A New Path to Prosperity?

Manufacturing and Knowledge-Based Industries As Drivers of Economic Growth

Lou Glazer, President, Michigan Future, Inc.

Donald Grimes, Senior Research Associate
Institute of Labor and Industrial Relations
University of Michigan

July 2004

contact information:

glazerl@earthlink.net
dgrimes@umich.edu

Introduction

Michigan lost nearly 163,000 manufacturing jobs from 2000 through 2003, a decline of 18 percent. This steep decline is Topic A in discussions about the future of Michigan's economy. There is a widespread concern that the lost manufacturing jobs are gone forever and, even more worrisome, that many of the more than 700,000 remaining manufacturing jobs are at risk.

Obviously, the permanent loss of a manufacturing job is a hardship for workers and their families. This is particularly true for the many former manufacturing workers who end up in lower-paying jobs for the remainder of their careers.

But the concern about manufacturing job losses goes beyond the effect on the workers and their families. Around the country, particularly in industrial states like Michigan, manufacturing employment losses are viewed with greater concern than job losses in other industries. Manufacturing, which historically has been a high-wage industry, is viewed as an irreplaceable mass pathway to the middle class. The fear is that without a robust manufacturing sector our economy will be increasingly dominated by low-wage service-providing industries. Also, there is concern that the large loss of good-paying manufacturing jobs will depress the overall economy. Manufacturing is viewed as an important engine powering the economy. In industrial states like Michigan, many view it as the most important engine.

This report is designed to explore whether these two concerns are warranted. We look at data to see if there are other industries producing lots of new middle-class jobs. We also explore whether high manufacturing concentrations are correlated with stronger state economies, and if not, what are the industries that are powering the most prosperous states?

We compare manufacturing as an engine of economic growth with what we call knowledge-based industries. These are a cluster of industries where work is largely done in offices, schools, and hospitals. The knowledge-based industries include:

- wholesale trade
- information
- financial activities
- professional and technical services
- management of companies
- education
- health care and social assistance
- government, except education

Before we explore the data, we should define what we mean by manufacturing. In our conversations about the manufacturing industry we tend to use two definitions, one related specifically to factory work, the other to those who work for a manufacturing company. For this report, manufacturing refers specifically to work done in factories, making products. This is the definition of manufacturing in the nation's new industrial classification system.

Workers in management as well as pre- and post-production occupations in such important Michigan industries as motor vehicles, office furniture, chemicals, and pharmaceuticals are no longer considered part of the manufacturing industry. They are now accounted for in the knowledge-based industries, primarily in management of companies and professional and technical services.

The data on employment by industry used in this report—compiled by the U.S. Department of Labor, Bureau of Labor Statistics (BLS)—utilizes the new industry definitions. Detailed description of industries are available at bls.gov (click on industries). For this report we use the BLS classifications except for education, where we combine both public and private K-16 education.

The new industrial classification system allows us to explore much more precisely the impact of the loss of good-paying factory jobs. These are the jobs that are seen by many as the backbone of a strong economy, and that seem to be most at risk, threatened by technology and trade. They are the jobs that have been identified by many as crucial to the future of Michigan's economy.

I. Employment in Michigan 1990–2003

We begin with a look at employment by industry in Michigan from 1990 through 2003. We chose this time period so as to be able to look at structural, rather than cyclical, changes in the Michigan economy. With these data we can look at how employment by industry changed in Michigan in a period that includes the boom years of the nineties as well as the subsequent downturn.

As shown in Table 1, we have divided the economy into three industry groupings:

- high pay, low education
- middle and high pay, high education (knowledge-based industries)
- low pay, low education

Table 1
Employment in Michigan by Type of industry, 1990–2003

Industry	Average Annual Pay	Employment			Change		
	2002	1990	2000	2003	1990–2000	2000–2003	1990–2003
Total all industries	$38,135	3,969,700	4,673,900	4,419,700	704,200	–254,200	450,000
High pay, low education		1,107,700	1,249,300	1,066,800	141,600	–182,500	–40,900
Manufacturing	$52,033	837,600	896,700	733,800	59,100	–162,900	–103,800
Mining	$44,398	9,700	7,600	5,900	–2,100	–1,700	–3,800
Construction	$42,951	143,100	209,600	199,400	66,500	–10,200	56,300
Transportation & utilities	$45,815	117,300	135,400	127,700	18,100	–7,700	10,400
Middle & high pay, high education		1,732,200	2,002,500	2,006,000	270,300	3,500	273,800
Wholesale trade	$51,580	159,500	186,000	173,900	26,500	–12,100	14,400
Information	$47,191	70,800	76,700	74,400	5,900	–2,300	3,600
Financial activities	$44,305	195,400	209,400	218,500	14,000	9,100	23,100
Prof. & tech. services	$60,524	201,000	276,100	254,600	75,100	–21,500	53,600
Management of companies	$77,490	59,900	70,500	67,200	10,600	–3,300	7,300
Education	$35,482	360,900	413,500	442,100	52,600	28,600	81,200
Health care & social assistance	$34,856	370,500	447,900	466,300	77,400	18,400	95,800
Gov't. except education	$39,530	314,200	322,400	309,000	8,200	–13,400	–5,200
Low pay, low education		1,129,800	1,422,400	1,346,700	292,600	–75,700	216,900
Natural resources (forestry & fishing)	$25,636	1,800	1,900	1,800	100	–100	0
Retail trade	$22,473	505,600	559,800	530,500	54,200	–29,300	24,900
Employment services	$27,130	57,300	174,700	143,800	117,400	–30,900	86,500
Other admin. support	$28,716	89,900	117,500	111,600	27,600	–5,900	21,700
Arts, entertainment & recreation	$23,647	39,300	64,000	62,300	24,700	–1,700	23,000
Accommodations & food service	$11,775	292,300	336,400	322,600	44,100	–13,800	30,300
Other services	$24,046	143,600	168,100	174,100	24,500	6,000	30,500

Source: Bureau of Labor Statistics, CES and CEW, http://stats.bls.gov/sae/home.htm, and http://stats.bls.gov/cew/home.htm, as of February 15, 2004.
Compiled by Donald Grimes, University of Michigan.

Michigan added 450,000 jobs (about 11 percent) from 1990 to 2003. Most noticeable is that manufacturing is virtually the only industry that lost jobs (more than 100,000) over this period. Small gains in manufacturing during the expansion years were more than offset by large job losses during the downturn.

The greatest employment gains (about 274,000) came in the knowledge-based industries. There also were substantial gains (about 217,000) in the low-paying, low-education industries. Even in the high-paying, low-education cluster, the nonmanufacturing industries added jobs (about 63,000).

In our last report, Michigan Workers in the Boom Years: Employment and Employment Earnings 1991–2000, we identified, as one of the long term trends driving the Michigan economy, that work is increasingly centered in offices, schools, and hospitals. This trend held true in both the expansion and downturn. Of our three groupings, knowledge-based industries employment was virtually unchanged during the downturn, while the other two suffered widespread job losses.

In 2003, knowledge-based industries employed slightly more than 2 million Michiganians, about 45 percent of all jobs in the state. The flip side of this long-term trend toward concentration of work in offices, schools, and hospitals is that Michigan jobs are increasingly less concentrated in factories. In 2003, manufacturing accounted for less than 17 percent of jobs in the state.

In Table 2, we look at employment by industry over the same period for Michigan compared with the nation. The headline here is that overall employment in Michigan from 1990 to 2003 grew less than two-thirds as fast as it did in the nation. If Michigan's employment growth had been the same as the nation's, there would have been about 290,000 more Michigan workers in 2003.

Perhaps most surprising, Michigan's slower job growth was not caused by the loss of manufacturing jobs. In fact, manufacturing employment in Michigan declined at a significantly slower rate in Michigan than in the nation (–12.4 percent vs. –17.9 percent). If manufacturing employment in Michigan had declined at the same rate as it did in the nation, 45,000 more Michigan manufacturing workers would have lost their jobs by 2003.

Table 2
A Comparison of Job Growth in Michigan and the United States, by Industry Category
1990–2003

	Average Annual Pay 2002		Michigan Employment		U.S. Employment		% Change 1990–2003	
Industry	Michigan	U.S.	1990	2003	1990	2003	Mich.	U.S.
Total all industries	$38,135	$36,764	3,969,700	4,419,500	109,487,100	129,931,500	11.3	18.7
High pay, low education			1,107,700	1,066,800	27,853,700	26,505,700	–3.7	–4.8
Manufacturing	$52,033	$44,097	837,600	733,800	17,695,000	14,524,000	–12.4	–17.9
Mining	$44,398	$60,392	9,700	5,900	680,100	502,300	–39.2	–26.1
Construction	$42,951	$39,027	143,100	199,400	5,263,000	6,722,000	39.3	27.7
Transportation & utilities	$45,815	$40,772	117,300	127,700	4,215,600	4,757,400	8.9	12.9
Middle & high pay, high education			1,732,200	2,006,000	50,193,300	63,229,200	15.8	26.0
Wholesale trade	$51,580	$49,241	159,500	173,900	5,268,400	5,605,700	9.0	6.4
Information	$47,191	$56,103	70,800	74,400	2,688,000	3,198,000	5.1	19.0
Financial activities	$44,305	$55,172	195,400	218,500	6,614,000	7,974,000	11.8	20.6
Prof. & tech. services	$60,524	$58,672	201,000	254,600	4,556,700	6,624,000	26.7	45.4
Management of companies	$77,490	$69,277	59,900	67,200	1,667,400	1,675,400	12.2	0.5
Education	$35,482	$34,058	360,900	442,100	9,320,000	12,653,300	22.5	35.8
Health care & social assistance	$34,856	$34,043	370,500	466,300	9,295,800	13,887,500	25.9	49.4
Gov't. except education	$39,530	$40,887	314,200	309,000	10,783,000	11,611,300	–1.7	7.7
Low pay, low education			1,129,800	1,346,700	31,440,100	40,196,600	19.2	27.9
Natural resources (forestry & fishing)	$25,636	$30,005	1,800	1,800	84,900	68,700	0.0	–19.1
Retail trade	$22,473	$23,232	505,600	530,500	13,182,300	14,912,000	4.9	13.1
Employment services	$27,130	$22,098	57,300	143,800	1,493,700	3,335,700	151.0	123.3
Other admin. support	$28,716	$27,657	89,900	111,600	3,130,600	4,362,700	24.1	39.4
Arts, entertainment & recreation	$23,647	$26,159	39,300	62,300	1,132,000	1,801,100	58.5	59.1
Accommodations & food service	$11,775	$13,946	292,300	322,600	8,155,600	10,324,400	10.4	26.6
Other services	$24,046	$23,784	143,600	174,100	4,261,000	5,392,000	21.2	26.5

Source: Bureau of Labor Statistics. Compiled by Don Grimes, University of Michigan.

The industries where Michigan lagged the nation are in the service sector. This is true both in the knowledge-based industries where employment grew 26 percent nationally compared with about 16 percent in Michigan, and in the low-paying, low-education cluster where employment grew nearly 28 percent nationally compared with just above 19 percent in Michigan.

The trend toward concentration of work in offices, schools, and hospitals is even more pronounced nationally than in Michigan. In 2003, 49 percent of American workers were employed in knowledge-based industries, only 11 percent in manufacturing.

This evidence should allay the widespread concern that most of the new jobs being created in Michigan—and across the country—are in the low-paying, low-education industries. As we have seen, there has been substantial employment growth in knowledge-based industries in Michigan and even more so nationally. To a lesser degree, traditional good-paying industries such as construction, transportation, and utilities continue to add jobs.

II. Drivers of State Prosperity

In this section we explore the relationship between the economic prosperity of states and their concentration in manufacturing and knowledge-based industries.

For the remainder of this report we focus on the four knowledge-based industries with the highest average annual pay nationally: information, financial activities, professional and technical services, and management of companies. These are the private sector industries that many believe are the main growth engines of the post-industrial economy. We call this cluster high-pay knowledge-based industries.

We use per capita income as our measure of economic well-being. We look at both per capita income by state in 2001 and the change in per capita income by state compared with the national average from 1969 to 2001. We include the trend data because we want to know how well states are doing as our economy makes the transition from the Industrial Age to the Information Age. We use 1969 as the base year because it is as far back as available data goes. It is also a reasonable base year for looking at the transition to a post-industrial economy.

(Per capita income is the most comprehensive and reliable estimate of income of state residents. It includes all wage, dividend, self-employment, and interest income as well as transfer payments. It also includes employer and government payments for health care and retirement. It does **not** include capital gains. The data are compiled by the U.S. Department of Commerce, Bureau of Economic Analysis.)

We use share of employment earnings as the measure of industry concentration. We use employment earnings, rather than employment, because we want to account for both the number of workers in an industry and how much they earn. Manufacturing, of course, is considered such a powerful engine of the economy because it both employs lots of workers and pays high wages. Share of employment earnings allows us to best measure the relative importance of an industry to the state's overall economy.

One drawback to the data is that per capita income is based on where a person lives, while employment earnings is based on where a person works. So, particularly in states where large numbers live in the state but work in another, the industry concentration statistics are not as precise as we would like.

We present the data on per capita income and share of earnings in Table 3, grouping the states into four categories:

- Above-average per capita income in 2001, above-average growth 1969–2001
- Above-average per capita income in 2001, below-average growth 1969–2001
- Below-average per capita income in 2001, above-average growth 1969–2001
- Below-average per capita income in 2001, below-average growth 1969–2001

Table 3
Per Capita Income and Share of Earnings by State, 1969–2001

	Per Capita Income		Share of Earnings, 2001 NAICS Basis	
State	Level in 2001	Change 1969–2001 Relative to U.S.	Manufacturing	High-pay knowledge-based industries
United States	**$30,527**	**n.a.**	**13.80%**	**23.32%**
Above-average per capita income in 2001, above-average growth 1969–2001				
District of Columbia	$45,284	31.24%	0.53%	31.55%
Massachusetts	$38,945	18.06%	13.25%	32.27%
Colorado	$34,003	15.51%	9.01%	27.58%
Connecticut	$42,550	13.37%	15.15%	32.24%
Virginia	$32,328	13.25%	9.02%	27.79%
New Hampshire	$33,771	13.23%	18.66%	19.44%
New Jersey	$39,077	10.39%	11.60%	28.55%
Minnesota	$32,722	8.99%	15.82%	24.04%
Maryland	$35,355	6.43%	7.75%	22.23%
Above-average per capita income in 2001, below-average growth 1969–2001				
Washington	$32,271	–0.70%	13.20%	23.76%
New York	$35,626	–2.90%	7.53%	38.66%
Illinois	$32,782	–5.80%	14.50%	26.40%
California	$32,892	–10.32%	13.17%	26.83%
Delaware	$31,494	–11.82%	11.05%	34.48%
Alaska	$31,837	–20.03%	3.78%	12.12%

—continued—

Table 3 (continued)
Per Capita Income and Share of Earnings by State, 1969–2001

State	Per Capita Income		Share of Earnings, 2001 NAICS Basis	
	Level in 2001	Change 1969–2001 Relative to U.S.	Manufacturing	High-pay knowledge-based industries
Below-average per capita income in 2001, above-average growth 1969–2001				
Georgia	$28,555	11.53%	12.19%	23.47%
Tennessee	$26,916	11.32%	18.21%	15.53%
North Carolina	$27,501	10.94%	19.22%	17.31%
Alabama	$24,845	10.27%	17.90%	15.24%
Mississippi	$21,967	9.68%	17.41%	11.53%
South Dakota	$26,876	9.60%	11.16%	14.30%
South Carolina	$25,067	8.78%	19.39%	13.12%
Arkansas	$23,072	7.75%	19.02%	14.50%
Maine	$27,157	7.34%	14.64%	15.86%
Texas	$28,943	7.19%	13.11%	20.03%
Vermont	$28,988	7.11%	18.99%	14.22%
Wyoming	$30,197	5.93%	5.16%	9.82%
Louisiana	$24,517	5.03%	11.58%	14.28%
Kentucky	$24,954	4.76%	19.33%	13.12%
North Dakota	$25,830	4.43%	8.65%	12.90%
West Virginia	$23,068	2.89%	13.43%	11.01%
New Mexico	$23,928	2.52%	6.61%	15.97%
Nebraska	$28,713	0.99%	12.32%	17.89%
Kansas	$28,490	0.78%	17.54%	17.99%
Florida	$29,247	0.55%	6.80%	20.51%
Below-average per capita income in 2001, below-average growth 1969–2001				
Pennsylvania	$30,318	–0.01%	16.68%	21.06%
Oklahoma	$25,447	–0.06%	16.11%	13.70%
Utah	$24,388	–0.74%	12.56%	20.11%
Wisconsin	$29,361	–1.47%	23.99%	15.69%
Missouri	$27,932	–1.49%	14.40%	21.84%
Rhode Island	$30,103	–1.83%	14.86%	20.11%
Oregon	$28,512	–2.12%	16.19%	17.37%
Idaho	$24,947	–2.72%	14.22%	16.21%
Arizona	$26,055	–5.29%	11.70%	18.37%
Indiana	$27,619	–5.62%	26.49%	13.37%
Iowa	$27,357	–5.69%	19.39%	15.19%
Montana	$24,036	–6.74%	6.37%	12.97%
Ohio	$28,627	–8.41%	21.14%	18.29%
Michigan	**$29,499**	**–11.79%**	**23.80%**	**19.80%**
Nevada	$30,347	–18.13%	4.78%	16.42%
Hawaii	$28,690	–24.45%	2.85%	14.18%

Source: Bureau of Economic Analysis. Compiled by Donald Grimes, University of Michigan.
High-pay knowledge-based industries include information, finance and insurance, professional and technical services, corporate headquarters.

Michigan's Performance

We begin with an overview of Michigan's economic performance.

- Its per capita income in 2001 ranked 20th among the states, 2.7 percent below the national average.
- Maybe most alarming, its per capita income from 1969 to 2001 grew nearly 12 percent slower than the national average. Only four states had a worse performance.
- Its share of employment earnings from manufacturing—the third highest in the nation—was 10 percentage points greater than the national average.
- Its share of employment earnings from high-pay knowledge-based industries—21st in the nation—was 3.5 percentage points below the national average
- It is one of fifteen states (including the surrounding states of Ohio, Indiana and Wisconsin) where manufacturing is greater than high-pay knowledge-based industries as a share of employment earnings.
- It is one of sixteen in the grouping of states that are below the national average in both 2001 per capita income and per capita income growth from 1969 to 2001.

As we will see, Michigan's performance is consistent with the patterns that emerge when we explore the data in Table 3.

National Patterns

When we look at the relationship between per capita income and concentrations of employment earnings in both manufacturing and high-pay knowledge-based industries, some clear patterns emerge:

1. Of the twenty-five states with employment earnings shares from manufacturing greater than the national average, twenty-one have 2001 per capita income **below** the nation average.
2. Of the thirteen states with employment earnings share from high-pay knowledge-based industries greater than the national average, twelve have 2001 per capita income **above** the nation average.

3. Of the fifteen states where the share of employment earnings from manufacturing is greater than from high-pay knowledge-based industries, all have 2001 per capita income **below** the national average.
4. Of the fifteen states with per capita income greater than the national average in 2001, **all** had a greater share of employment earnings from high-pay knowledge-based industries than from manufacturing.

There are a few exceptions to these patterns:

- Three of the four states that are exceptions to pattern 1 (Connecticut, Minnesota, and Illinois) are part of pattern 2. They have employment earnings shares above the national average from both manufacturing and high-pay knowledge-based industries. This suggests that what matters most to achieving higher per capita income is a high concentration in high-pay knowledge-based industries.
- New Hampshire is the fourth state with an employment earnings share from manufacturing greater than the national average and 2001 per capita income above the national average. It also has an employment earnings share from high-pay knowledge-based industries below the national average. It seems to be an exception to both pattern 1 and pattern 2. As we noted earlier, per capita income is based upon the state of residence, while employment earnings is based upon the location of the place of work. We believe that New Hampshire's exception to pattern 2 reflects the commuting of high-wage, high-skill service industry workers to jobs in Massachusetts, rather than a lack of residents who work in high-pay knowledge-based industries.
- In addition to New Hampshire, Alaska and Maryland are the other states with 2001 per capita income above the national average and an employment earnings share from high-pay knowledge-based industries below the national average.

  Maryland's status as a high-income state with a high-pay knowledge-based industries concentration below the national average, like New Hampshire's, likely reflects the fact that many of its high-wage residents commute to high-pay knowledge-based jobs in the District of Columbia.

  Alaska, of course, has an economy unique from the rest of the nation in that it is so dependent on natural-resource-based industries. (It too may be paying a price for having such a low share of employment earnings shares from high-pay knowledge-

based industries: its per capita income compared with the nation fell more than any other state from 1969 to 2001.)

- Georgia is the only state with 2001 per capita income below the national average and with employment earnings shares from high-pay knowledge-based industries greater than the national average—but it is just .15 percentage points above.

Taken together, these patterns strongly suggest that being concentrated in high-pay knowledge-based industries, rather than manufacturing, is now the most reliable pathway to prosperity for states.

III. Comparing Michigan with the More Successful States

In this section we compare Michigan with the eight states and the District of Columbia that have 2001 per capita income and per capita income growth from 1969 to 2001 above the national average.

In Table 4, we repeat the data from Table 3 for these eight states and the District of Columbia, and add a column showing the proportion of 25- to 34-year-olds with a bachelor's degree or more. We wanted to see if there is any evidence that a concentration of people in that category is associated with prosperity.

Governor Granholm has established preparing, retaining, and attracting young knowledge workers as a state economic development priority. She is not alone in this; a number of communities across the country have begun programs to attract college-educated young adults.

There is a growing belief that where young professionals choose to locate helps drive the economy, for two reasons: (1) high-pay knowledge-based industries are more likely to locate in communities with lots of knowledge workers; and (2) young professionals are starters of new businesses.

In Table 5, we present the same data for the dominant metropolitan area in each of the more successful states, as well as for the Grand Rapids and Detroit regions. The list includes:

- the New York City region as the dominant region for Connecticut and New Jersey as well as for the state of New York
- the Washington, D.C., region for the District of Columbia, Maryland, and Virginia
- the Boston region for Massachusetts and New Hampshire

We use the new 2004 definitions of the regions. The Detroit-Warren-Flint CSA includes Genesee, Lapeer, Livingston, Macomb, Monroe, Oakland, St. Clair, Washtenaw, and Wayne Counties. The Grand Rapids-Wyoming-Holland CSA includes Allegan, Barry, Ionia, Kent, Muskegon, Newaygo, and Ottawa Counties.

Table 4
States with Above-Average Per Capita Income in 2001
and Above-Average Growth in Per Capita Income in 1969–2001

	Per Capita Income		Share of Earnings, 2001 NAICS Basis		Share of population 25–34 with bachelor's degree or more in 2000
	Level in 2001	Change 1969–2001 relative to U.S.	Manufacturing	High-pay knowledge-based industries	
United States	**$30,527**	**n.a.**	**13.80%**	**23.32%**	**27.5%**
Michigan	**$29,499**	**–11.79%**	**23.80%**	**19.80%**	**26.0%**
District of Columbia	$45,284	31.24%	0.53%	31.55%	50.6%
Massachusetts	$38,945	18.06%	13.25%	32.27%	41.4%
Colorado	$34,003	15.51%	9.01%	27.58%	34.8%
Connecticut	$42,550	13.37%	15.15%	32.24%	35.3%
Virginia	$32,328	13.25%	9.02%	27.79%	33.1%
New Hampshire	$33,771	13.23%	18.66%	19.44%	33.3%
New Jersey	$39,077	10.39%	11.60%	28.55%	34.7%
Minnesota	$32,722	8.99%	15.82%	24.04%	34.5%
Maryland	$35,355	6.43%	7.75%	22.23%	34.2%

Source: Bureau of Economic Analysis for earnings and income data; the 2000 Census for educational attainment.

Table 5
Per Capita Income and Share of Activity in Manufacturing and Selected Services,
Consolidated Statistical Areas

	Per Capita Income		Share of Earnings, 2001 NAICS Basis		Share of population 25–34 with bachelor's degree or more in 2000
	Level in 2001	Change 1969–2001 relative to U.S.	Manufacturing	High-pay knowledge-based industries	
United States	**$30,527**	**n.a.**	**13.80%**	**23.32%**	**27.5%**
Detroit-Warren-Flint	**$33,151**	**-9.52%**	**18.53%**	**23.72%**	**28.8%**
Grand Rapids-Wyoming-Holland	**$27,372**	**-7.70%**	**31.53%**	**13.45%**	**27.2%**
Boston-Worcester-Manchester	$40,457	20.90%	13.50%	33.52%	43.2%
Denver-Aurora-Boulder	$38,859	20.54%	8.11%	33.05%	38.1%
Minneapolis-St. Paul-St. Cloud	$36,355	7.88%	15.12%	27.81%	39.9%
New York-Newark-Bridgeport	$40,840	5.92%	7.37%	39.96%	36.4%
Washington-Baltimore-Northern Va.	$39,298	13.64%	4.38%	30.12%	40.9%

Source: Bureau of Economic Analysis and 2000 Census. The share of the population with a bachelor's degree or more is based on the 1990s metro area definitions, whereas the other data is based on the 2004 area definitions.

The state data in Table 4 clearly shows the differences between Michigan and the more successful states. On the prosperity side, Michigan's per capita income is significantly lower. Perhaps most worrisome is the difference in per capita income growth rates compared with the nation. Michigan's employment earnings mix is also quite different: more in manufacturing, less in high-pay knowledge-based industries.

The data on the proportion of 25- to 34-year-olds with a bachelor's degree or more show another dramatic contrast between Michigan and the more successful states. Michigan is below the national average; all the more successful states are substantially above. The gap between Michigan's and the other states ranges from more than 7 percentage points below Virginia to more than 15 percentage points below Massachusetts.

When we look at the data by region in Table 5, we see the evidence, in the data for the Boston and Washington regions, showing why it is likely that citizens of both New Hampshire and Maryland may earn more from high-pay knowledge-based industries than is accounted for in Table 3.

The regional data in Table 5 also demonstrate, even more clearly, the patterns we have identified. High concentrations in high-pay knowledge-based industries and a higher proportion of 25- to 34-year-olds with a bachelor's degree or more are associated with the high and rapidly growing per capita income of the dominant regions of the more successful states. These regions are also characterized by small concentrations in manufacturing. These are post-industrial economies.

By contrast, Michigan's two largest regions have substantially lower per capita income with far slower growth rates. Consistent with the patterns we have identified in this report, they are more concentrated in manufacturing, less concentrated in high-pay knowledge-based industries, and lower in the proportion of 25- to 34-year-olds with a bachelor's degree or more.

The contrast is particularly stark in the Grand Rapids metropolitan area. Of all the regions we look at, its economy is the most industrial and the least post-industrial. Its share of employment earnings from manufacturing ranges from 13 percentage points greater than even the Detroit region to nearly 27 percentage points greater than the Washington region. On the flip side, its share of employment earnings from high-pay

knowledge-based industries ranges from 10 percentage points less than metro Detroit to 26 percentage points less than metropolitan New York.

Consistent with the patterns we have identified, the Grand Rapids region's high concentration of manufacturing and low concentration of high-pay knowledge-based industries is associated with lower per capita income. The region's per capita income ranges from nearly $6,000 less than the Detroit region to more than $13,000 less than metro New York.

The regional data from Table 5 offer the strongest evidence that being concentrated in high-pay knowledge-based industries, rather than manufacturing, is now the most reliable pathway to prosperity.

IV. Conclusion

The evidence presented in this report strongly suggests that knowledge-based industries are playing the same role in a post-industrial economy as manufacturing did in the industrial economy. Knowledge-based industries are now the major source of employment growth, particularly of good-paying jobs. And they are the most powerful engine fueling overall economic growth.

Fears that the decline of manufacturing employment will lead to a substantial decline of middle-class jobs or an overall slowdown of the economy appear to be exaggerated, if not unwarranted.

The evidence also suggests that Michigan's sub-par longer-term economic performance is due, in large part, to the slower growth of its knowledge-based industries compared with the nation. During the last economic cycle, Michigan lost manufacturing jobs at a slower rate than the nation, and it remains one of the leading states in share of employment earnings from manufacturing.

This paper is not designed to provide policy recommendations, but we do think it raises some questions that should be considered by both the public and policy makers:

1. Can Michigan, in any substantial way, affect the long-term trend of the loss of manufacturing employment? The forces of trade and technology that are driving the decline of American manufacturing are quite powerful. It is hard to imagine any lever available to state policy makers that can counterbalance these forces.

2. Should Michigan make the preservation of manufacturing jobs its economic priority? One thing that Michigan policy makers—in both political parties—seem to agree on is that saving manufacturing jobs is the state's top economic priority. The evidence in this report suggests that this may not be the best use of state resources. If the state is going to target industries to provide special supports, the evidence in this report suggests that manufacturing may not be the best choice.

3. How can Michigan both attract and grow knowledge-based industries and prepare, retain, and attract young professionals? The evidence in this report strongly suggests that knowledge-based industries and young professionals will be the most important drivers of future economic growth. Communities with high concentrations of both are quite likely to be more prosperous. It seems that the best use of policy makers' time and attention with respect to the economy might come from developing a new agenda on how best to grow a knowledge-based economy in Michigan.