

# Measuring the Global Competitiveness of Michigan's Workforce



Michigan Department of  
Labor & Economic Growth  
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# “Measuring the Global Competitiveness of Michigan’s Workforce”

*A report to the Michigan Council for Labor & Economic Growth,  
Global Competitiveness Committee*

by:

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## Introduction

Michigan's economic vitality depends in large part on its ability to provide employers with skilled workers. Global markets push industries and firms to ever increasing productivity levels and lead entrepreneurs to capitalize on previously unimagined opportunities. Just as competition applies constant pressure on firms to improve and innovate, workforce skill and knowledge requirements must evolve to keep pace with employer demand. In 2007, Michigan's Council for Labor & Economic Growth (CLEG) established a committee to examine the global competitiveness of the state's workforce and recommend strategies for improvement.

The committee enlisted DLEG's Bureau of Labor Market Information & Strategic Initiatives to assess the competitiveness of Michigan's workforce. With guidance from the committee, the research team reviewed reports and analyses from around the world, looking for the most insightful and relevant models. The team identified potential measures in three categories: human capital, the knowledge economy, and education and skills. CLEG membership provided input to help prioritize the measures selected for analysis. To facilitate benchmarking, selection of data sources was limited to those providing annual data comparable across states. This limitation required the team to adopt definitions from published data sources for purposes of analysis. Where possible, analysis also compared the United States to global leaders. Key findings on these measures are highlighted below.

### Key Findings

#### ***Overall Economic Performance: GDP and Human Capital***

Gross domestic product is a useful gauge of the overall vitality of an economy. Michigan was one of only three states to witness a drop in inflation-adjusted gross domestic product in 2007, posting just over a one percent decline. Michigan was one of 11 states to have a decline in real per capita GDP in 2007, off by nearly one percent from the previous year. While slowdowns in manufacturing output have contributed to Michigan's overall sluggish growth, the U.S. remains the world leader in manufacturing.

With a slowing economy and rising cutbacks in the manufacturing industry, Michigan's dependence on production leaves many of its low skilled workers susceptible to job loss. At the same time, relatively high rates of out-migration by the state's young, highly educated cohort combined with low rates of in-migration by the same group, result in slow population growth and a loss to the potential high skilled workforce of tomorrow.

Michigan's talent pool is a critical factor in the health of the state's economy, now and into the future. Michigan's young, well-educated population (as a percent of the total age group) lags both the national average, and our Great Lakes neighbors. However, Michigan's 25-34 year olds as a group are better educated than the 55-64 age group on the brink of retirement. Foreign-born residents, another potential boost to the cadre of knowledge workers, represent just six percent of Michigan residents, compared to seven percent in the Great Lakes region overall, and nearly 13 percent nationally.

#### ***The Knowledge Economy***

Michigan has significant assets at its disposal to make our state a leader in innovation, with a foundation of universities and a business base that is grounded in emerging high-tech and knowledge industries. Despite its strong infrastructure, Michigan is experiencing slow growth in knowledge industries.

Michigan lags the U.S. in knowledge industries as a percent of total employment, although the state's ratio has improved over recent years because knowledge industry employment has been more stable than total employment in Michigan. Another important measure is the state's employment in industries considered high tech. Since 2004 Michigan has lagged the U.S. in high tech industries as a percent of total employment.

Colleges, universities, and other research institutions are a defining resource in a knowledge economy; Michigan reaps great benefit from a rich flow and exchange of knowledge and ideas between these institutions and the communities in which they reside. Although anecdotal evidence abounds of the

myriad ways Michigan institutions share knowledge, efforts to quantify and compare this knowledge transfer are, to date, very limited in scope or in early stages of development.

Teacher professional development presumably translates into better student performance, although the specific nature of the relationship is not widely understood. Michigan has benefited from strong performance among 8<sup>th</sup> grade math teachers, who have greater professional development participation rates than their Great Lakes and national counterparts. Michigan's 4<sup>th</sup> grade math and science teachers participate in professional development activities at or above the national average rate.

### ***Education and Skills***

The new knowledge economy demands a workforce that is both highly educated and highly skilled. The state's ability to transform the workforce at all educational levels, from pre-kindergarten through university, is the most significant leverage that policy makers have in moving Michigan forward. But Michigan ranks in the middle of the pack or worse in a number of education-related measures.

Participation of four-year-olds in education helps ensure children enter school ready to learn. Michigan ranked 16<sup>th</sup> of 38 states in terms of the percent of its four year olds enrolled in state-funded pre-kindergarten programs.

High school graduation is a vital foundation for the post-secondary education and training required for success in today's labor market. Boosting the state's graduation rate not only increases the pool of workers attaining this necessary credential, but also expands the population that is prepared to move on to higher education and training. Michigan's graduation rate stands at 73 percent, ranking 38<sup>th</sup> in the U.S. and near the bottom of the Great Lakes states.

In educational attainment Michigan performs slightly above the national average in the adult population with a high school diploma or equivalent. This would seem to indicate that although a higher percentage of Michigan students do not complete high school in four years, many of these students eventually complete the equivalent of a high school education. Michigan falls behind the U.S. average in students graduating with bachelor's and post-graduate degrees.

## State-Level Gross Domestic Product

A study of the nature of Michigan’s workforce in the context of the global economy must first be grounded in a brief analysis of the state’s economic performance at large. A growth rate and per capita analysis of Michigan’s Gross Domestic Product (GDP), compared to both U.S. and international benchmarks, will help to situate the state’s underachieving economy in terms of the international marketplace.

The definition for Gross Domestic Product is well established and universal. The Bureau of Economic Analysis (BEA) explains that GDP by state is a measure of a state’s output; it estimates “the value added in production by labor and capital located in the state.”

### Domestic<sup>1</sup>

- For the 2007 calendar year, Michigan witnessed a 1.15 percent decline in real GDP, the second worst in the nation after Delaware.
- For the years 2003-2007, Michigan has twice finished last in the nation for GDP growth (47<sup>th</sup> in 2003, 51<sup>st</sup> in 2004, 48<sup>th</sup> in 2005, 51<sup>st</sup> in 2006, 50<sup>th</sup> in 2007).
- Michigan’s rate of growth last outpaced that of the U.S. in 2002, when the state recovered from widespread declines the previous year to post a 3.1 percent growth rate.

Figure 1

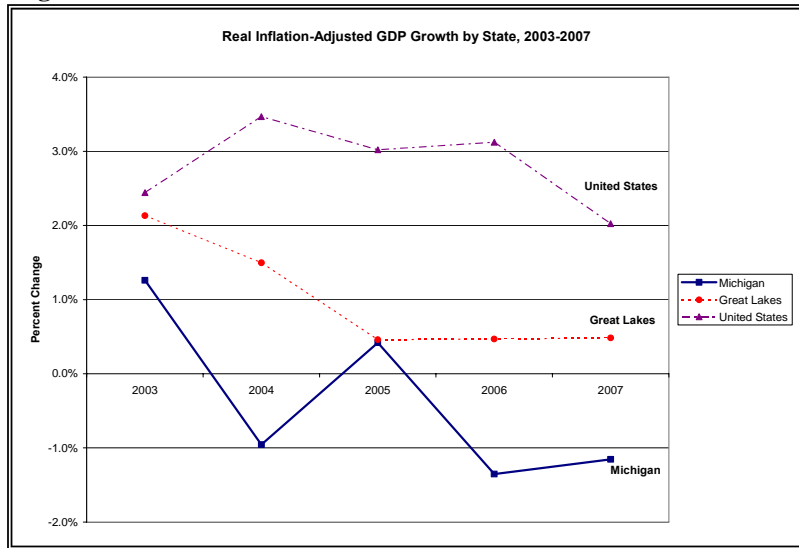


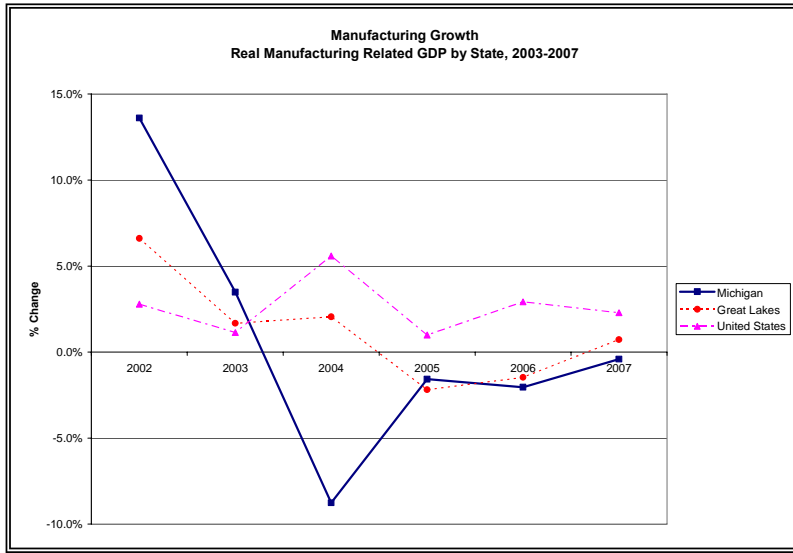
Figure 2

	Per capita real GDP (dollars)	Percent of U.S. Average	Ranking		Per capita real GDP (dollars)	Percent of U.S. Average	Ranking
<b>United States</b>	<b>38,020</b>	<b>100%</b>	<b>--</b>	<b>Michigan</b>	<b>32,846</b>	<b>86%</b>	<b>38</b>
Dist. Of Columbia	126,421	333%	1	Oklahoma	28,894	76%	47
Delaware	56,496	149%	2	Montana	28,201	74%	48
Connecticut	51,911	137%	3	Arkansas	27,781	73%	49
New York	49,038	129%	4	West Virginia	24,929	66%	50
Massachusetts	47,351	125%	5	Mississippi	24,477	64%	51

- The absolute size of an economy (as described by real GDP) does not speak to the standard of living for the participants of that economy. Per capita real GDP, however, helps describe the level of personal prosperity within an economy, as well as the individual level impact of economic growth. The table above depicts the top and bottom five states with regard to per capita real GDP, with Michigan ranked 37<sup>th</sup>.
- In terms of real per capita GDP, Michigan was down nearly one percent, from \$33,129 in 2006 to \$32,864 in 2007. While Michigan was the only state to experience a decline in 2006, it shared that distinction with 11 other states in 2007.
- On a per capita basis, Michigan’s nationwide standing has slid steadily since the start of the 21<sup>st</sup> century (ranked 23<sup>rd</sup> in per capita GDP in 2003, 30<sup>th</sup> in 2004, 32<sup>nd</sup> in 2005, 35<sup>th</sup> in 2006, and 37<sup>th</sup> in 2007).
- The Great Lakes states have not beaten the per capita national average since 1999, indicative of a region-wide economic slowdown. Michigan moved ahead of Indiana in 2007 to rank 4<sup>th</sup> among the five Great Lakes states.

<sup>1</sup> Bureau of Economic Analysis (BEA) – Regional Economic Accounts

Figure 3



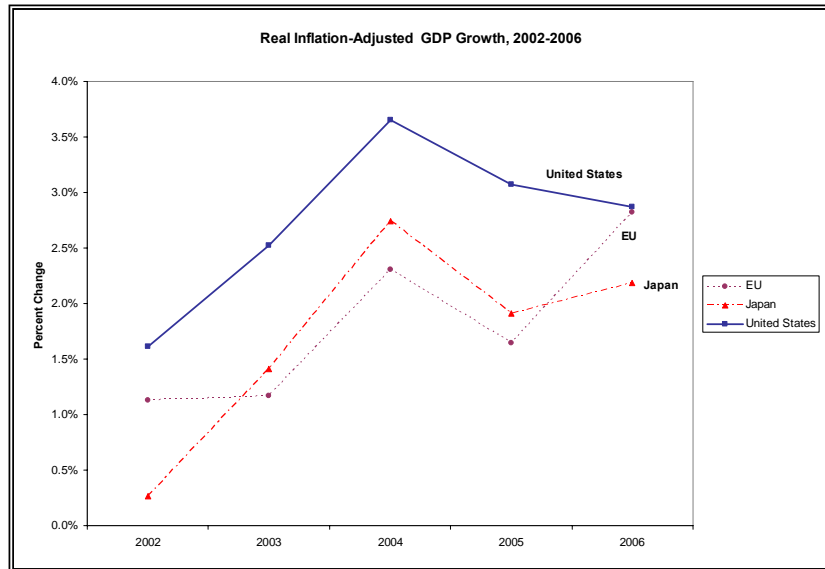
- Of the leaders in manufacturing industry share, the state of Michigan has suffered the greatest slowdown in output.
- Michigan's share of the U.S. manufacturing sector has dropped more than 1.5% since 1998, while California (up 2.8 percent) and Texas (up 2.1 percent) have experienced marked increases.
- Ranked 4<sup>th</sup> in the nation in manufacturing output, Michigan was the only state in the top five to post a decline from 2006 to 2007.

**International<sup>2</sup>**

- The slow growth that has plagued the state of Michigan and the Great Lake states is not representative of the United States picture as a whole. While regional manufacturing facilities have been beset by shutdowns, Global Insight, Inc. suggests that the United States has remained the world leader in manufacturing output, besting China by nearly \$1.7 trillion in 2005.<sup>3</sup>

Figure 4

- For comparably sized nations or economies, the U.S. is not only the largest but also the fastest growing.
- In fact, the United States economy is more than double the size of any nation in the world.
- The United States has ranked 4<sup>th</sup> worldwide in per capita GDP each of the past five years. This is a poignant feat given that the U.S. population is more than twice that of Japan, the second largest developed nation in the world.



- Ireland, a member of the European Union (EU) and often in the news for consistently being one of the fastest movers in the world, is growing at more than 5 percent/year, but its economy is 1.2 percent the size of the U.S.

<sup>2</sup> Organisation for Economic Co-operation and Development (OECD)

<sup>3</sup> Global Insight data as used by the Council On Competitiveness - Competitiveness Index: Where America Stands

## Young Knowledge Workers

As the state of Michigan looks to adapt to a changing economy and marketplace, it is necessary to ascertain whether the future talent of the state's labor supply will be adequate for driving future growth. The baby boomers are a highly talented and productive segment of the state's labor supply. Indeed, the age cohort 55-64 still accounts for almost 11 percent of Michigan's population. But while their productivity does not wane, a high percentage of this segment of the workforce is on the verge of retiring en masse, a fact that could leave our economy in peril. Our young workers' ability to fill the role of the retiring workforce is essential for Michigan's resurrection. We will compare the education level of today's young, working-age population against that of the age cohort set to retire, and in so doing will determine if today's Michigan holds the pool of young talent required for the growth of tomorrow. Our study of young knowledge workers will look to population data for the populace aged 25 to 34 who have obtained at least a bachelor's degree.<sup>4</sup>

### Findings<sup>5</sup>

- Michigan's crop of young knowledge workers, on a percentage basis, lags both their Great Lakes and United States counterparts.

- From 2002-2007, on average 28.0 percent of Michigan's population aged 25 to 34 held a bachelor's degree or better, compared to 28.8 regionally and 30.3 percent nationally.

- The percentage of the national and regional populations age 55-64 with bachelor's degrees is also higher than that in Michigan.

- On average from 2002-2007, 23.4 percent of Michigan's population aged 55 to 64 held a bachelor's degree or better, compared to 24.1 percent in the region and 28.7 percent in the U.S.

- While there are proportionally fewer young knowledge workers in the state of Michigan than there are in the Great Lakes or U.S., the state of Michigan boasts the greatest difference between the young knowledge cohort and their older counterparts.

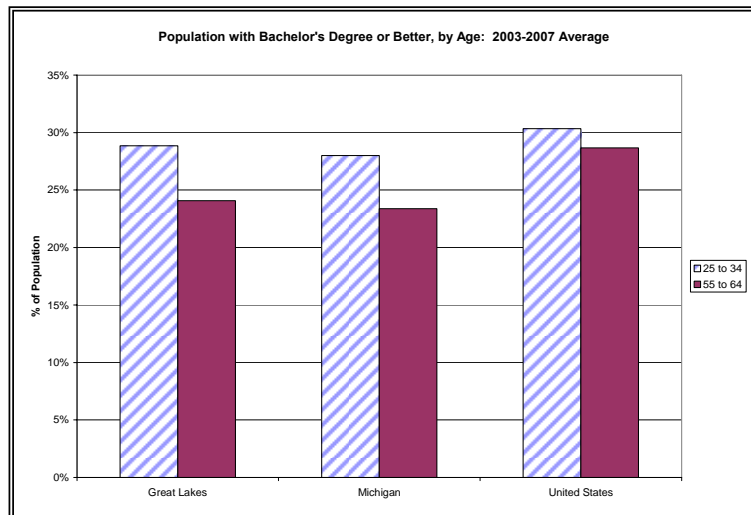
- In absolute terms, for the years 2002-2007 Michigan had approximately 356,000 young knowledge citizens, and a population of 237,000 highly educated, 55 to 64 year olds on the brink of retirement.

- Of the Great Lakes states, Illinois had the largest proportion of degree holding 25- to 34-year-olds, and the second largest disparity between the two age cohorts with a difference of 6.4 percent between the older and younger highly educated populations.

- As a proportion of the age cohort, Michigan's young knowledge population ranked 4<sup>th</sup> among the five regional states, surpassing only Indiana.

- There is evidence to suggest that Michigan's young knowledge workers will be prepared to take on the responsibilities of the next wave of retirees. The quantity of highly skilled workers that will truly be required for a growing economy, however, cannot be determined from this analysis. In order to realize new and sustainable growth, Michigan must ensure that it retains its current crop of highly skilled workers, and continue to raise a new and even better-educated workforce poised to regain the vitality that our state and economy once knew.

Figure 17



<sup>4</sup> Our analysis adopts a population level data set in lieu of less robust records pertaining only to the workforce (employed, self-employed or unemployed members of society). There is a tradeoff inherent to this decision: In the case of the young age cohort, we capture both workers who have obtained degrees as well as degree earners who have yet to join the workforce but who have considerable future potential. In the case of the older contingent, our data may capture degree earning retirees who are no longer a part of the labor force.

<sup>5</sup>U.S. Census Bureau – Current Population Survey



## Diversity of the Population

A demographic analysis of Michigan’s population will help to offer a certain level of understanding of the cultural diversity in Michigan’s populace, while potentially underscoring the theory that a highly diverse citizenry, with the range of thought and intellectual pursuit that stem from the people, may help spur the state’s revitalization.

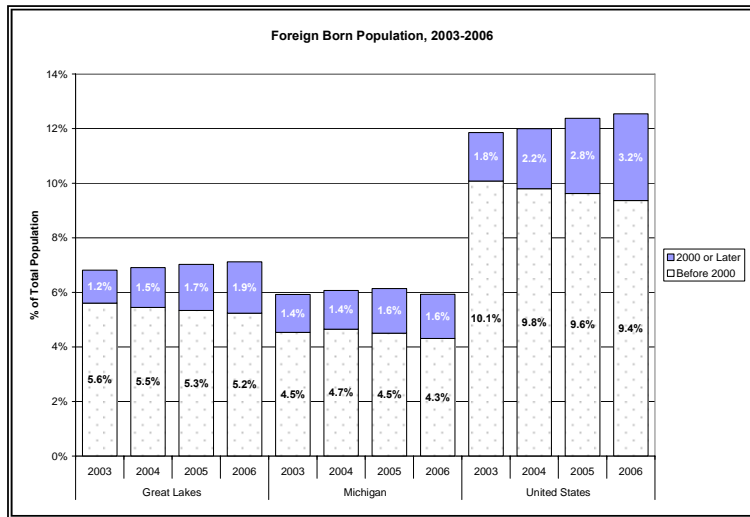
Previous analysis by Michigan Future, Inc. has suggested that a highly diverse population and workforce are conducive to a number of characteristics that may drive economic growth.<sup>6</sup> While their work focuses solely on the nature of the central city, in general it suggests that social diversity leads to a vibrancy of thought, a commitment to quality public service, and a need for local development.

### Findings<sup>7</sup>

#### Population Origins

- The state of Michigan ranks 27<sup>th</sup> in terms of the fraction of foreign-born residents that make up the population (2006).
  - Foreign-born residents account for 12.6 percent of the total U.S. population, but only 7.1 percent of Great Lakes states and 6.1 percent of Michigan’s population.
  - The foreign-born share of the nation’s population is on the rise: from 11.9 percent in 2003 to 12.6 percent in 2006. At the same time, Michigan’s share has remained almost unchanged.
  - California (27.2%), New York (21.6%), and New Jersey (20.1%), have the highest proportion of foreign-born residents.
- The U.S. population in 2006 increased by more than 6/10<sup>th</sup> of a percent due to an influx of foreign-born residents alone. Michigan has not experienced such foreign-based growth.

Figure 18



#### Demographics

- In 2006, Michigan’s population had the following racial composition:
  - 79.5 percent White alone (27<sup>th</sup> in the nation)
  - 14.1 percent Black or African American alone (16<sup>th</sup>)
  - 2.3 percent Asian alone (23<sup>rd</sup>)
  - 0.5 percent American Indian or Alaska Native alone (21<sup>st</sup>)
  - 3.6 percent other or more than one race (34<sup>th</sup>)
- Independent of race, 3.9 percent of Michigan’s population in 2006 identified with the terms “Hispanic” or “Latino”, compared to 14.8 percent nationwide. While Michigan’s overall Hispanic and/or Latino population ranked 18<sup>th</sup> in the country by size, the group ranks 35<sup>th</sup> in the nation by proportion of the total state population.

<sup>6</sup> Michigan Future Inc., Lou Glazer- Revitalizing Michigan’s Central Cities: A Vision and Framework for Action

<sup>7</sup> U.S. Census Bureau – American Community Survey

**Diversity in Michigan's Central Cities**

- Previous work by Lou Glazer shows a number of characteristics that are nearly universal to Michigan's center cities (Detroit, Flint, Grand Rapids, Lansing):
  - Population decrease of more than 6 percent from 1990 to 2000, except in Grand Rapids where there was a 4.6 percent increase.
  - The greatest decreases came from the non-Hispanic white population.
  - Detroit held the lowest percentage of non-Hispanic white residents, with just 12 percent of the city's population. None of Michigan's other central cities had fewer than 40 percent non-Hispanic white residents.
  - Flint was the hardest hit by the population decline from 1990 to 2000 and the only city to lose foreign born population.

## Percent of Workforce in At-Risk/Low-Skill Occupations

The technological advances of today and the future, and their inherent ability to increase productivity with a downsized staff, will place particular stress upon those occupations requiring only limited skill sets. In our analysis of at-risk occupations, we will analyze occupational forecast data to determine which occupations are expected to decline over the forecast period, and will compare the proportion of the workforce committed to those jobs across multiple geographies. We will then look at the skills and experience of these at-risk workers who are expected to suffer job loss. If the workforce predicted to be displaced in Michigan is less skilled than its national counterparts, they will likely be less likely to adapt to an ever-advancing economy. Such immobility will constrict the labor supply available to fuel Michigan's economic growth.

### Findings<sup>8</sup>

Figure 19

- The Michigan economy is forecasted to have an 8 percent increase in its overall workforce for the years 2004 to 2014. The U.S. is projected to have a 13 percent increase.
- In 2004, 14.6 percent of Michigan's workforce was in at-risk (or declining) jobs. By 2014, 54,500 of those 688,000 workers are expected to lose their jobs.
  - Declining jobs in the U.S. account for just 10.4 percent of the base year occupation estimate, while the Great Lakes States carry nearly 17 percent of their workforce in at-risk occupations.
  - Ohio has a regional worst 21.8 percent of its workforce in at-risk occupations. Michigan has the second lowest proportion in the Great Lakes behind Wisconsin (12.6 percent).

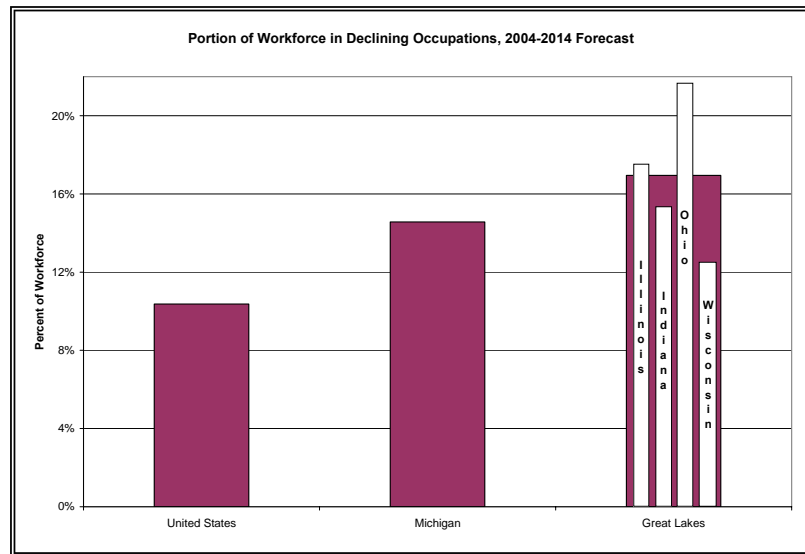
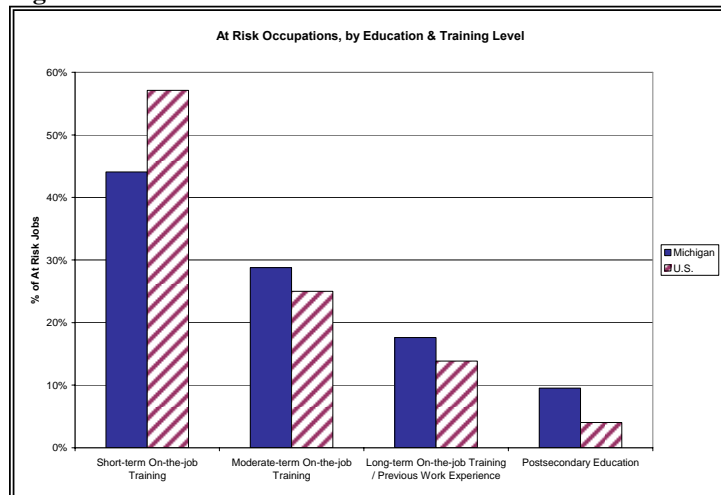


Figure 20



skilled workers.

### Skills<sup>9</sup>

- Michigan is expected to have declines in 152 occupations from 2006 to 2016. Forty-three of those occupations require just short-term on-the-job training, leaving nearly 418,000 Michigan workers low-skilled and at risk. More than 30,000 of those low skilled positions are expected to be lost by 2016.
- At the national level, positions requiring short-term training are even more susceptible: 954,000 jobs are expected to be lost among a population of 12.2 million low-

<sup>8</sup>Bureau of Labor Statistics (BLS) – Office of Occupational Statistics and Employment Projections

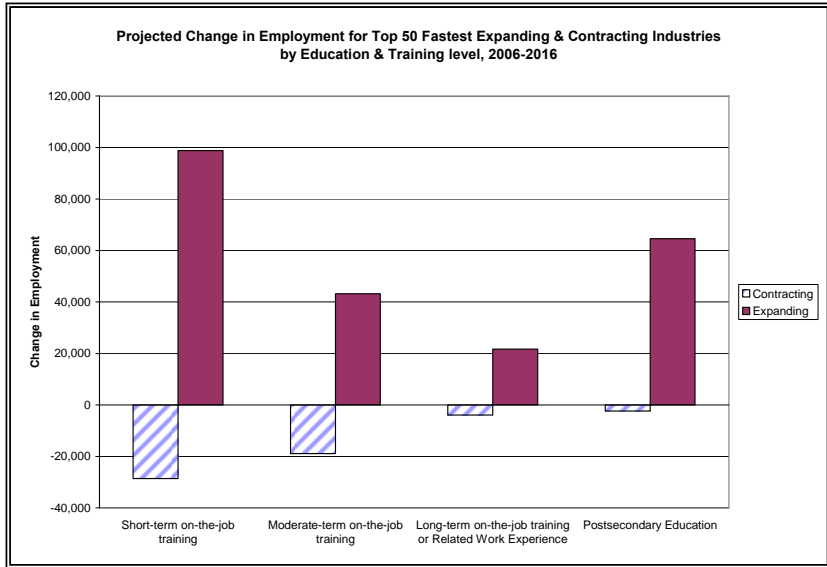
<sup>9</sup>BLS – Postsecondary Education or Training Category Report

- Even more highly educated workers are not immune to job loss. Nearly 10% of Michigan’s workforce are in at risk occupations that require postsecondary education. These workers, more than 90,000 in total, are expected to lose 3,100 jobs by 2016, representing a 3.5 percent contraction.

**Opportunities for Dislocated Workers**

- Of the 50 occupations expected to witness the greatest contraction by 2016, only 4.5 percent of the estimated 54,000 dislocated workers are currently employed in fields requiring a postsecondary degree.
- Only three of the 50 most at-risk occupations require postsecondary education of any sort, accounting for 69,800 jobs in 2006. The rest rely entirely on occupational training (722,060 jobs as of 2006).

**Figure 21**



- In contrast, the 50 jobs anticipated to have the highest growth from 2006 to 2016 will largely be in positions that require a postsecondary education: These jobs account for more than a quarter of the projected 228,000 worker expansion.
  - Of those jobs requiring postsecondary education, more than half (54 percent) will require at least a bachelor’s degree. The remainder will require a vocational award or associate’s degree.
- Should the forecast predications be realized, there will be a most certain disparity between the skills and experiences of Michigan’s at-risk employees and those required be the opportunities offered them in high growth areas. The production workers, stock clerks and assembly line workers of today will have to compete for jobs in the service industry and work retail floors, customer service lines and restaurant tables.

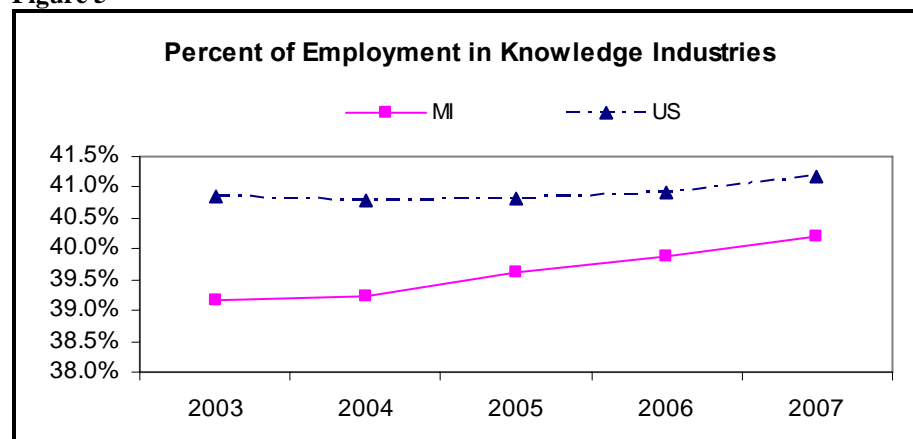
## Knowledge and High-Tech Industries

Global forces are producing fundamental change in the Michigan economy. Manufacturing activity, historically the engine of growth, has been in decline. Many experts believe the road to future growth lies in strategies to take advantage of industries requiring a higher level of knowledge and skill. To gauge Michigan's position in this new economy it will be useful to know how much of the state's workforce is already employed in knowledge and high-technology fields.

### Definitions

- The definitions of knowledge and high-tech are two different sides of the same picture.
  - The knowledge industries definition is education based. If more than 30 percent of employees in an industry have a bachelor's degree or higher (which is 110 percent of the national average) that industry is considered a knowledge industry.<sup>10</sup>
  - The definition of high-tech industries is occupation-based. If more than twice the 4.9 percent national average are employed in technology-oriented occupations, that industry is considered high-tech.<sup>11</sup>
- The definitions vary greatly in the extent to which each is manufacturing-based. In 2003 manufacturing accounted for just 2 percent of total employment in the knowledge industries, whereas 22 percent of total employment in the high-tech industries was in manufacturing.<sup>12</sup>

Figure 5



### Knowledge Industry Findings<sup>13</sup>

- Michigan's employment in knowledge industries is consistently lower than the U.S. average. Since 2003, this gap has been shrinking. This is not because Michigan is gaining more knowledge jobs than the U.S., but because Michigan is losing jobs more rapidly outside of the knowledge industries.
- For the 2003-2007 period Michigan had mixed year-to-year performance but for the period as a whole, we had a slight decrease in the total number of knowledge jobs (0.74 percent or 12,600 jobs). Knowledge jobs in the U.S. grew every year during this period, rising by a total of 7 percent.
- For context, Michigan's total employment has decreased every year from 2003-2007, falling 3 percent (143,400 jobs). U.S. total employment has risen every year during this period, resulting in overall growth of 6 percent.
- From 2003-2007, Michigan was hit hardest in *management of companies*<sup>14</sup> industries, losing 16 percent (10,600 jobs) while the U.S. gained 11 percent.

<sup>10</sup> **Michigan Future, Inc.** "Michigan's Transition to a Knowledge-Based Economy: First Annual Progress Report." (February 2008)

<sup>11</sup> **Hecker, Daniel.** "High-technology employment: a NAICS-based update." *Monthly Labor Review* (July 2005)

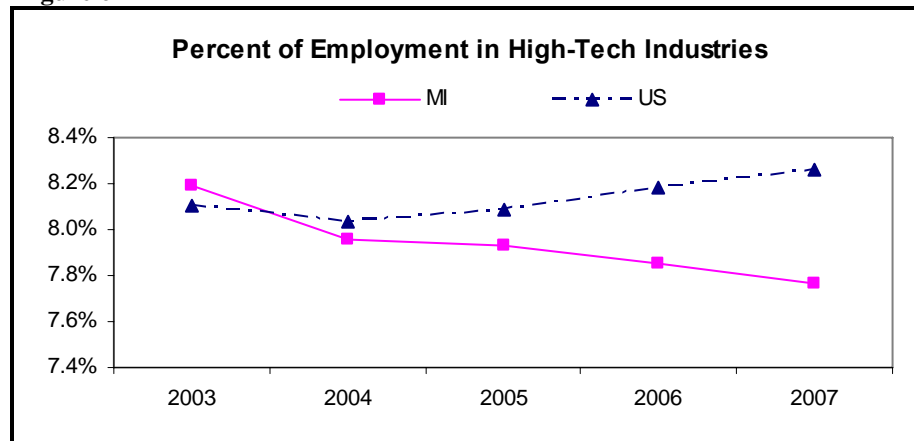
<sup>12</sup> It is important to note that motor vehicle and parts manufacturing is not included under either definition used for this analysis.

<sup>13</sup> **Bureau of Labor Statistics (BLS)**, definition from "Michigan's Transition to a Knowledge-Based Economy: First Annual Progress Report."

<sup>14</sup> Includes: Centralized and Corporate offices, Head offices, Regional offices, holding companies.

- Michigan’s strongest growth in knowledge industries over the period was in the health care and social assistance sector, with gains of nearly 13,500 jobs in offices of physicians and 11,600 in hospitals.

**Figure 6**



**High-Tech Findings<sup>15</sup>**

- The percent of Michigan’s workforce in high-tech industries is now lower than the U.S. average. The gap has grown wider since Michigan experienced a large decrease in high-tech industry employment in 2004. U.S. high-tech employment has been on the rise since 2004, whereas Michigan’s continues to slide.
- Michigan has seen the total number of high-tech jobs shrinking every year from 2003-2007. For the entire period, Michigan lost 8 percent (29,800 jobs). U.S. employment has increased every year since 2003 and is up 8 percent over the period.
- Michigan was hit hardest in the manufacturing areas where it lost 11,500 jobs (15 percent) while the U.S. lost only 4 percent.

<sup>15</sup> Data from **Bureau of Labor Statistics (BLS)** - definition from “High–technology employment: a NAICS-based update”

## Technological Transfer

The state of Michigan enjoys one of the most talented, influential learning banks in the world, with its collection of universities and tertiary schools continually paving new ground in technological and intellectual innovation. Eliminating the disconnect between public institutions and their private counterparts, strengthening the mobility of idea-exchange, and fostering an environment that will be conducive to collaborative research efforts could be the first great steps to revitalizing an otherwise depressed state economy.

Knowledge transfer is generally thought of as the two-way exchange of ideas between a research entity and the broader community. From a practical point of view, however, the data that are available to measure knowledge transfer are somewhat limited. Consequently, we focus largely on licensing activity between private and public universities and their for-profit or intellectual community counterparts. The narrative told by such technological transfer data, however, is only a small piece of that which composes a true understanding of knowledge transfer.

### Findings<sup>16</sup>

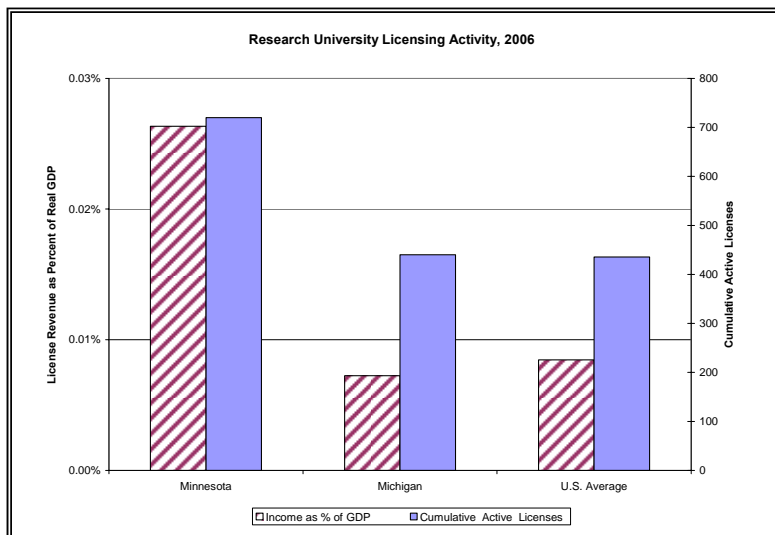
- In 2006, Michigan's universities ranked 12<sup>th</sup> in the nation in license income and 15<sup>th</sup> in the number of active licenses -- active relationships between institutions and for-profit corporations or investment communities.

- These licenses are written proof of a relationship forged between a university research group and an outside organization that will develop or commercialize a given technology. The licensees tend to be companies rather than individuals.

- The data highlighted in the chart depict a combination of newly written licenses and repeat licenses. Repeat licenses are renewals of lapsed agreements and are easily acquired by a university. As such, states with a long history of licensing activity may tend to dominate current and future markets. Michigan ranked 4<sup>th</sup> in the number of licenses and options executed in 2006 alone, but only 15<sup>th</sup> in total active licenses. Michigan universities are gaining ground and stand at the forefront of today's innovation.

- Other interesting facts from Fiscal Year 2006 – Michigan ranked:
  - 7<sup>th</sup> in the number of startups businesses created
  - 4<sup>th</sup> in the number of licenses and options executed
  - 5<sup>th</sup> in the number of patents issued
  - 9<sup>th</sup> in total research expenditures
- In Fiscal Year 2005 Michigan ranked:
  - 10<sup>th</sup> in license income, 14<sup>th</sup> in active licenses, 10<sup>th</sup> in new licenses and options
  - 14<sup>th</sup> in startups generated
  - 7<sup>th</sup> in patents
  - 11<sup>th</sup> in R&D investment
- On the whole, Michigan's foundation of top-tier, research-oriented universities have a positive economic and intellectual impact on the private sector. A relatively high number of resources are invested in innovation, and the people of Michigan appear to reap the benefit.

Figure 7



<sup>16</sup> Association of University Technology Managers (AUTM)

## Teacher Professional Development

By sending out a better prepared, better equipped, and more invested set of educators into the workforce, the classrooms of Michigan may enjoy increased productivity and job commitment, as well as increased pupil performance.

Teacher professional development incorporates maintenance of the general skills required to serve as a proficient educator, with the acquisition of the latest advancements in the field in order to adapt with changing technologies and best practices. For the purposes of our study, we have labeled continued developers as those educators who have participated in a conference or professional association in the two years prior to the survey date. Given the overwhelming agreement in the importance of STEM disciplines (science, technology, engineering, mathematics), we have focused our analysis on the areas of mathematics and science.

### Findings <sup>17</sup>

- As of 2007, mathematics instructors in the state of Michigan appear to out-perform both their regional and nationwide peers for participation in professional development activities. The state's educators ranked 16<sup>th</sup> in the nation for rate of participation.
- Fourth grade educators meet or exceed the nationwide average participation rate for the mathematics and science disciplines (with Vermont and Kentucky serving as the nation's best in the two disciplines, respectively).

Figure 8

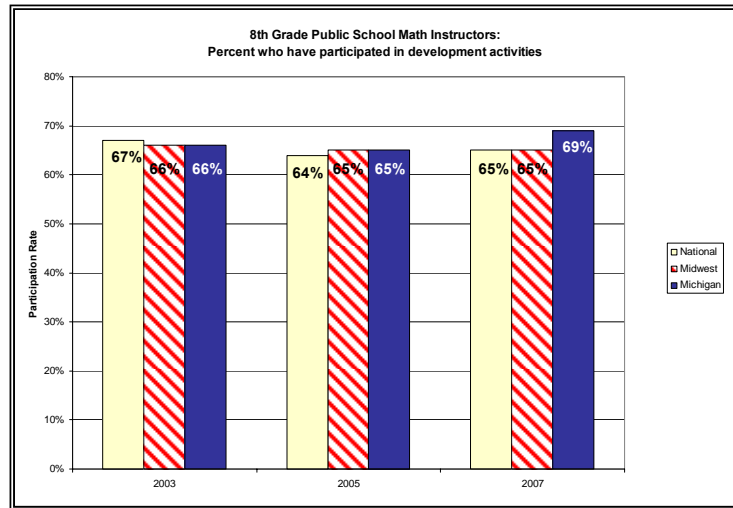
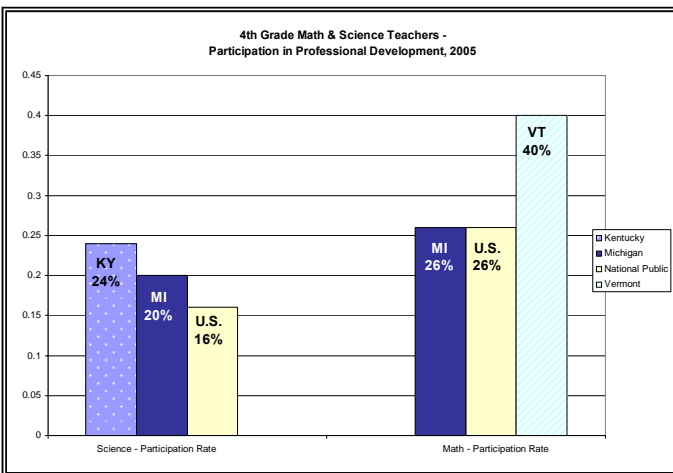


Figure 9



- Michigan and 39 other states have written professional development standards, and Michigan is one of just 15 states to require districts or schools to set aside time for their educators to participate in professional development.<sup>18</sup>
- Michigan is one of only 12 states, however, that does not finance professional development activities for its educators, and one of 14 states that does not provide financial incentives for attainment of National Board Certification (Michigan uses licensure for incentive, as do 49 other states).
- All high school teachers in the state are required to be appropriately certified and hold a degree with major or minor in their subject area.

<sup>17</sup> U.S. Department of Education - National Center for Education Statistics (NCES), National Assessment of Educational Progress (NAEP), 2003, 2005 and 2007 Mathematics Assessments; 2005 Science Assessments.

<sup>18</sup> Education Week – Quality Counts at 10: A Decade of Standards-Based Education (2006).



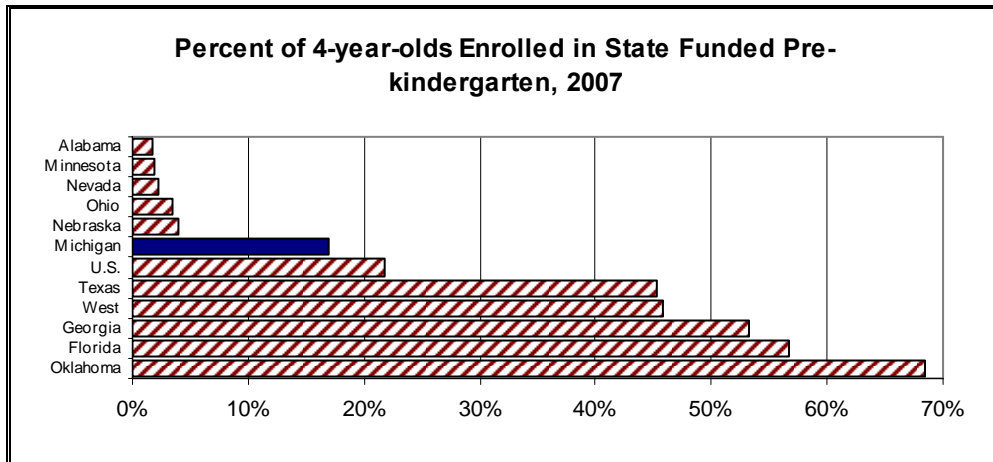
## Participation of Four-Year-Olds in Education

In considering requirements to improve Michigan’s competitiveness in the United States and the world, it is useful to consider strategies to make Michigan competitive both now and in the future. To maximize Michigan’s competitive position, we should have our ‘best and brightest’ active in the workforce. Parents of young children are likely to be more confident leaving the home and entering the workforce if they know their children are in a safe, nurturing environment that fosters their development. Michigan’s ability to offer quality pre-kindergarten could make an important difference in this respect.

To be competitive in the future, Michigan must ensure children enter kindergarten ready to learn. Making better pre-kindergarten education more accessible will presumably help students achieve a higher level of success in kindergarten and throughout their education.

The chart below shows the percentage of four-year-olds enrolled in state-funded pre-kindergarten. It compares Michigan to the five states with the highest percentages and the five states with the lowest percentages (note that 12 states do not provide such programs).

Figure 10



### Findings<sup>19</sup>

- In 2007, with 17 percent of its four-year-olds enrolled in pre-kindergarten, Michigan ranked 16<sup>th</sup> among the states in this category. The U.S. average for states that fund pre-kindergarten programs is 22 percent; Oklahoma ranked 1<sup>st</sup> with 68 percent.
- When federally funded Head Start and Special Education are factored in, Michigan had 38 percent of its four-year-olds enrolled in school, ranking 17<sup>th</sup> in the U.S. Even with this broader measure, Oklahoma ranked #1, at 90 percent.
- Michigan ranks 3<sup>rd</sup> in the Great Lakes states ahead of only Ohio (Indiana has no program).
- Michigan is one of eight states in the U.S. experiencing pre-kindergarten enrollment decreases from 2002-2007. Michigan enrollment rose from 2006-2007, reversing the earlier trend.
- Michigan ranks 14<sup>th</sup> in the U.S. in per pupil spending for state-funded pre-kindergarten. Michigan spends more per student than four of the five states that have the highest percent of four-year-olds enrolled in state-funded programs.
- In 2007, Michigan spent nearly \$500 more per student than the U.S. average. Since 2005, Michigan has reversed a trend of decreasing per-pupil expenditures, with increases in each of the last two years.

<sup>19</sup> National Institute of Early Education Research (NIEER)

## High School Graduation Rate

As the job market becomes more knowledge driven, it is important to know how much of Michigan's potential labor force is receiving the basic level of education needed to graduate from high school. To compete with other states and countries for knowledge-based or high-tech jobs will require a pool of educated workers. One way to increase this pool of educated workers is to increase the graduation rate.

### Definition

- **Average Freshman Graduation Rate** – Average freshman graduation rate (AFGR) is an estimate of the percentage of an entering freshman class graduating in four years. For 2004–05, it equals the total number of diploma recipients in 2004–05 divided by the average membership of the 8th-grade class in 2000–01, the 9th-grade class in 2001–02, and the 10th-grade class in 2002–03.
- Michigan recently introduced a "four-year adjusted cohort graduation rate." This measures only those students who graduate on time and comply with No Child Left Behind guidelines. This calculation also aligns with the National Governors Association's definition which allows results for all states to be compared. The class of 2007 is the first graduating class in Michigan for which the data will be calculated in this way.

### Domestic Findings<sup>20</sup>

- While Michigan's graduation rate returned to its 2002 level of 73 percent, the state's relative rank in 2005 represents a decline to 38<sup>th</sup> in the nation from the 2002 position of 32<sup>nd</sup>. Nebraska led the nation in 2005 with a graduation rate of 88 percent.
- The Midwest and Plains states performed well in 2005, taking five of the top six positions nationally. Nebraska, Wisconsin, Iowa, North Dakota, and Minnesota were in the top six every year from 2002-2005.<sup>21</sup>
- The states near the top of the rankings are more tightly clustered than the ones near the bottom; thus even in 2002 and 2003 when Michigan was ahead of the U.S. average, it still ranked in the bottom half of all states.
- Michigan had the lowest graduation rate of all of the Great Lakes states in 2004 and 2005. Michigan and Indiana both fell below the U.S. average in those years. Wisconsin has led the Great Lakes region in each of the years from 2002-2005.

Figure 12

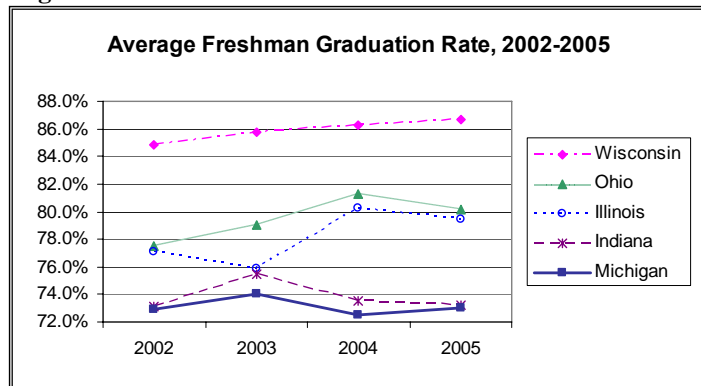
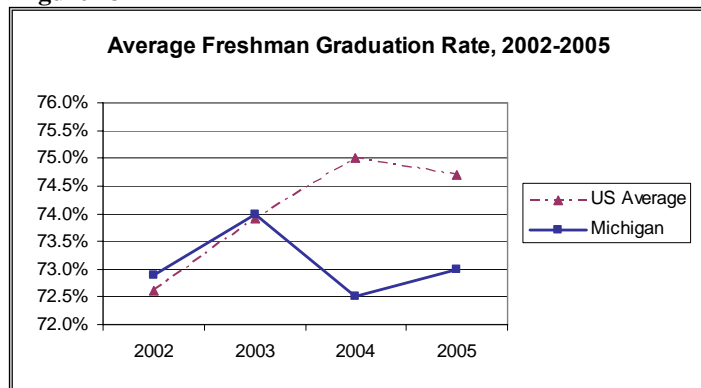


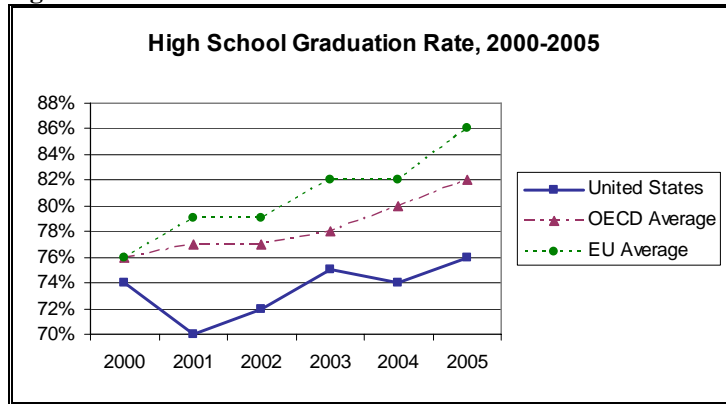
Figure 13



<sup>20</sup> U.S. Department of Education, National Center for Education Statistics (NCES) CCD Data

<sup>21</sup> Wisconsin reported no data in 2004

Figure 14



**International Findings<sup>22</sup>**

- There is a discrepancy in the international and domestic data. This is due to a difference in calculations between the OECD and NCES. The AFGR is based on public high school graduates and an estimate of the size of the incoming freshman class (derived from enrollment in grades 8-10). The international figure includes private schools. In the international method, the number of high school graduates (public and private) is divided by the number of persons at the typical age of high school graduation.
- The U.S. average trails the OECD and EU averages in each year from 2000 to 2005, and the gap has widened. In 2000 the US trailed the EU average by just two percentage points. That gap grew to 10 percentage points in 2005.
- The U.S. trails Germany, Japan and Canada, three of Michigan’s five biggest trading partners (the other two--Mexico and China--are not included in the OECD).

<sup>22</sup> Organisation for Economic Co-Operation and Development (OECD)

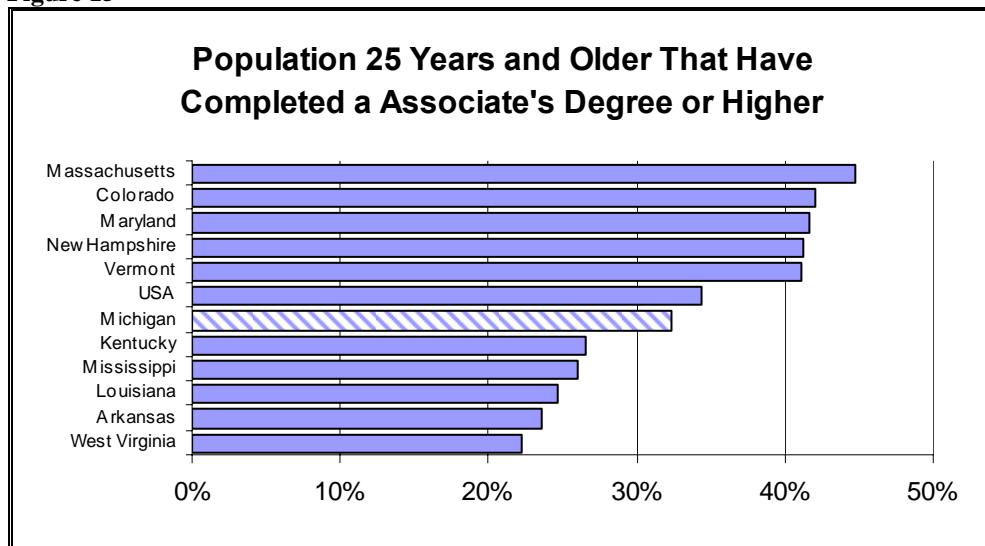
## Educational Attainment

As Michigan moves from a manufacturing-based economy to a more knowledge-driven economy, the amount of education that a pool of potential workers has received becomes increasingly important. It is no longer enough to have only a high school diploma. To compete for knowledge-based jobs, workers need to achieve higher levels of education than the generations before them.

The December 2004 Final Report of The Lt. Governor's Commission on Higher Education & Economic Growth established the goal of doubling the number of degrees and postsecondary credentials within 10 years. Measuring educational attainment is a way of showing whether or not Michigan is on track to achieve this goal.

For this analysis we will be following the Cherry Commission's lead of tracking those who have completed postsecondary degrees. In order to do this, nationally, we will look at the population that has attained an associate's degree or higher. Internationally, we will look at the population that has attained a tertiary education (either type A or B.)<sup>23</sup> The numbers for domestic and international are not meant to be used for comparison. Domestic figures exclude the population over the age of 64 and the definitions of "associate's and higher" and "tertiary" are not the same.

**Figure 15**

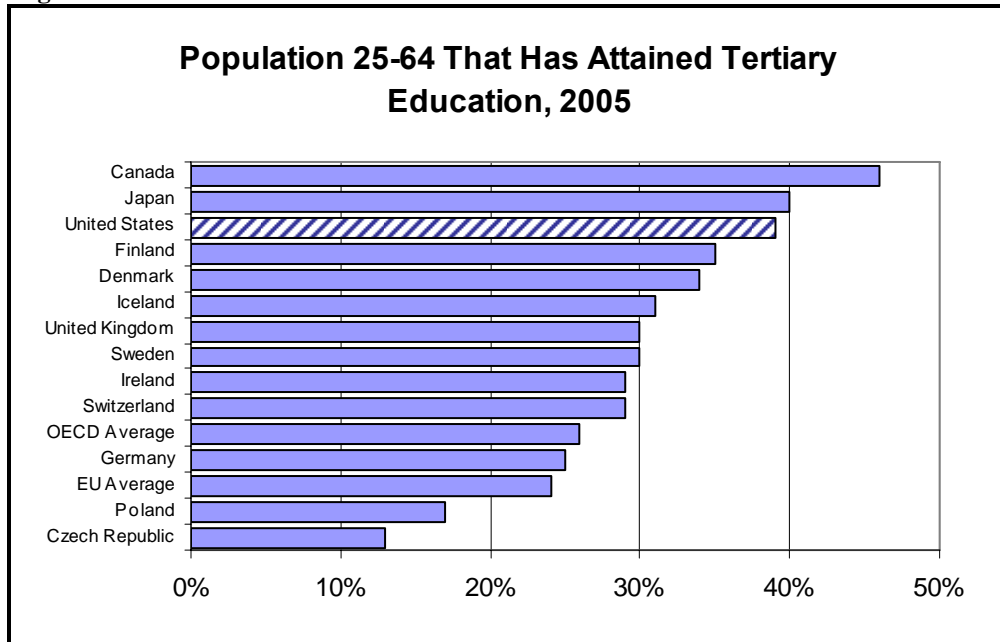


<sup>23</sup> The OECD defines a tertiary education in two parts:

- Tertiary-type A programs are largely theory based and are designed to provide sufficient qualifications for entry to advanced research programs and professions with high skill requirements, such as medicine, dentistry or architecture. Tertiary-type A programs have a minimum cumulative theoretical duration (at tertiary level) of three years' full-time equivalent, although they typically last four or more years.

- Tertiary-type B programs are typically shorter than those of tertiary-type A and focus on practical, technical or occupational skills for direct entry into the labor market, although some theoretical foundations may be covered in the respective programs. They have a minimum duration of two years full-time equivalent at the tertiary level.

Figure 16



**Findings<sup>24</sup>**

- Michigan ranks 35<sup>th</sup> out of all states in attainment of associate’s degrees and higher (34.4 percent vs. 44.7 percent for the number one state, Massachusetts.)
- Michigan performs in the middle of the pack nationally in high school completion degrees and in students moving from high school into college, with 55 percent of Michigan's adult population moving into post secondary education vs. 54 percent nationally.
- Michigan falls behind the U.S. average in students graduating with bachelor’s and post-graduate degrees. Michigan sees the largest drop-off in those who start but do not complete a college degree, 23 percent vs. less than 20 percent nationally.
- The Northeast states are the leaders in higher educational attainment, capturing five of the top six positions.
- The U.S. ranks third, behind Canada and Japan in the percentage of the population age 25-64 with a tertiary education.
- The U.S. outperformed both the OECD average and the European Union region by 13 percent and 15 percent respectfully.

<sup>24</sup> Domestic data obtained from **U.S. Census Bureau**.

- International data obtained from **Organisation for Economic Co-Operation and Development (OECD)**