Metropolitan Michigan Knowledge Economy Indicators

Michigan State University Community and Economic Development Program

June 2005

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FOREWORD

The Michigan State University Community and Economic Development Program (MSU-CEDP), host of MSU's Economic Development Administration University Center program, has over 30 years of experience in addressing the economic problems of communities throughout Michigan. Strong private, state and local partnerships have been developed over these years, having resulted in the collaborative identification of needs, and implementation of strategies. These partnership strategies have enabled the MSU-CEDP EDA University Center to build the capacity of organizations throughout the state. Through research, technical assistance, and education, the MSU-CEDP EDA University Center assists in developing innovative strategies that are effective in overcoming the barriers to higher-skilled higher-wage jobs, developing successful local economic development strategies which result in the creation of new businesses or jobs in their communities.

The MSU-CEDP EDA University Center seeks to improve the capacity of local economic development agencies and public and private organizations to promote favorable economic conditions. This is accomplished through the cultivation and channeling of resources available through a variety of colleges, departments, and programs at the university. The objectives include targeted technical assistance, training, public policy development for economic development, further applied research, outreach, and dissemination of information.

This research project is the result of the talents of many individuals who have contributed to this work. Contributors to data collection, analysis and presentation include several colleagues from Michigan State University including Eric Frederick, Alexander Jung, Dr. Jongyeul Moon, Seth Shpargel, Karan Singh, and Olatunbosun Williams. We would also like to thank Mary Cotton, Jennifer Patterson, and Kassandra Ray-Smith for their assistance.

Special thanks are due to our research team colleagues Dr. Kenneth E. Corey and Dr. Mark Wilson for their guidance throughout the conception and implementation of this research project.

While several individuals contributed to this concept, the product presented in the following pages is the direct effort of the following key authors: Dr. Rex LaMore, Jimish Gandhi, John Melcher, Faron Supanich-Goldner, and Kyle Wilkes.

This research was in part conducted pursuant to the receipt of financial assistance from the U.S. Department of Commerce, Economic Development Administration. The statements, findings, conclusions, recommendation and other data are solely those of the authors and publishers, and do not necessarily reflect the views of the government or the University.

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INTRODUCTION

The transformation from an industrial to a knowledge-based economy at the close of the twentieth century has been well documented by scholars of planning and economics.[1] Cities and their metropolitan areas are critical to this transition to an economy based on knowledge. A knowledge-based economy is strongly linked to the creation of highly-skilled, well-paying jobs. The knowledge economy affects existing enterprises, while also offering opportunities for new and emerging enterprises to offer new products and services. In Michigan in 2000 the average knowledge economy wage (selected occupations of education/training, computers, life and social science occupation, architects, engineers, and management occupations) was approximately $61,000 per year, while the average wage in Michigan for all occupations is just over $37,000 per year.[2] Workers in knowledge-based jobs earned approximately $25,000 per year more in wages.

The ability of communities and individuals to apply new ideas and technologies for future success in the globally competitive economy depends on creativity, innovation, and adaptability at every level. While some communities are prepared to help their citizens benefit from the opportunities presented by the new paradigm, many are ill-equipped to move forward in the knowledge economy, leaving them vulnerable to economic decline. Research conducted by the MSU-CEDP has revealed that, despite the importance of developing metropolitan community and economic development strategies, planning for the knowledge economy is limited. A recent study of the key organizations responsible for economic development planning in Michigan found that these organizations were not fully aware of the opportunities in the knowledge economy, nor the preparation required for their communities to thrive in such an environment.[3] Furthermore, planning for the information and communications technology infrastructure, workforce development, regional predictors of private sector technology investments, and other predictors of competitiveness in the knowledge economy, were not found to be incorporated into the traditional economic development planning that occurs at the local and regional level.

The *Michigan Metropolitan Indicators* report is intended to assist Michigan communities to identify their position in the knowledge economy and facilitate the development of effective local economic development strategies. The methodology used in this analysis parallels similar research conducted on the national level by Robert D. Atkinson, et. al., of the Progressive Policy Institute (PPI) Technology & New Economy Project. In their pioneering work, The State New Economy Index,[4] PPI provided a state by state comparison of knowledge economy indicators.

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1. See, for example, David B. Audretsch, Barry Bozeman, Kathryn L. Combs, et al. 2002, "The economics of science and technology," in *Journal of Technology Transfer* 27(2): 155-203; David B. Audretsch and A. Roy Thurik, 2001, "What's new about the new economy? Sources of growth in the managed and entrepreneurial economies," in *Industrial and Corporate Change* 10(1): 267-315; and Edward E. Leamer and Michael Storper 2001, "The economic geography of the internet age," in *Journal of International Business Studies* 32(4): 641-665.

2. Michigan Labor Market Information. Service of the Michigan Department of Labor and Economic Growth, Bureau of Labor Market Information & Strategic Initiatives. Online at www.michlmi.org.

3. Kenneth E. Corey. 2002. *Survey of planners.* Unpublished report available from Michigan State University Community and Economic Development Program, 1801 W. Main St., Lansing, MI 48915.

4. Robert D. Atkinson, Randolph H. Court, and Joseph M. Ward. July 1999. *The 1999 State New Economy Index: Benchmarking economic transformation in the states.* Washington DC: Progressive Policy Institute.

PPI later conducted a similar metropolitan-level analysis, comparing the nation's largest metro regions on similar variables.[5]

The *Michigan Metropolitan Indicators* report presents information on a metro scale about key knowledge economy indicators, addressing issues such as physical infrastructure, human capital, and innovation capacity. For the purpose of the present study the research team defined the knowledge economy as "the application of new methods or new technologies to the production or distribution of goods and services." This report builds upon a recent MSU-CEDP county-level analysis of Michigan's knowledge economy indicators.[6] To accommodate data availability, not all of the specific indicators used in this analysis are identical to those in prior studies. In adapting the New Economy Index measures for a metropolitan Michigan analysis, the authors have made every attempt to use the best available and reliable data to represent the knowledge economy. Still, much remains unknown about local and metropolitan knowledge economy readiness. A comprehensive comparative analysis is made difficult by rapid changes in some knowledge economy dimensions, along with issues of data availability and comparability.

The report is organized into two primary sections. The first presents data on Michigan's MSAs for fourteen individual indicators, in four categories: knowledge jobs, innovation, digital economy, and globalization. The second section is organized to present much of the same information separately for each of the eight metro areas, including national, state, and MSA comparisons. An appendix provides practical recommendations for planners, for each of the four indicator categories. The Technical Appendix and Sources section provides detailed information describing the sources and methods used to obtain and present data about each indicator.

As others have pointed out, simple community ranking schemes are often misunderstood or misapplied.[7] With that in mind, the following metropolitan indicators are presented as a 'glimpse' into Michigan's knowledge economy status, to stimulate local stakeholders to incorporate this information into local development planning processes. We recognize that alternative variables may exist for some of the indicators, resulting in different interpretations of a given MSA's performance in the knowledge economy. We encourage readers to reflect on their understanding of their local community and to construct their own indicators of their local knowledge economy.

The MSU-CEDP seeks to help communities and industry, particularly those most economically vulnerable, to take an active role in preparing for this knowledge economy and overcoming the barriers to creating higher-skilled higher-wage jobs. This emphasis on the knowledge economy complements existing economic development efforts such as small business development and retention, manufacturing retention and expansion, capital asset development, and community economic development that are ongoing in many communities throughout the state. It is our hope that the information presented here will assist local leaders in community and economic development to be better prepared to anticipate and plan for economic development in a globally competitive knowledge economy.

5. Robert D. Atkinson and Paul D. Gottlieb. April 2001. *The Metropolitan New Economy Index: Benchmarking economic transformation in the nation's metropolitan areas*. Washington DC: Progressive Policy Institute.

6. Rex L. LaMore, John Melcher, Faron Supanich-Goldner, and Kyle Wilkes. July 2004. *Michigan Knowledge Economy Index: A county-level assessement of Michigan's Knowledge Economy*. Lansing: Michigan State University CEDP.

7. Joseph Cortright and Heike Mayer. 2004. "Increasingly rank: The use and misuse of rankings in economic development." *Economic Development Quarterly* 18(1): 34-39.

SELECTED
INDICATORS AND AREAS

Knowledge Economy Indicators

There are a variety of ways to describe and measure important aspects of the knowledge economy. This report presents data about thirteen specific measures ('indicators') of selected characteristics of the knowledge economy, in the four categories listed below.

The Technical Appendix and Sources section of this report provides detailed descriptions of the data sources and methods used to collect and present data for each indicator.

Knowledge Jobs Indicators

- Workforce Education
- Management and Professional Jobs
- Information Technology Jobs
- High-Skill/Wage/Growth Jobs

Innovation Indicators

- Engineers
- High Tech Jobs
- Patents
- Venture Capital Firms

Digital Economy Indicators

- Online Economic Development
- Online Population
- Cable Modem Access

Globalization Indicators

- Firms with Foreign Parents
- Exporting Firms

Michigan Metropolitan Statistical Areas (MSAs)

The indicators in this report are reported for the eight Metropolitan Statistical Areas (MSAs) in Michigan. Metropolitan Statistical Areas are regions defined by the U.S. Office of Management and Budget to provide a common basis for comparing the nation's largest centers of population and activity. Metropolitan Statistical Areas in Michigan include one or more counties, and one or several key cities. The eight MSAs in Michigan encompass 24 of the State's 83 Counties, as indicated below.

Descriptions and maps of each MSA are included in the Metropolitan Area Snapshots section of this report.

Ann Arbor

Lenawee, Livingston, and Washtenaw Counties

Detroit-Dearborn-Pontiac

Lapeer, Macomb, Monroe, Oakland, St. Clair, and Wayne Counties

Flint

Genesee County

Grand Rapids-Muskegon

Allegan, Kent, Muskegon, and Ottawa Counties

Jackson

Jackson County

Kalamazoo-Battle Creek

Calhoun, Kalamazoo, and Van Buren Counties

Lansing

Clinton, Eaton, and Ingham Counties

Saginaw-Bay City-Midland

Bay, Midland, and Saginaw Counties

KNOWLEDGE ECONOMY INDICATORS

KNOWLEDGE JOBS

Description:
As knowledge and information drive growth and competitiveness, the availability of "knowledge jobs" is an increasingly important indicator of the vitality of regional economies. This report includes four indicators of knowledge jobs, reflecting the level of education, skills, and creativity represented in Michigan's workforce and job markets.

Knowledge Jobs Indicators

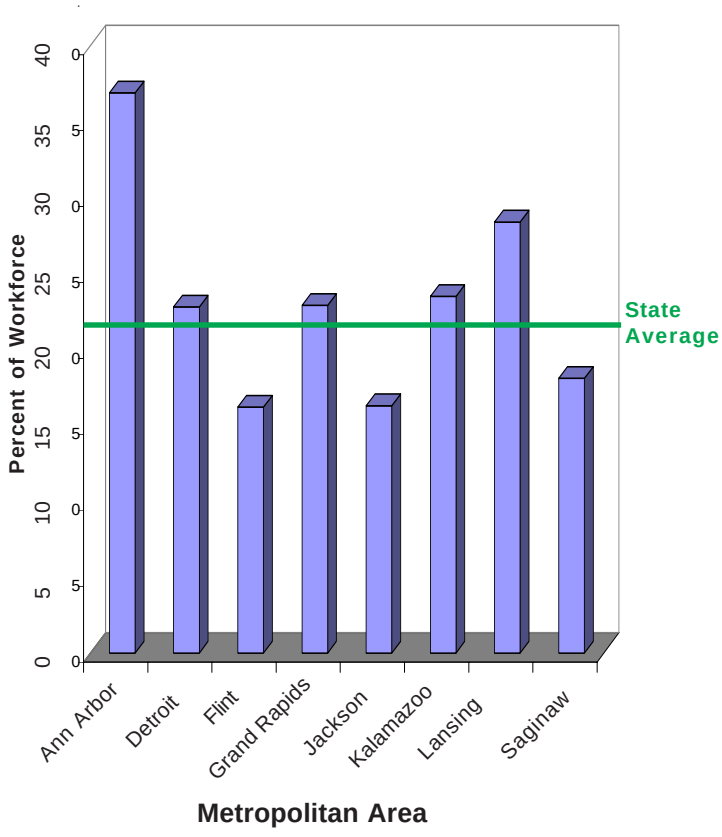
Workforce Education

Management and Professional Jobs

Information Technology Jobs

High-Skill/Wage/Growth Jobs

Figure 1. Workforce Education



Source: *U. S. Census Bureau, 2000.*

Table 1. Percent of population over age 25 with four-year degree

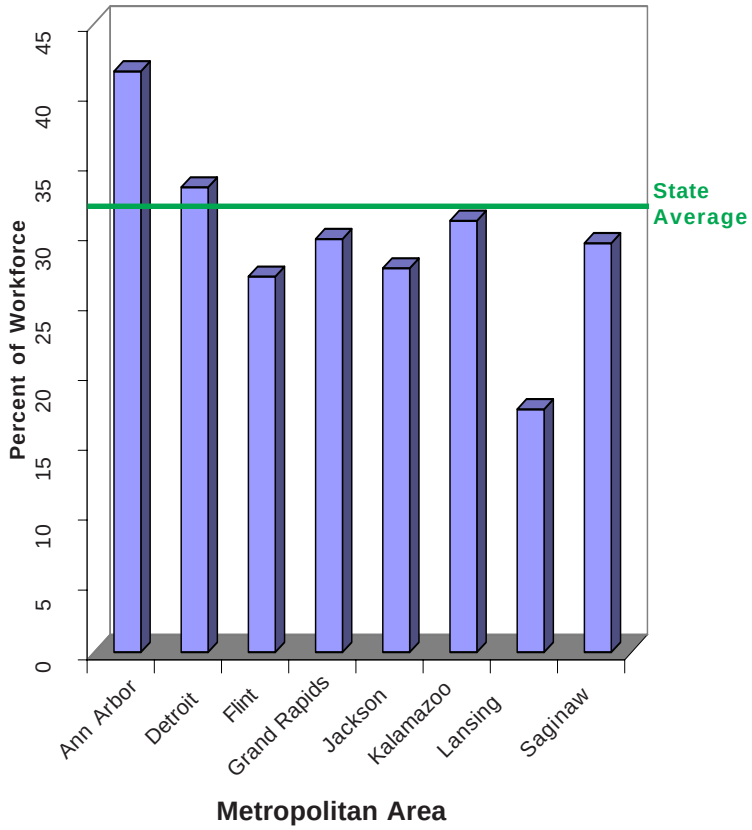
Metro Region	Percent
Ann Arbor	36.9 %
Lansing	28.4
National Average	**23.9**
Kalamazoo-BattleCreek	23.5
Grand Rapids-Muskegon	22.9
Detroit-Dearborn-Pontiac	22.8
Michigan Average	**21.8**
Saginaw-Bay-Midland	18.1
Jackson	16.3
Flint	16.2

Source: *US Census Bureau, 2000*

Workforce Education

Figure 1 and Table 1 display the proportion of adults over age 25 with at least a four-year college degree. Considerable variation is evident in this indicator. Two of Michigan's MSAs exceed the national average for workforce education, while five of the eight regions surpass the statewide average.

Figure 2. Management and Professional Jobs



Source: *U. S. Census Bureau, 2000.*

Table 2. Percent of workforce in managerial, professional, and related occupations

Metro Region	Percent
Ann Arbor	41.6 %
National Average	**33.6**
Detroit-Dearborn-Pontiac	33.3
Michigan Average	**31.5**
Kalamazoo-BattleCreek	30.9
Grand Rapids-Muskegon	29.6
Saginaw-Bay-Midland	29.3
Jackson	27.5
Flint	26.9
Lansing	17.4

Source: *US Census Bureau, 2000*

Knowledge Jobs Indicators

Workforce Education

Management and Professional Jobs

Information Technology Jobs

High-Skill/Wage/Growth Jobs

Management and Professional Jobs

Figure 2 and Table 2 indicate the percent of the workforce over age 16 employed in managerial, professional, or related occupations, as classified by the U.S. Census Bureau. Most of Michigan's MSAs trail both state and national averages on this indicator.

Knowledge Jobs Indicators

Workforce Education

Management and Professional Jobs

Information Technology Jobs

High-Skill/Wage/Growth Jobs

Information Technology Jobs

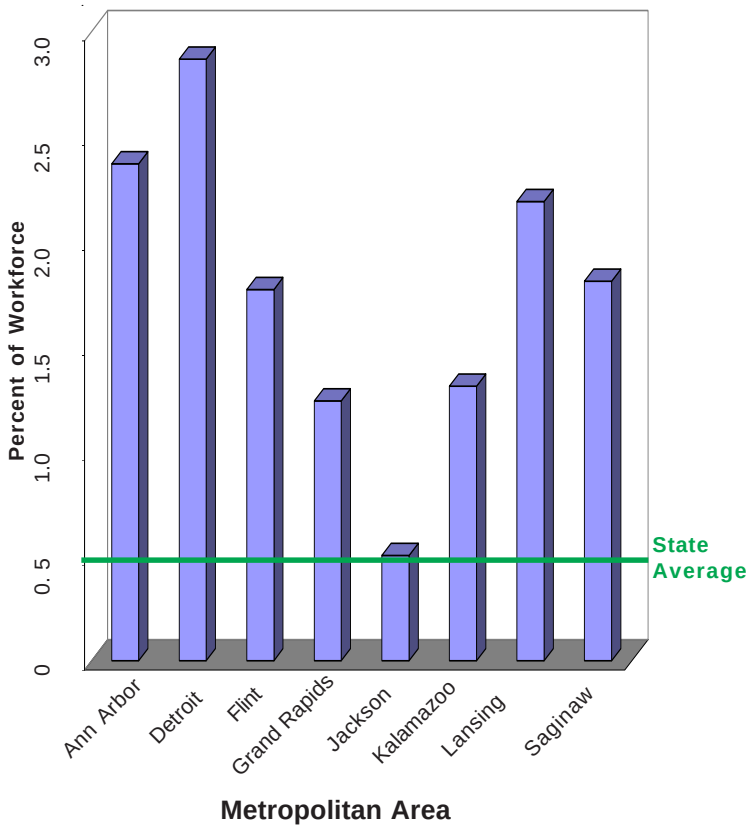
Figure 3 and Table 3 present the percentage of the total MSA workforce employed in selected information technology-related industry categories. Such jobs in Michigan are concentrated in metropolitan areas: nearly all of Michigan's metro regions far exceed the state average on this measure.

Table 3.
Percent of workfore in IT Jobs

Metro Region	Percent
Detroit-Dearborn-Pontiac	2.9 %
Ann Arbor	2.4
Lansing	2.2
Saginaw-Bay City-Midland	1.8
Flint	1.8
Kalamazoo-BAttle Creek	1.3
Grand Rapids-Muskegon-Holland	1.2
Jackson	0.5
Michigan Average	**0.5**

Source: *US Census Bureau, 2000*

Figure 3. Information Technology Jobs



Source: *2000 County Business Patterns (NAICS), U. S. Census Bureau.*

Knowledge Jobs Indicators

Workforce Education

Management and Professional Jobs

Information Technology Jobs

High-Skill/Wage/Growth Jobs

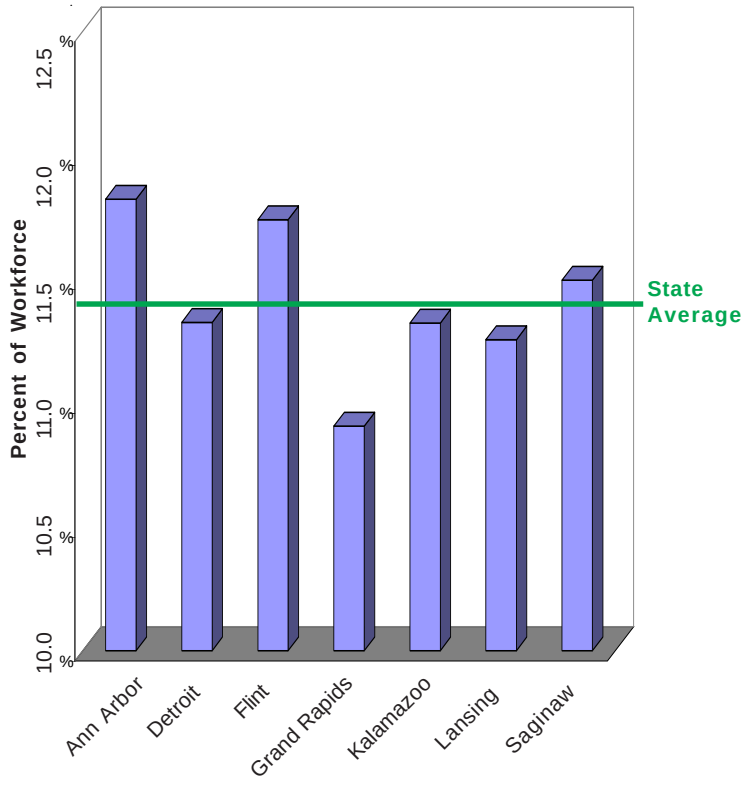
High Skill, High-Wage, High-Growth Jobs

Figure 4 and Table 4a represent the share of the MSA workforce employed in occupations that typically require at least two years post-secondary education and exceed the national median in both median annual wages and projected employment growth ("high-skill, high-wage, high-growth," abbreviated to "H3 jobs").

Table 4b indicates annual incomes for those employed in "H3 jobs" in Michigan's MSAs (figures indicate the weighted average of median incomes from each occupation).

The Jackson MSA was excluded from this indicator to maximize the number of comparable occupations available for analysis.

Figure 4. High-Skill, High-Wage, High-Growth Jobs



Source: *Bureau of Labor Statistics, 2003*

Table 4a. Percent of Workforce in "H3" Jobs

Metro Region	Percent
National Average	**13.1%**
Ann Arbor	11.8
Flint	11.7
Saginaw-Bay-Midland	11.5
Michigan Average	**11.4**
Detroit-Dearborn-Pontiac	11.3
Kalamazoo-BattleCreek	11.3
Lansing	11.3
Grand Rapids-Muskegon	10.9

Source: *Bureau of Labor Statistics, 2003*

Table 4b. Median Wages for "H3" Jobs

Metro Region	Annual Wage
Detroit-Dearborn-Pontiac	$ 65,705
Ann Arbor	62,461
Michigan Average	**60,299**
National Average	**58,005**
Lansing	57,965
Grand Rapids-Muskegon	57,244
Saginaw-Bay-Midland	56,148
Kalamazoo-BattleCreek	55,850
Flint	53,582

Source: *Bureau of Labor Statistics, 2003*

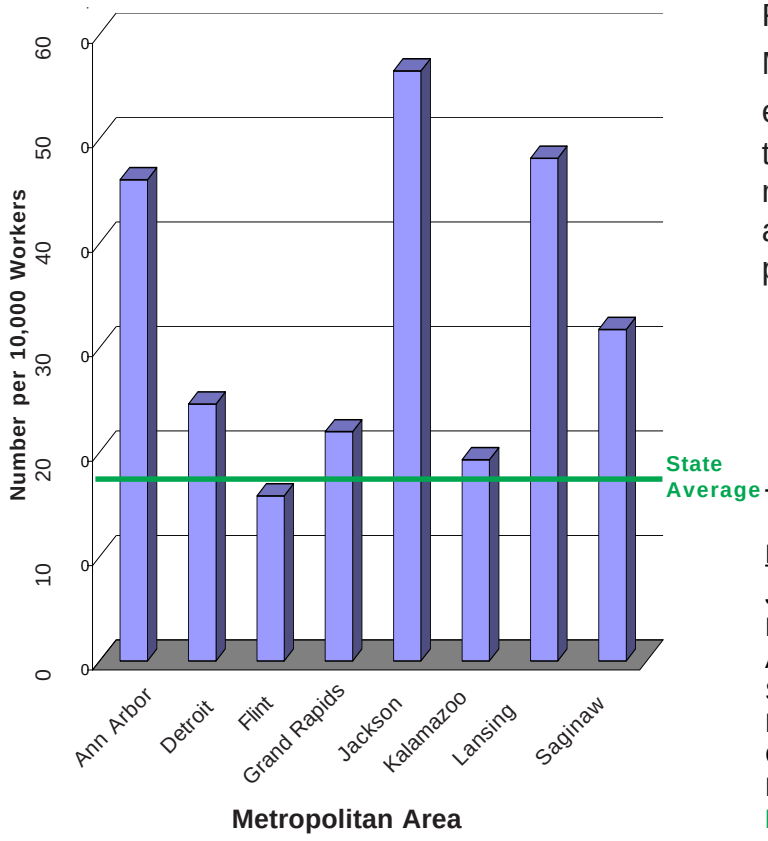
INNOVATION

Description:
The capacity for economic innovation is a central feature of competitive regions in the knowledge economy. This category includes four measures, incorporating individual, organziational, and community-level characteristics.

Innovation Indicators

Engineers
High Tech Jobs
Patents
Venture Capital Firms

Figure 5. Professional Engineers



Professional Engineers

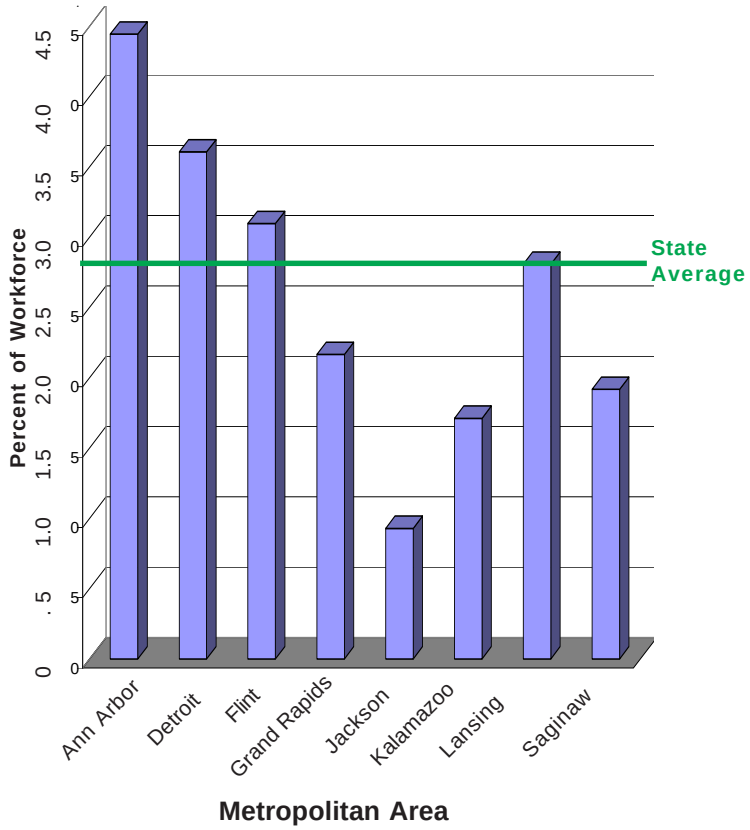
Figure 5 and Table 5 display, for each MSA, the number of licensed engineers per 10,000 members of the workforce. Most of Miichigan's metro regions far exceed the state average concentration of professional engineers.

Table 5. Engineers per 10,000 workers

Metro Region	Engineers
Jackson	56
Lansing	48
Ann Arbor	46
Saginaw-Bay-Midland	32
Detroit-Dearborn-Pontiac	25
Grand Rapids-Muskegon	22
Kalamazoo-BattleCreek	19
Michigan Average	**17**
Flint	16

Source: *State of Michigan*

Figure 6. High Technology Jobs



Source: *2000 County Business Patterns (NAICS), U. S. Census Bureau.*

High Technology Jobs

Figure 6 and Table 6 indicate the percentage of the workforce employed in industries considered sources of strong employment for workers in high-technology fields. A wide range is evident among Michigan MSAs on this measure.

Table 6. Percent of workforce in High Technology Jobs

Metro Region	Percent
Ann Arbor	4.4
Detroit-Dearborn-Pontiac	3.6
Flint	3.1
Lansing	2.8
Michigan Average	**2.8**
Grand Rapids-Muskegon	2.2
Saginaw-Bay-Midland	1.9
Kalamazoo-BattleCreek	1.7
Jackson	0.9

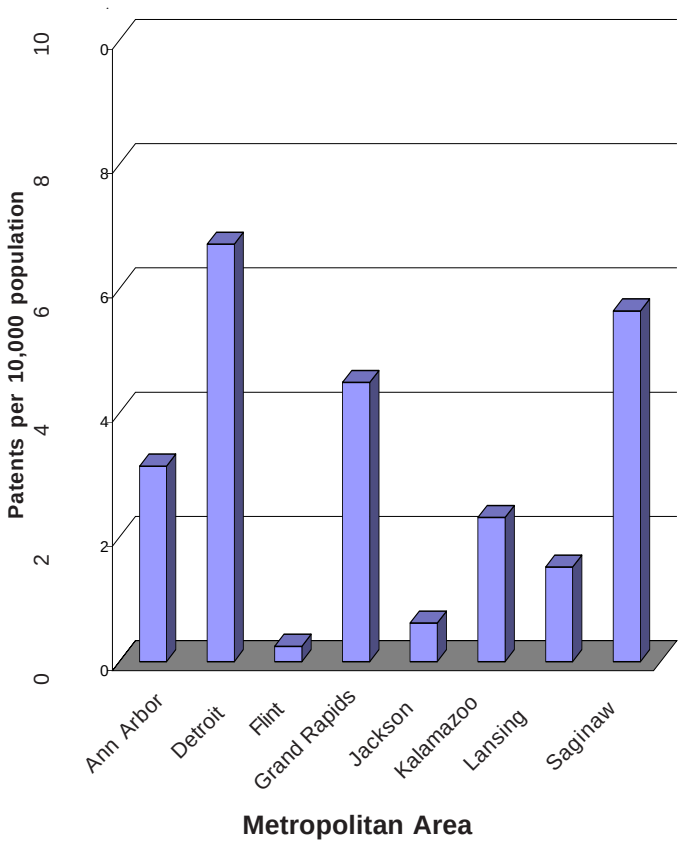
Patents

The number and concentration of registered patents is often used as an indicator of the innovative capacity of a region. Figure 7 and Table 7 compare the number of patents assigned in Michigan's MSAs, adjusted for population.

Table 7. Patents per 10,000 population

Metro Region	No. of Firms
Detroit-Dearborn-Pontiac	6.7
Ann Arbor	3.1
Lansing	1.5
Jackson	0.6
Grand Rapids-Muskegon	4.5
Kalamazoo-Battle Creek	2.3
Flint	0.2
Saginaw-Bay City-Midland	5.6

Figure 7. Patents per 10,000 population



Source: *US Patent and Trademark Office, 2002*

Venture Capital Firms

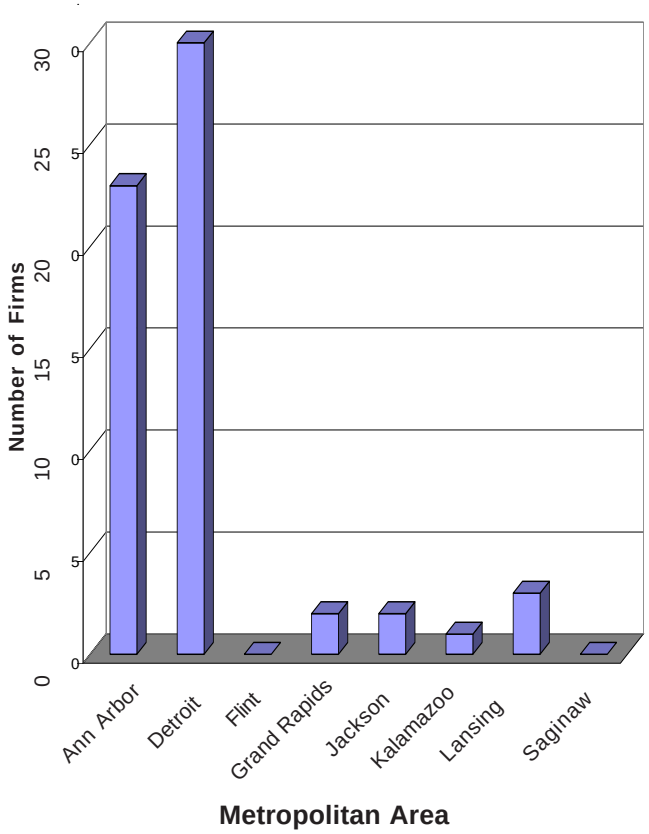
Unlike traditional sources of financing, venture capital rewards new, potentially higher-risk, ideas, and is therefore considered an important contributing factor to economic innovation. As seen in Table 8 and Figure 8, venture capital firms in Michigan are relatively small in number and concentrated in a few locations.

Table 8. Venture Capital Firms

Metro Region	No. of Firms
Detroit-Dearborn-Pontiac	30
Ann Arbor	23
Lansing	3
Jackson	2
Grand Rapids-Muskegon	2
Kalamazoo-BattleCreek	1
Flint	0
Saginaw-Bay-Midland	0

Source: *Michigan Economic Development Corporation, 2003*

Figure 8. Venture Capital Firms



Source: *Michigan Economic Development Corporation, 2003*

DIGITAL ECONOMY

Description:
Information and communication technologies are increasingly important for engaging individuals and firms in economic, social, and civic life. Three measures are included to begin to capture the extent to which communities are able to effectively engage in the digital environment.

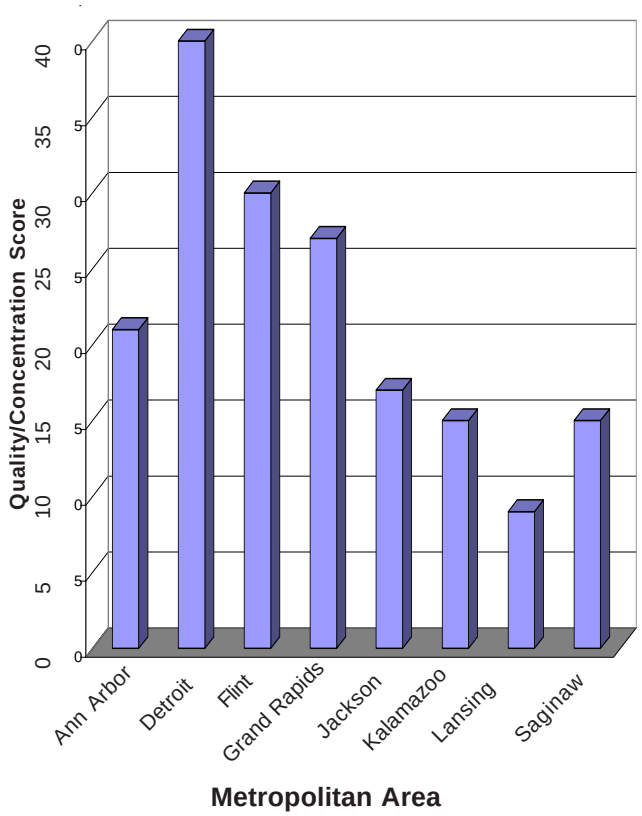
Digital Economy Indicators

Online Economic Development

Online Population

Cable Modem Access

Figure 9. Online Economic Development

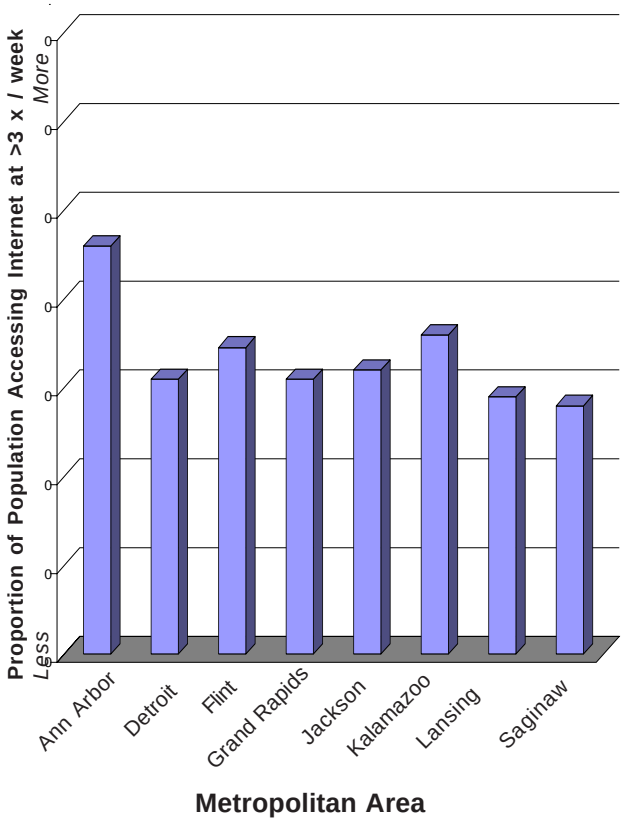


Sources: *Cyber-state.org, 2001 and Singh, 2003*

Online Economic Development

As regions compete in the knowledge economy, communities must effectively use the Internet in conjunction with more traditional approaches to promote themselves as attractive locations for cutting edge industries. Figure 9 represents an estimate of the concentration and economic development focus of local government websites in Michigan's MSAs.

Figure 10. Online Population



Source: *MSU State of the State Survey, 2001.*

Digital Economy Indicators

Online Economic Development

Online Population

Cable Modem Access

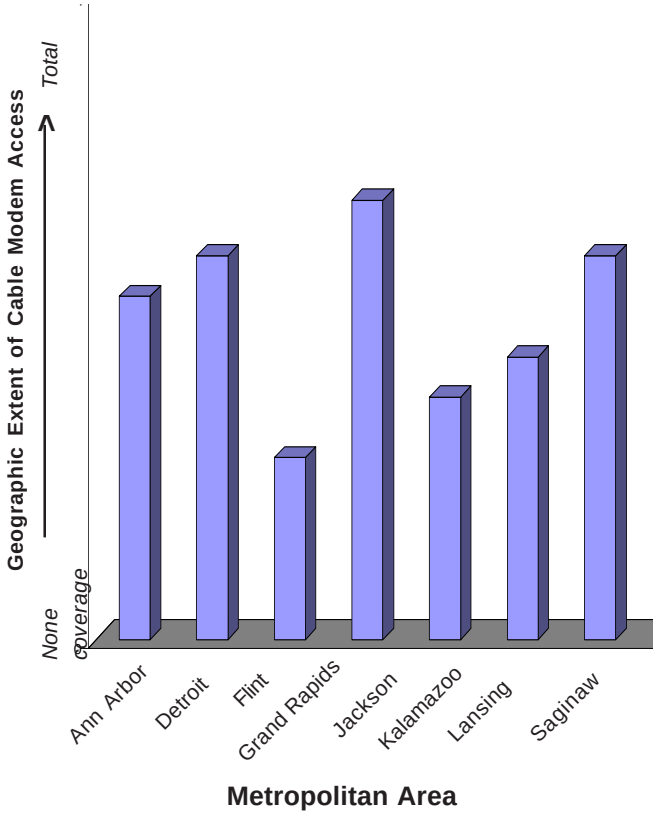
Online Population

Residents' use of the Internet is a simple indicator of a region's engagement in the digital economy. Figure 10 reflects the proportion of a region's population that uses the Internet with regular frequency (at least three times per week).

Cable Modem Access

Access to a high-speed or 'broadband' internet connection is rapidly becoming a basic utility in the knowledge economy. Figure 11 indicates the geographic extent to which Michigan's regions have high speed internet available via cable modem.

Figure 11. Cable Modem Access



Source: *Michigan Economic Development Corporation, 2001*

GLOBALIZATION

Description:

To be competitive in the new economy, cities and regions must operate in the global economy.

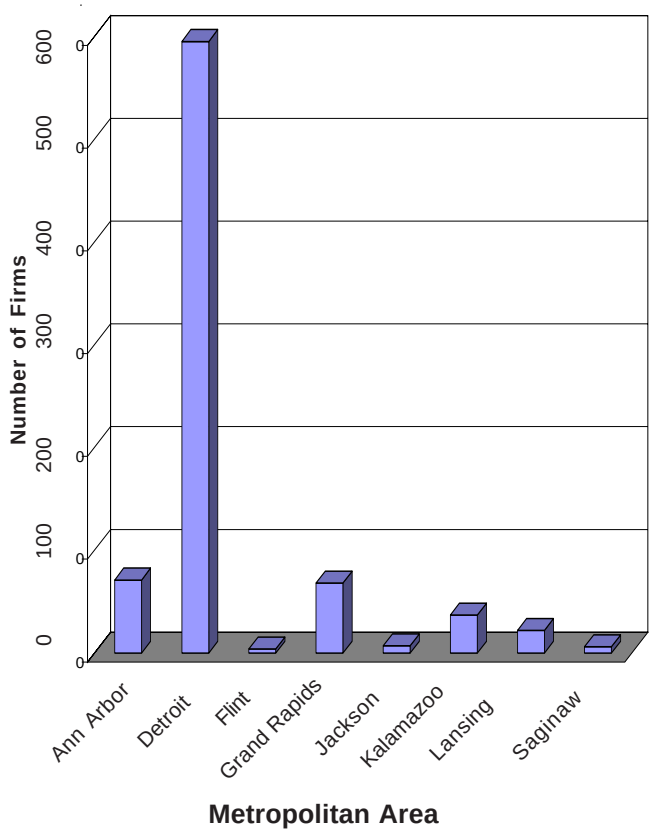
Metropolitan scale indicators of globalization included in this report reflect direct foreign investment in Michigan and the extent to which Michigan enterprises are reaching international markets.

Globalization Indicators

Foreign Owned Firms

Exporting Firms

Figure 12. Firms with Foreign Parents



Sources: *Michigan Economic Development Corporation, 2001*

Foreign Owned Firms

One indicator of direct foreign investment is foreign ownership of private firms. Figure 12 indicates for each MSA the number of firms with foreign owners.

Globalization Indicators

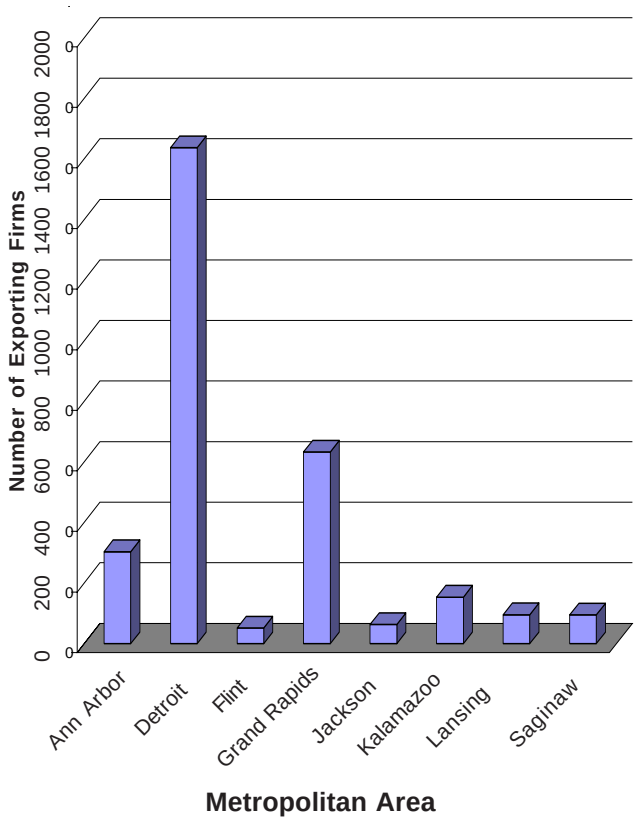
Foreign Owned Firms

Exporting Firms

Exporting Firms

Another indicator of globalization is export activity of a region's firms or industries. Figure 13 indicates the number of firms in each MSA classified as having significant exporting activity.

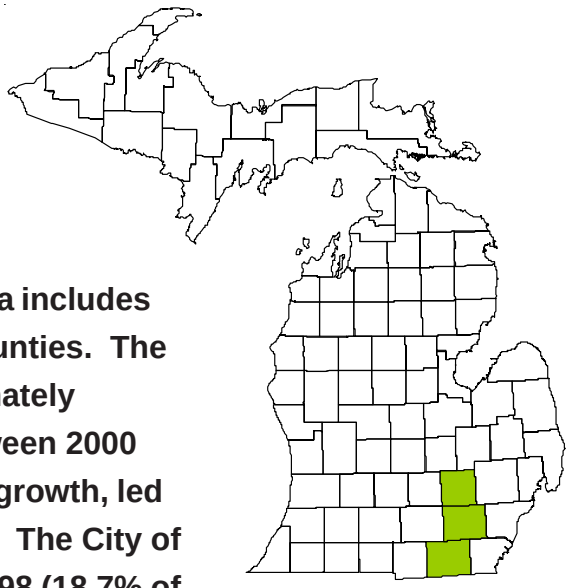
Figure 13. Exporting Firms



Sources: *Michigan Economic Development Corporation, 2004*

METROPOLITAN AREA SNAPSHOTS

ANN ARBOR AREA SNAPSHOT



The Ann Arbor Metropolitan Statistical Area includes Lenawee, Livingston, and Washtenaw Counties. The total population of this MSA was approximately 612,000 in 2003, an increase of 5.8 % between 2000 and 2003. All three counties experienced growth, led by a 10.1% increase in Livingston County. The City of Ann Arbor had a 2003 population of 114,498 (18.7% of the MSA total), slightly higher than in 2000.

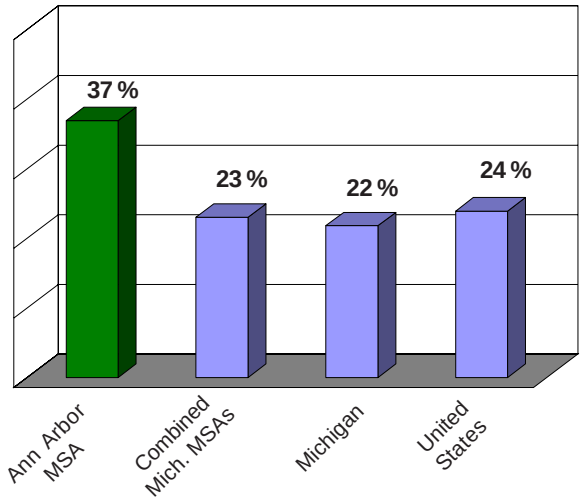
As of the 2000 Census, the Ann Arbor area's per capita income was $26,222, which was 18% higher than the statewide figure. The poverty rate for the region was 8.3%, lower than the 10.5% statewide rate.

The Ann Arbor region compares very favorably with other Michigan MSAs and with state and national averages, on the selected knowledge economy indicators included in this analysis.

ANN ARBOR METROPOLITAN STATISTICAL AREA INDICATORS

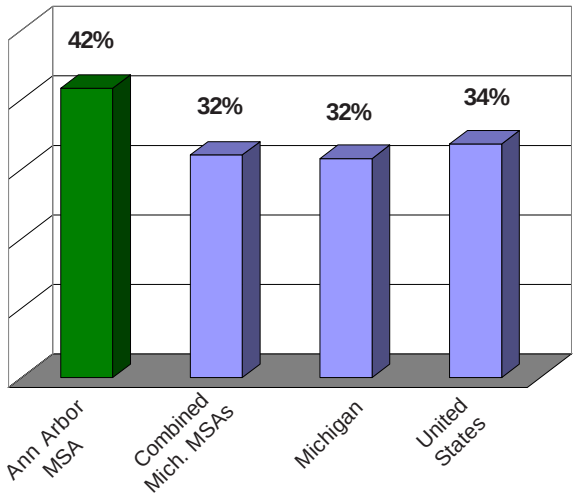
Workforce Education

(Percent of workforce with BA degree)



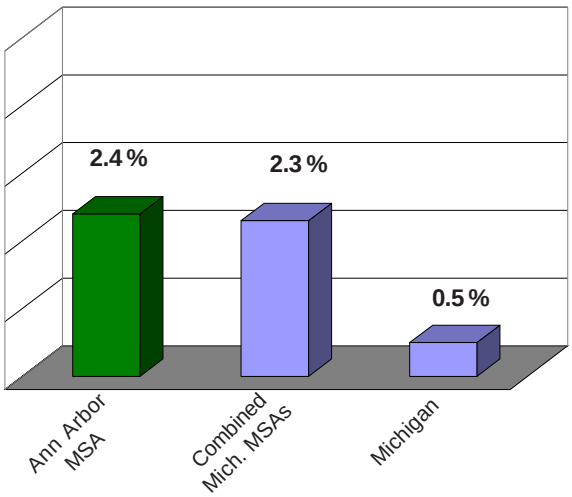
Management and Professional Jobs

(Percent of workforce)



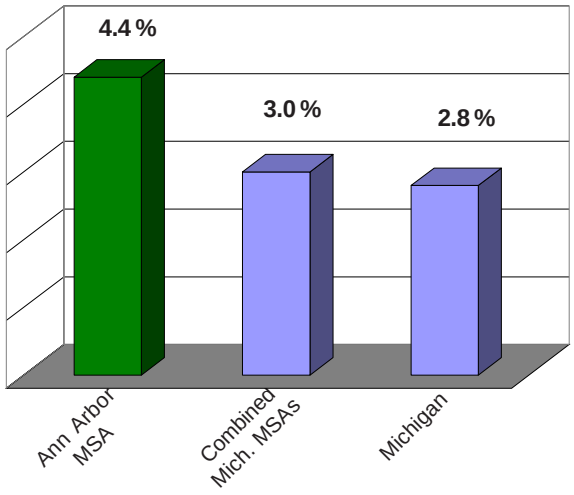
Information Technology Jobs

(Percent of workforce in IT industries)

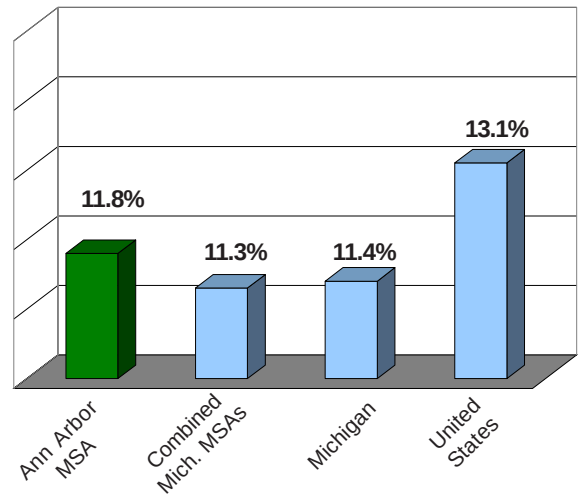


High-Technology Jobs

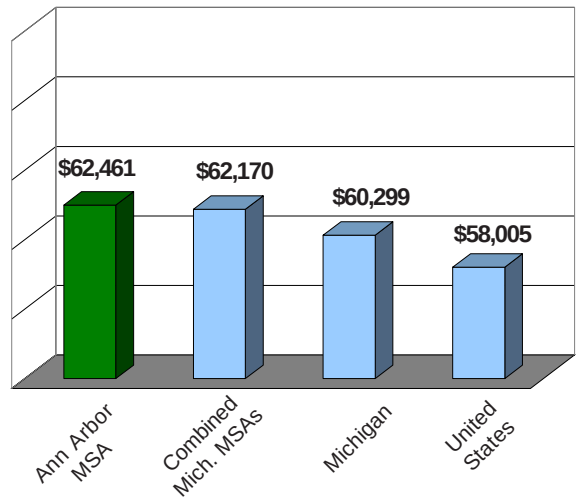
(Percent of workforce in high-tech industries)



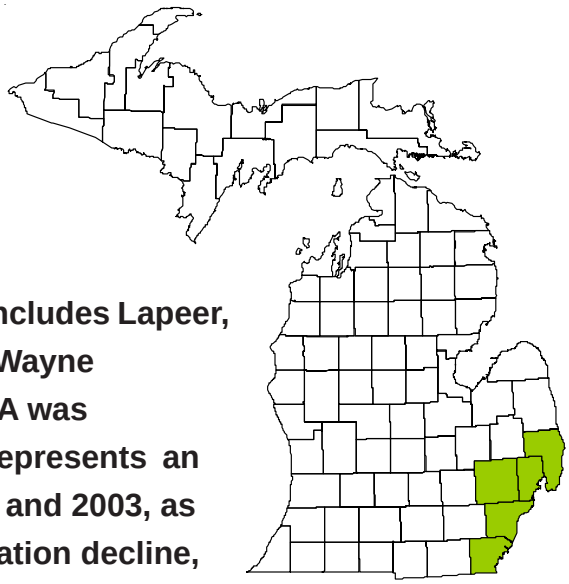
Share of Jobs in High-Skill, High-Wage, High-Growth Jobs



Median Wages in High-Skill, High-Wage, High-Growth Jobs



DETROIT AREA SNAPSHOT



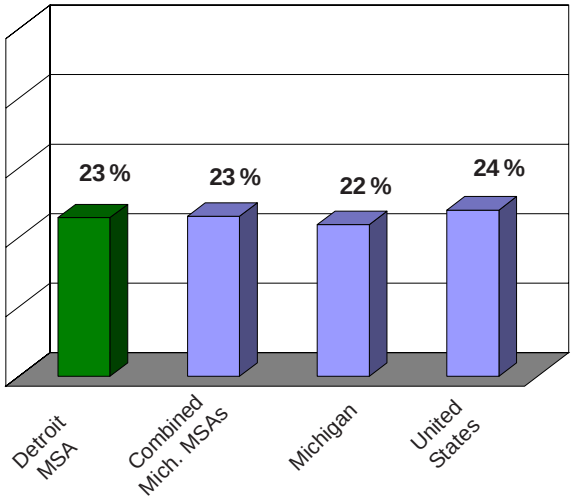
The Detroit Metropolitan Statistical Area includes Lapeer, Macomb, Monroe, Oakland, St. Clair, and Wayne Counties. The total population of this MSA was approximately 4.46 million in 2003. This represents an increase of less than 0.5% between 2000 and 2003, as Wayne County experienced a 1.6% population decline, offset by modest growth in the five other counties in the region. The cities of Detroit (911,402), Dearborn (96,670), and Pontiac (67,152) had a comined 2003 population of just over one million people (24.1% of the MSA total), each having declined in population between 2000 and 2003.

As of the 2000 Census, the Detroit-area's per capita income was $24,354, about 10% higher than the statewide figure. The poverty rate for the region was 10.7%, or slightly greater than the 10.5% statewide rate.

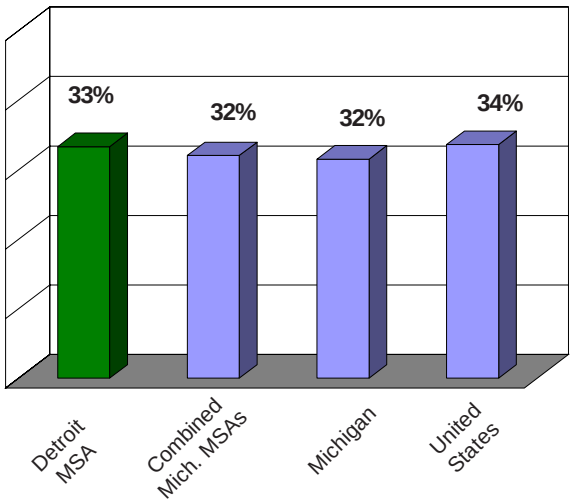
The Detroit area, like Ann Arbor's region, rates high on the knowledge economy indicators included in this analysis. This is in part due to the sheer size of the region's economy; Detroit also ranks well, however, on several indicators that adjust for population.

DETROIT METROPOLITAN STATISTICAL AREA INDICATORS

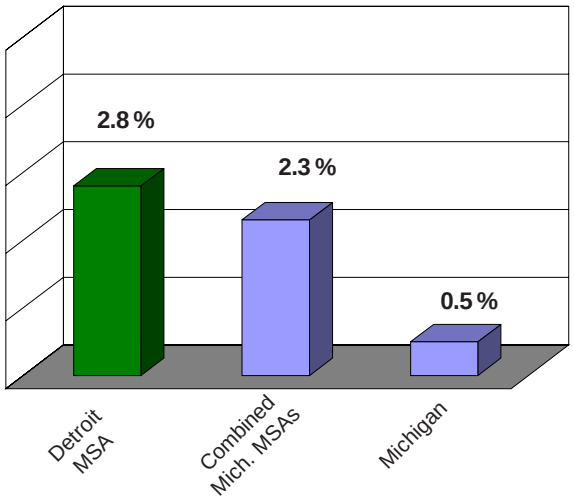
Workforce Education
(Percent of workforce with BA degree)



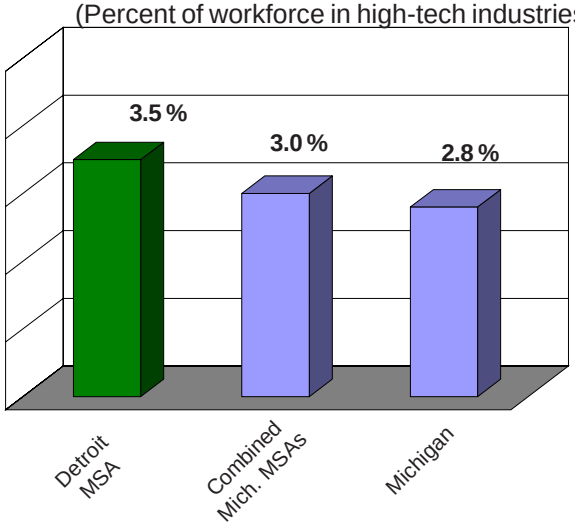
Management and Professional Jobs
(Percent of workforce)



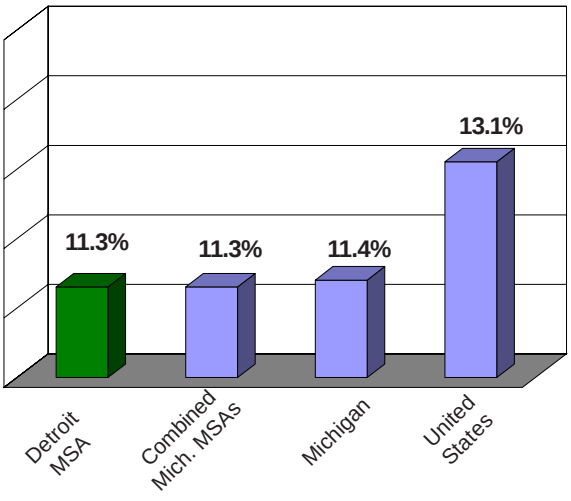
Information Technology Jobs
(Percent of workforce in IT industries)



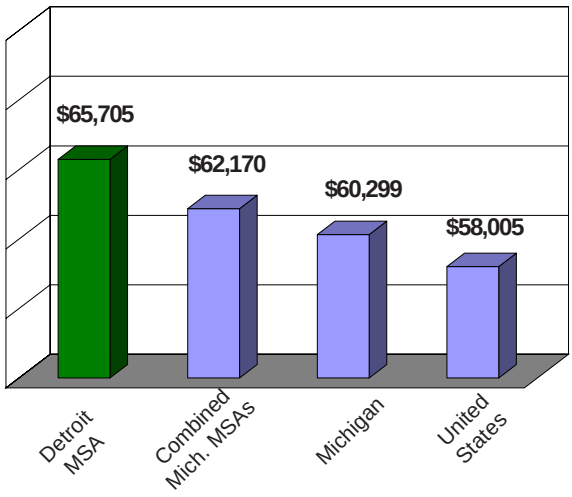
High-Technology Jobs
(Percent of workforce in high-tech industries)



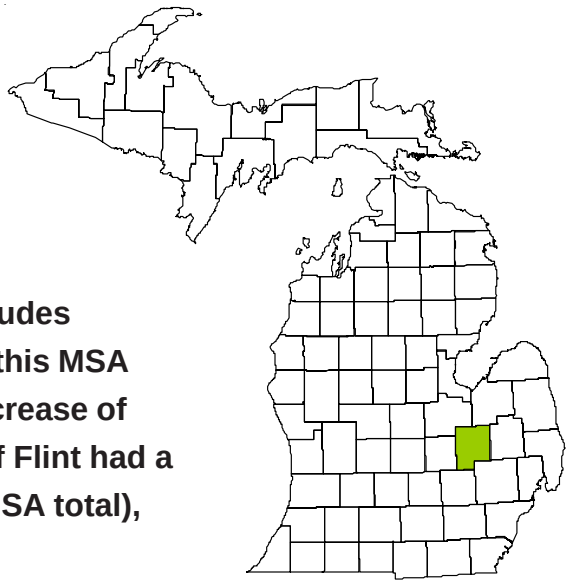
Share of Jobs in High-Skill, High-Wage, High-Growth Jobs



Median Wages in High-Skill, High-Wage, High-Growth Jobs



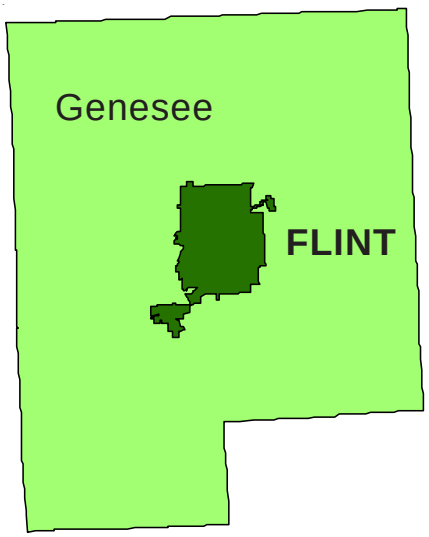
FLINT AREA SNAPSHOT



The Flint Metropolitan Statistical Area includes Genesee County. The total population of this MSA was approximately 442,250 in 2003, an increase of 1.4 % between 2000 and 2003. The City of Flint had a 2003 population of 120,292 (27 % of the MSA total), having declined nearly 4% from 2000.

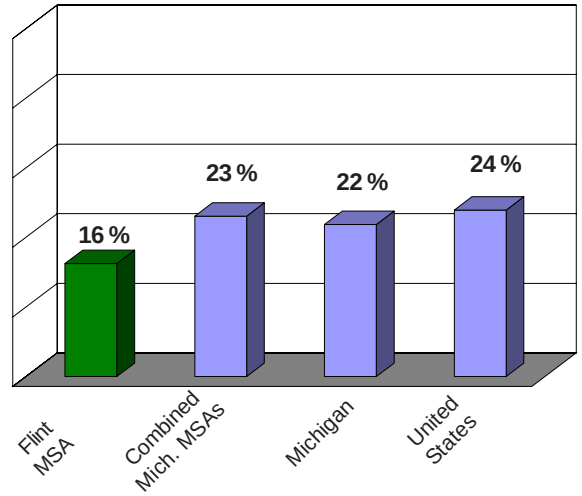
As of the 2000 Census, the Flint area's per capita income was $20,883, nearly 6% lower than the statewide figure. The poverty rate for the region was 13.1%, considerably higher than the 10.5% statewide rate.

Although Flint performs well on indicators of online economic development and shares of high technology and high-skill, high-wage, high-growth jobs, the region underperforms the other Michigan MSAs on most indicators.

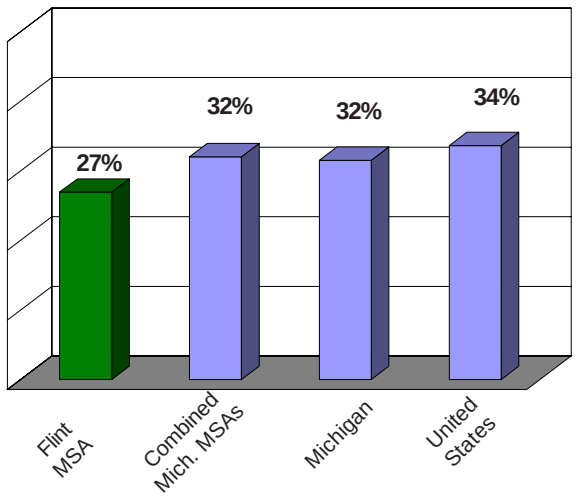


FLINT METROPOLITAN STATISTICAL AREA INDICATORS

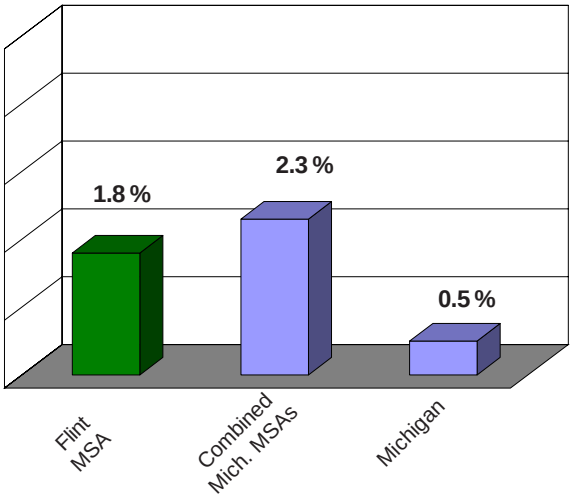
Workforce Education
(Percent of workforce with BA degree)



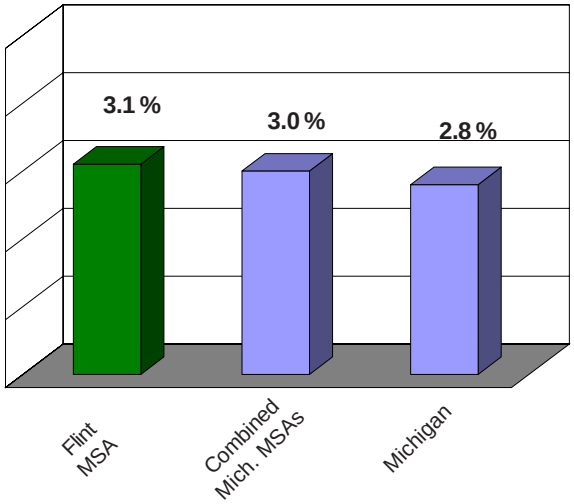
Management and Professional Jobs
(Percent of workforce)



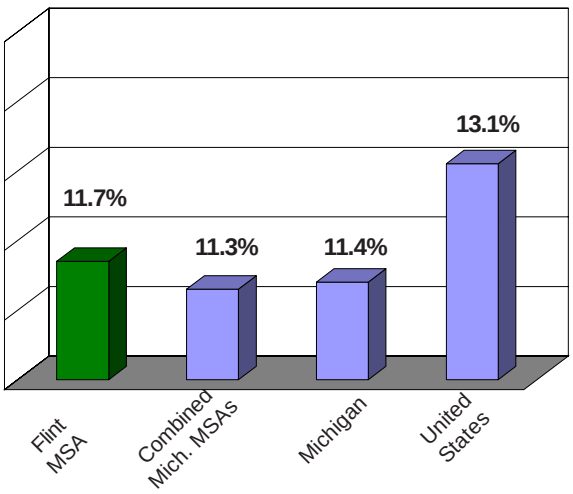
Information Technology Jobs
(Percent of workforce in IT industries)



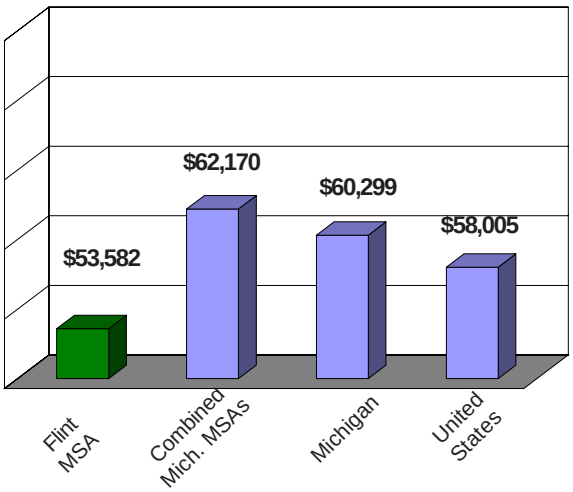
High-Technology Jobs
(Percent of workforce in high-tech industries)



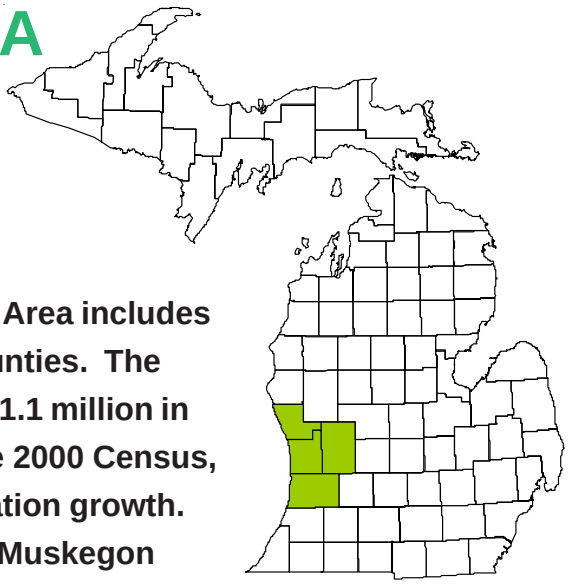
Share of Jobs in High-Skill, High-Wage, High-Growth Jobs



Median Wages in High-Skill, High-Wage, High-Growth Jobs



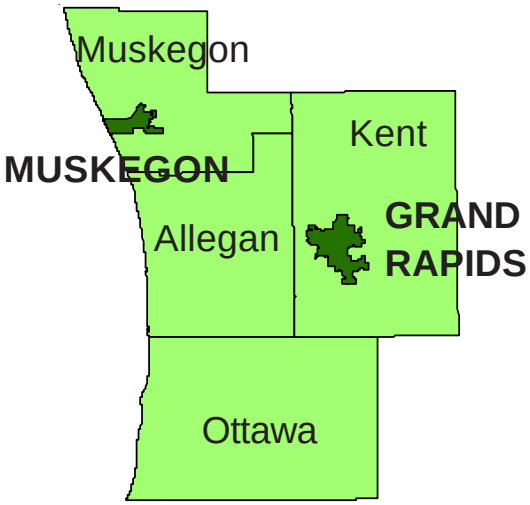
GRAND RAPIDS AREA SNAPSHOT



The Grand Rapids Metropolitan Statistical Area includes Allegan, Kent, Muskegon, and Ottawa Counties. The total population of this MSA was just over 1.1 million in 2003. This reflects a 3% increase over the 2000 Census, with all four counties experiencing population growth. The cities of Grand Rapids (195,601), and Muskegon (39,825) had a combined 2003 population amounting to 21% of the MSA total.

As of the 2000 Census, theGrand Rapids area's per capita income was $20,901, nearly 6% lower than the statewide figure. The poverty rate for the region was 8.4%, lowerthan the 10.5% statewide rate.

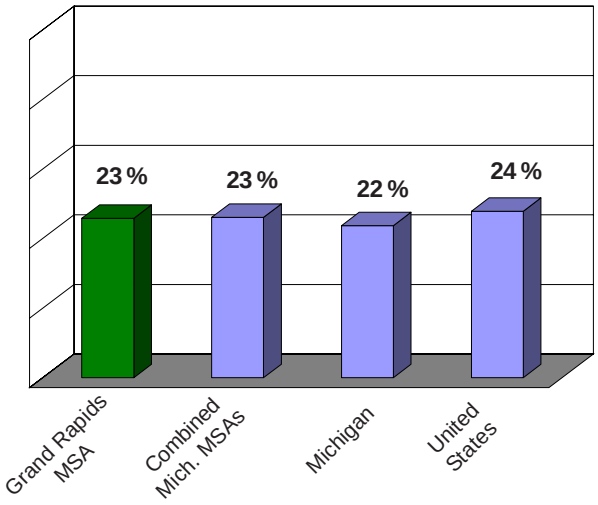
In relation to other MSAs, the Grand Rapids region ranked most highly in this set of indicators on cable modem access and globalization measures. On most other measures the region was neither the highest nor lowest ranked region.



GRAND RAPIDS METROPOLITAN STATISTICAL AREA INDICATORS

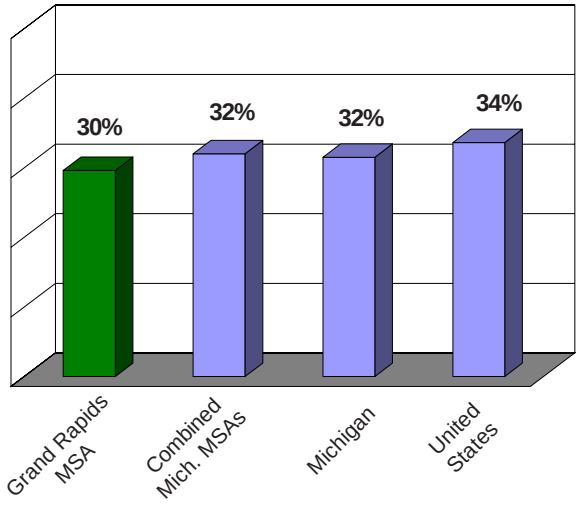
Workforce Education

(Percent of workforce with BA degree)



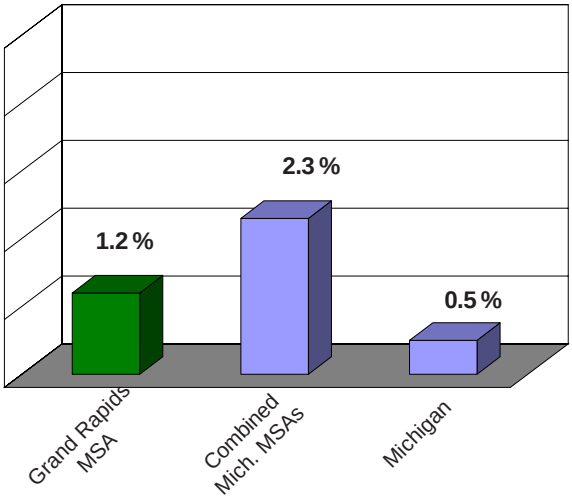
Management and Professional Jobs

(Percent of workforce)



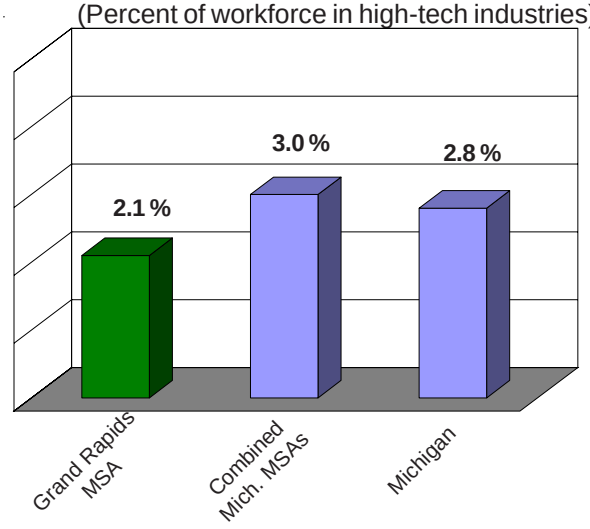
Information Technology Jobs

(Percent of workforce in IT industries)

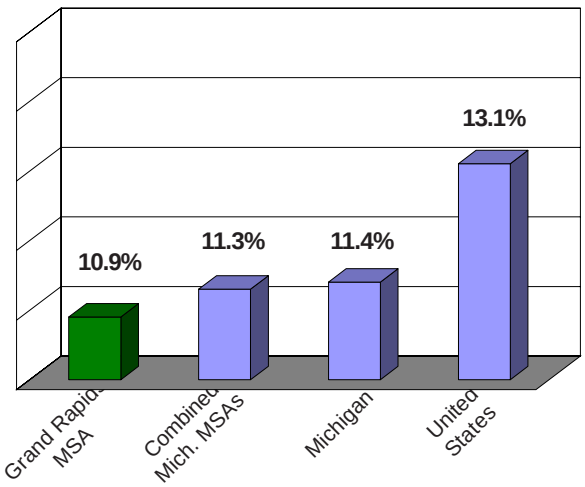


High-Technology Jobs

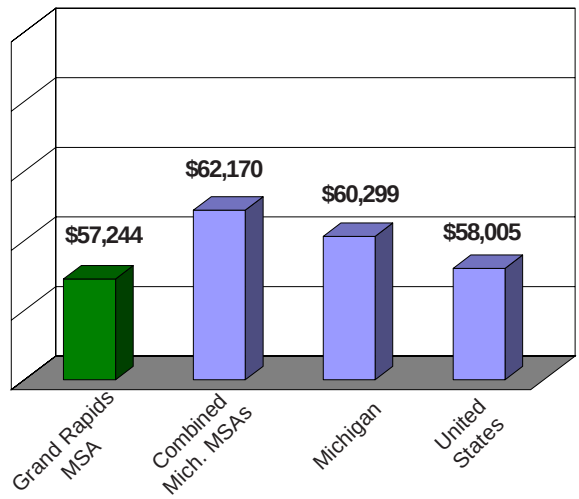
(Percent of workforce in high-tech industries)



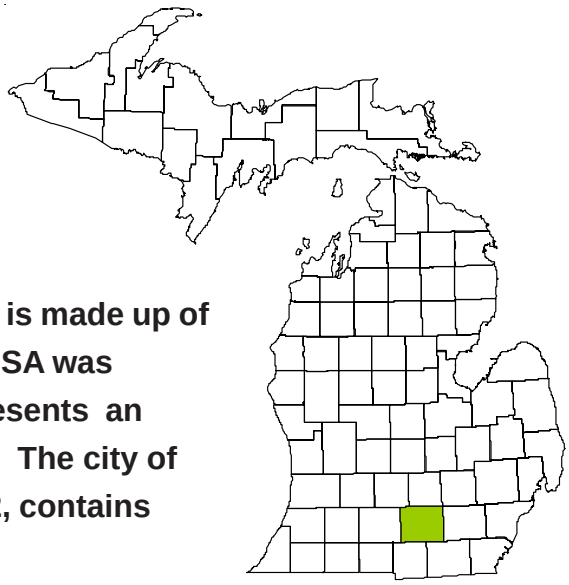
Share of Jobs in High-Skill, High-Wage, High-Growth Jobs



Median Wages in High-Skill, High-Wage, High-Growth Jobs



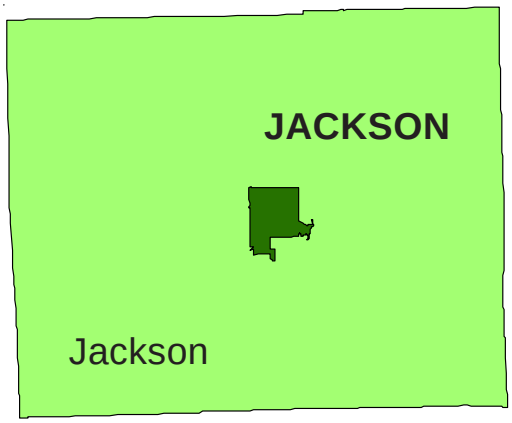
JACKSON AREA SNAPSHOT



The Jackson Metropolitan Statistical Area is made up of Jackson County. The population of the MSA was approximately 162,000 in 2003. This represents an increase of 2.5 % between 2000 and 2003. The city of Jackson, with a 2003 population of 35,152, contains about 22% of the county's residents.

As of the 2000 Census, the Jackson area's per capita income was $20,171, about 9% lower than the statewide figure. The poverty rate for the region was 9.0%, lower than the 10.5% statewide rate.

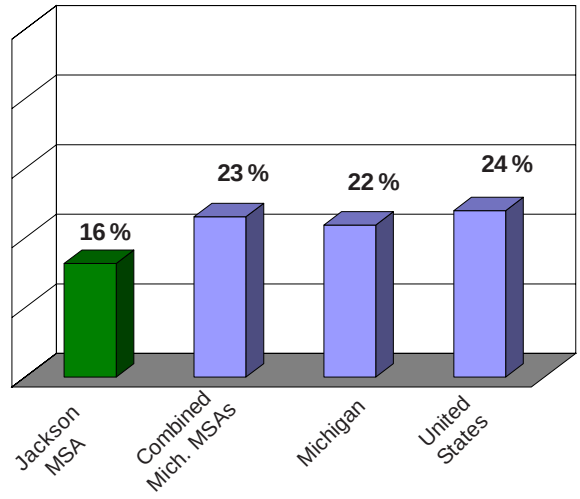
The Jackson region, perhaps due to the relatively small scale of its overall economy, consistently underperformed the other MSAs in Michigan on the knowledge economy indicators reported here. One notable exception is the share of engineers in the workforce: Jackson has the largest number of engineers per 10,000 workers (56) of all the MSAs, and more than three times the state average.



JACKSON METROPOLITAN STATISTICAL AREA INDICATORS

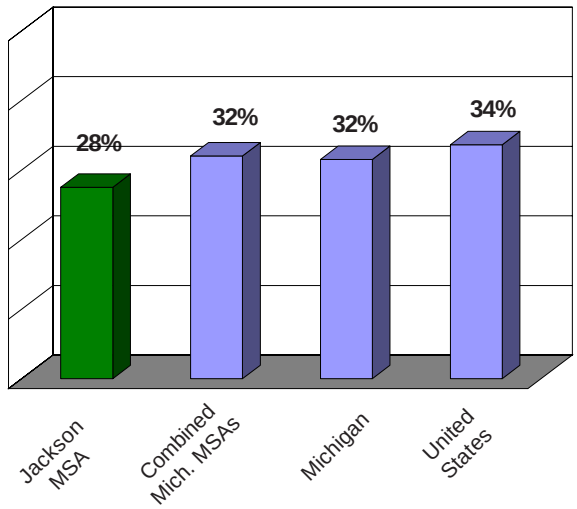
Workforce Education

(Percent of workforce with BA degree)



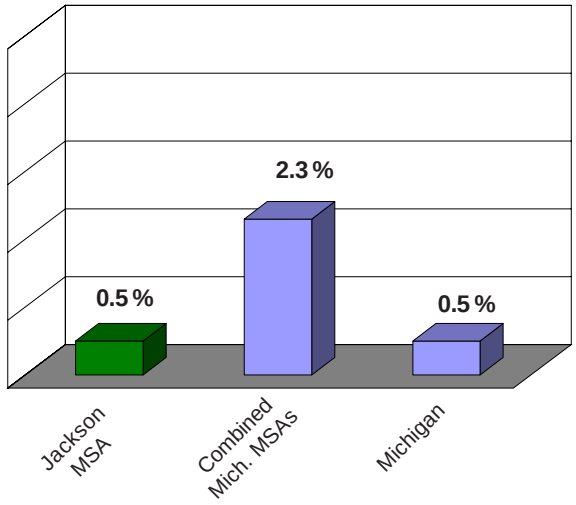
Management and Professional Jobs

(Percent of workforce)



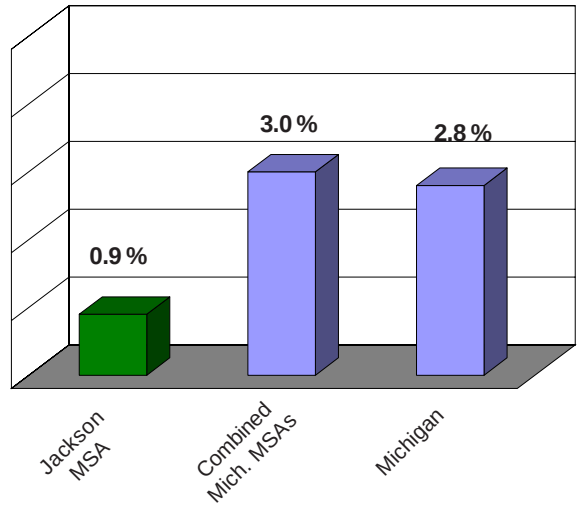
Information Technology Jobs

(Percent of workforce in IT industries)



High-Technology Jobs

(Percent of workforce in high-tech industries)



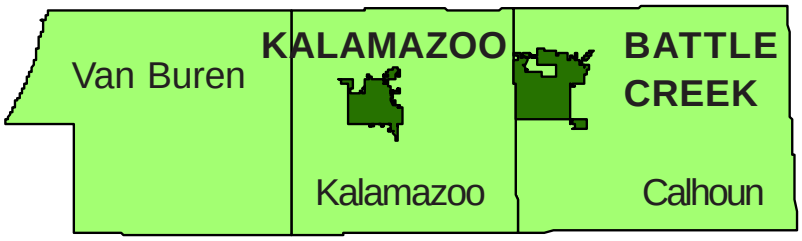
Note: The Jackson area was not included in the High-Skill, High-Wage, High-Growth (H3) Jobs indicators because information on employment and wages was available for far fewer of the H3 occupations in this region than in the other seven Michigan MSAs. To have included Jackson would have severely limited the extent of comparison available across MSAs.

KALAMAZOO AREA SNAPSHOT

The Kalamazoo Metropolitan Statistical Area is made up of Calhoun, Kalamazoo, and Van Buren Counties. The population of the MSA was approximately 460,000 in 2003, slightly greater than in 2000. The cities of Battle Creek (53,827) and Kalamazoo (75,312) combine to make up 28% of the MSA total, with Battle Creek growing slightly and Kalamazoo declining slightly in population in recent years.

As of the 2000 Census, the Kalamazoo area's per capita income was $20,325, about 8% lower than the statewide figure. The poverty rate for the region was 11.6%, somewhat greater than the 10.5% statewide rate.

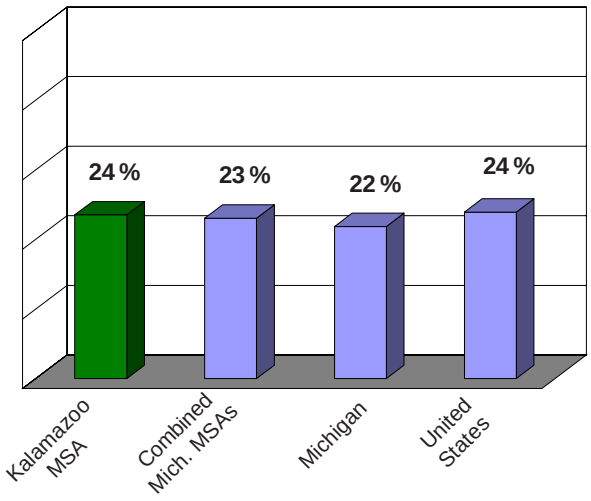
The Kalamazoo region performs in the middle of the group of MSAs on most measures in this report, with highest rankings on online population, workforce education, and management and professional jobs.



KALAMAZOO METROPOLITAN STATISTICAL AREA INDICATORS

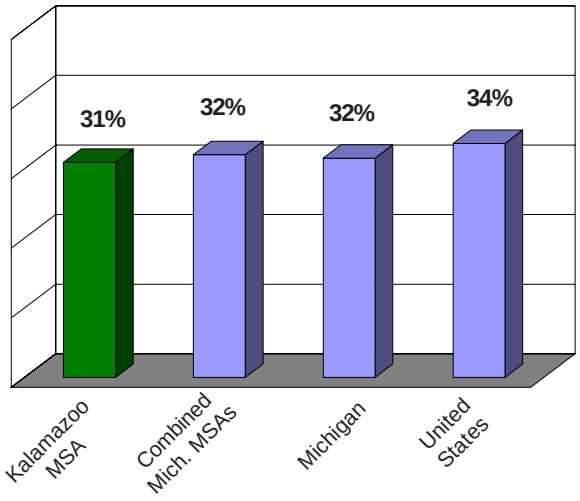
Workforce Education

(Percent of workforce with BA degree)



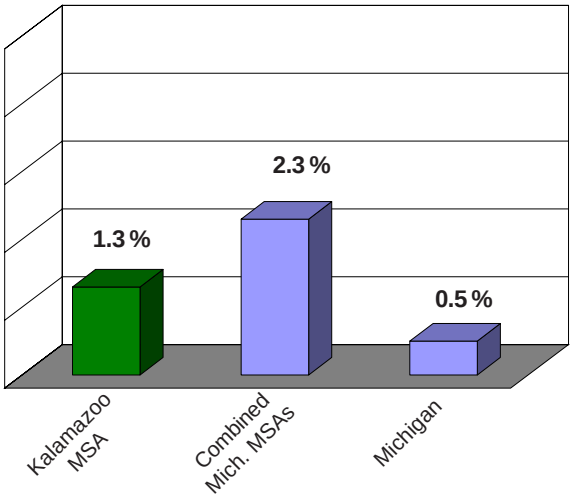
Management and Professional Jobs

(Percent of workforce)



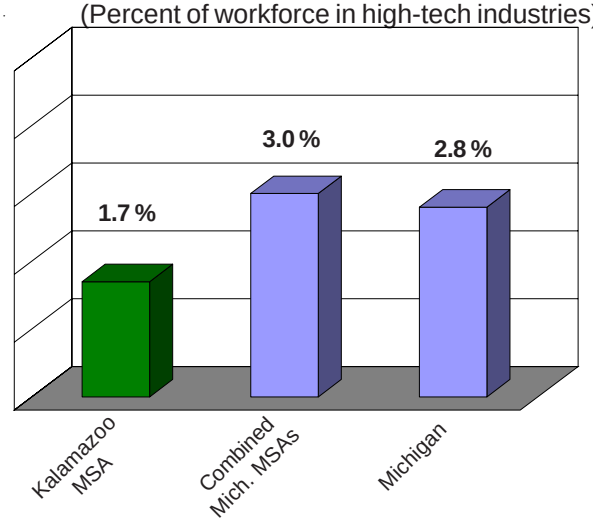
Information Technology Jobs

(Percent of workforce in IT industries)

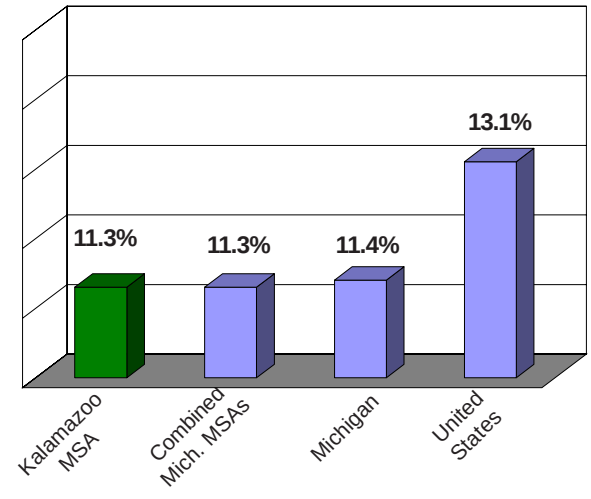


High-Technology Jobs

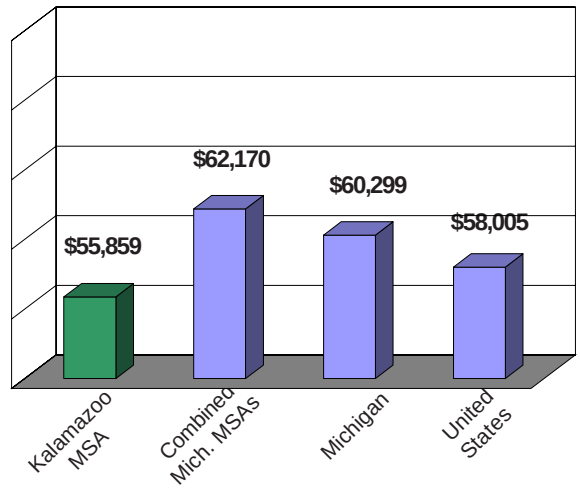
(Percent of workforce in high-tech industries)



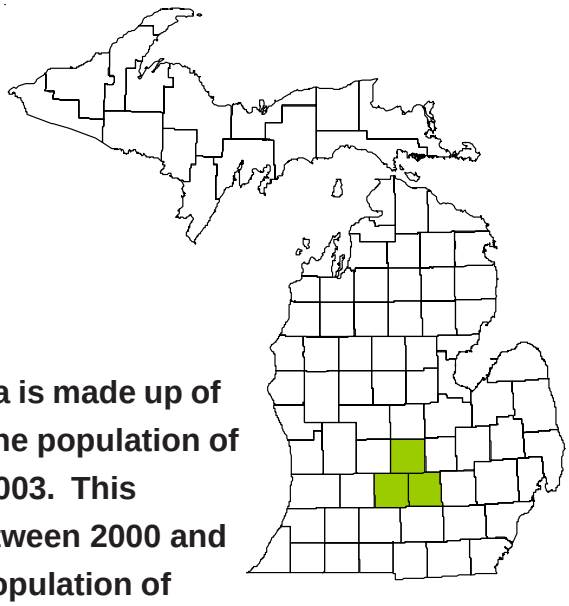
Share of Jobs in High-Skill, High-Wage, High-Growth Jobs



Median Wages in High-Skill, High-Wage, High-Growth Jobs



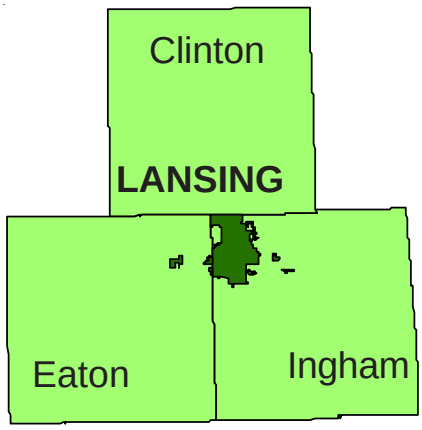
LANSING AREA SNAPSHOT



The Lansing Metropolitan Statistical Area is made up of Clinton, Eaton, and Ingham Counties. The population of the MSA was approximately 456,000 in 2003. This represents an increase of nearly 2% between 2000 and 2003. The city of Lansing, with a 2003 population of 118,379, comprises 26% of the MSA total.

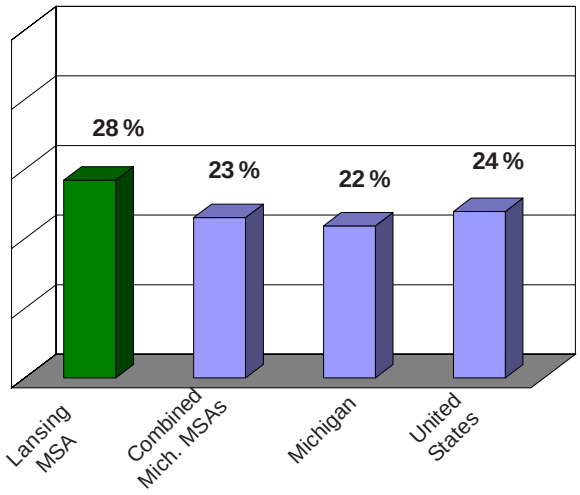
As of the 2000 Census, the Lansing area's per capita income was $21,653, about 2% lower than the statewide figure. The poverty rate for the region was 11.1%, slightly higher than the 10.5% statewide rate.

The Lansing area compares most favorably to other Michigan MSAs on indicators of workforce development and professional engineers. On most indicators in this report the Lansing area ranks in the middle of the group of MSAs.

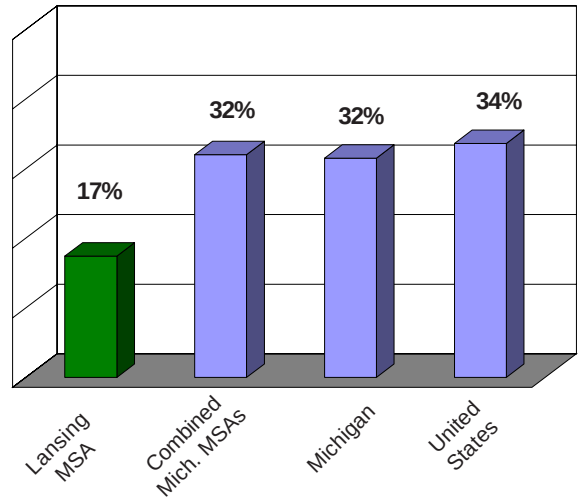


LANSING METROPOLITAN STATISTICAL AREA INDICATORS

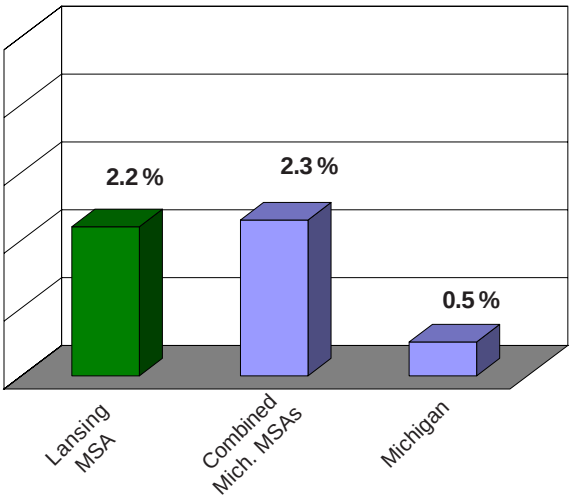
Workforce Education
(Percent of workforce with BA degree)



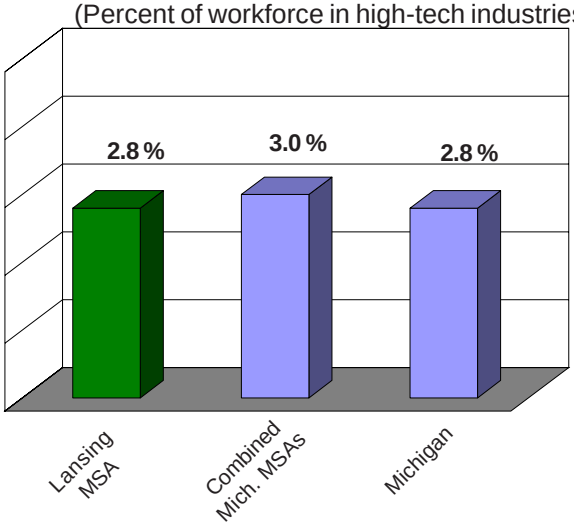
Management and Professional Jobs
(Percent of workforce)



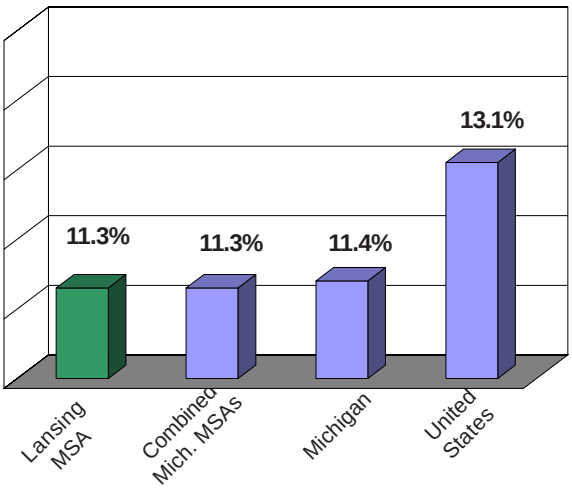
Information Technology Jobs
(Percent of workforce in IT industries)



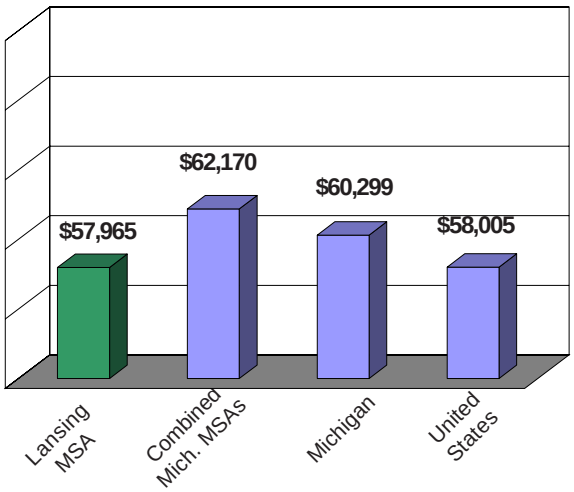
High-Technology Jobs
(Percent of workforce in high-tech industries)



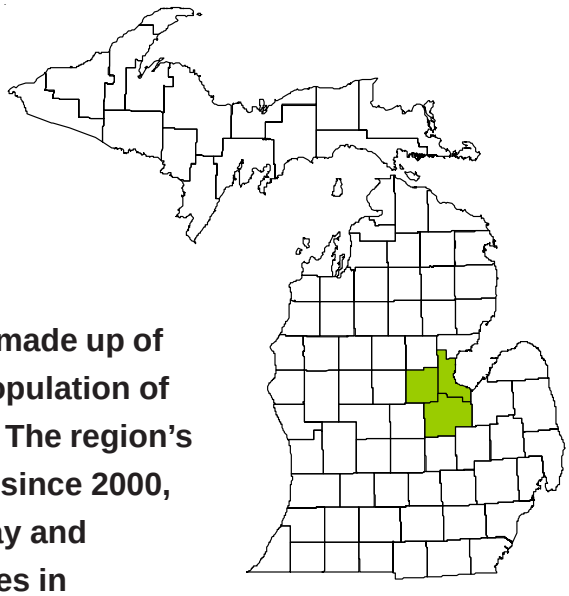
Share of Jobs in High-Skill, High-Wage, High-Growth Jobs



Median Wages in High-Skill, High-Wage, High-Growth Jobs



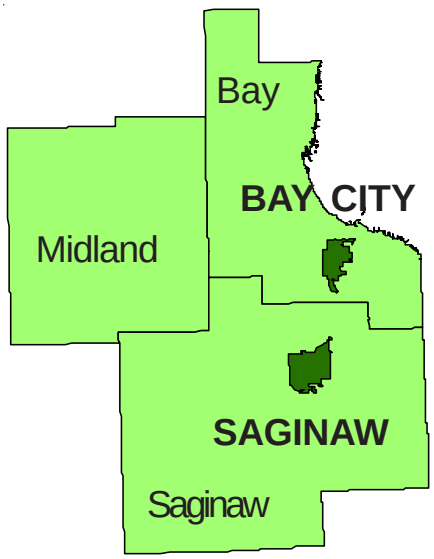
SAGINAW AREA SNAPSHOT



The Saginaw Metropolitan Statistical Area is made up of Bay, Midland, and Saginaw Counties. The population of the MSA was approximately 400,000 in 2003. The region's overall population has remained unchanged since 2000, with Midland County growing slightly and Bay and Saginaw Counties experiencing small declines in population. The cities of Bay City (35,428) and Saginaw (59,235) account for about 15% of the region's population.

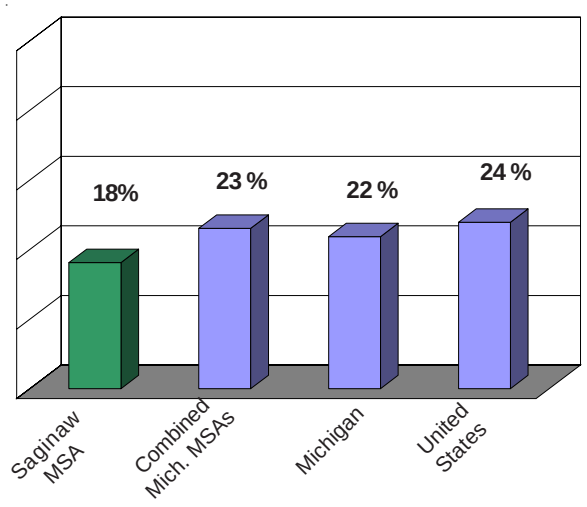
As of the 2000 Census, the Saginaw area's per capita income was $20,320, about 8% lower than the statewide figure. The poverty rate for the region was 11.6%, compared with the statewide rate of 10.5%.

The Saginaw region underperfomed other Michigan MSAs on most indicators in this report. The region compared most favorably on indicators of cable modem access and the share of high-skill, high-wage, high-growth jobs.

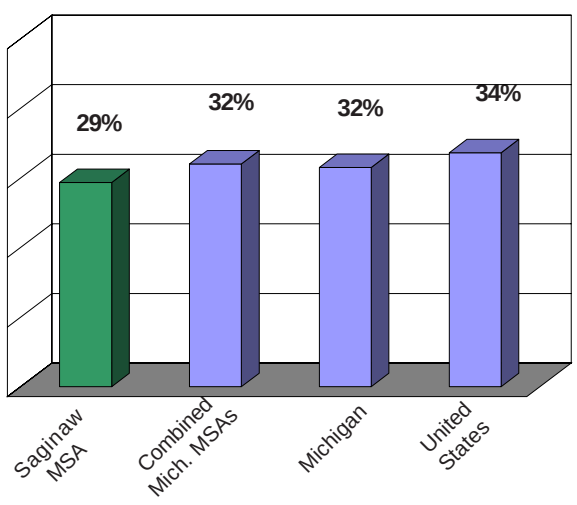


SAGINAW METROPOLITAN STATISTICAL AREA INDICATORS

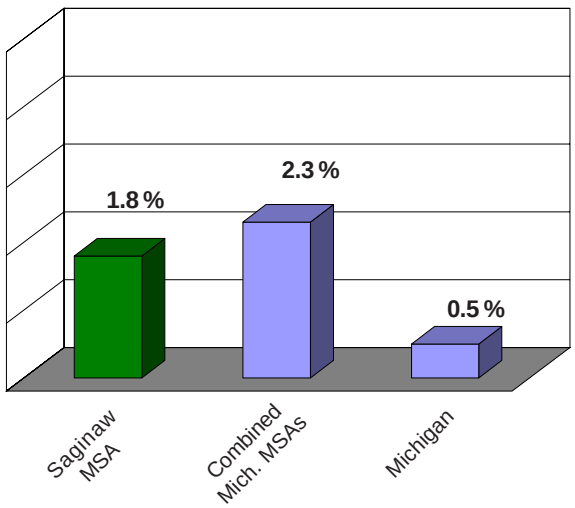
Workforce Education
(Percent of workforce with BA degree)



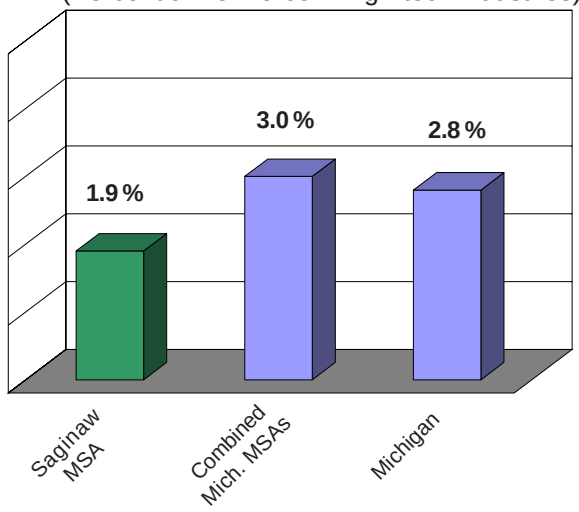
Management and Professional Jobs
(Percent of workforce)



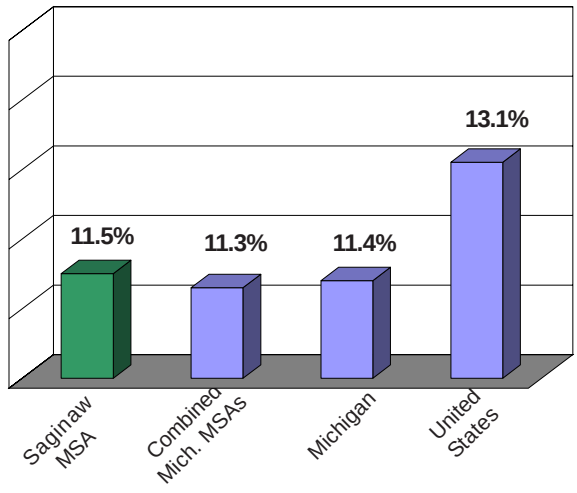
Information Technology Jobs
(Percent of workforce in IT industries)



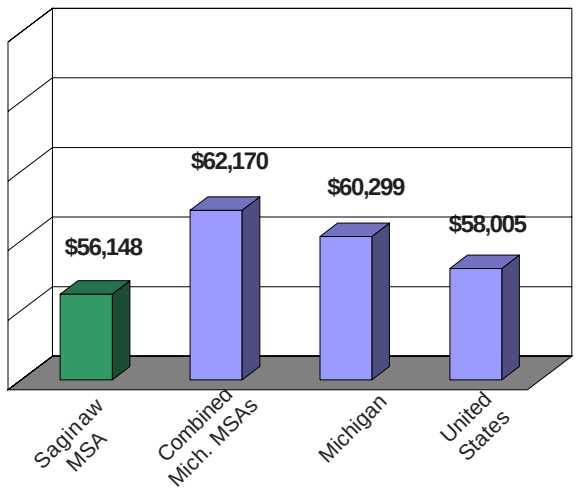
High-Technology Jobs
(Percent of workforce in high-tech industries)



Share of Jobs in High-Skill, High-Wage, High-Growth Jobs



Median Wages in High-Skill, High-Wage, High-Growth Jobs



CONCLUSION

The promise of technology to aid humankind in the securing of our basic needs and releasing us from the drudgery of meaningless toil has been the hope and aspiration of modern civilization. Evidence of our technological cleverness is pervasive in our daily lives, and our potential to actualize a civil society in which our economic and democratic prosperity are assured almost seems within our grasp.

Technology-led economic development offers great wealth generation potential for those individuals and communities who are creative, talented, have a modern IT infrastructure, and have the foresight to plan for the new economy. Many of these characteristics are present in "university towns" where public and private investments in knowledge generation and application have been a long-term priority. Cities and metropolitan areas with a research and development capacity will likely do relatively well in the knowledge, technology-led economy that is emerging globally. However, those communities that do not succeed as research and development or other high-knowledge centers will probably find themselves competing with the rest of the world to be the cheap labor pool of choice, and thus may join the widening disparity between winner and loser communities worldwide.

While Michigan has a number of public and private higher education/research institutions (depending on how one counts we estimate there are between 116-175 post K-12 education and research facilities throughout the state), many core cities and metropolitan areas do not have this historic intellectual infrastructure. As a result, cities have an important role in all elements of the innovation-commercialization continuum (see Figure 1).

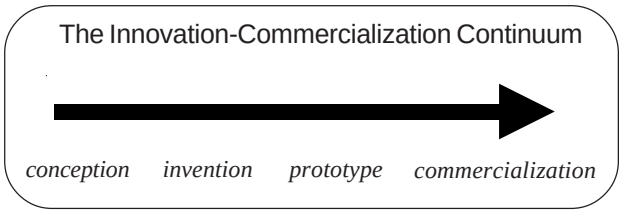


Figure 1. The Innovation-Commercialization Continuum

For publicly funded technology-led economic development to have a broad economic impact beyond just creating a few highly-skilled, highly-paid jobs for professionals in gifted communities, economic development practitioners and public policy officials must have a basic grasp of the creative process that supports innovation and commercialization. This creative and commercialization process can be described as the innovation-commercialization continuum.

Current practice suggests that in the early phases of conceptualizing and prototyping an innovation, it is often critical for the "inventor" to be near a university/research institute where the necessary intellectual mass (human capital), technological infrastructure, financial capital, and creative environment are in place to support the incubation of a new idea/method. However, once the innovation has been prototyped and is ready for commercialization, the routine production of the new "product" can conceivably occur anywhere that a labor force,

transportation/information system, business environment, and community amenities are conducive to the production of that "product". At this point in the continuum, Michigan incubated inventions can actually shop globally for a production home. It is a rather curious potential consequence of the technology-led innovation-commercialization continuum that a state or other public institution might make all the initial up-front investments in the innovative process only to see the "pay-offs" in terms of jobs go to other places.

Cities and their metropolitan areas must pursue strategies designed to enhance their competitive advantage in a technology driven economy and improve their features that would retain, attract and develop industries in the knowledge economy. Communities with the desired infrastructure, labor pool, amenities, quality of life and other factors can compete for the high-skilled high-wage jobs in the knowledge economy.

Strategic Community and Economic Development Actions

The selection of appropriate economic development strategies must be done in the context of your local situation. The unique social, economic, environmental, political, institutional, and individual character of a community will in a large part determine the "apply-ability" of each or any combination of these strategies. The following are potential strategic actions communities can pursue to enhance their competitive advantage in creating and retaining jobs in the globally competitive knowledge economy:

Establish a shared vision: Public/private partnerships that are committed to a shared community vision have the highest potential to succeed. Broad-based inclusive participation in establishing a set of shared objectives is critical to community mobilization and goal attainment. Work together to address your shared concerns. Identify key leaders who can "spread the word" on the challenges and opportunities for the community.

Continuously develop your workforce: The most critical resource in the knowledge economy is our human capital. A community that fails to educate and retrain its residents does so at its economic peril! Worker retraining, proactive lifelong learning, and an effective K-12 education system are basic elements of a globally competitive community economy.

Analyze your current strengths and capacities: An assessment of your current abilities and resources is an important first step in the community and economic development process. Business "Cluster analysis", community resource and individual skill inventories and other asset based assessment methods are useful in targeting limited resources to actions that may have immediate and significant pay offs. The capacity for business innovation is often facilitated by industry "clusters"; these are broad networks of producers, suppliers, and organizations that can bring new products to the market.

Support creativity and entrepreneurship: Sir Francis Bacon is credited with saying "If we are to achieve results never before accomplished, we must employ methods never before attempted." A new economy is based on new ideas! Support creativity in all its forms, support reasoned risk takers, create an environment that encourages the development and implementation of new ways of producing and distributing goods and services. Change is an

important of the knowledge economy. Look for those who seek to innovate and support their creative endeavors where appropriate.

Provide access to capital: Access to venture, equity and debt capital are critical to the development and implementation of new enterprises. A community needs a broad set of financial resources to provide for the creation and development of new economic enterprises. Assess your current financial institutional capacity and mobilize to address gaps in your capital resources.

Develop and maintain infrastructure: The knowledge-based global economy requires both the traditional public works of the 20th century, roads, sewers, water etc. and a unique set of new infrastructure requirements. Access to the internet, and related telecommunications technologies are as essential to economic development as roads were in the mid-20th century. Assess your 21st century infrastructure capacity and invest strategically in those areas that are critical and underdeveloped.

Promote quality of life: Place is still critical in the global knowledge-based economy. Knowledge workers and knowledge based industries in considering location decisions consider the overall quality of life available in a community. Examine and promote your cultural and environmental amenities. Where necessary support the development of a diverse quality life that will attract high-skilled, high-paid workers. Place makes a difference – make your place different!

Summary

The challenge confronting policy makers in pursuing a publicly funded technology-led economic development strategy, is to not only support the elusive creative process but to insure that the benefits (jobs/revenues) of that process accrue to those communities or public institutions that made the crucial investments in the first place. In an integrated global economy this is a particularly daunting task.

Private investors and higher education institutions often seek to secure, through patents and other property rights protections, some rate of return on their investment in innovation. There are few, if any, tools available to state and local governments to realize a reasonable rate of return on their public investments in technology-led economic development, particularly if after the incubation period and during the commercialization of the “product” the production moves to a foreign shore.

Technology-led economic development offers a great opportunity for economic growth and an improved quality of life for a few well-positioned communities. But for many others, isolated rural areas, abandoned or distressed urban/suburban neighborhoods, publicly supported technology-led economic development strategies raise a new set of challenges for practitioners and policymakers alike. As with the publicly funded economic development strategies of the past millennium, a new set of tools to enhance and secure an improved quality of life, particularly for distressed communities, needs to be developed and implemented. We owe it to ourselves, and our posterity, to seek out these tools and apply them appropriately.

APPENDICES

Adapting Planning Practice to the Knowledge Economy

Sources and Technical Appendix

Adapting Planning Practice to the Knowledge Economy

A Checklist of Possible Strategic Actions for Local Communities and Regions

Planning for Knowledge Jobs

- ☐ In the knowledge economy, an educated citizenry is critical to success. If a community does not get smarter it **will** get poorer.
- ☐ A community should provide educational opportunities across the life-span of the workforce.
- ☐ Begin with early childhood development with a seamless transition to k-12, higher education, career development and retraining programs.
- ☐ Establish a business/education roundtable as a regular forum for businesses to discuss education and training needs and for education to discuss program challenges, curriculum options and resources
- ☐ Develop "technology education centers" designed to train participants on relevant technologies of interest to the local community.
- ☐ Recapture high school graduates that leave the area for higher education through strategies such as forgiving student loans, promote local alumni networks, and welcome home events.

Planning for Innovation

- ☐ Establish a technology business incubator.
- ☐ Create flexible investment funds to make capital available to emerging enterprises/ technologies/entrepreneurs.
- ☐ Support and entrepreneurial environment that values risk takers and innovators.
- ☐ Provide broadband access.
- ☐ Host business/community "innovation fairs."
- ☐ Provide patent assistance.
- ☐ Establish links to higher education technology centers in your region to facilitate the location/expansion of innovative enterprises to your community.
- ☐ Establish a "speaker's bureau" of informed community leaders who can help spread the word on the global knowledge economy and its potential challenges and opportunities for your community.
- ☐ Create a "technical assistance network" that can provide low or no cost preliminary consultation to local businesses on incorporating technology within their enterprise.

Planning for a Digital Economy

- ☐ Link homes, schools, businesses and government to the global internet and to each other.
- ☐ Create a community/business/government web presence.
- ☐ Provide broadband access where currently not available.
- ☐ Provide wireless access where appropriate.
- ☐ Provide non-formal adult education programs for residents on the global communications network.
- ☐ Map your community's global communications network.
- ☐ Use digital communications to support democratic governance in you community.
- ☐ Provide technical and financial assistance for residents and businesses to improve and expand their access to the digital economy.
- ☐ Require "open capacity" on any fiber optic infrastructure that is constructed, which may be used in the future to expand your e-commerce capacity.

Planning for Globalization

- ☐ Facilitate export trade and global markets for existing products and services in your community (remember Canada is a Michigan neighbor)
- ☐ Identify existing exporting firms and identify related local industries that may also export to similar markets
- ☐ Consider attracting foreign based firms to your community in strategic and complementary industries
- ☐ Link to Michigan foreign trade zones.
- ☐ Identify and describe your community's global transportation capacity and share that with your local businesses.
- ☐ Identify and celebrate local ethnic/cultural heritages and explore possible international social capital opportunities.
- ☐ Conduct an "Industry Cluster Analysis" to assess possible global linkages and opportunities
- ☐ Organize and conduct training for key industry personnel and entrepreneurs on international trade and working in a culturally diverse economy.

Sources and Technical Appendix

Knowledge Jobs

Workforce Education

Source: U.S. Census Bureau, American Factfinder, 2000

Online at: http://factfinder.census.gov/home/saff/main.html

The U.S. Census collects data on educational attainment, including those over the age of twenty-five with a bachelor's degree or higher. This data was collected using American Factfinder for each county within an MSA, and data was aggregated from a county level to the MSA level. The educational attainment numbers were divided by the total number of people age twenty-five and older to obtain the reported percentage.

Managerial and Professional Jobs

Source: U.S. Census Bureau, Summary File 3, Matrices P49, P50, and P51

Online at: http://factfinder.census.gov/servlet/DTGeoSearchByListServlet?ds_name=DEC_2000_SF3_U&_lang=en&_ts=136201616468

The U.S. Census reports employment figures for six occupational groups (Management, professional, and related; Service; Sales and office; Farming, fishing and forestry; Construction, extraction, and maintenance; and Production, transportation, and material moving). This indicator was developed by first collecting county level data on employment in Management, professional and related occupations for each county within Michigan's MSAs, aggregating the number from the county to the MSA level, and dividing by the total number of jobs in the six occupational groups to obtain the share of managerial and professional jobs as a percentage of the workforce.

Information Technology Jobs

Source: 2000 County Business Patterns (NAICS), U. S. Census Bureau.

Online at: http://censtats.census.gov/cgi-bin/msanaic/msasel.pl

Information on employment for information technology industries was derived from U. S. Census data. Four NAICS industry codes were identified to represent industries providing IT jobs (5132 Cable Networks and Program Distribution; 5133 Telecommunications; 514 Information Services and Data Processing Services; and 5415 Computer Systems Design and Related Services). The number of jobs for each code and the total number of jobs was determined for each metropolitan statistical area by aggregating the data for each county within an MSA. The number of IT related jobs for each MSA was then divided by the total number of jobs within an MSA to obtain IT jobs as a percentage of the workforce.

High-Skill, High-Wage, High-Growth Jobs

Source: 2003 Bureau of Labor Statistics (BLS), U.S. Department of Labor

Online at: http://www.bls.gov/home.htm

Information on High Skill, High Wage and High Growth Jobs (H3 Jobs) was obtained using Bureau of Labor Statistics data. First, of all the occupations classified by BLS, three filters were applied to obtain a list of occupations meeting all three of the following criteria: typically required at least an Associate Degree or higher of education (using the education-level search provided by BLS); having an annual median income (nationally) above the median level for all occupations; and having a projected growth rate in employment for 2000-2010 (nationally) that was higher than the overall average growth rate. A total of 136 occupations satisfied the criteria for H3 Jobs. Not all 136 H3 occupations had employment and wage data reported in each MSA in Michigan; 52 occupations had data available for seven of the eight Michigan MSAs (to include the Jackson MSA would have reduced this number by about half, so Jackson was not included in the H3 indicators). Total employment and annual median wage data were collected for these 52 occupations for each MSA. Weighted average median income for H3 Jobs was calculated for each MSA by summing the products of total employment and annual median income for each occupation, and dividing by the total employment in all H3 occupations in the given MSA.

Innovation

Professional Engineers

Source: Michigan Department of Labor and Economic Growth, 2003

Professional engineers are licensed by the State of Michigan. The Licensing Division of the Michigan Department of Labor and Economic Growth (formerly Consumer and Industry Services) maintains a database of registered engineers, including residential address. Using a hard copy printout of the database, addresses of licensed engineers were aggregated to the county level. The county data was again aggregated to the MSA level and are reported as a share of the total MSA workforce (private, nonfarm workers over 16) as reported by the United States Census Bureau, 2000.

High Technology Jobs

Source: 2000 County Business Patterns (NAICS), U.S. Census Bureau

Online at: http://censtats.census.gov/cgi-bin/msanaic/msasel.pl

Seven NAICS industry codes were identified to represent industries providing high technology related jobs (334 Computer and Electronic Product Manufacturing; 5112 Software Publishers; 5132 Cable Networks and Program Distribution; 5133 Telecommunications; 514 Information Services and Data Processing Services; 5415 Computer Systems Design and Related Services; and 5417 Scientific Research and Development). The number of jobs for each code and the total number of jobs was determined for each county and aggregated with other county data within each MSA. For each MSA, the combined number of jobs in the high technology categories was divided by the total number of jobs to determine the percentage of the workforce employed in such jobs.

Patents

Source: U.S. Patent and Trademark Office, 2002
Online at: http://patft.uspto.gov/netahtml/search-adv.htm

Using the online U.S. Patent and Trade Office (USPTO) database, all patents registered in calendar year 2002 were identified by the geographic location of the patent assignee in Michigan. Each patent was associated with the county in which the assignee address is located. These county numbers were then aggregated to the metropolitan statistical area level and divided by the total population of each MSA and multiplied by 100,000 to obtain patents per 100,000 residents.

Venture Capital Firms

Source: Michigan Economic Development Corporation (MEDC), 2003
Online at: http://www.medc.michigan.org

MEDC maintains a database of venture capital firms located in Michigan. The total number of venture capital firms per county (as of March 2003) was collected and then aggregated to the MSA level. The home office location for each firm is represented in this indicator.

Digital Economy

Internet Use

Source: State of State Survey, MSU Institute for Public Policy and Social Research, 2002.

The 28th round of the State of the State Survey (SOSS) was conducted by MSU's Institute for Public Policy and Social Research (IPPSR) from October 19 through December 31, 2002. The quarterly survey is administered by telephone by IPPSR's Office for Survey Research. This round of the survey reached 989 Michigan adults. Results were aggregated to MSU Extension regions, which include six multi-county regions (responses from the City of Detroit are incorporated into Southeast Michigan results). Regarding Internet use, respondents were asked, "How often, if at all, do you access the Internet, either for the purposes of sending e-mail or visiting or browsing the "world wide web?" Responses were classified by county, and then aggregated to the MSA level.

Cable Modem Access

Source: Michigan Economic Development Corporation, 2000.
Online at: http://www.medc.michigan.org

In January 2000 MEDC released a map of cable modem infrasturcture coverage, including existing coverage as of January 2000 and projected coverage to January 2002. Using the map's projected 2002 coverage, independent raters estimated the extent of geographic coverage in each county and classified coverage into twelve categories (total coverage, no coverage, and ten intermediate stages). After comparing independent ratings, the raters discussed differences until reaching consensus on rankings. County rankings were aggregated to the MSA level (for MSAs containing more than one county) using the simple average of county rankings.

Online Economic Development

Sources: Cyber-state.org, Local Government & Community Initiative (Online at: http://www.cyber-state.org/1_0/govt2001/mi_localgov.html) and Karan Singh (2003). *Michigan's Windows to the Global Knowledge Economy: A county and regional level web site analysis from an economoic development perspective*. Lansing: Miichigan State University CEDP.

This indicator combines quantitative and qualitative results from two separate studies of local government web sites. Cyber-state data was used to determine the percentage of local government units (city, village, township, and county) in each MSA that had an online presence (in the form of an official government web site). The Singh report was used to classify each county on a scale of 1-4, based on the extent to which it had an online economic development presence. The combined quantity/quality score was calculated by multiplying the poercentage of local units with a website (0 to 100) by the qualitative score (rank of 1=1.0, 2=.75, 3=.5, and 4=.25) to obtain a combined score between 0 and 100. County level scores were aggregated to the MSA level using a simple average of scores for the counties in an MSA.

Globalization

Firms with Foreign Parents

Source: Michigan Economic Development Corporation (MEDC), 2001

A database of Michigan companies with foreign parents is maintained by MEDC's International and National Business Development division. From a hard copy print out of a database issued June 19, 2001, companies were assigned to counties based on geographic location and the number of firms with foreign parents for each county was aggregated to the MSA level.

Exporting Firms

Source: Michigan Economic Development Corporation, 2004.

Online at: http://medc.michigan.org/export/search/searchexpdir.asp
MEDC maintains a running database of Michigan companies that export to foreign countries in eight different categories: Agriculture, automotive, computers, environment, machine tool, medical, plastics, and miscellaneous other. Each company was assigned to an MSA based on its reported location.

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