, however, and perhaps they will again in the future.

Looking Forward

Industry is relocating. The pace is slow and sporadic but the leading indicators are always clear -- slackening capital investment, reduced training, shrinkage in the number or fraction of production workers, land acquisition problems, labor troubles initiated by either side, technological obsolescence, unenlightened management, the misapplication of individual effort, governmental ineptitude and financial humbuggery. We can avoid the problem of a shrinking industrial base if we wish but we will have to work together. Improvement is possible, as the successful counties have demonstrated. But success is not guaranteed as the unsuccessful counties have been able to prove.

APPENDIX

Note: The tables published in the appendix are available separately through the St. Thomas Technology Press at 651-962-6423. Descriptons of each table (Appendix) are listed below.

Data Collection Methods

Although state and federal governments produce much useful information on the workings of our economy, we may have to gracefully accept the fact that statistical information is frequently undependable -- especially at the SIC level for individual countries. This information is still of interest because it may be approximately correct -- at least part of the time. But, it would require great courage to form conclusions based solely on statistical evidence. Government-supplied statistics were used in this study, but they were greatly supplemented by direct contact with the individual communities and by the accumulation of financial and other information on individual companies.

The University of St. Thomas Manufacturing Database includes data on the following:

- Public Industrial Company Summary by State
- Specific Company Financial Data on every public manufacturing company in the US
- Specific Company Financial Data on most public manufacturing companies overseas
- Public Industrial Company Summary for every State
- Summary of Public Industrial Companies by Industry - US Total
- Summary of Public Industrial Companies by Industry - Individual States
- Public Industrial Companies by 2 Digit SIC Code
- Industrial Employment by Employer within County for all counties in the US
- SIC Code Summaries for Individual States
- Employment, Payroll and Establishment Changes by State 1979 - 1993
- Employment, Payroll and Establishment Changes by State 1988 - 1995
- Employment and Value-added Changes by County 1987 - 1992
- Employment and Value-added Changes by SIC Code within State 1987 - 1992
- Classified Counties Largest Manufacturing Employers 1998
- Birth/Death/Migration Report 1990-1997

Appendix A - Public Industrial Company Summary by State

Appendix A provides a summation of the basic financial measures for all public companies headquartered in each state. The measures tabulated are the following:

State Abbreviation The official 2 character State Abbreviation Code.

Revenue Total annual revenue for all public companies for a one year period ending in late 1997.

Cost of Sales Annual cost-of-Sales for all public companies for a one year period ending in late 1997.

S, G & A Selling, General and Administrative Expense for all public companies, etc..

R & D Research and Development Expense for all public companies, etc..

Net Income bef Extra Net Income before Taxes and Extraordinary Items for all public companies, etc..

Net Income aft Extra Net Income after Taxes and Extraordinary Items for all public companies, etc..

Assets Total Assets for all public companies, etc..

Liabilities Total Liabilities for all public companies, etc..

Equity Total Stockholder Equity for all public companies, etc..

Retained Earnings Total Retained Earnings (reinvested profits) for all public companies, etc..

Bankable Equity Total Stockholder Equity minus Intangible Assets minus 50% of inventory for all public companies, etc.. This measure has been established to reflect the potential borrowing potential for corporations.

Appendix B - Summary of Public Industrial Companies by Industry - US Total

Appendix B provides a summation of the basic financial measures for all public companies by 2 digit SIC code for the US in total. The measures tabulated are the following:

State Abbreviation The official 2 character State Abbreviation Code.

Revenue Total annual revenue for all public companies for a one year period ending in late 1997.

Cost of Sales Annual cost-of-Sales for all public companies for a one year period ending in late 1997.

S, G & A Selling, General and Administrative Expense for all public companies, etc..

R & D Research and Development Expense for all public companies, etc..

Net Income bef Extra Net Income before Taxes and Extraordinary Items for all public companies, etc..

Net Income aft Extra Net Income after Taxes and Extraordinary Items for all public companies, etc..

Assets Total Assets for all public companies, etc..

Liabilities Total Liabilities for all public companies, etc..

Equity Total Stockholder Equity for all public companies, etc..

Retained Earnings Total Retained Earnings (reinvested profits) for all public companies, etc..

Bankable Equity Total Stockholder Equity minus Intangible Assets minus 50% of inventory for all public companies, etc.. This measure has been established to reflect the potential borrowing potential for corporations.

Appendix C - Minnesota Public Industrial Companies by 2 Digit SIC Code

Appendix C provides a listing of selected financial measures for all public companies by 2 digit SIC code for Minnesota. The measures tabulated are the following:

Company Name Official name of the public company.
SIC Code Standard Industry Classification Code - 4 digit
State Abbreviation The official 2 character State Abbreviation Code.
SIC Code Standard Industry Classification Code - 3 digit
SIC Description Standard Industry Classification Description - 3 digit
SIC Code Standard Industry Classification Code - 2 digit
Revenue Total annual revenue for all public companies for a one year period ending in late 1997.
Cost of Sales Annual cost-of-Sales for all public companies for a one year period ending in late 1997.
Gross Profit Rate Percentage of Revenue that results in Gross Profit (Revenue - Cost-of-sales).
Period Ending The ending date of the one year period being considered.
Max Security Rating The maximum rating of company debt for the one year period being considered.
% ***Net Income bef Extra*** Net Income before Taxes and Extraordinary Items as a percent of Revenue.
% ***Net Income aft Extra*** Net Income after Taxes and Extraordinary Items as a percent of Revenue.
Bankable Equity Total Stockholder Equity minus Intangible Assets minus 50% of inventory for all public companies, etc.. This measure has been established to reflect the potential borrowing potential for corporations.
Bankable Equity Rate Bankable Equity as a percentage of Stockholder Equity**.**
Debt to Bankable Equity Total Debt divided by Bankable Equity.
Inv Turn on Rev Revenue divided by Total Inventory.
Inv Turn on COS Revenue divided by Total Cost-of-Sales.
R & D Research and Development Expense.
% Retained Earnings The percentage of Stockholder Equity that results from Retained Earnings.
Dividend Payout The percentage of Net Income paid out in Dividends
Assets Total Assets.
Liabilities Total Liabilities.
Equity Total Stockholder Equity.
Retained Earnings Total Retained Earnings (reinvested profits).
% ***R & D*** Research and Development Expense as a percent of Revenue.
% ***S, G & A*** Selling, General and Administrative Expense as a percent of Revenue.
% ***NCOS*** Non-cost-of-sales Expense as a percent of Revenue.
Debt Total Debt (Assets - Stockholder Equity).

%***Debt to Bankable Eq.*** Total Debt divided by Bankable Equity expressed as a percentage.
Net Income bef Extra Net Income before Taxes and Extraordinary Items.
Net Income aft Extra Net Income after Taxes and Extraordinary Items.

Appendix D - Industrial Employment by Employer within County

Appendix D provides a listing of the manufacturing employers by county in order of employee count (descending order) as they appear in the *Manufacturing News Data Base* as of January of 1998. Manufacturing employers in the Classified Counties with local employee counts of 500 or more are listed. The measures tabulated are the following:

State Code The official 2 character State Code (numerical).

County Code The official 3 character County Code (numerical).

Areaname The County Name and State Abbreviation.

Compname Company Name.

SIC 3 digit Standard Industry Classification Code - 3 digit

SIC Description Standard Industry Classification Description - 3 digit

Location Count Numbers of Employees listed for the company in that location.

MINSALES The minimum amount of revenue reported in the past few years.

MAXSALES The maximum amount of revenue reported in the past few years.

Square Feet The approximate square footage at that manufacturing location.

Class A separate code used only for research purposes.

Appendix E - Employment and Value-added Changes by State 1987 - 1992

Appendix E provides a summation of the employment and value-added changes from 1987 to 1992 by state and for the US in total. The measures tabulated are the following:

State Code The official 2 character State Code (numerical).

County Code The official 3 character County Code (numerical).

Areaname The County Name and State Abbreviation.

SIC Standard Industry Classification Code - 2 or 3 digit

SIC Description Standard Industry Classification Description - 2 or 3 digit

SICKEY Standard Industry Classification Code - 2 or 3 digit

FIPS Numeric The combination of the State and County Code.

Mfg Estab 1987 Number of Manufacturing Establishments listed for the SIC Code in that Areaname for 1987.

Mfg Estab 1992 Number of Manufacturing Establishments listed for the SIC Code in that Areaname for 1992.

Mfg Employment 1987 Number of Employees listed for the SIC Code in that Areaname for 1987.

Mfg Employment 1992 Number of Employees listed for the SIC Code in that Areaname for 1992.

Mfg Empl % Incr 87-92 Manufacturing Employment Increase for the SIC Code in that Areaname from 1987 to 1992.

Mfg Empl Incr 87-92 Percent Increase in Manufacturing Employment Increase for the SIC Code in that Areaname from 1987 to 1992.

Mfg Payroll 1987 Manufacturing Payroll listed for the SIC Code in that Areaname for 1987.

Mfg Payroll 1992 Manufacturing Payroll listed for the SIC Code in that Areaname for 1992.

Mfg Payroll Incr 87-92 Manufacturing Payroll Increase for the SIC Code in that Areaname from 1987 to 1992.

Mfg Payroll % Incr 87-92 Percent Increase in Manufacturing Payroll for the SIC Code in that Areaname from 1987 to 1992.

Workers 1987 Manufacturing Production Workers listed for the SIC Code in that Areaname for 1987.

Workers 1992 Manufacturing Production Workers listed for the SIC Code in that Areaname for 1992.

Workers Incr 87-92 Manufacturing Production Workers Increase for the SIC Code in that Areaname from 1987 to 1992.

Workers % Incr 87-92 Percent Increase in Manufacturing Employment Production Workers Increase for the SIC Code in that Areaname from 1987 to 1992.

%EmplChange=Workers The percentage of the 1987 to 1992 change in employment accounted for by the change in the number of production workers

Hours 1987 Manufacturing Production Hours listed for the SIC Code in that Areaname for 1987.

Hours 1992 Manufacturing Production Hours listed for the SIC Code in that Areaname for 1992.

Hours Incr 87-92 Manufacturing Production Hours Increase for the SIC Code in that Areaname from 1987 to 1992.

Hours % Incr 87-92 Percent Increase in Manufacturing Employment Production Hours for the SIC Code in that Areaname from 1987 to 1992.

Wages 1987 Manufacturing Production Wages listed for the SIC Code in that Areaname for 1987.

Wages 1992 Manufacturing Production Wages listed for the SIC Code in that Areaname for 1992.

Wages Incr 87-92 Manufacturing Production Wages Increase for the SIC Code in that Areaname from 1987 to 1992.

Wages % Incr 87-92 Percent Increase in Manufacturing Employment Production Wages for the SIC Code in that Areaname from 1987 to 1992.

Pay % of Shipments Manufacturing Payroll as a % of Shipments in 1992.

Wages % of Shipments Manufacturing Production Wages as a % of Shipments in 1992.

Mat'l % of Shipments Materials as a % of Shipments in 1992.

Value-added 1987 Manufacturing Value-added listed for the SIC Code in that Areaname for 1987.

Value-added 1992 Manufacturing Value-added listed for the SIC Code in that Areaname for 1992.

Value-added Incr 87-92 Manufacturing Value-added Increase for the SIC Code in that Areaname from 1987 to 1992.

Value-add % Incr 87-92 Percent Increase in Manufacturing Value-added for the SIC Code in that Areaname from 1987 to 1992.

Materials 1987 Manufacturing Production Materials listed for the SIC Code in that Areaname for 1987.

Materials 1992 Manufacturing Production Materials listed for the SIC Code in that Areaname for 1992.

Materials Incr 87-92 Manufacturing Production Materials Increase for the SIC Code in that Areaname from 1987 to 1992.

Materials % Incr 87-92 Percent Increase in Manufacturing Employment Production Materials for the SIC Code in that Areaname from 1987 to 1992.

Shipments 1987 Manufacturing Production Shipments listed for the SIC Code in that Areaname for 1987.

Shipments 1992 Manufacturing Production Shipments listed for the SIC Code in that Areaname for 1992.

Shipments Incr 87-92 Manufacturing Production Shipments Increase for the SIC Code in that Areaname from 1987 to 1992.

Shipments % Incr 87-92 Percent Increase in Manufacturing Shipments for the SIC in Areaname from 1987 to 1992.

Cap Exp 1987 Manufacturing Capital Expenditures for the SIC Code in that Areaname for 1987.

Cap Exp 1992 Manufacturing Capital Expenditures for the SIC Code in that Areaname for 1992.

Cap Exp Incr 87-92 Manufacturing Capital Expenditures Increase for the SIC Code in that Areaname from 1987 to 1992.

Cap Exp % Incr 87-92 Percent Increase in Manufacturing Capital Expenditures for the SIC Code in that Areaname from 1987 to 1992.

Cap Exp/Empl 1987 Capital Expenditures per employee for the SIC Code in that Areaname for 1987.

Cap Exp/Empl 1992 Capital Expenditures per employee for the SIC Code in that Areaname for 1992.

Appendix F - Classified County Employment, Establishments & Payroll 1988 to 1995

Appendix F provides a summation of the employment, establishments and payroll from 1988 to 1995 for the Classified Counties by state. The measures tabulated are the following:

State Code The official 2 character State Code (numerical).

County Code The official 3 character County Code (numerical).

Areaname The County Name and State Abbreviation.

Border Indicates border county for special analysis.

Mfg Employment 1988 Number of Employees listed for the SIC Code in that Areaname for 1988.

Mfg Employment 1995 Number of Employees listed for the SIC Code in that Areaname for 1995.

Mfg Empl Incr 88-95 Percent Increase in Manufacturing Employment Increase for the SIC Code in that Areaname from 1988 to 1995.

Mfg Empl % Incr 88-95 Manufacturing Employment Increase for the SIC Code in that Areaname from 1988 to 1995.

Mfg Payroll 1988 Manufacturing Payroll listed for the SIC Code in that Areaname for 1988.

Mfg Payroll 1995 Manufacturing Payroll listed for the SIC Code in that Areaname for 1995.

Mfg Payroll $ Incr 88-95 Dollar Increase in Manufacturing Payroll for the SIC Code in that Areaname from 1988 to 1995 ($000).

Mfg Payroll % Incr 88-95 Percent Increase in Manufacturing Payroll for the SIC Code in that Areaname from 1988 to 1995.

Class Industrial Expansion Class

Class Description Description of Industrial Expansion Class

Mfg Estab 1988 Number of Manufacturing Establishments listed for the SIC Code in that Areaname for 1988**.**

Mfg Estab 1995 Number of Manufacturing Establishments listed for the SIC Code in that Areaname for 1995.

Mfg Estab Incr 88-95 Percent Increase in Manufacturing Establishment Increase for the SIC Code in that Areaname from 1988 to 1995.

Mfg Estab % Incr 88-95 Manufacturing Establishment Increase for the SIC Code in that Areaname from 1988 to 1995.

% Incr Avg Pay 88-95 Percent Increase in Manufacturing average annual pay for the SIC Code in that Areaname from 1988 to 1995.

Mfg Payroll % Incr 79-93 Percent Increase in Manufacturing Payroll for the SIC Code in that Areaname from 1979 to 1993.

% College Grad 1990 Percent of adults with College Degrees in 1990.

Govt Payroll % Mfg Payrl Government Payroll as a percent of Manufacturing Payroll in 1994.

Appendix G - State Employment, Establishments & Payroll 1988 to 1995

Appendix G provides a summation of the employment, establishments and payroll for manufacturing for each state from 1988 to 1995 grouped by geographical region. The measures tabulated are the following:

State Code The official 2 character State Code (numerical).

State Name The State Name.

SIC Standard Industry Classification Code - 2 or 3 digit

SIC Description Standard Industry Classification Description - 2 or 3 digit

1988.

Mfg Employment 1988 Number of Employees listed for the SIC Code in that Areaname for 1988.

Mfg Payroll 1988 Manufacturing Payroll listed for the SIC Code in that Areaname for 1988.

Mfg Estab 1988 Number of Manufacturing Establishments listed for the SIC Code in that Areaname for ***Mfg Employment 1995*** Number of Employees listed for the SIC Code in that Areaname for 1995.

Mfg Payroll 1995 Manufacturing Payroll listed for the SIC Code in that Areaname for 1995.

Mfg Estab 1995 Number of Manufacturing Establishments listed for the SIC Code in that Areaname for 1995.

Mfg Empl Incr 88-95 Percent Increase in Manufacturing Employment Increase for the SIC Code in that Areaname from 1988 to 1995.

Mfg Empl % Incr 88-95 Manufacturing Employment Increase for the SIC Code in that Areaname from 1988 to 1995.

State Code The official 2 character State Code (numerical).

State Name The State Name.

SIC Standard Industry Classification Code - 2 or 3 digit

SIC Description Standard Industry Classification Description - 2 or 3 digit

1988.

Mfg Empl Incr 88-95 Percent Increase in Manufacturing Employment Increase for the SIC Code in that Areaname from 1988 to 1995.

Mfg Empl % Incr 88-95 Manufacturing Employment Increase for the SIC Code in that Areaname from 1988 to 1995.

Mfg Payroll % Incr 88-95 Percent Increase in Manufacturing Payroll for the SIC Code in that Areaname from 1988 to 1995.

Mfg Estab Incr 88-95 Percent Increase in Manufacturing Establishment Increase for the SIC Code in that Areaname from 1988 to 1995.

Mfg Estab % Incr 88-95 Manufacturing Establishment Increase for the SIC Code in that Areaname from 1988 to 1995.

% Incr Avg Pay 88-95 Percent Increase in Manufacturing average annual pay for the SIC Code in that

Areaname from 1988 to 1995.

FIPS Numeric The combination of the State and County Code.

Appendix H - Births, Deaths and Migration 1990 to 1997

Appendix H provides a summation of the employment, establishments and payroll for manufacturing for each state from 1988 to 1995 listed in descending order of percent increase in manufacturing payroll. The measures tabulated are the following:

State Code The official 2 character State Code (numerical).

County Code The official 3 character County Code (numerical).

Areaname The County Name and State Abbreviation.

Class Industrial Expansion Class.

Class Description Description of Industrial Expansion Class.

VS02093 Birth Rate in 1993.

Birth/Death Ratio 1993 Birth to Death Ratio in 1993.

Birth/Death Ratio 90-97 Birth to Death Ratio from 1990 to 1997.

Births 90-97 Birth from 1990 to 1997.

Int Migration 90-97 International Migration from 1990 to 1997.

% Int Migration 90-97 Percent International Migration from 1990 to 1997.

Dom Migration 90-97 Domestic Migration from 1990 to 1997.

% Dom Migration 90-97 Percent Domestic Migration from 1990 to 1997.

Mig % of Births 90-97 Total Migration as a percent of Births from 1990 to 1997.

90-97 Bths % of Mfg Emp Births from 1990 to 1997 as a percent of Manufacturing Employment in 1995.

90-97 Mig % of Mfg Emp Total Migration from 1990 to 1997 as a percent of Manufacturing Employment in 1995.

90-97 Int Mig % of Mfg International Migration from 1990 to 1997 as a percent of Manufacturing Employment in 1995.

Mfg Employment 1995 Number of Employees listed for the SIC Code in that Areaname for 1995.

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