MICHIGAN'S TRANSITION TO A KNOWLEDGE-BASED ECONOMY: THIRD ANNUAL PROGRESS REPORT

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This is Michigan Future's third annual report on Michigan's transition to a knowledge-based economy. How well Michigan does in this transition will, in large part, determine whether we get more prosperous or poorer.

As we detailed in our 2006 A New Agenda for a New Michigan report, Michigan's decline is caused, in large part, because Michigan – its citizens, enterprises and communities – has been slow to adapt to a rapidly changing global economy. Today, leading-edge communities are leaving behind the Industrial Age. They are adapting quicker and better to a more knowledge-driven and entrepreneurial economy: the flat world.

(The New Agenda report and the related A New Path to Prosperity? report are available at www.michiganfuture.org)

Four years later it is even clearer that the only reliable path to recreating a high-prosperity Michigan is to be concentrated in knowledge-based enterprises. There is a clear pattern across the country that the states, and most importantly metropolitan areas, with the most successful economies are those that are concentrated in the knowledge-based sectors: primarily health care, education, information, financial services and insurance, and professional and technical services. Michigan is lagging the nation mainly because of our slow growth in these dynamic, higher-wage sectors.

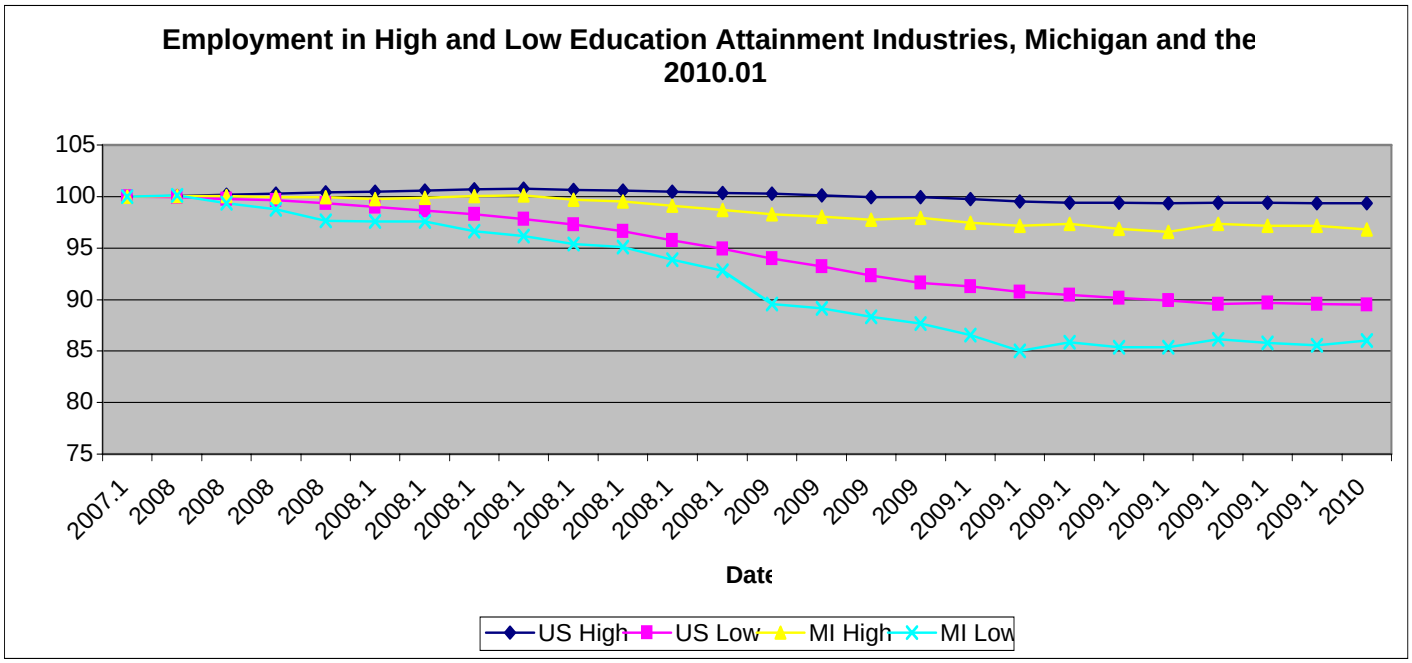
We start with a look at where the economy has gone in this most severe downturn since the Great Depression. We understand that the economy has changed fundamentally since the start of what has come to be known as the Great Recession. It is clear that when the next expansion begins two of the most important drivers of the expansion years almost certainly will not be repeated: the housing bubble and highly leveraged financial services.

The detailed data we use for these progress reports is only available through 2008. So we need to use less precise data – from the Bureau of Labor Statistics' monthly employment reports at the major industry level – to get a picture of what has happened to the national economy from the start of the downturn in December 2007 through February 2010.

What we found is stunning. The trends that we have written about in our previous reports have accelerated in the downturn. As depicted in Figure 1, low-education attainment industries (primarily manufacturing, construction, retail, hospitality and temporary services) have suffered job losses of 7.9 million, compared to job losses of 400,000 in high-education attainment industries (primarily the knowledge-based sectors listed above).

The low-education attainment industries nationally have had employment losses of more than 10 percent since the recession began compared to less than 1 percent in the high-education attainment industries. In Michigan the low-education attainment industry loses are around 13 percent compared to 4 percent in the high-education attainment industries.

Figure 1



Using the same database, we looked at the long-term trend. From January 1990 (also a recession year) to February 2010, low-education attainment industries employment rose 5 percent compared to 39 percent in the high-education attainment industries. So for two decades – whether the nation's economy was expanding or contracting – the American economy has been going through a profound structural transformation from an industrial to a knowledge-based economy. We are confident that when the current severe downturn

ends knowledge-based industries will continue to be where job growth is the strongest and average wages are the highest.

The inescapable conclusion is that what made Michigan prosperous in the past is no longer a path to prosperity. The knowledge-based economy is now the path to prosperity for Michigan.

There are some hard truths that Michiganians needs to confront:

• Michigan's prosperity in the last century was built primarily on good-paying, lower-education attainment jobs. Those jobs are gone forever.

• The auto industry will never again be the major engine of prosperity in Michigan. Even if the domestic auto industry survives the current downtown, it will be substantially smaller, employ far fewer and will pay its workers less with fewer benefits.

• The decline in autos is part of an irreversible new reality that manufacturing (work done in factories) is no longer a sustainable source of high-paid jobs. Nor is it a source of future job growth. Manufacturing makes up less than 10 percent of the American workforce today and is declining.

The average manufacturing wage nationally is about $54,000. That is still substantially above the national average wage of about $45,000, but below the Michigan average manufacturing wage of $60,000.[1] In the future Michigan factory workers will earn around the national manufacturing average. So whether it's traditional Michigan industries like autos and furniture or new industries like alternative energy, factory jobs will not be a source of new high-paid jobs for Michiganians.

• The other industries that are widely believed to be drivers of the Michigan economy – farming and tourism – are also not a source of lots of good-paying jobs. Less than 2 percent

[1] The average annual wage in an auto assembly plant in Michigan in 2008 was $93,361, and the average wage in a parts plant was $68,851 (which includes lower-wage non-Detroit Three plants). The very generous wages in this industry is why Michigan's manufacturing wage is about 10% above the national average.

of Michiganians work on a farm and, on average, it is not a high paying industry. And tourism, although a likely source of job growth, is also a low-wage industry.

To be clear, we are not advocating that Michigan abandon these industries. They are and will be important parts of the Michigan economy – especially in rural communities – and as such deserve support. But, they are not a path to high prosperity or a broad middle class. If the Michigan economy of the future is built on a base of factories, farms and tourism we will be a low-prosperity state.

The world has changed fundamentally. We either adjust to the changes or we will continue to get poorer compared to the nation. As the data in this report makes clear, the new path to prosperity is the broad knowledge-based economy.

Human capital is the asset that matters most to knowledge-based enterprises. Michigan's fundamental economic challenge is that we rank 34th in the proportion of adults with a four-year degree. States without concentrations of talent will have great difficulty retaining or attracting knowledge-based enterprises and are unlikely to be the place where new knowledge-based enterprises are created.

Michigan has lagged in its support of the assets necessary to develop the knowledge-based economy at the needed scale. Building that economy is going to take a long time and require fundamental change. But we believe it is the only reliable path to regain high prosperity. The choice we face is: Do we do what is required to build the assets needed to compete in the knowledge-based economy or do we accept being a low-prosperity state?

Our New Agenda framework

The development of our new agenda started with the question**, "**Where do we want to go from here?" Our answer: A high prosperity Michigan **-–** a place with a per capita income consistently above the national average in both national economic expansions and contractions.

High prosperity is different from the most often used measure for economic success – low unemployment. We believe that the goal should be to create an economy with lots of good-paying jobs **-–** a place with a broad middle class where there is a realistic chance for families to realize the American Dream. There are many areas across the country with low unemployment, but low incomes. That isn't success to us.

Table 1 compares West Virginia and Minnesota, two states with virtually identical unemployment rates. If unemployment is your goal, they are equally successful. But, if your goal is income, the choice is clear. You want to be like Minnesota.

Table 1 also includes data for Alabama. In previous reports we used Alabama as the comparison state. From 2006 through 2008 it and Minnesota had similar unemployment rates. As with West Virginia, Minnesota had substantially higher income and a lower poverty rate. We argued that Michigan should want to aim toward Minnesota rather than Alabama. In 2009, Alabama's unemployment rose to 10.1 percent, substantially above Minnesota's jobless rate. It's even clearer now that you want to be more like Minnesota than Alabama.

Table 1: Michigan, Alabama, Minnesota, West Virginia comparison

State	Per Capita Income, 2008	Unemployment rate, 2009	Poverty rate, 2008	Bachelor's plus, 2008
U.S.	$40,166	9.3%	13.2%	27.67%
Alabama	$33,655	10.1%	15.7%	21.99%
Minnesota	$42,953	8.0%	9.6%	31.52%
Michigan	$34,953	13.6%	14.4%	24.75%
West Virginia	$31,634	7.9%	17.0%	19.39%

Michigan enjoyed high per capita income for most of the last century. As recently as 2000 we were 18th in per capita income. Now we are consistently below the national average in both upturns and downturns. In 2008 we were 13 percent below the national average. This is the lowest Michigan has ranked since the federal government started collecting data in 1929.

We use per capita income as our metric of economic well-being because it is the most comprehensive and reliable estimate of the income of a community's 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.

Having set per capita income as our measure of prosperity, we then asked, **"**What characterizes those areas across the country with high prosperity?" We found that there are two paths to high prosperity. One, for a small number of states, is having natural resources that benefit from high energy prices. The other path, however, is the one taken by most states with high per capita income. These states:

- Are over concentrated compared to the nation in the proportion of wages coming from knowledge-based sectors;
- Have a high proportion of adults with a four-year degree;
- Have a big metropolitan area with even higher per capita income than the state;
- Tend to have in that big metro area, a high proportion of residents in its largest city with a four-year degree or more.

Our basic conclusion: What most distinguishes successful areas from Michigan is their concentrations of talent, where talent is defined as a combination of knowledge, creativity and entrepreneurship. Quite simply, in a flattening world where work can increasingly be done anyplace by anybody, the places with the greatest concentrations of talent win.

Rich Karlgaard, publisher of Forbes magazine, summed it up best:

Best place to make a future Forbes 400 fortune? Start with this proposition: The most valuable natural resource in the 21st century is brains. Smart people tend to be mobile. Watch where they go! Because where they go, robust economic activity will follow.

In this report we want to (1) see if this pattern continues to hold true across the country and (2) measure how well Michigan and its largest metropolitan areas are doing in each of these areas.

We collected data for states and the 55 metropolitan areas with populations of 1 million or more, plus Lansing and Madison, Wisconsin. We think it's important to understand the characteristics of those places with high prosperity before we explore the performance of Michigan and its largest regions.

The knowledge-based economy

Before we explore the data, we should define what we mean by knowledge-based industries. We define the knowledge-based part of the economy as those industries where the proportion of employees with a bachelor's degree or more is at least 30 percent (110 percent of the national average of adults with a bachelors degree or more).

For this report we apply this standard to NAICS industries at the six-digit level. Where applicable we combine public- and private-sector workers into a single industry. This is what we mean by high-education attainment industries and knowledge-based industries. We use the terms interchangeably.

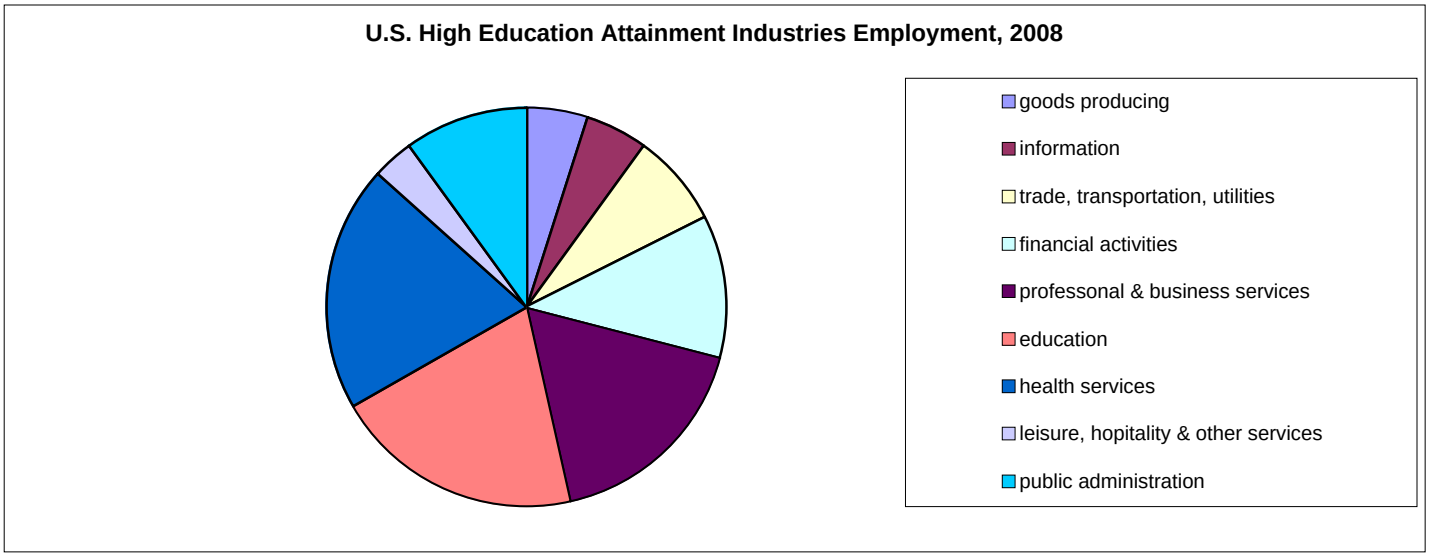
(The procedure we use in determining high-education industries is detailed in the end notes. The high education attainment industries are listed at the end of the report.)

It is important to note that workers in management as well as pre- and post-production occupations in such important Michigan industries as motor vehicles, office furniture and chemicals 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.

As you can see in Figure 2 national employment in the high-education industries are highly diversified across the economy. They are not narrowly focused in industries commercializing new technologies.

They are concentrated in, but not limited to, five broad sectors of the economy: information; finance and insurance; professional and technical services (including management of companies); health care and education. In fact, health care and education, which have dominated job growth this decade, account for 40 percent of the employment in high-education attainment industries.

Figure 2



Across the country, states and regions are focusing their economic development efforts on a few technology-based industries in the belief that these are the drivers of future growth. The industries are primarily information technology, the life sciences, alternative energy and/or green technology.

The data lead us to believe that this narrow focus on new technologies is unlikely to be the best economic growth strategy. That's because it is the broad knowledge-based economy where most of job growth is occurring and where most of the good-paying jobs are located in the American economy. The high-education attainment industries we have identified in 2008 were 44 percent of national employment and 58 percent of the wages earned by American workers. The average wage in these industries is nearly $60,000 as compared to just above $34,000 in all other industries.

Maybe most importantly, the high-education attainment industries had job growth in America from 2001-2008 almost five times the rate of low-education attainment industries: 7.6 percent as compared to 1.3 percent. The high-education attainment industries accounted for 82 percent of the new jobs from 2001-2008.

What we found: state data

In Table 2 we present data for the U.S., Michigan and the top 10 states in 2008 for per capita income. Table 3 has the same data for the six Great Lakes states. (Appendix A has all the data we collected for states. The end notes list the sources for our data.)

Table 2: High per capita personal income states

	pcpi 08	%ch pcpi 01 to 08	%wages hi ed 08	%bach 08	%hh under 25k 08	%hh over 25k 08
Connecticut	$56,245	28.97%	64.15%	35.61%	17.70%	45.87%
New Jersey	$51,473	29.70%	64.12%	34.40%	16.59%	47.13%
Massachusetts	$50,897	28.94%	67.19%	38.09%	19.80%	43.81%
New York	$48,809	37.66%	69.99%	31.92%	23.23%	37.49%
Wyoming	$48,580	55.13%	44.77%	23.63%	20.08%	33.18%
Maryland	$48,164	32.77%	65.06%	35.18%	15.13%	46.86%
Virginia	$44,075	32.56%	64.01%	33.69%	19.01%	40.82%
Alaska	$43,922	36.12%	55.01%	27.31%	13.71%	45.33%
California	$43,852	29.40%	61.64%	29.59%	20.04%	40.81%
New Hampshire	$43,423	25.11%	60.25%	33.32%	17.13%	41.89%
United States	$40,166	28.96%	58.54%	27.67%	23.29%	33.39%
Michigan	$34,953	16.62%	52.85%	24.75%	24.81%	29.77%

Table 2 clearly shows, with two exceptions, that high-prosperity states continue to be characterized by high concentrations in knowledge-based industries as well as the proportion of adults with four-year degrees or more. The exceptions are Wyoming and Alaska. Their path to prosperity is based predominantly on having natural resources that benefit from high energy prices.

The other eight are all above the national average in share of wages from high-education attainment industries and all are above the national average in the proportion of adults with bachelor's degrees or more. For both metrics seven of the eight are in the top 10 states. (California is 15th in adults with a four-year degree. New Hampshire is 12th in knowledge-based industries concentration.)

Michigan, on the other hand, lags the national average in all the metrics, and is substantially behind the eight high-prosperity/high-knowledge-based states.

It is interesting to note that other than New York the high-prosperity/high-knowledge-based states are not in the top 10 in terms of per capita income growth from 2001-2008. Growth rates are a traditional way to measure success. Many assume that they are predictive of future results. But growth rates can be high if you start with a small base. It will be interesting to watch as we go forward whether the 2001-2008 per capita growth rates are reflective of a long-term trend away from the patterns we have identified.

Our best guess is that the proportion of adults with a bachelor's degree or more is a far better predictor of future prosperity. In a flattening world, human capital will continue to grow in value. Per capita income growth rates, on the other hand, even over a period as long as seven years are likely to be more reflective of cyclical events than long-term structural trends.

We include data on share of households with income below $25,000 and share of households with income $75,000 and more. We do this to measure whether a knowledge-based economy is generating a broad middle class.

There is widespread concern that the decline of good-paying manufacturing jobs will mean the days of a mass middle class in America are coming to an end. There are many who believe that those who own and/or lead enterprises, the most talented athletes and entertainers, and those with advanced degrees will be the winners, while the rest of us see a declining standard of living.

We wrote in our New Agenda report that far more likely is a change in the nature of good-paying jobs, not their decline. That middle-class employment in the future will come primarily in the high-education attainment industries. This is consistent with America's past. As the American economy has evolved, the nature of good-paying work has changed. But the pattern is that as we get more productive, our per capita income goes up.

More than one-third of American households in 2008 have incomes of $75,000 and more. (Median household income was around $50,000.) Each of the eight states with both high per capita income and high concentrations in knowledge-based industries are in the top 11 in the nation in proportion of households with income of $75,000 or more. And all have a smaller proportion than the nation of households with incomes $25,000 or less. So in the states where the knowledge-based economy is strongest, there are proportionately more higher-income and fewer lower-income households than the nation.

Table 3: Great Lakes states

State	pcpi 08	%ch pcpi 01 to 08	% wages hied ind 08	%bach+ 08	%hh under $25k 08	%hh $75k plus 08
Minnesota	$42,953	28.83%	61.11%	31.52%	19.59%	36.38%
Illinois	$42,540	28.17%	58.15%	29.88%	21.68%	36.39%
Wisconsin	$37,770	25.49%	49.76%	25.69%	21.36%	31.43%
Ohio	$35,889	22.63%	52.55%	24.10%	25.36%	28.44%
Michigan	$34,953	16.62%	52.85%	24.75%	24.81%	29.77%
Indiana	$34,543	23.15%	46.94%	22.89%	24.45%	28.18%
United States	$40,166	28.96%	58.54%	27.67%	23.29%	33.39%

As displayed in Table 3, the same patterns hold true for the Great Lakes states. The two states above the national average in per capita income – Minnesota (12th) and Illinois (14th) – are also the top-ranked Great Lakes states in share of wages from high-education attainment industries and proportion of adults with a bachelor's degree or more. Minnesota and Illinois also have the highest proportion of households with incomes $75,000 and more of the Great Lakes states. Minnesota has the smallest proportion of households with incomes under $25,000 in the region. (Illinois, by a small margin, trails Wisconsin on this metric.)

All six states were below the national average in per capita income growth – only slightly for Minnesota and Illinois – in part due to the region's historic high concentration in high-paying manufacturing jobs, which have suffered huge declines this decade.

What we found: regional data

Economies are regional. States and municipalities are political jurisdictions, not economic units. State economies can best be understood as the sum of their regional economies. This is illustrated when you look at the wide variation in the economic success of metropolitan areas within the same state (some that actually spill over into surrounding states). As an example, of the regions with population of one million or more, San Jose has the highest per capita income ($58,780). Also in California is Fresno, which is last ($30,369). Almost all states are characterized by regions that are doing well economically and those that aren't. Regions within states also tend to have widely different sector concentrations, which is a major driver of economic well-being.

Appendix B has all the data we collected for the 55 metropolitan areas with populations of 1 million or more, as well as Lansing, Madison and Michigan's smaller metropolitan areas. We focus on metropolitan areas of 1 million or more because this is where the knowledge-based economy and adults with a bachelor's degree or more are concentrating.

Table 4: Performance of metros by size

CSAs and nonCSA MSAs	Number metros	Category Population, 2008	pcpi 08	%ch pcpi 01 to 08	%wages hi ed 08	%bach 08	%hh under 25k 08	%hh over 25k 08
United States		301,621,159	$40,166	28.96%	58.54%	27.67%	23.29%	33.39%
3.5 million or more	15	120,188,852	$45,667	26.77%	62.46%	32.79%	19.31%	40.75%
1.6 million to 3.5 million	22	49,019,348	$39,490	25.40%	57.67%	29.82%	21.15%	34.42%
1.0 million to 1.6 million	18	21,945,525	$37,470	28.84%	53.69%	25.63%	24.67%	30.19%
500,000 to 1.0 million	44	29,060,045	$35,734	29.04%	52.54%	25.04%	24.44%	29.89%
200,000 to 500,000	86	26,874,335	$35,304	32.39%	50.32%	24.13%	26.22%	27.79%
under 200,000	111	15,373,665	$33,304	31.75%	49.45%	23.12%	26.75%	25.59%

Simply put, big metros are winning! Many futurists expected the opposite. In a flat world where more and more work can be done anyplace, many predicted an economic resurgence in smaller metropolitan and even rural areas. The pattern as shown in Table 4 is

the opposite: big metropolitan areas are where knowledge-based industries and college-educated adults are concentrating.

The larger the metropolitan area, the better the performance on all of our metrics except per capita income growth. Most surprising to us is the largest metropolitan areas not only have the highest proportion of households with incomes of $75,000 or more, but also the smallest proportion of households with incomes under $25,000.

Table 5 presents data on the top 10 metropolitan areas with populations of 1 million or more in 2008 per capita income as well as metro Chicago and Pittsburgh, the nine-county Detroit region and the seven-county Grand Rapids region. Chicago and Minneapolis are the most prosperous regions among the Great Lakes states. We have added Pittsburgh as a comparison. Many find it a possible model because it is both a cold-weather region as well as having gone through a restructuring (with the collapse of the steel industry) similar to what we are going through with the auto industry. Chicago ranks 11th, Pittsburgh 16th.

Table 5: Highest-income metro areas

Area (CSA)	pcpi 08	%ch pcpi 01 to 08	% wages hied ind 08	%bach+ 08	%hh under $25k 08	%hh $75k plus 08
United States	$40,166	28.96%	58.54%	27.67%	23.29%	33.39%
San Jose-San Francisco-Oakland, CA	$58,780	26.20%	69.28%	41.28%	15.69%	51.27%
New York-Newark-Bridgeport, NY-NJ-CT-PA	$54,956	34.56%	70.66%	35.28%	20.00%	44.32%
Washington-Baltimore-Northern Virginia, DC-MD-VA-WV	$53,273	32.97%	72.75%	42.02%	13.40%	51.97%
Boston-Worcester-Manchester, MA-RI-NH	$49,922	28.47%	66.72%	37.40%	19.17%	44.59%
Hartford-West Hartford-Willimantic, CT	$49,448	29.89%	63.62%	33.73%	18.83%	43.37%
Seattle-Tacoma-Olympia, WA	$48,589	31.54%	62.54%	34.91%	16.43%	42.80%
San Diego-Carlsbad-San Marcos, CA (MSA)	$46,649	34.49%	63.06%	34.17%	18.63%	42.71%
Denver-Aurora-Boulder, CO	$46,612	19.02%	64.57%	38.62%	19.34%	39.67%
Minneapolis-St. Paul-St. Cloud, MN-WI	$46,383	25.76%	63.08%	36.28%	16.17%	42.33%
Houston-Baytown-Huntsville, TX	$45,480	30.51%	54.94%	28.04%	20.90%	37.07%
Chicago-Naperville-Michigan City, IL-IN-WI	$45,049	26.94%	59.19%	32.56%	19.83%	40.33%
Pittsburgh-New Castle, PA	$41,704	32.65%	60.03%	28.25%	26.43%	28.52%
Detroit-Warren-Flint, MI	**$38,107**	**13.74%**	**56.75%**	**27.07%**	**23.10%**	**34.18%**
Grand Rapids-Muskegon-Holland, MI	**$32,593**	**17.05%**	**42.96%**	**24.63%**	**23.42%**	**29.00%**

The data show the same patterns as for states. The high-prosperity metropolitan areas are characterized by high concentrations in knowledge-based industries as well as the proportion of adults with four-year degrees or more. Only Houston deviates somewhat from the pattern. It, of course, is an economy that does well when energy prices are high. With the exception of Houston, all are substantially above the national average on both metrics. And all ten are well ahead of the national average on both proportion of households with incomes $75,000 or more and proportion of households with incomes under $25,000.

The pattern we found in our previous reports, that high-prosperity states have big metropolitan areas with even higher per capita income, holds true. Except for Wyoming and Alaska, each of the top 10 states includes at least one of the top 10 metropolitan areas.

So metropolitan Detroit and, to a lesser degree, metropolitan Grand Rapids and metropolitan Lansing are the main drivers of a prosperous Michigan. In fact, it is hard to imagine a high-prosperity Michigan without an even higher-prosperity metropolitan Detroit.

In Table 6 we present the same data for the four-county Lansing region and metropolitan Madison. We do so because midsize metropolitan areas with major universities (and in many cases state capitals) also are places where the knowledge-based economy is growing.

Table 6: Lansing and Madison metro areas

Area	pcpi 08	%ch pcpi 01 to 08	% wages hied ind 08	%bach+ 08	%hh under $25k 08	%hh $75k plus 08
United States	$40,166	28.96%	58.54%	27.67%	23.29%	33.39%
Lansing-East Lansing-Owosso, MI (CSA)	**$32,943**	**21.30%**	**61.87%**	**28.58%**	**24.25%**	**29.16%**
Madison-Baraboo, WI (CSA)	$43,455	28.06%	61.87%	37.70%	18.52%	37.66%

Clearly the Lansing region is lagging. Metropolitan Madison follows the same pattern as the other high-prosperity states and regions. In many ways Madison's performance is extraordinary. Its per capita income is exceeded by only 12 of the 55 metropolitan areas with populations of 1 million or more.

As we see in Tables 5 and 6, Michigan's three largest regions clearly trail the most successful metropolitan areas across the country. Building a strong knowledge-based economy in metropolitan Detroit, Grand Rapids and Lansing is the central challenge we must meet if we are to create a high-prosperity Michigan.

In Table 7, we present the same data for Michigan's smaller metropolitan areas. (More detailed data for each is contained in Appendix B.) Like most smaller regions across the country they are struggling. They are all low in per capita income, per capita income growth, share of wages from knowledge-based industries and, except for Kalamazoo, college education attainment.

Table 7: Michigan' smaller metro areas

Area	pcpi 08	%ch pcpi 01 to 08	% wages hied ind 08	%bach+ 08	%hh under $25k 08	%hh $75k plus 08
United States	$40,166	28.96%	58.54%	27.67%	23.29%	33.39%
Kalamazoo-Portage, MI (MSA)	$33,685	23.42%	54.49%	29.77%	26.41%	26.23%
Niles-Benton Harbor, MI (MSA)	$33,669	23.91%	41.79%	22.30%	29.93%	25.54%
Battle Creek, MI (MSA)	$31,652	24.09%	39.59%	18.58%	29.17%	21.95%
Saginaw-Bay City-Saginaw Township North, MI (CSA)	$30,432	16.78%	47.43%	19.94%	28.51%	24.73%
Jackson, MI (MSA)	$29,610	18.00%	44.63%	17.04%	22.79%	27.73%

What we found: Michigan

Obviously the Michigan economy has been dreadful this decade, having recorded an unprecedented nine consecutive years of job losses. The state is at the bottom of the national rankings in both employment and per capita income growth.

During the national expansion many referred to it as a single-state recession. We believe that Michigan's experience during the 2001-2007 expansion is far better characterized as a single-industry recession. Or, more accurately, a single portion of an industry recession. Despite all our efforts for decades to diversify, the domestic auto industry is still the engine that drives the Michigan economy.

For the foreseeable future Michigan's economy will continue to lag the nation. With the existence of the domestic auto industry still somewhat in doubt, we are, at best, in for a few more years of stagnation.

What we are working on at Michigan Future is what comes next. Our work is designed to identify what a high-prosperity Michigan economy looks like when the domestic auto industry is no longer the preeminent engine of economic success. Our goal: Michigan on a path that will better position its citizens to succeed in a flattening world economy.

The national data we have just reviewed makes clear that high prosperity is occurring chiefly in those places where knowledge-based enterprises across many sectors are concentrating. They are concentrating in areas with a high proportion of adults with a bachelor's degree or more.

In 2000, at the end of the boom years, Michigan still ranked 18th in per capita income. We were 34th in bachelor's degree attainment. In many ways 2000 marked the end of an era when you could have high prosperity with low-education attainment. No more! In 2008 Michigan ranked 36th in per capita income, an unprecedented drop of 18 places in a relatively short seven-year period. We were tied for 34th in bachelor's degree attainment.

In Table 8 we present an overview of the data we previously presented for Michigan and its two largest regions. All rank low in share of wages from high-education attainment industries and the proportion of adults with a bachelor's degree or more.

Metropolitan Detroit is declining rapidly. Its per capita income was 26th in 2005, now 37th. Metropolitan Grand Rapids – which many believe is Michigan's most successful region – is declining from very low levels. It was 51st in 2005, now 53rd. Both regions rank low in the proportion of adults with a four-year degree and share of employment earnings from knowledge-based industries. In the latter statistic, metro Grand Rapids is next to last. As we saw in Table 6, the story is basically the same for the Lansing region, which substantially trails metropolitan Madison on most of our metrics.

Table 8: Ranking of Michigan, Detroit and Grand Rapids

Area	Per Capita Income, 2008	%change PCI 2001-08	share wages high ed ind 2008	share pop 25+ with bach+, 2008
Michigan	36	50	32	34
Detroit-Warren-Flint, MI (CSA)	37	54	33	37
Grand Rapids-Muskegon-Holland, MI (CSA)	53	52	54	45

In our report two years ago we wrote that our best guess was that unless we substantially increased the proportion of college-educated adults in Michigan – particularly in our biggest metropolitan areas – the state would continue to trend downwards in the per capita income rankings towards the mid 30s. That prediction came true in one year. Unfortunately, with the continuing decline of the domestic auto industry, it's highly likely that Michigan in the next few years will fall to the bottom 10 in the nation. This is a stunning collapse of what historically was one of the most prosperous states in the nation.

Our basic belief: over the long term Michigan's and its regions' per capita income will be consistent with their rankings in the proportion of adults with a four-year degree or more.

In addition to the data on per capita income, we have collected data on employment – the

traditional measurement for economic growth. In Table 9 we present employment growth from 2001-2008 for the US, Michigan and its three largest metropolitan areas.

Table 9: Employment change by educational attainment

Employment Change, 2001-2008 Industry Group	United States	Michigan	Detroit CSA	Grand Rapids CSA	Lansing CSA
All Industries	5,166,183	-405,744	-280,147	-23,153	-13,542
(percent change)	3.99%	-9.06%	-11.43%	-3.88%	-5.75%
High Education Attainment Industries	4,218,254	-33,056	-24,675	8,294	1,596
(percent change)	7.57%	-1.88%	-2.42%	4.23%	1.43%
Low Education Attainment Industries	947,929	-372,688	-255,472	-31,447	-15,138
(percent change)	1.28%	-13.72%	-17.88%	-7.86%	-12.24%

In Table 9, we have divided the economy between the high-education attainment industries and other industries. The data clearly shows the preeminence of the high-education attainment industries in employment growth. Michigan lagged the nation substantially. The state was last in overall employment growth and employment growth in high-education attainment industries. Michigan and its three largest metropolitan areas all suffered heavy job losses in the low-education attainment industries. This includes the severe loss of manufacturing jobs, particularly in the domestic automotive industry.

It is important to note that the national pattern of better performance in the high-education attainment industries holds true for Michigan as well. Employment in the low-education attainment industries fell off a cliff, down an astonishing 13.7 percent. In the high-education attainment industries the loss was 1.9 percent. That there was a loss of jobs in the knowledge-based industries we believe is primarily due to the decline in employment in the knowledge-based portions of the domestic auto industry.

All three of Michigan's largest metropolitan areas saw job losses during the national expansion. Of the three, metro Grand Rapids fared best. It had the smallest – but still substantial – loss in the low-education attainment industries, combined with solid employment growth in the high-education attainment industries. Metro Lansing also saw gains in the high-education industries combined with big declines in the low-education

attainment industries. Metro Detroit – the epicenter of the domestic auto industry – lagged on all metrics.

In Table 10 we look at average wage data by industry category. The pattern: high-paying work is concentrating in the high-education attainment industries nationally and in Michigan. Nationally the knowledge-based industries' average wage is more than $26,000 above the low-education attainment industries.

Table 10: Average wage by educational attainment

Industry Group	United States	Michigan	Detroit CSA	Grand Rapids CSA	Lansing CSA
All Industries	$45,564	$44,244	$49,154	$39,052	$41,447
High Education Attainment Industries	$60,138	$55,136	$60,744	$47,020	$50,182
Low Education Attainment Industries	$33,888	$36,223	$39,312	$34,633	$32,319

Michigan's low-education attainment industries, which include manufacturing, have wages more than 10 percent above the national average. We believe this is unsustainable. The high-paying, low-skill jobs that have been the backbone of middle-class Michigan will almost surely continue to decline.

By comparison, in the high-education attainment industries, Michigan's wages are nearly 10 percent below the national average. And the gap is even wider than that in metro Grand Rapids and Lansing. Our best guess is that the higher average wages in the high-education attainment industries in metro Detroit is concentrated in the knowledge-based parts of the auto industry. Also, we think it is likely that metro Detroit wages in the other high-education attainment industries are below that of most big metropolitan areas.

Higher wages have been a competitive disadvantage for Michigan in retaining manufacturing jobs. Lower wages in the knowledge-based sectors of the economy – where most of the job growth and good-paying jobs are – could be a competitive edge for Michigan.

What we found: Metropolitan Pittsburgh

Many in Michigan seem to believe that the decline of the domestic auto industry and more generally the loss of so many high-wage factory jobs, means that the state will never again be prosperous. We disagree!

In our 2004 report A New Path to Prosperity? we presented compelling evidence that the states with the highest incomes were now those concentrated in knowledge-based industries, rather than manufacturing. We found that factory-based economies were no longer the path to prosperity as they had been for much of the 20th century.

Six years later the evidence is clear that moving to a knowledge-based economy is the only reliable path to prosperity. If Michigan gets on that path there is no reason we can't return to high prosperity. Others have done it. So can we.

The best evidence of the possibilities of making the transition to a knowledge-based economy probably comes from the experience of metropolitan Pittsburgh. Its past successes were largely the result of its dominant 20th century industry – steel. Like autos here, steel provided lots of high-paid factory jobs.

We looked at data for metro Pittsburgh from 1969-2008. Its per capita income peaked compared to the nation over that period in 1977 at 104 percent of the national average. That year primary metals manufacturing (the industry that includes steel) accounted for 14 percent of the employment earnings of the region. And all of manufacturing accounted for 34 percent of the region's employment earnings, compared to 25 percent nationally.

It's the prototypical 20th century economic success story. If you were over-concentrated in manufacturing – particularly high-wage factory work – you were more prosperous than the nation. But then steel collapsed in metro Pittsburgh. Its firms were no longer competitive.

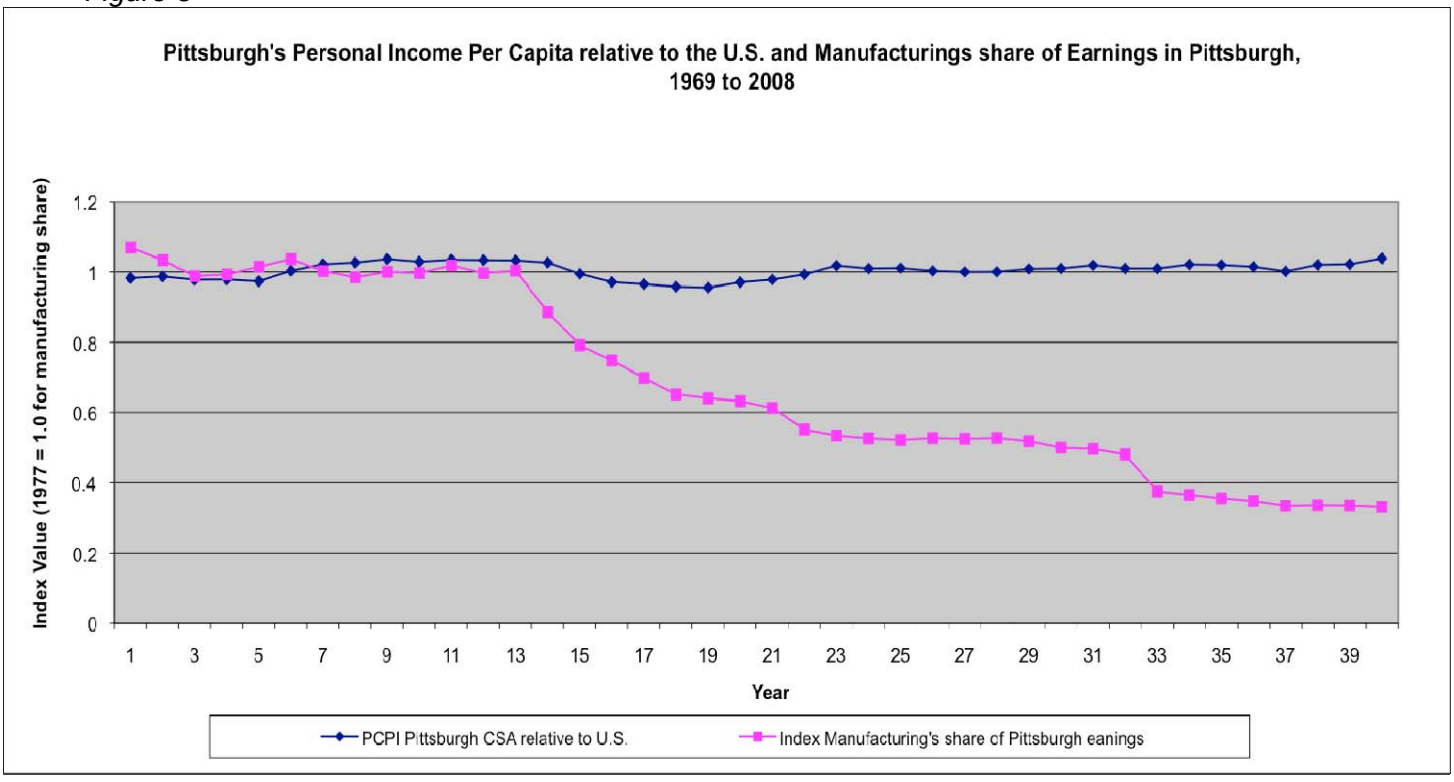
By 1985 primary metals were only 6 percent of the region's employment earnings – a nearly 60 percent decline in share of earnings in just eight years. And all of manufacturing had fallen to just about the national average, accounting for 24 percent of the region's

employment earnings. As you would expect per capita income tumbled along with the decline in steel, from 4 percent above the national average to 3 percent below.

Primary metals and all of manufacturing continued to decline as a share of metro Pittsburgh's employment earnings. But it didn't consign the region to permanent low-prosperity status. During the 1990s Pittsburgh was at or above the national average in per capita income even though primary metals accounted for only 4 to 5 percent of employment earnings and 17 to 19 percent for all of manufacturing.

In 2008 Pittsburgh returned to its previous peak compared to the nation—104 percent of the national average. Of the 55 metropolitan areas with populations of a million or more, it ranked 16th and was more prosperous than Dallas, Raleigh/Durham, Austin, Portland and Atlanta**.**

Figure 3



Consistent with other prosperous regions, Pittsburgh is above the national average in the proportion of adults with a four-year degree and share of wages from knowledge-based

industries. In the city of Pittsburgh 34 percent of its residents have, at least, a bachelor's degree. And it is attracting talent. From 2007 to 2008 the region had a net increase of adults with a bachelor's degree of more than 5,600.

The metro Pittsburgh story is not a fairy-tale success. It didn't happen overnight and there was a lot of pain in the transition. It certainly took a long time for the region to regain its prosperity – more than 30 years. And obviously a lot of folks who had enjoyed a high standard of living working in the steel industry never again earned as much. The region also suffered a large population decline. Metropolitan Pittsburgh's population fell from 2.79 million in 1977 – its peak income year in the steel heyday – to 2.45 million in 2008. That's a decline of 340,000, or 12 percent.

But that said, it is a success story. By making the transition from a factory-based economy to a knowledge-based economy, Pittsburgh has regained its status as one of the nation's most prosperous regions.

The Pittsburgh experience probably better than any offers hope for Michigan. Losing a dominant industry as well as a substantial reduction in high-paid manufacturing work does not consign a state or region to permanent low prosperity. There is a way back. But it involves aligning with – rather than resisting – the new realities of a flattening world.

What we found: retaining and attracting talent

We quoted Rick Karlgaard earlier. His central insight is that where smart people choose to live and work, robust economic activity will follow. This means that retaining and attracting talent becomes the key to building a high-prosperity economy. In this final section we will look at the metrics on where talent is concentrating.

As we saw in Table 4, talent is concentrated in the nation's largest metropolitan areas. In our previous work, we found that high-prosperity metropolitan areas have a high proportion of residents with bachelor's degree in their largest cities. In Table 11 we present data on college attainment for the top 10 regions, the three high-prosperity Great Lakes regions, Pittsburgh and Michigan's three largest regions, and the largest city in each region.

Table 11: Educational attainment of metros and central cities

Area Name	Per Capita Income, 2008	Metro Area Bach +, 2008	Central City Bach +, 2008
San Jose-San Francisco-Oakland, CA (CSA)	$58,780	41.28%	35.23%
New York-Newark-Bridgeport, NY-NJ-CT-PA (CSA)	$54,956	35.28%	32.69%
Washington-Baltimore-Northern Virginia, DC-MD-VA-WV (CSA)	$53,273	42.02%	48.24%
Boston-Worcester-Manchester, MA-RI-NH (CSA)	$49,922	37.40%	42.05%
Hartford-West Hartford-Willimantic, CT (CSA)	$49,448	33.73%	15.63%
Seattle-Tacoma-Olympia, WA (CSA)	$48,589	34.91%	55.16%
San Diego-Carlsbad-San Marcos, CA (MSA)	$46,649	34.17%	40.80
Denver-Aurora-Boulder, CO (CSA)	$46,612	38.62%	38.57%
Minneapolis-St. Paul-St. Cloud, MN-WI (CSA)	$46,383	36.28%	44.32%
Houston-Baytown-Huntsville, TX (CSA)	$45,480	28.04%	28.37%
Chicago-Naperville-Michigan City, IL-IN-WI (CSA)	$45,049	32.56%	31.07%
Madison-Baraboo, WI (CSA)	$43,455	37.70%	49.37%
Pittsburgh-New Castle, PA (CSA)	$41,704	28.25%	34.25%
Detroit-Warren-Flint, MI (CSA)	**$38,107**	**27.07%**	**10.84%**
Grand Rapids-Muskegon-Holland, MI (CSA)	**$32,593**	**24.63%**	**26.88%**
Lansing-East Lansing-Owosso, MI (CSA)	**$32,943**	**28.58%**	**24.44%**

Except for Hartford the pattern of high-education attainment in the largest city of high prosperity regions holds true. Detroit's low concentration is particularly worrisome. Quite simply, vibrant central cities matter!

Most college-educated households, like the rest of America, live in the suburbs. But a growing proportion of college-educated households – mainly those without children – are choosing to live in central-city neighborhoods. This is particularly true for the most mobile segment of the population – young college graduates without children. (See our Young Talent in the Great Lakes report at www.michiganfuture.org for details.)

What is different over the past decade or so is that suburban growth in high-prosperity metropolitan areas is now accompanied by growth in their central cities. The evidence is that the most successful regions across the country are those where both the suburbs and central cities are prospering.

We conclude with a look at data on adults with a four-year degree moving from state to state and to the United States from another country. With the advent of the Census Bureau's American Community Survey annual data is now available on people who moved from one state to another or from another country.

There are some limitations in the data. It accounts for all adults 25 and older – whether they are working or not. Also, for metropolitan areas that are in more than one state, the data counts as movers those who move across state lines, but still live in the same metropolitan area. This exaggerates the movers in those regions compared to other regions that are exclusively in one state.

Michigan from 2007-2008 was last in net college-educated movers with a loss of roughly 9,800 adults with a four-year degree or more.

From 2007 to 2008 there were roughly 2 million individuals with a bachelor's degree or more who moved from one state to another or from another country. Of those nearly 71 percent moved to a metropolitan area with a population of 1 million or more. These big

metros account for nearly 63 percent of the nation's population. This is more evidence of the trend of talent increasingly concentrating in big metros.

Table 12: Net movers by metro areas

Area Name	Net Movers (bachelors +) 2007 to 2008
United States	456,440
San Jose-San Francisco-Oakland, CA (CSA)	28,916
New York-Newark-Bridgeport, NY-NJ-CT-PA (CSA)	28,908
Washington-Baltimore-Northern Virginia, DC-MD-VA-WV (CSA)	31,354
Boston-Worcester-Manchester, MA-RI-NH (CSA)	17,216
Hartford-West Hartford-Willimantic, CT (CSA)	2,059
Seattle-Tacoma-Olympia, WA (CSA)	24,989
San Diego-Carlsbad-San Marcos, CA (MSA)	7,560
Denver-Aurora-Boulder, CO (CSA)	12,119
Minneapolis-St. Paul-St. Cloud, MN-WI (CSA)	3,279
Houston-Baytown-Huntsville, TX (CSA)	19,664
Chicago-Naperville-Michigan City, IL-IN-WI (CSA)	2,047
Pittsburgh-New Castle, PA (CSA)	5,659
Madison-Baraboo, WI (CSA)	-150
Detroit-Warren-Flint, MI (CSA)	**-7,534**
Grand Rapids-Muskegon-Holland, MI (CSA)	**-1,854**
Lansing-East Lansing-Owosso, MI (CSA)	**804**

In Table 12 we look at the data on net college-educated movers for the 10 big regions with the highest per capita income, as well as metropolitan Chicago, Pittsburgh, Madison and Michigan's three largest regions. (Data on movers is part of Appendices A and B.)

All the high-prosperity metropolitan areas are places that are substantially adding to already large concentrations of college-educated adults. Metro Pittsburgh's net increase of more than 5,600 is noteworthy. Metro Detroit and Grand Rapids saw a net out-migration of college-educated adults. This is one metric in which metro Lansing did better than metro Madison.

A path to a high-prosperity Michigan

To us the clear message from the data we have just reviewed is that the key to economic growth is talent. Quite simply, in a flattening world, economic development priority one is to prepare, retain and attract talent.

There are no quick fixes. The Michigan economy is going to continue to lag the nation for the foreseeable future. But there is a path back to high prosperity. As is laid out in our New Agenda report, we believe the framework for action is:

• Building a culture aligned with (rather than resisting) the realities of a flattening world. We need to place a much higher value on learning, an entrepreneurial spirit and being welcoming to all.

• Ensuring the long-term success of a vibrant and agile higher-education system. This means increasing public investments in higher education. Our higher-education institutions – particularly the major research institutions – are the most important assets we have to develop the concentration of talent needed in a knowledge-based economy.

• Creating places where talent – particularly mobile young talent – wants to live. This means expanded public investments in quality of place with an emphasis on vibrant central city neighborhoods.

• Transforming teaching and learning so that it is aligned with the realities of a flattening world. All of education needs reinvention. Most important is to substantially increase the proportion of students who leave high school academically ready for higher education.

• Developing new public and – most importantly – private sector leadership that has moved beyond a desire to recreate the old economy and continue the old fights. Michigan needs a leadership that is clearly focused, at both the state and regional level, on preparing, retaining and attracting talent so that we can prosper in the global economy.

End Notes

U.S. Department of Commerce, Bureau of Economic Analysis http://www.bea.gov/regional/index.htm#state accessed on April 30, 2010.

We used the 5 percent PUMS sample data maintained at the University of Minnesota. Steven Ruggles, Matthew Sobek, Trent Alexander, Catherine A. Fitch, Ronald Goeken, Patricia Kelly Hall, Miriam King, and Chad Ronnander. Integrated Public Use Microdata Series: Version 3.0 [Machine-readable database]. Minneapolis, MN: Minnesota Population Center [producer and distributor], 2004. http://usa.ipums.org/usa/

The information on employment and wages by industry is from the U.S. Department of Labor, Bureau of Employment Statistics, Quarterly Census of Employment and Wages http://www.bls.gov/cew/home.htm, accessed in summer and fall of 2009. When the employment and wage data was masked due to publication disclosure rules, estimates were generated using procedures developed at the Institute for Research on Labor, Employment and the Economy, University of Michigan.

The basic information on which industries were identified as high-education attainment industries was derived from the 2000 Census **1** percent micro data sample. The Census data allocated employed individuals among 230 industries using the 1997 NAICS industry definitions. However, our industry employment data, at the six-digit NAICS level, was based upon the 2002 NAICS definitions for the 2001 to 2006 data, and for the 2007 and 2008 data on the 2007 NAICS definitions. These differences in the industry codes introduced a complication into our allocation procedure, for example, the 2000 Census data did not include the industry category "wholesale trade, electronic markets and agents and brokers (NAICS 425)," consequently we had to arbitrarily allocate this industry, and choose to place it in the high-education attainment category. Also, in certain cases we arbitrarily allocated part of an industry to low- or high-education attainment based upon our judgment of the activity of that detailed industry. For example, the census data set only included information on the NAICS industry 5121 (motion pictures and video industries), but using our judgment we categorized one of its sub-industries, NAICS industry 51213 (motion

picture and video exhibition) as a low-education attainment industry, while categorizing the other component industries of NAICS 5121 as high-education attainment industries.

Information on Population, Educational Attainment, and Income Distribution are from the U.S. Census Bureau, American Community Survey (ACS) for 2008. http://www.census.gov/acs/www/

High education attainment industries

1131	Timber tract operations
1132	Forest nursery and gathering forest products
211	Oil and gas extraction
2211	Power generation and supply
2212	Natural gas distribution
32411	Petroleum refineries
3251	Basic chemical manufacturing
3253	Agricultural chemical manufacturing
3254	Pharmaceutical and medicine manufacturing
3256	Soap, cleaning compound, and toiletry mfg.
3259	Other chemical product and preparation mfg.
334	Computer and electronic product manufacturing
3364	Aerospace product and parts manufacturing
3391	Medical equipment and supplies manufacturing
4234	Commercial equip. merchant wholesalers
4242	Druggists' goods merchant wholesalers
4246	Chemical merchant wholesalers
425	Electronic markets and agents and brokers
443112	Radio, TV, and other electronics stores
44312	Computer and software stores
44313	Camera and photographic supplies stores
44611	Pharmacies and drug stores
451211	Book stores
4541	Electronic shopping and mail-order houses
481	Air transportation
486	Pipeline transportation
51 except 51213	Information except motion picture and video exhibition
52 except 52212 & 52213	Finance & insurance except savings institutions & credit unions
531	Real estate
533	Lessors of nonfinancial intangible assets
54	Professional and technical services
55	Management of companies and enterprises
5611	Office administrative services
5612	Facilities support services
61	Educational services
621 except 6216	Ambulatory health care except home health care services
622	Hospitals
6241	Individual and family services
6242	Emergency and other relief services
711	Performing arts and spectator sports
712	Museums, historical sites, zoos, and parks
813 except 81393	Membership associations and organizations except labor unions
921 except 92115	Executive, legislative and general except tribal government
92211	Courts
92213	Legal counsel and prosecution
fed & state 92212	federal & state government police protection

fed & state 92215	federal & state government parole offices and probation offices
fed & state 92216	federal & state government fire protection
fed & state 92219	federal & state government other justice and safety activities
923	Administration of human resource programs
924	Administration of environmental programs
925	Community and housing program administration
926	Administration of economic programs
927	Space research and technology
928	National security and international affairs