



Summer 2012

Rick Snyder, Governor  
Department of Technology, Management & Budget  
Bureau of Labor Market Information & Strategic Initiatives  
[www.michigan.gov/lmi](http://www.michigan.gov/lmi)

# Michigan Economic and Workforce Indicators

## Preface

Michigan's unemployment rate has been trending down over the last year, due in part to job growth in manufacturing, health care, and professional and business services. Yet, segments of the Michigan workforce have struggled to take part in what has become a slow national economic recovery.

New college graduates, older workers, veterans, and even experienced workers with solid work histories have found that a job search often takes longer than ever before. Understanding the dynamics of today's labor market often requires an examination of the state's key economic indicators and basic labor market components.

This edition of the Michigan Economic and Workforce Indicators publication provides details behind the unemployment rate as well as recent trends in labor dynamics. In addition, it takes a look into the job market with particular focus on the auto industry, dimensioning the changes occurring with the economy and the labor force.

Also key to any recovery is the availability of a skilled labor force that is aligned with market demands. Today, a number of employers are looking to expand their workforce but are having trouble finding candidates with their specific skill requirements. Identifying skill needs as defined by employers for current and projected job opportunities is proving to be a major challenge and one the market is rethinking.

The global economy requires dynamic and expansive information systems to stay on top of the competitive environment. The Bureau of Labor Market Information and Strategic Initiatives is committed to providing the most current and insightful data and analysis to inform and benefit its users today and anticipate tomorrow's needs.

Richard Waclawek, Director  
Bureau of Labor Market Information & Strategic Initiatives  
Michigan Department of Technology Management and Budget

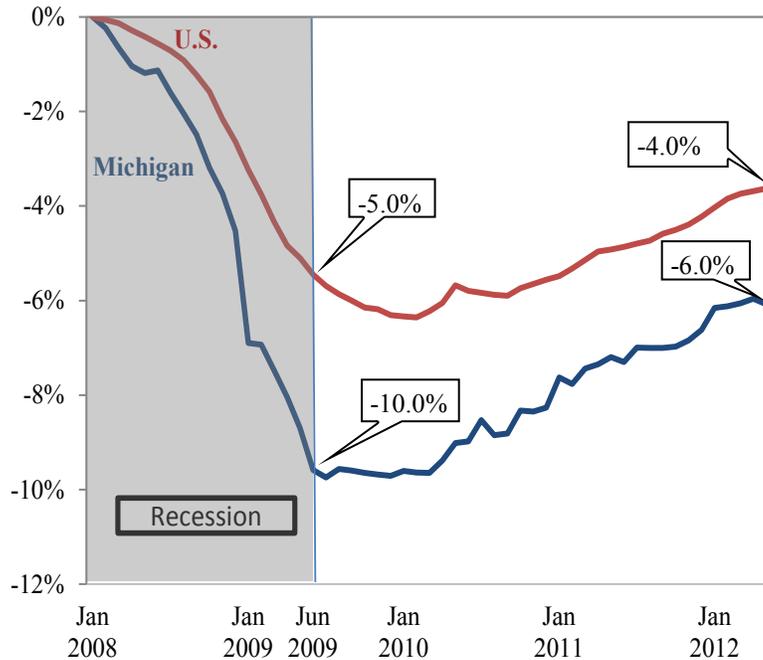
## **Table of Contents**

Preface	2
Michigan Job Trends	4
Payroll Jobs by Industry Sector	5
Unemployment Rate	6
Long-Term Unemployment	7
Alternative Measures of Labor Underutilization	8
Difficult to Fill Occupations	9
Per Capita Personal Income	9
STEM Degrees	10
Motor Vehicle Employment	11
In-Demand Occupations and Skills in Michigan's Auto Industry	12
Jobs in High-Tech Industries	13
Workforce Dynamics—QWI Overview	14
Business Employment Dynamics—Younger and Older Firms	15
Globalization Indicator: Export-Related Manufacturing Jobs	16
What's New From LMISI?	17
Appendix	18

# Michigan Job Trends

## Nonfarm Payroll Jobs

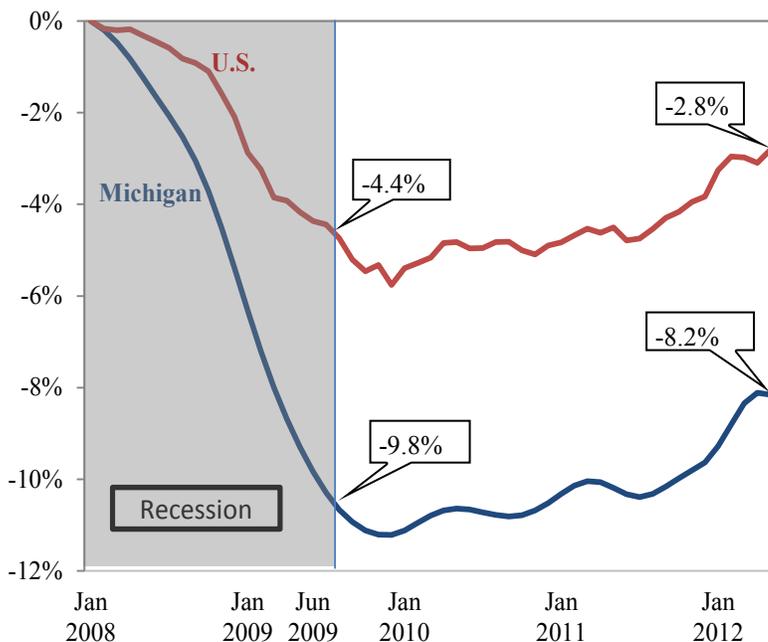
Michigan vs. U.S. Total Payroll Jobs  
(percent change since January 2008)



Source: U.S. Bureau of Labor Statistics / DTMB

## Household Employment

Michigan vs. U.S. Total Household Employment  
(percent change since January 2008)

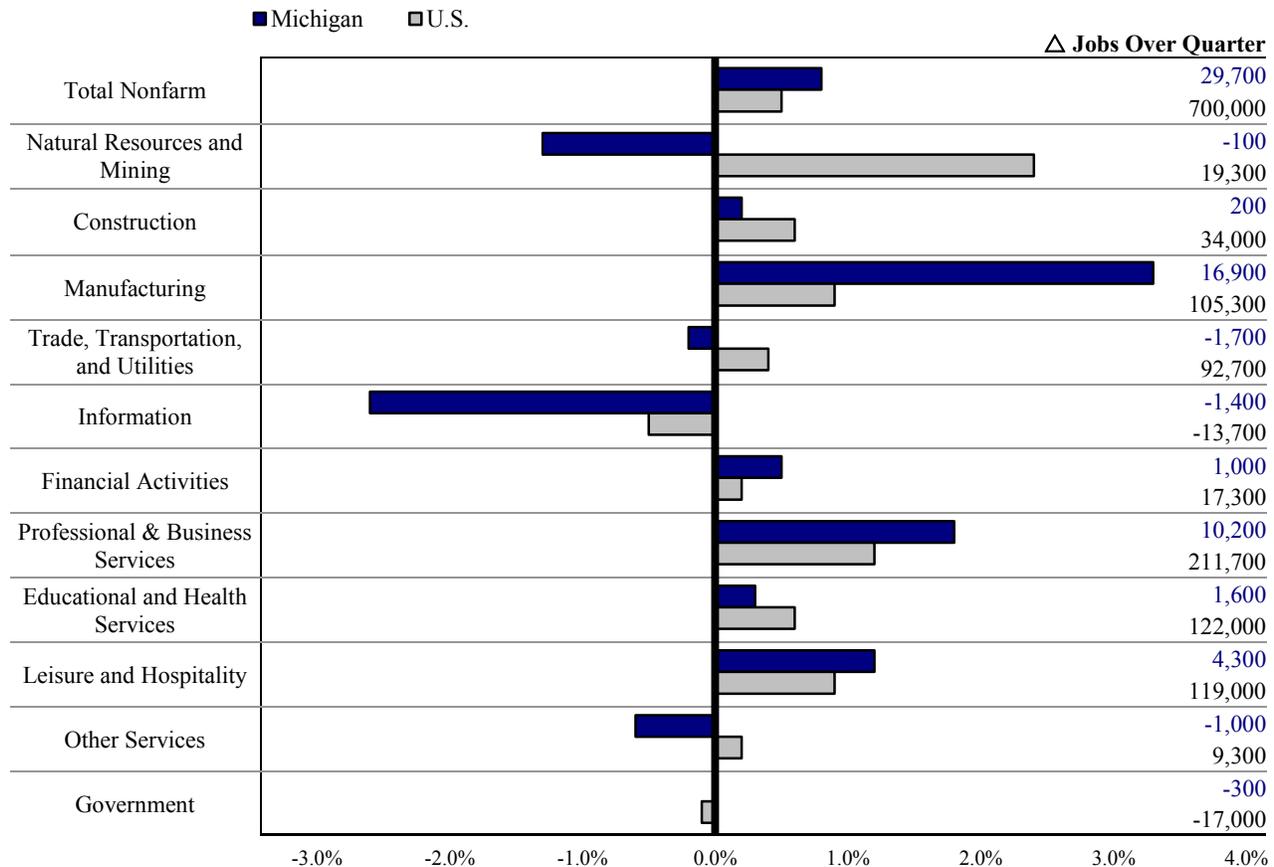


Source: U.S. Bureau of Labor Statistics / DTMB

- There are two government surveys that measure the state of the labor market: the *establishment survey* and the *household survey*. These surveys provide the most current information on trends in jobs and employment for Michigan and the nation.
- The *nonfarm payroll or establishment survey* measures the total number of jobs supplied by establishments in the state and its metro areas. This survey excludes the self-employed and agriculture.
- Michigan payroll jobs expanded by 23,000 through the first five months of 2012. This lags behind the pace of job creation set in 2011, when the state added 75,000 jobs over the twelve-month period.
- Michigan has recorded job gains for the last nine quarters as it begins to recover a modest share of the recessionary job losses, reclaiming over 150,000 positions since December 2009. Over the past year, payrolls have advanced by 47,500 positions.
- The U.S. continued to add jobs in May, but at a rate much slower than the accelerated speed of the 1st quarter of 2012. Payrolls in recent months have advanced, but at a more measured and cautious pace. Since May 2011, 1.8 million jobs have been added to the national economy.
- The *household survey* measures the number of Michigan residents who are employed. This survey is more comprehensive than the payroll survey, including all segments of employment including the self-employed.
- Michigan's total household employment hit a low point of 4,126,000 in December 2009, and then experienced very modest rates of expansion of less than a percent during 2010 and 2011.
- However, employment gains in Michigan over the past twelve months have been more substantial. From May 2011 to May 2012, total employment jumped by a significant 94,000 or 2.3 percent. Nationally, employment rose by over 2.4 million or 1.8 percent over this period.
- Since the end of the most recent national recession in June 2009, Michigan household employment has rebounded by 78,000 or nearly 2.0 percent. However, employment levels in Michigan remain over 700,000 below the peak levels reached in early 2000.
- The University of Michigan, Research Seminar in Quantitative Economics forecasts continued payroll job gains in Michigan of 57,000 during 2012 and 50,000 during 2013.

## Payroll Jobs by Industry Sector

Michigan vs. U.S.  
Percent change, 4th Quarter 2011 – 1st Quarter 2012  
(Seasonally Adjusted)

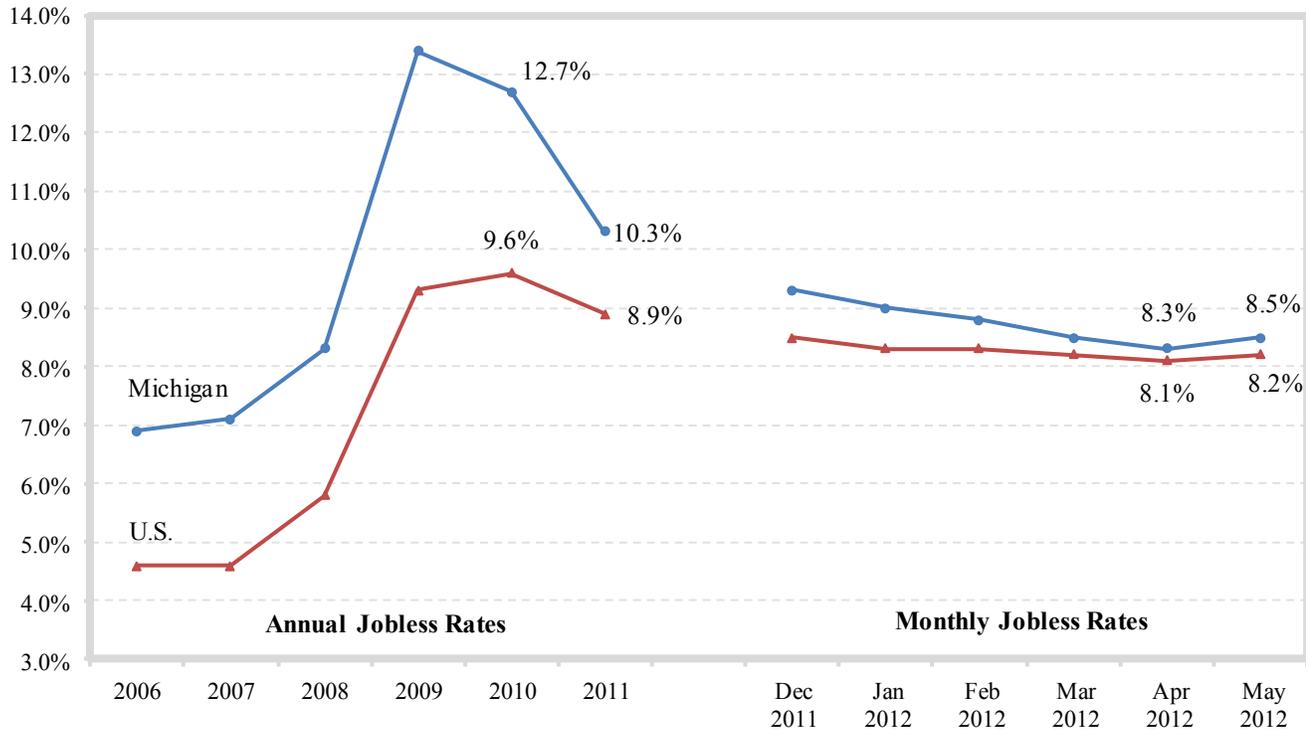


Source: U.S. Bureau of Labor Statistics / DTMB

- Over the past year (first quarter 2011 to first quarter 2012), the U.S. and Michigan recorded very similar rates of job gain. The nation added 2 million jobs (+1.5 percent) while Michigan payrolls advanced by nearly 64,000 (+1.6 percent). In the first quarter 2012, employment increased nationwide by 700,000 or 0.5 percent, while Michigan payrolls expanded by 29,700 positions or 0.8 percent.
- Private Sector payrolls in Michigan increased over the year (1st quarter 2011 to 1st quarter 2012) by 2.2 percent. Private service producing industries recorded a gain of 1.6 percent. Goods producing employment recorded a robust rise of 4.6 percent due mainly to job gains in *Manufacturing*. *Government* jobs continued to decrease (-1.4 percent). Nationally, private sector payrolls increased by 2.1 percent with private services employment advancing by 2.0 percent. Goods producing industries were up 2.3 percent (at half the Michigan rate) and *Government* employment remained sluggish (-1.0 percent).
- During the first quarter of 2012, Michigan managed to outpace the rate of national job gain, largely due to rapid job additions in the *Manufacturing* sector. *Manufacturing's* recent resurgence in Michigan, in fact, has led to ten consecutive quarters of employment growth. Nationally, the *Auto manufacturing* sector posted a gain of 1.9 percent during the first quarter 2012, while the Michigan rate of expansion was nearly three times as high at 5.6 percent.
- Nationally, *Professional and business services* employment increased by 1.2 percent (+205,300) during the 1st quarter 2012. Well over half of the upturn (+117,000) was in the *Administrative and waste services* sector, which also includes the temporary help industry. In Michigan, this industry also outperformed national trends, by adding 10,200 positions (+1.8 percent). Jobs in the *Education and health* sector nationally and locally rose by 0.6 and 0.3 percent, respectively.
- Michigan's 1st quarter job gain of 1.2 percent in *Leisure and hospitality* ended a string of job cuts for three consecutive quarters. Nationally, *Leisure and hospitality* recorded a first quarter job increase of 0.9 percent, which was the eighth consecutive quarterly advance posted for this sector.
- *Construction* jobs in the nation edged up by 0.6 percent in the 1st quarter 2012. *Construction* jobs in Michigan inched up in 2011, but have generally declined since 2004.

# Unemployment Rate

Average Annual & Monthly Jobless Rates, Michigan and U.S.



Source: U.S. Bureau of Labor Statistics / DTMB

- The Michigan jobless rate has recorded significant reductions since the most recent peak of 14.2 percent in August 2009. The rate has dropped by over 5 percentage points to the May 2012 rate of 8.5 percent.
- Michigan’s unemployment rate decline over the past year has also led the nation. The Michigan jobless rate fell by 2.1 percentage points from May 2011 to May 2012, ranking first along with Nevada among U.S. states.
- As recently as 2010, Michigan had the highest unemployment rate in the nation. As of May 2012, a total of 11 states had higher jobless rates than Michigan, and the state rate was just slightly above the national rate of 8.2 percent.
- Michigan’s jobless rate reduction over the past year is primarily due to significant job advances in key *Manufacturing* industries, such as *Metals, Machinery, and Auto manufacturing*. Other primary sources of recent job gains were *Business and technical services* and *Health care*.
- The state workforce, which has declined sharply in recent years due to out-migration from the state and reduced labor force participation, has shown signs of stabilizing. In fact, the state workforce has increased modestly thus far in each of the first five months of 2012.
- The gap between the U.S. and Michigan jobless rates has narrowed considerably in recent quarters, from 1.7 percentage points in early 2011 to just 0.6 percentage points in the 1st Quarter 2012.

Jobless Rates By Quarter

Month	Michigan	U.S.	Gap
January	9.0	8.3	0.7
February	8.8	8.3	0.5
March	8.5	8.2	0.3
<b>1st Quarter 2012</b>	<b>8.8</b>	<b>8.2</b>	<b>0.6</b>
October	9.9	8.9	1.0
November	9.6	8.7	0.9
December	9.3	8.5	0.8
<b>4th Quarter 2011</b>	<b>9.6</b>	<b>8.7</b>	<b>0.9</b>
January	10.9	9.1	1.8
February	10.7	9.0	1.7
March	10.5	8.9	1.6
<b>1st Quarter 2011</b>	<b>10.7</b>	<b>9.0</b>	<b>1.7</b>

Quarterly Rate Movements

	Michigan	U.S.
1st Quarter 2012 Average Rate	8.8	8.2
Change Since Prior Quarter	-0.8	-0.5
Change Since 1st Quarter 2011	-1.9	-0.8

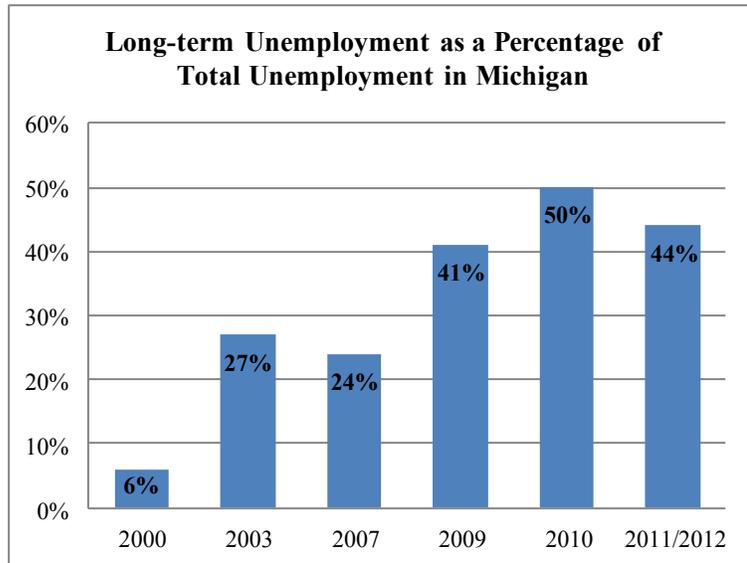
Source: U.S. Bureau of Labor Statistics / DTMB

## Long-Term Unemployment

Since the end of the recession in June 2009, the number of unemployed has fallen dramatically in Michigan as well as nationally. However the long-term unemployed as a share of total unemployment has risen to near historical highs, and remains a hallmark of the post-recession period. This chronic joblessness is a statewide and national issue which threatens the economic welfare of tens of thousands of families.

Long-term unemployment is generally considered six months or longer. The focus here will concentrate on those unemployed for over 27 weeks, and over 52 weeks. Long-term joblessness as a percentage of total unemployed reached its height in 2010, however remains stubbornly high in early 2012. The number of long-term unemployed individuals in Michigan currently stands at 204,000.

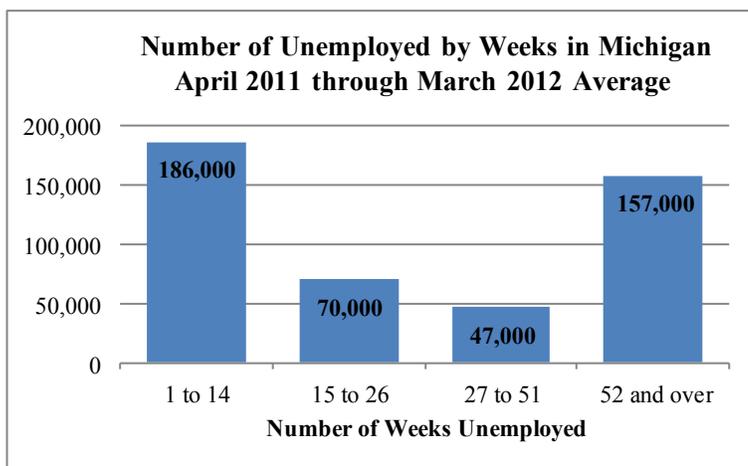
To be considered unemployed, an individual must be actively seeking employment on a monthly basis. Many not accounted for in this report have already left the labor force. Michigan’s labor force has been declining since 2001, and from 2007 to April 2012 the state’s seasonally adjusted workforce declined by 375,000 or 7.4 percent.



Source: DTMB, U.S. Bureau of Labor Statistics, Current Population Survey  
\*2011/2012 data reflects April 2011—March 2012

The official seasonally adjusted jobless rate in Michigan has dropped by nearly six full percentage points from the end of the recession to spring 2012. The U.S. rate has declined by around two percentage points over the same period.

- The number of unemployed in Michigan fell by nearly 300,000 or 43 percent since the trough of the recession, while nationally it declined by 20 percent over the same period.
- In 2000, a very robust year for the Michigan and U.S. labor markets, the long-term unemployed (27 weeks and over) as a percentage of total unemployment was six percent.
- In 2003, two years after the 2001 recession, Michigan long-term unemployment as a share of all unemployed remained very high at 27 percent.



Source: DTMB, U.S. Bureau of Labor Statistics, Current Population Survey

- By 2009, the height of the latest recession, the percentage of long-term unemployed soared to 41 percent, and continued to rise after the recession to 50 percent in 2010.
- The latest data available (the 2nd quarter 2011 through the 1st quarter 2012) show a slight reduction in the share of long-term unemployed, as 44 percent of the unemployed were out of work for 27 weeks or over. This is a remarkably high percentage considering that the national recession has been over for more than two and a half years. Currently, national data record a similar long-term unemployed share of 41 percent.
- Long-term unemployment impacts men and women relatively equally in Michigan, as the latest data shows both to be very close to the state average share of 44 percent of all unemployed.

- The number of residents in Michigan unemployed for more than a year also increased substantially from prior to the recent national recession to 2011-2012. In 2007, 14 percent of the unemployed were jobless for over 52 weeks. By the most recent twelve-month period through March 2012, this share had jumped to 34 percent. This means 157,000 Michigan residents were currently unemployed for a year or more.

## Alternative Measures of Labor Underutilization

The unemployment rate is one of the most widely-cited measures of labor markets and of economies in general. Yet, the official unemployment rate is sometimes criticized because it excludes some individuals; in particular, left out are those who have given up looking for work or those that are working part time for economic reasons. The Bureau of Labor Statistics addresses this issue, by publishing several “Alternative Measures of Labor Underutilization.” Included are measures that are both narrower and broader, depending on who is included and who is excluded in the definition.

The first two alternative measures paint a much *narrower* picture of the unemployment situation:

- The first measure (U-1) includes only people who have been unemployed fifteen weeks or longer. Because this measure does not count those who have been unemployed for up to fifteen weeks, it is markedly lower than the official unemployment rate.
- The second measure (U-2) counts only those who lost jobs or those who completed temporary jobs. Because this measure does not include people who have left their job voluntarily or others entering or reentering the labor force, it is lower than the official rate.

The third measure (U-3) is the official unemployment rate. To be counted under the official unemployment rate, an individual must not be working, must be actively seeking employment in the last four weeks, and must be willing, able, and available to work. (Note that receiving unemployment insurance benefits is not a factor in the calculation of the official unemployment rate.)

The next three alternative measures include additional workers in the definition and are therefore *broader* in scope.

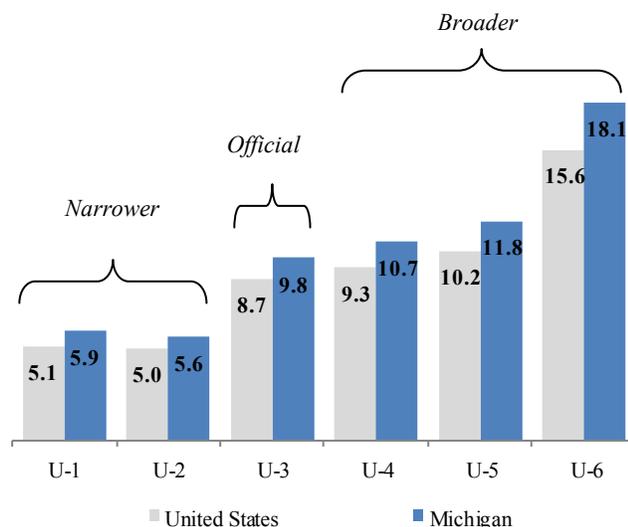
- The next measure (U-4) includes not only those who are officially unemployed but also “discouraged workers”. Someone is “discouraged” if they have looked for work in the last twelve months but not in the last four weeks due to the belief that there are no jobs available for them. Since 2010, this measure has ranged from 0.5 to 1.3 percentage points higher than the official unemployment rate.
- Like the U-4, the next measure (U-5) includes those who are unemployed and those who are discouraged, but it also includes those who are “marginally attached to the labor force.” Someone is “marginally attached to the labor force” if they have looked for work within the last year, but not within the last four weeks for any reason. This measure is also higher than the official unemployment rate. Since 2010, the U-5 has been between 1 to 3 percentage points above the official rate.
- The final measure (U-6) is much broader by adding “involuntary” part-time workers. Someone may be working part time “involuntarily” if their hours have been cut from full time or if they can only find part time work. In both cases, the individual wants to be working full time, but can only work part time. Because it includes so many more people, even employed workers, this measure can be dramatically higher than the official unemployment rate.

How do these alternative measures compare to the official unemployment rate today? The chart summarizes these alternative measures for Michigan and for the United States. As noted, the U-3 is the official unemployment rate. To the left of the U-3 are the narrower measures (U-1 and U-2) and to the right are the broader measures (U-4, U-5, and U-6). As discussed, the narrower measures produce lower rates and the broader measures result in rates of underutilization that are above the unemployment rate.

One of the more common criticisms of the official unemployment rate is the fact that it does not include individuals who have given up looking for work. For those interested in including these individuals, the broader U-4 and U-5 measures can be used. According to those alternative measures, the jobless rate would be higher by only 1 or 2 percentage points when including discouraged workers or marginally attached workers, respectively.

These measures are available quarterly, and can be obtained for all states from the Bureau of Labor Statistics website at [www.bls.gov/lau/stalt.htm](http://www.bls.gov/lau/stalt.htm).

**Alternative Measures of Labor Underutilization  
2011-2012 Moving Average**



Source: U.S. Bureau of Labor Statistics

## Difficult-to-Fill Occupations

- On average, about 6.4 percent of online job advertisements have been active for 90 days or longer. What occupations are responsible for generating the most long-running advertisements?
- Perhaps not surprisingly, *Healthcare* occupations have the largest share of ads that have been active for an extended period of time. Both *Healthcare practitioners and technical* occupations and *Healthcare support* occupations topped the list, with long-running ads comprising 15 percent and 10.8 percent of total ads, respectively.
- *Healthcare practitioners and technical* occupations with the most long-running ads include *Registered nurses*, *Physical therapists*, *Occupational therapists*, *Primary care physicians*, and *Speech and language pathologists*. Employers may be having difficulty filling these vacancies because each requires extensive training or even licensure, which depends on adequate education capacity.
- Among the *Healthcare support* occupations, *Occupational therapists assistants*, *Physical therapist assistants*, *Nursing aides*, and *Home health aides* appear to be the toughest positions to fill. Finding the properly trained candidate for these positions may be difficult, considering growing demand for workers and relatively high turnover.
- *Web developers*, *Computer systems analysts*, and *Computer software engineers* were among the detailed occupations causing the *Computer and mathematical* occupational category to generate a significant share of difficult to fill vacancies. Many of these vacancies go unfilled for extended periods due to a shortage of educated and experienced candidates, or due to specific skill expectations of employers.

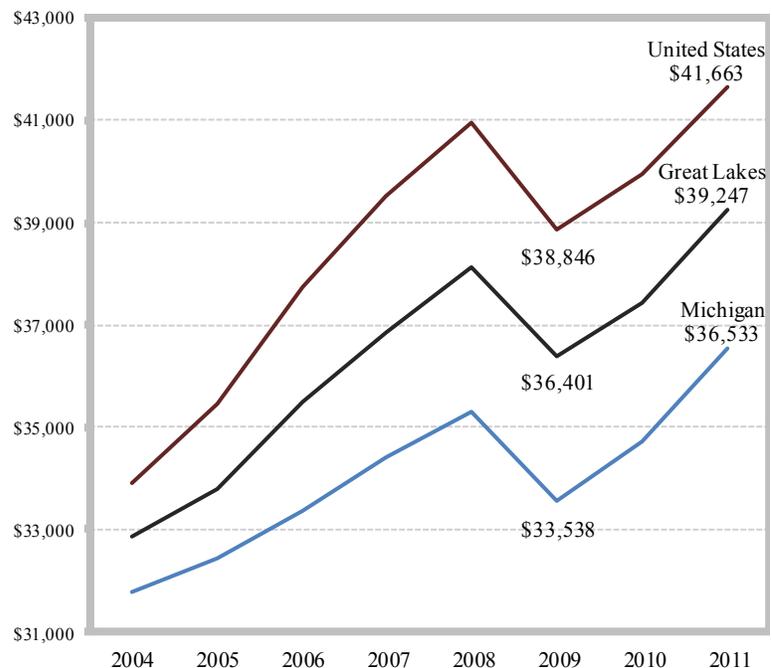
Occupational Category	Percent of Online Ads Active for >90 Days
Healthcare Practitioners and Technical	15.0%
Healthcare Support	10.8%
Transportation and Material Moving	7.8%
Computer and Mathematical	6.8%
Education, Training, and Library	6.6%
Management	6.5%
<b>Total</b>	<b>6.4%</b>
Architecture and Engineering	6.1%
Business and Financial Operations	5.6%
Production	5.5%
Community and Social Services	5.4%
Sales and Related	5.2%
Office and Administrative Support	4.7%
Legal	4.0%
Installation, Maintenance, and Repair	4.0%
Life, Physical, and Social Science	3.3%
Protective Service	2.7%
Personal Care and Service	2.5%
Food Preparation and Serving Related	1.4%
Construction and Extraction	1.2%

Source: Conference Board, Help Wanted Online / DTMB

## Per Capita Personal Income

- The state’s per capita personal income (PCPI) measured \$36,533 in 2011, up from \$34,714 in 2010. Despite this increase, Michigan’s per capita income remained in the bottom quartile of all states (38th overall). As recently as 2004, the state ranked near the middle of all states in per capita income.
- Michigan’s PCPI level rose by 5.2 percent between 2010 and 2011, the 5th best growth rate nationwide during this period. Population stagnation in the past year was partially responsible for the state’s high ranking in terms of PCPI gains in the most recent year, though income growth overall was still in the top third nationally.
- The gap between Michigan’s PCPI and the U.S. average increased steadily to a peak in 2008, where the national level was 16 percent higher. While the state remains well below the national average, the PCPI gap has slightly decreased each year since that time.
- Rebounds in the state’s manufacturing sector have contributed to the growth of personal income since 2010. Earnings growth in durable goods manufacturing in Michigan measured 10.7 percent, second only to the state of Washington (+11.2 percent).

Per Capita Personal Income, 2004 to 2011



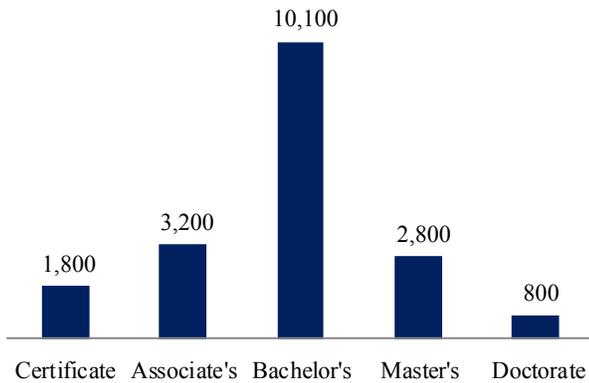
Source: U.S. Bureau of Economic Analysis, Regional Economic Information System

## Science, Technology, Engineering, and Math (STEM) Degrees

The number of individuals graduating with college degrees is one critical measure of the quality of the potential workforce. Identifying the number of graduates with degrees in the Science, Technology, Engineering, and Math (STEM) fields may be of particular importance, especially considering the projected employment demand for workers employing these degrees.

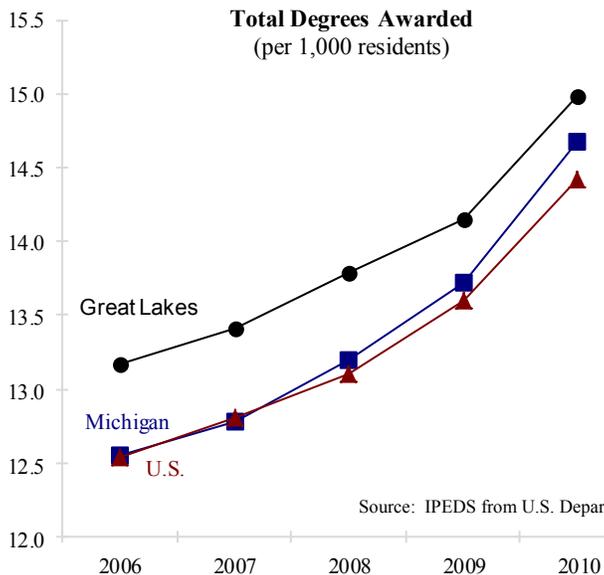
- In 2010, Michigan continued an upward trend, recording an increase in the number of post high school degrees and certificates conferred. Michigan remained 9<sup>th</sup> in the nation in total degrees granted, due in part to the relatively large number of educational institutions, which include 15 public universities, more than 50 private universities, and 28 community colleges.
- Michigan again ranked 7<sup>th</sup> in the United States in the number of Science, Technology, Engineering and Math degrees conferred with 18,600 in 2010. Of those, the majority of degree recipients graduated with an associate's (3,200), bachelor's (10,100), master's (2,800), or doctorate degree (800). The remaining graduates earned awards that required less than one or two years to complete. Due to a large year-over-year decline in engineering graduates, 2010 was the first annual decline in STEM degrees in the past five years. This is especially troublesome considering how vital engineering skills are to the Michigan economic environment.

Degrees in Science, Technology, Engineering, and Math by Type

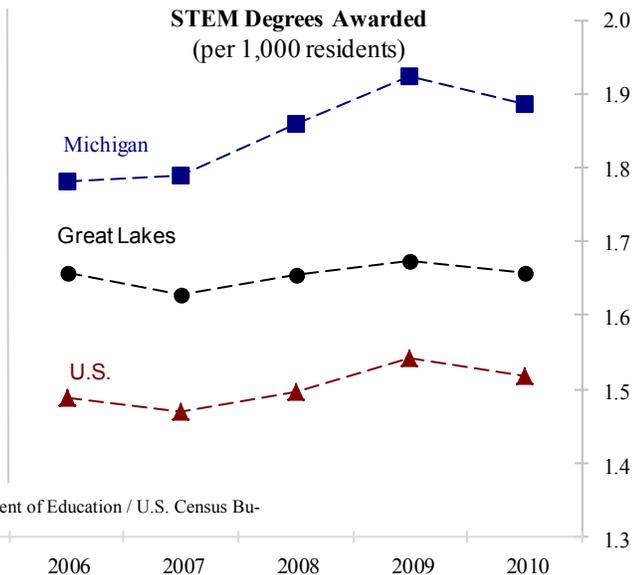


Source: IPEDS from U.S. Department of Education / U.S. Census Bureau

- In 2010, women received 60 percent of all post high school degrees but only 28 percent of STEM degrees. This confirms the frequently discussed fact that women are more likely than men to receive college certifications and degrees, yet are less likely than men to receive them in STEM programs.
- The most male-dominated fields included engineering and computer science. Biology, the only area of study with more female grads than male, accounted for nearly 40 percent of total female STEM graduates.
- Nonresident aliens are taking a disproportionate share of STEM degrees. In 2010, nonresident alien students took only 4 percent of the total degrees in the State of Michigan but were awarded nearly 12 percent of the STEM degrees.
- More than 56 percent of nonresident alien students graduating with a STEM degree took a degree in an engineering field. In addition, significant numbers of degrees were granted in the fields of computer science (16 percent) and biology (10.7 percent.)



Source: IPEDS from U.S. Department of Education / U.S. Census Bu-



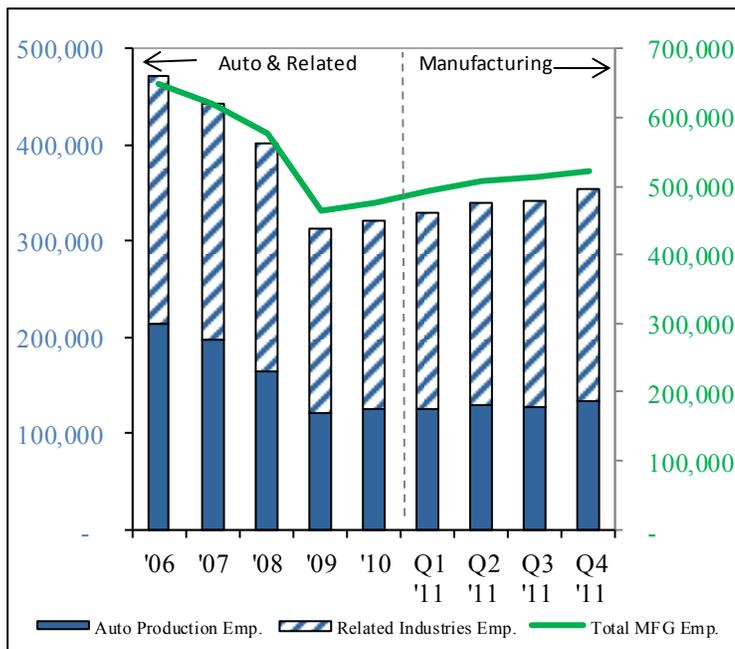
<sup>1</sup> In previous reports STEM was defined using 2000 CIP codes, this has been updated using 2010 CIPs. This definitional change has caused the data for past years to change slightly from our previous studies.

## Motor Vehicle Employment

In recent years, Michigan has made numerous headlines due to the downturn of the domestic auto industry. Recently, however, Michigan has made news for a different reason: the auto industry’s rebound. Indeed, the automobile industry has seen a resurgence. Jobs data is seeing strong growth, domestic sales are up, and automotive exports are on the rise, steadying profits and bringing wages back from their peak-recession lows.

Michigan remains the automotive capital of the world. And as goes the auto industry, so too goes Michigan’s manufacturing sector, and Michigan’s economy. The analysis that follows identifies some of the storylines that are driving the resurgence in this highly important business sector.

### Auto, Auto-Related, and Manufacturing Employment ('06-'11)



Source: DTMB, Quarterly Census of Employment and Wages

- More than 1 in 10 jobs in Michigan is engaged in automotive production or an auto-related industry. These industries have seen steady gains in employment since the mid-2009 lows, accounting for over 353,500 jobs by the 4th quarter of 2011. That is an increase of nearly 10 percent from a year ago.
- Automotive production, alone, accounted for about 134,000 of those jobs, and expanded its ranks by 9,400, or 7.5 percent, over the year. This core area of business consists of *Motor vehicle manufacturing*, *Motor vehicle body and trailer manufacturing*, and *Motor vehicle parts manufacturing*.
- The resurgence in automotive and auto-related industries led to widespread gains in the manufacturing sector at large, which added more than 47,000 jobs between 2010 and the 4th quarter of 2011. One out of five of those new jobs came in one of the core automotive production industries, strong evidence that Michigan’s automotive industry is a leading factor in the statewide recovery.

### Employment Trends in Key Auto-Related Industries

As discussed in more detail on the following page, automotive production industries employ workers with a diverse array of skills and experiences. An equally diverse network of auto-related industries feed into and support the state’s automotive sector.

- Michigan boasts 37,265 workers in the *Engineering services* industry, many of whom are mechanical, electrical, and systems engineers, who work on motor vehicle and parts design and production.
- *Testing labs* account for another 21,159 jobs in Michigan, many in support of the auto industry. Such labs conduct mechanical, acoustic, or vibration testing related to passenger vehicles.
- A number of manufacturing industries have long been a cornerstone of Michigan’s automotive industry, supplying necessary parts and equipment. These include machine shops and tool and die shops, both of which have enjoyed increased employment, of late, in conjunction with the resurgence in auto.

#### Michigan’s Top Auto-Related Industries

Industry	Employment 2011	Employment Change 2010 - 2011
Engineering Services	37,265	↑ 10.2%
Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	25,841	↑ 15.0%
Testing Laboratories	21,159	↑ 9.6%
R&D in the Physical, Engineering, and Life Sciences (except Biotechnology)	15,540	↑ 0.7%
Special Die and Tool, Die Set, Jig, and Fixture Mfg.	14,584	↑ 8.8%
Industrial Machinery and Equipment Merchant Wholesalers	12,495	↑ 5.4%
Motor Vehicle Supplies and New Parts Merchant Wholesalers	11,913	↑ 9.7%

Source: DTMB, Quarterly Census of Employment and Wages

## In-Demand Occupations and Skills in Michigan’s Auto Industry

It is important to recognize that as the auto industry enjoys its rebound, it is undergoing some fundamental changes. One such change involves the workforce. The days of high paying, lower skills jobs in the industry are over. What is now needed to sustain the resurgence in the auto industry, and manufacturing generally, is a highly-trained, well-educated workforce. According to **Bob Sherer**, Manufacturing Talent Director for the State of Michigan, “Manufacturers are demanding a different mix of occupations and more skills than they were in the past.” What are those occupations and skills? The tables below identify some of the occupations and skills that may be in high demand in the auto industry, as measured by the number of active online advertised job postings from the Conference Board’s Help Wanted Online data series.

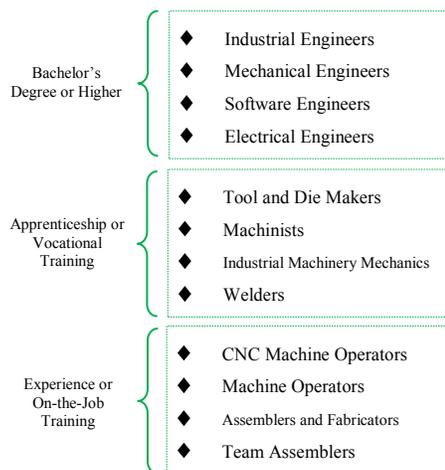
Occupations registering the most job vacancies in the auto industry are diverse, ranging from high-skill *Computer and mathematical* occupations to moderate-skill *Production* occupations.

- High-skill occupations are leading the auto industry in terms of ready-to-fill vacancies. For example, the majority of openings are for *Industrial engineers, Mechanical engineers, Software engineers, and Electrical engineers*.
- What about skilled trades positions? Occupations like *Tool and die makers, Machinists, and Industrial machinery mechanics* are seeing moderate online job demand. Others, like *Welders*, are recording fewer but still some vacancies.
- Finally, there was only sparse demand for lower-skilled occupations like *Assemblers and fabricators* and *Machine operators*.

These trends offer strong evidence that the auto industry is experiencing a shift away from a lower-skilled workforce toward a higher-skilled workforce.

According to forecasts from the Bureau of Labor Market Information and Strategic Initiatives, these trends are expected to continue. High-skilled occupations like *Engineers* are expected to see significant employment growth by 2020 while low-skill occupations will see little or no growth, but will continue to provide opportunities for *some* jobseekers as the industry replaces existing workers.

### In-Demand Occupations by Education/ Training in the Auto Industry



Source: Conference Board, Help Wanted Online

### In-Demand Tools, Technologies, and Certifications in the Auto Industry



Source: Conference Board, Help Wanted Online

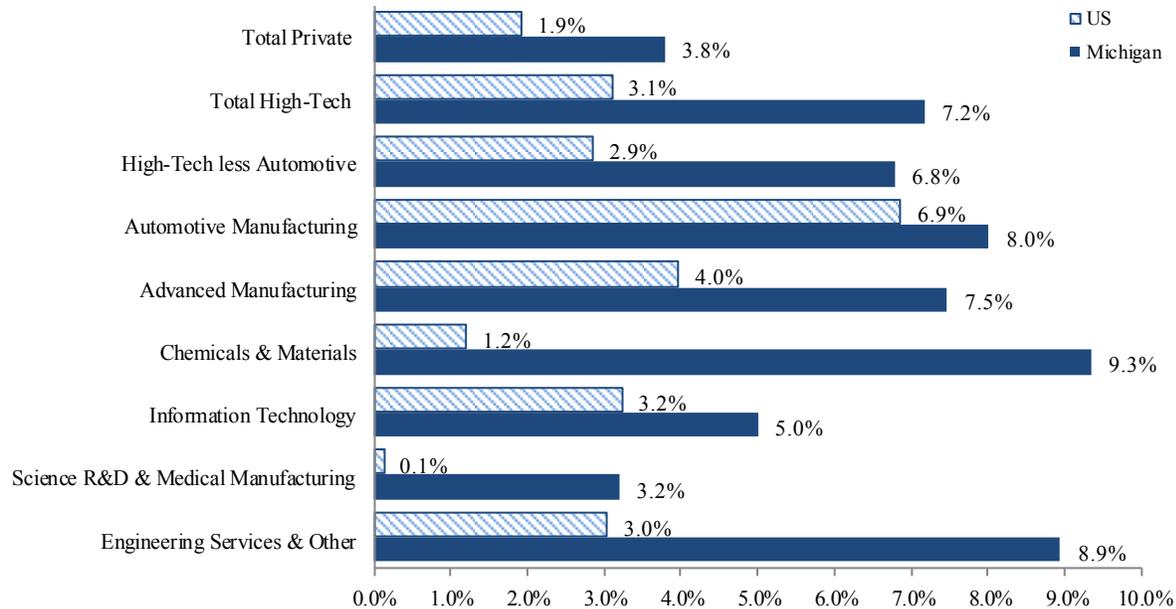
By analyzing what types of tools, technologies, and certifications employers are looking for from candidates, data on real-time job postings can identify some of the current “skills” that are needed in the auto industry.

- Tools, technologies, and certifications with the most demand are related to either quality, applications, management and strategy, or standards.
- Six Sigma and Failure Modes and Effects Analysis are tools and technologies focused on quality and eliminating defects in manufactured products and processes. Both are important for all levels in the manufacturing operations, but are especially important for engineers and managers.
- Most of the high demand certifications are also related to quality. For example, CQE, ASQ, ASE, and Six Sigma Black Belt are all certifications that focus on quality or excellence.
- Also in high demand are tools and technologies like AutoCAD (or proprietary equivalents) and MATLAB. These applications are important for engineers and other occupations that engineer, design, and machine automobiles and automobile parts.
- Demand for EPA Standards certifications reflects increased regulations and environmental standards facilitating the “greening” of the auto industry.

The mix of demanded tools, technologies, and certification in the auto industry confirms, yet again, that the industry has changed and will continue to change into one that demands highly-skilled workers.

## Jobs in High-Tech Industries

### Percent Change in Payroll Jobs 3rd Qtr. 2010 to 3rd Qtr. 2011



### Michigan Job Levels in High Tech Industries

Period	Total Private Jobs	Total High-Tech Jobs	High-Tech less Auto	Automotive Mfg.	Advanced Mfg.	Chemicals & Materials	Information Technology	Science R&D & Medical Mfg.	Engineering Services & Other
2010 3rd Qtr	3,219,800	392,200	267,000	125,200	43,700	15,500	77,500	37,100	93,200
2011 3rd Qtr	3,342,200	420,300	285,100	135,200	47,000	16,900	81,300	38,300	101,600
Change	122,400	28,100	18,100	10,000	3,300	1,400	3,800	1,200	8,400
Percent	3.8%	7.2%	6.8%	8.0%	7.5%	9.3%	5.0%	3.2%	8.9%

Source: DTMB, Quarterly Census of Employment and Wages

- Employment in high-tech industries continued its positive trajectory in the state, increasing by a notable 7.2 percent between 2010 and 2011. High-tech jobs in Michigan rose at double the national growth rate over this period. However, employment levels have not yet recovered to match pre-recessionary levels. Michigan's high-tech employment remains 13.6 percent below 2007 levels, while high-tech jobs in the nation were lower by 4.8 percent.
- High-tech jobs in Michigan increased by nearly 30,000 during 2011. The majority of the detailed industries in the high-tech field added jobs, with *Motor vehicle parts manufacturing* and *Architectural, engineering, and related services* providing the largest employment gains. These two industries alone accounted for nearly half of the total growth in high-tech. Six high-tech industry sectors did cut jobs in 2011, however job losses were minimal. Overall, the declining high-tech industries combined for a total reduction of only about 350 jobs.
- From 2010 to 2011, Michigan outperformed the nation as all six high-tech Michigan clusters recorded higher job growth rates. The gap between the state and national rates of expansion exceeded five percent for two high-tech clusters: *Chemicals & materials* and *Engineering services*. These two clusters also exhibited the fastest high-tech job gains in the state, 9.3 percent and 8.9 percent, respectively. Growth in *Chemicals & materials* provided jobs for production occupations, whereas various engineering and computer related positions benefited from the expanding *Engineering services* cluster.
- In the U.S., growth in *Automotive manufacturing* led all clusters as employment advanced by 6.9 percent. However, the national increase was still lower than the statewide gain of eight percent. A strong automotive sector is crucial to high-tech as many auto-related activities rely heavily on advanced technology. *Automotive manufacturing* has added a significant number of jobs over the past year, and many of the engineering and technical jobs in the industry are concentrated in Michigan.
- The high-tech job growth rate (+7.2 percent) nearly doubled the rate of gain for all private jobs in Michigan (+3.8 percent). Some of the state's leading growth industries, such as *Information technology*, *Engineering services*, and *Manufacturing* produce large numbers of high-tech jobs.

## Workforce Dynamics—QWI Overview

The Local Employment Dynamics (LED) program is the result of a partnership between the Bureau of Labor Market Information and Strategic Initiatives and the U.S. Census Bureau. By combining the state's quarterly worker and business wage records with existing business and household data, the Census Bureau is able to produce new information about our local economies. Census makes these data available to the public through eight Quarterly Workforce Indicators (QWI), which can be analyzed, over time, in terms of geography, industry, age, gender, education, and race or ethnicity. Here's a brief overview of the main QWI. In later editions, we'll continue to take a closer look at the underlying dynamics driving some of these measures.

- **Employment** - Total number of workers who were employed by the same employer in both the current and previous quarter. This serves as LED's most general measure of labor market performance.
- **Net Job Flow** - The difference between current and previous employment at each business. This can show which areas of the economy are expanding, and which are contracting.
- **Job Creation** - The number of new jobs that are created by either new area businesses or the expansion of employment by existing firms. This is helpful for determining what industries are creating the most jobs.
- **New Hires** - Total number of workers who were new hires by the employer in the last quarter and are full-quarter employed in the current quarter. This reveals what industries are doing the most hiring, the age and education demographics of those being hired, and what geographic areas are doing the most hiring.
- **Separations** - The total number of workers who were employed by a business in a given quarter, but not in the subsequent quarter. This is important for understanding what types of workers are leaving their jobs, and what industries workers are leaving.
- **Turnover** - The average of new hires and separations as a share of stable employment. This can be interpreted as the rate at which employers are gaining or losing employees. High turnover may be harmful to a firm or industry's productivity if experienced workers leave, and a high share of new workers predominate.
- **Average Monthly Earnings** - Total earnings for full-quarter employees, on a monthly average basis. This measure is helpful for understanding the average earnings of core employees in an industry.
- **Average New Hire Earnings** - Total earnings for full-quarter, newly hired employees, on a monthly average basis. This reveals the wage differences for new hires across industries, and can signify increased or decreased demand for certain workers.

The table below offers a summary of the most recent QWI data, and a brief look at how these metrics have been performing over time.

2011 Quarterly Workforce Indicators

QWI	Avg of Previous 4 Quarters	Most Recent Quarter (2011)	5 Year Trend
Employment	3,747,330	3,779,934	
Net Job Flow	13,288	625	
Job Creation	204,348	179,302	
New Hires	484,966	535,668	
Separations	600,283	491,646	
Turnover	8.7%	8.2%	
Avg. Monthly Earnings	\$3,791	\$3,748	
Avg. New Hire Earnings	\$2,166	\$1,940	

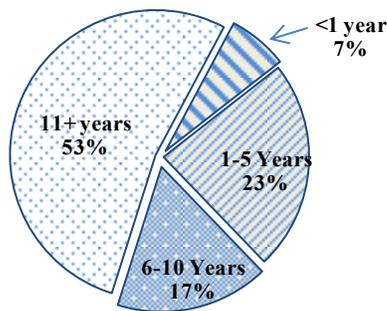
Source: U.S. Census Bureau / DTMB

## Role of Younger and Older Establishments in the State's Labor Market

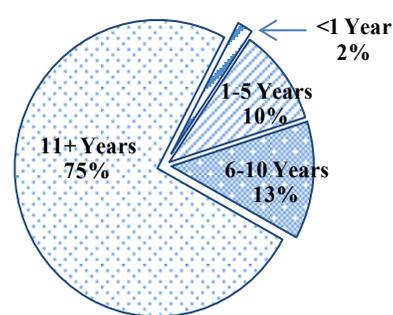
The debate on the role of small versus large size firms as job creators has recently shifted to the role of younger versus older firms. This discussion is facilitated by the new Business Employment Dynamics (BED) data (released by the Bureau of Labor Statistics, BLS) which measures employment and business survival rates by establishment age. This data is recorded at the private sector establishment level and provides information on firm age and survival rates from March of each year. The age of an establishment is determined by its date of first positive employment. BLS defines an opening as any establishment that did not have employees in the previous quarter. Research using this data shows that though new establishments start small, if successful, they expand employment with maturity. Research has also shown that younger firms are subject to more volatility as they have higher rates of job creation and destruction. This indicator examines the age composition of establishments in Michigan, average employment in the age groups and rates of survivability, and employment retention.

### Establishment Age Composition and Employment in MI -March 2011

Percent of private sector establishments by age



Percent of total employment by establishment age

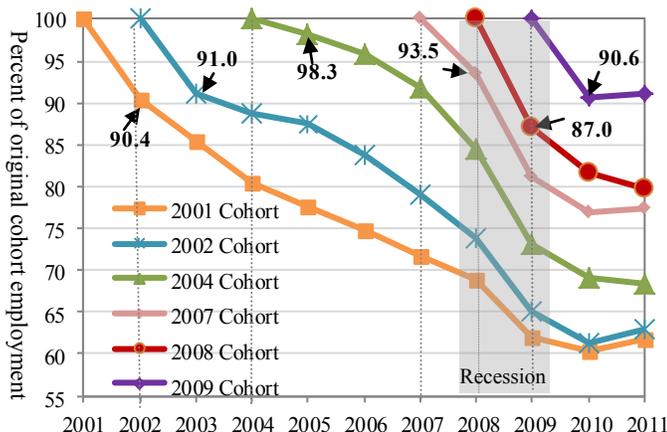


- In 2011, Michigan had a larger share of older establishments than the U.S., and those firms had a higher average job level.
- In March 2011 establishments that were 5 years and younger accounted for 30 percent of total private sector establishments with 12 percent of employment. Nationally, these firms accounted for 34 percent of establishments and 15 percent of employment. The age group of 6 years and older accounted for 70 percent of establishments and 88 percent of employment in Michigan, slightly greater than the nation.
- Between March 2007 and March 2011, new establishment openings in Michigan dropped by 24 percent with an employment decline of 30 percent. Nationally, new openings fell by 18 percent with a reduction of 27 percent in employment.

	MI		U.S.	
	Mar-07	Mar-11	Mar-07	Mar-11
<1 year	5.1	4.7	5.3	4.7
1-5 Years	10.0	8.0	9.1	7.7
6-10 Years	15.8	13.3	14.8	12.4
11+ years	25.7	25.0	24.3	23.0

- The table above shows that as firms age, average employment increases. It also shows the drop in average employment in all age groups between March 2007 and March 2011 for both Michigan and the U.S.

### Employment Retention and Survival Rates of Cohorts: March-2001 to March-2011



The availability of BED data allows us to follow employment retention and survival rates of establishments that opened in a given year (known as cohorts):

- **Employment Retention** - The chart shows the percent of the original employment retained by selected cohorts (March 2001-March 2009) over the years. The numbers mark the one year retention rate of employment. Notice that employment in establishments that opened in 2004 held at 98.3 percent compared to the March 2008 cohort that kept only 87.0 percent of its original employment in the first year after opening. Employment dropped sharply for all the cohorts during the recession.
- **Survival** - The average one year survival rate of establishments for the 2001 to 2010 cohorts was 76 percent. The 2004 cohort had a survival rate of 78 percent compared to 72 percent for the establishments that opened in 2008. In 2010 (latest data), the one year survival rate had gone up to 78 percent with the surviving firms actually adding employment, (up 6.3 percent), for the first time since March 1997.

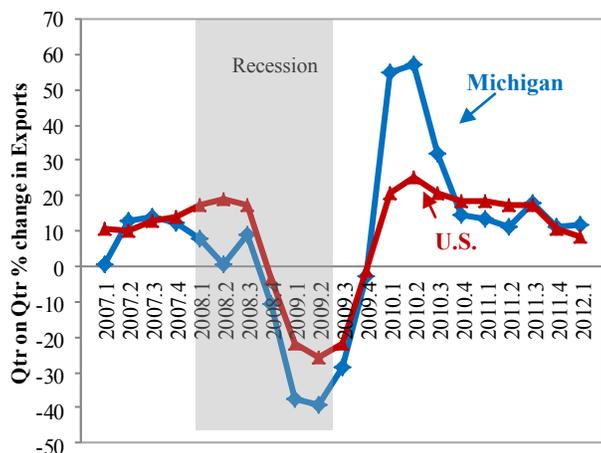
Source: U.S. Bureau of Labor Statistics / DTMB

## Globalization Indicator: Export Related Manufacturing Jobs

Along with domestic demand, foreign demand for goods has a major impact on jobs and economic activity. Exports help stabilize production and employment when there are fluctuations in the domestic economy and consumer demand is weak. However, they can also perpetuate a steeper decline in economic activity and jobs when the recession is global as witnessed in 2008-2009. In this indicator we analyze the recently released export related employment (XRE) data for 2009 to help us identify which of our exports have a larger percent of export related employment. We then look at the countries that are creating the demand for these exports. This information can help businesses diversify their market base and become competitive in the global economy.

### Michigan Merchandise Export Growth in Current Value (2007Q1—2012Q1)

**Michigan & U.S. Exports: Recession & Recovery**  
Percent Change (Same Quarter, Prior Year)



Source: WISER Trade

- Michigan’s shipments of merchandise exports totaled \$50.8 billion in 2011, ranking second among the Great Lakes states (after Illinois) and eight nationwide.
- Michigan recorded a higher rate of export growth (+12 percent) compared to the U.S. (+9 percent) in the first quarter 2012 (year to date) compared to the same period of 2011.
- In 2009, Michigan had 11,210 companies exporting (up 12 percent from 2005) with 91 percent (10,169 companies) of them in the small and medium size business sector (less than 500 employees). This sector accounted for 18 percent of total merchandise exports (compared to 13 percent in 2005).
- The chart shows the percentage change in exports (same quarter, over the year). The decline in exports due to the Great Recession and auto related bankruptcies followed by the subsequent recovery were both more pronounced in Michigan than the U.S. Michigan’s transportation equipment manufacturing exports, which were 52 percent of the total value of exports in 2007, fell to 43 percent in 2009 and have rebounded to 51 percent in 2012.

### Export Related Employment (XRE) Industry Breakdown - 2009(p) Survey

- Michigan had a higher share of private sector jobs related to manufactured exports than the U.S. (6.4 percent compared to 4.8 percent nationally). More than a quarter of Michigan manufacturing jobs (26.9 percent) are export related compared to one in every 5 manufacturing jobs nationally (22 percent). Michigan ranked 5th (tying with Ohio) in percentage of Manufacturing employment from exports.
- Column 3 & 4 of the table show that in 6 out of the top 10 manufacturing industries Michigan had a larger share of export related jobs than the U.S.
- Columns 1 & 2 compare the rate of recession-related job declines by manufacturing sector in total jobs versus export related jobs. Though employment fell in all industries, in 6 of the 10 industries the XRE decline was at a smaller rate than the drop in total employment.

1		2		Michigan's Top 10 Manufacturing Industries (XRE as percent of Industry Employment)	3		4	
2008 - 2009(p)		% change in			2009(p)			
Total Emp.	XRE				XRE as a % of Industry Emp.		MI	U.S.
-19.6	-22.2			<b>Total Manufacturing</b>	<b>26.9</b>	<b>21.9</b>		
<b>-18.8</b>	<b>-13.5</b>			Primary metals	<b>71.1</b>	<b>46.5</b>		
-15.9	-20.0			Nonmetallic mineral products	<b>34.0</b>	<b>10.8</b>		
<b>-26.2</b>	<b>-20.5</b>			Fabricated metal products	<b>32.7</b>	<b>22.1</b>		
-22.7	-29.0			Transportation equipment	29.2	32.0		
-2.6	-13.8			Chemicals	28.5	28.5		
<b>-27.2</b>	<b>-24.8</b>			Plastics and rubber products	<b>26.9</b>	<b>18.8</b>		
-10.1	-27.6			Computers and electronic products	26.3	33.9		
-24.0	<b>-4.8</b>			Elec. equip, appliances, and components	<b>26.3</b>	<b>26.1</b>		
<b>-21.9</b>	<b>-21.8</b>			Machinery	26.1	32.7		
<b>-8.8</b>	<b>0.0</b>			Paper	<b>21.1</b>	<b>16.2</b>		

Source: U.S. Census Bureau, International Trade Administration; (p) preliminary data for 2009

### Who is Buying our Manufactured Exports?

- Michigan’s manufactured products make their way around the world. Identifying which countries buy our products is important, especially considering the tens of thousands of Michigan jobs that depend on foreign trade. With 71 percent of primary metals jobs coming from exports, Michigan’s exports in this sector go chiefly to Canada, but significant production is also bought by China, Mexico, Japan, Germany, and Korea. Similar trends were seen for nonmetallic mineral products, another important export industry for Michigan. The most nonmetallic minerals were exported to Germany, Canada, Korea, Mexico, and China, in that order.
- The automotive industry is critical to Michigan. Which countries are buying our motor vehicles and motor vehicle parts? Due to NAFTA and geographical considerations, the majority of these products are exported to Canada and Mexico. Saudi Arabia, China, and Germany round out the top 5 importers of Michigan’s transportation equipment. Other countries buying significant volumes of transportation equipment include Australia, United Arab Emirates, Venezuela, and Singapore.

## **What's New from LMISI?**

Find these and other articles at:  
[www.michigan.gov/lmi](http://www.michigan.gov/lmi)

### ***Business Employment Dynamics Highlights***

Aneesa I. Rashid

This monthly report analyzes Business Employment Dynamics, a data set generated from the Quarterly Census of Employment and Wages, which sheds light on dynamic job change in Michigan due to business expansions, contractions, openings, and closings.

### ***Michigan's Online Job Demand Monthly Analysis***

Jeff Anderson

This monthly report looks at online job advertisements in Michigan using the Conference Board's Help Wanted Online data series. This report discusses short-term and long-term trends in online vacancies as well as occupational demand for workers.

### ***Michigan's Labor Market News***

A monthly newsletter that presents information on labor force and industry job trends for Michigan and its major regions, as well as short articles on employment-related topics.

### ***Michigan's Hot 50 Jobs***

This publication highlights favorable long-term Michigan careers with high growth potential, solid numbers of annual job openings, and good wages, broken down by educational requirement.

### ***LMI Dashboard***

Jacob Bisel

Updated monthly, the LMI Dashboard provides an overview of workforce & economic trends, serving as an at-a-glance look at the labor market and economic situation in Michigan. User-customizable by geography.

### ***Unemployment Insurance Recipients and the Official Unemployment Rate: Why the Numbers Are Different***

Jim Rhein

One of the most common misperceptions of the unemployment rate is the belief that it is simply a representation of the number of people who are receiving state unemployment insurance benefits. This article addresses that misperception.



## Appendix

### College Graduates / Tech Degrees

<b>Science, Technology, Engineering and Math (STEM) Degrees - CIP Codes</b>		
Computer Science	11.xxxx	(Except 11.06xx)
Engineering	14.xxxx	
Engineering Technology	15.xxxx	
Biological and Medical Science	26.xxxx	
Mathematics and Statistics	27.xxxx	
Military Technology	29.0101	
Physical Science	40.xxxx	
Science Technology	41.xxxx	
Health Professions and Related Clinical Sciences	51.1401	
Actuarial Science	52.1304	

Source: The National Center for Education Statistics / Classification of Instructional Programs (CIP)  
 Note: Definition excludes CIP codes designated as “all other.”

### Jobs in High-Tech Industries

<b>High-Tech Industries:</b>			
NAICS Code	2007 NAICS U.S. Title	NAICS Code	2007 NAICS U.S. Title
<b>Automotive Manufacturing Cluster</b>		<b>Information Technology Cluster</b>	
3361	Motor Vehicle Manufacturing	3341	Computer and Peripheral Equipment Manufacturing
3362	Motor Vehicle Body and Trailer Manufacturing	3342	Communications Equipment Manufacturing
3363	Motor Vehicle Parts Manufacturing	3343	Audio and Video Equipment Manufacturing
<b>Advanced Manufacturing Cluster</b>		3344	Semiconductor and Other Electronic Component Manufacturing
3329	Other Fabricated Metal Manufacturing	3346	Manufacturing and Reproducing Magnetic and Optical Media
3331	Agriculture, Construction and Mining Machinery Manufacturing	5112	Software Publishers
3333	Commercial and Service Industry Machine Manufacturing	5171	Wired Telecommunication Carriers
3336	Engine, Turbine and Power Transmission Equipment Manufacturing	5172	Wireless Telecommunication Carriers (Except Satellite)
3339	Other General Purpose Machinery Manufacturing	5174	Satellite Telecommunications
3345	Navigational, Measuring, Electromedical, Control Instrument Manufacturing	5179	Other Telecommunications
3353	Electrical Equipment Manufacturing	5182	Data Processing, Hosting, and Related Services
3359	Other Electrical Equipment and Compound Manufacturing	51913	Internet Publishing and Broadcasting and Web Search Portals
3364	Aerospace Product and Parts Manufacturing	5415	Computer Systems Design and Related Services
3369	Other Transportation Equipment Manufacturing	<b>Science R&amp;D &amp; Medical Manufacturing Cluster</b>	
<b>Chemicals &amp; Materials Cluster</b>		3254	Pharmaceutical and Medicine Manufacturing
3241	Petroleum and Coal Products Manufacturing	3391	Medical Equipment and Supplies Manufacturing
3251	Basic Chemical Manufacturing	5417	Science R & D Services
3253	Pesticide, Fertilizer and Other Ag Chemical Manufacturing	<b>Engineering Services &amp; Other Cluster</b>	
3255	Paint, Coating and Adhesive Manufacturing	4234	Professional and Commercial Equipment & Supplies Merchant Wholesalers
3256	Soap, Cleaners and Toilet Preparation Manufacturing	5413	Architectural, Engineering and Related Services
3259	Other Chemical Product and Preparation Manufacturing	5416	Management, Scientific, and Technical Consulting Services

Source: Michigan Bureau of Labor Market Information and Strategic Initiatives

## Motor Vehicle Indicators

Automotive Manufacturing and Related Industries			
NAICS Code	2012 NAICS U.S. Title	NAICS Code	2012 NAICS U.S. Title
326121	Unlaminated Plastics Profile Shape Manufacturing	335911	* Storage Battery Manufacturing
326199	All Other Plastics Product Manufacturing	3361	Motor Vehicle Manufacturing
326211	Tire Manufacturing (except Retreading)	3362	Motor Vehicle Body and Trailer Manufacturing
326220	* Rubber and Plastics Hoses and Belting Manufacturing	3363	Motor Vehicle Parts Manufacturing
326291	Rubber Product Manufacturing for Mechanical Use	336992	Military Armored Vehicle, Tank, and Tank Component Manufacturing
327211	Flat Glass Manufacturing	423110	Automobile and Other Motor Vehicle Merchant Wholesalers
331111	Iron and Steel Mills	423120	Motor Vehicle Supplies and New Parts Merchant Wholesalers
331511	Iron Foundries	423130	Tire and Tube Merchant Wholesalers
332510	* Hardware Manufacturing	423830	Industrial Machinery and Equipment Merchant Wholesalers
3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	425110	* Business to Business Electronic Markets
333511	Industrial Mold Manufacturing	425120	* Wholesale Trade Agents and Brokers
333514	Special Die and Tool, Die Set, Jig, and Fixture Manufacturing	541330	Engineering Services
333515	Cutting Tool and Machine Tool Accessory Manufacturing	541380	Testing Laboratories
333618	Other Engine Equipment Manufacturing	541712	** Research & Dev't in Physical, Engineering, and Life Sciences (except Biotech)
334514	* Totalizing Fluid Meter & Counting Device Manufacturing	55111	* Management of Companies and Enterprises
335110	* Electric Lamp Bulb and Part Manufacturing		

Notes: \* partial  
 \*\* estimated

Source: DTMB, with assistance from the Center for Automotive Research



### Great Lakes States

Illinois

Indiana

Michigan

Ohio

Wisconsin

Source: DTMB

**Bureau of Labor Market Information & Strategic Initiatives**

Cadillac Place

3032 West Grand Blvd. Suite 9-100

Detroit MI 48202

Phone: (313) 456-3100

Fax: (313) 456-3150

***[www.michigan.gov/lmi](http://www.michigan.gov/lmi)***

This report was prepared by the staff of the Bureau of Labor Market Information & Strategic Initiatives of the Department of Technology Management and Budget.

Substantial contributions were made by:

Rhea Acuna  
Jeffrey Anderson  
James Astalos  
Jacob Bisel  
Robert Hayes  
Jason Palmer  
Pinkie Parker  
Aneesa I. Rashid  
Mark Reffitt  
Jim Rhein  
Rick Waclawek  
Bruce Weaver  
Michael Williams



DTMB is an equal opportunity employer/program. Auxiliary aids, services and other reasonable accommodations are available upon request to individuals with disabilities.