

**THE ECONOMIC AND DEMOGRAPHIC OUTLOOK
FOR MICHIGAN THROUGH 2040**

Prepared for

Bureau of Transportation Planning
Michigan Department of Transportation

Prepared by

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Introduction

Since the early 1990s, we have produced five sets of long-term economic and demographic forecasts (1994, 1998, 2003, 2008, and 2012) for the Michigan Department of Transportation (MDOT), the Metropolitan Planning Organizations (MPOs), and the State Regional Planning Organizations. In this report we summarize the methods used and the broad results for the most recent outlook.

A consistent set of forecasts have been developed for the state as a whole and for each of Michigan's counties, with Wayne County partitioned into the city of Detroit and the balance of the county. County results can be summed to form any region. The last year of historical data in the model is 2008; the forecast period runs through 2040. Forecasts are provided for each year through 2015 and in five-year intervals from 2015 through 2040; they include population, employment, personal income, households, and Gross Domestic Product for each county and for the state as a whole. The forecasts were developed using a version of the Regional Economic Models, Inc. (REMI) TranSight model, together with a methodology for developing household forecasts designed by the University of Michigan in cooperation with MDOT.

The forecasts are very detailed. The population forecasts are subdivided into eleven age cohorts for both males and females. The major components of population change are also isolated (natural change, net domestic migration, and net international migration). The employment forecasts are based on the Bureau of Economic Analysis series and are broken out into seventy-one divisions consistent with the North American Industrial Classification System (NAICS) for defining industry categories. Included is a detailed breakout of manufacturing industries, the better to accommodate MDOT's

truck/commodity modeling activities. Personal income is partitioned into five major subcategories, total shipments (sales) are categorized into sixty-six private nonfarm industries, and a single series per county is provided for Gross Domestic Product. The household forecasts cover the population in households and in group quarters, the number of households, and the average household size. Included are projections of the distribution of households by size of household, age of household head, category of income, number of vehicles, and with/without children status.

The forecasts can be requested, including individual counties, from the Bureau of Transportation Planning at MDOT. Because of the density of these forecasts, in number of regions, number of years, and number of indicators per region, it is not possible to present the detailed results in this summary report. Instead, we summarize here the general process and trends that characterize these forecasts, with a primary focus on the state as a whole.

In the next section, we discuss our use of models to generate the forecasts for the counties. Following that, we look at two of the major influences on our state outlook: recent economic conditions, and the future path of the national economy and population. We then present our economic and demographic forecasts for Michigan, followed by a summary county breakout of these forecasts. We close with a brief concluding section.

Method

The Economic/Demographic Model

The forecasts, except for the household forecasts, were developed using an economic/demographic model constructed by Regional Economic Models, Inc. (REMI) of Amherst, Massachusetts [2], and adapted by the research team at the University of

Michigan. The REMI model has been fully documented and peer-reviewed in the professional literature [3, 4] and is probably the most widely applied regional economic forecasting and policy analysis tool in the nation. We have been using evolving versions of the REMI model since 1983 to assess projects for several state government agencies in Michigan.

For this study, we were guided by the University of Michigan's near-term economic forecast for the state, which is used by the administration of the State of Michigan, the House Fiscal Agency, and the Senate Fiscal Agency [1]. We updated economic and demographic information for periods not in the model when it was delivered but that subsequently have been released prior to finalizing our forecasts. We also made numerous adjustments to the model based on both our expertise and the comments and insights of a number of local MPOs and regional planning organizations. Specifically, since no model is able to include all local knowledge about a regional economy, we generated a preliminary set of forecasts and solicited input from these local organizations. Their comments guided several of the adjustments that contributed to the final set of forecasts summarized in this report.

The REMI model used in this study was an eighty-four-region model that included eighty-two counties, the city of Detroit, and the balance of Wayne County. An economic model was chosen to produce the forecasts for a number of reasons:

- A model imposes a logical consistency and objectivity across counties.
- Its success patterns can be replicated, and forecast errors can be systematically analyzed and corrections introduced.
- The forecasts can be very comprehensive in coverage.

- The forecasts can be generated frequently.
- The model can capture the interactions between demographic and economic forces.
- Sophisticated models can capture trade flows among regions, and thus a county's responsiveness to activities outside of the county.
- A model does not assume that trends continue indefinitely; unlike extrapolation techniques, a model allows the economy to adjust over time.

Among economic models, the REMI model was selected because of several of its features and credentials:

- It is a state-of-the-art model that has been extensively peer-reviewed in the professional literature.
- It has been field-tested for over thirty years.
- The model is sufficiently comprehensive to incorporate both an economic and a demographic module that interact.
- The model accounts for trade flows among counties.
- It is a very detailed model that captures the dynamic interactions among economic sectors.
- It is used by other government agencies in Michigan.

The Household Model

The REMI model in isolation does not generate household forecasts. Thus, our research team at the University of Michigan, in cooperation with MDOT, developed an interface model to produce such forecasts. The interface model uses data from the 2000

PUMS and a spreadsheet program to apportion households by age category (i.e., the age of the household head) at the county level.

The changing age structure of the population is what drives all of the household forecasts. If, for example, we know from the Census that in county X there were 4,000 people aged 45 to 54 in 2000, with 1,500 households headed by someone in that age group, then the household/population ratio for this age group is 0.375 (1,500/4,000). These 1,500 households are then allocated to the other household categories included in the forecast (income, household size, number of motor vehicles available, presence or absence of children) based on the distribution from the PUMS data. All of these ratios are held constant over the forecast period. The variable that moves the forecast forward is the population in each age category, which changes over time. The resulting apportionment contains seven categories for age, five for household size, three for income, four for vehicle availability, and two for presence or absence of children, for a total of 840 cells for each county.¹

Recent Economic Conditions

The structure of the models, with its embedded mapping of the dynamic movements of the economy and underlying response rates, is a key determinant of the forecast results presented in this study. The results are also influenced by two additional elements. The first is recent and current conditions in the regional economy, which establishes the jumping-off point for the forecast. Obviously, where the economy is headed over the next few years is influenced by how it is performing currently. In this regard, there is both bad news and good news.

¹The total of 840 cells is arrived at as follows: 7 (age) × 5 (household size) × 3 (income) × 4 (number of vehicles available) × 2 (presence or absence of children) = 840 cells.

The bad news, which isn't really news, is that over the past decade the state of Michigan has suffered through the worst economic crisis in our lifetime. From 2000 to 2010, Michigan lost a shocking 549,000 jobs,² over two-thirds of the jobs gained, in number, during the robust growth era between 1990 and 2000. And 346,000 of the job losses—five in eight—occurred in a single year, during the unprecedented crash of 2009.

The hardship wrought over the past decade shows its face in many ways: An unemployment rate that is far too high and only creeping down slowly. Too many families are under water on their mortgages. Too many businesses remain reluctant to hire. The greatest risk is a widespread relinquishing of hope for improvement—the loss of optimism.

Now for the better news. There is light at the end of the tunnel, and in some ways, we are emerging from the tunnel. The path taken by the auto industry shows that retrenchment is not necessarily synonymous with collapse or the abandonment of hope. From the bankruptcy proceedings, the auto companies have seen renewed growth, much to the benefit of the state as a whole; all three of them are now making a profit, albeit with a smaller work force. We remain optimistic that we can and will do better.

This point of view is reflected in our forecast for the state, supported by the data that have come in since the crash of 2009, particularly the most recent numbers. Alternate data sources indicate that 2011 turned out to be a very solid year of growth for the state. The national press has seized on these numbers in recent months to trumpet Michigan's comeback, seeing the state "starting to roll again," "getting back some lost swagger," and observing that "These days, people think about Detroit differently." CNN,

²Throughout this report, the employment data are based on the measure published by the U.S. Bureau of Economic Analysis [6], and as such, include the self-employed, farm workers, and military personnel.

Bloomberg, and other national outlets have described Detroit as the next Silicon Valley. And a few months ago, Bloomberg constructed a new index that showed Michigan's economy recovering at the second-fastest pace in the United States (oil-rich North Dakota is first). We have a long way to go, to be sure, but we've made a good start, and it is heartening that we are no longer viewed as the nation's economic caboose.

Exuberance should be tempered, however. We are extricating ourselves from a very deep hole, and recovering from a recession induced by a financial crisis is a slow climb. Although we see growth for the region in the years ahead, our growth forecast is more muted now than our predictions of several years ago. The details are in the numbers, which make up much of the rest of this report.

Inputs to the Forecast

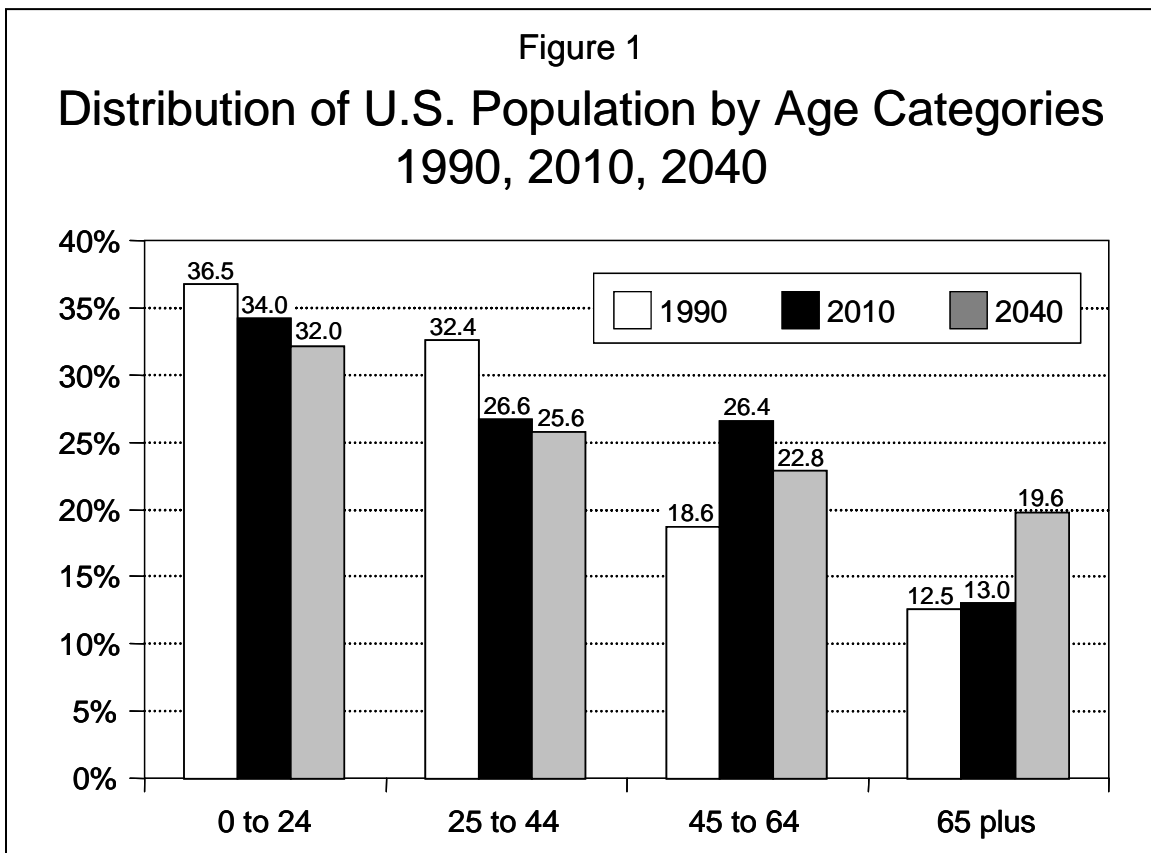
The other key element influencing the forecast outcomes is the series of assumptions that serve as inputs to the model. Even if we accurately capture the workings of the economy, it is also the case that all forecasts are conditional on the assumptions that guide the results. In the case of regional forecasts, many or most of the inputs take the form of assumptions involving the future path of the national economy and population. In the REMI model, some of the features of the U.S. forecast are fixed in the program; consequently, in some instances we have made direct adjustments to the local area forecasts.

In the rest of this section, we touch on several of the overarching assumptions on the national demography and economy.

Inputs Related to the Demographics

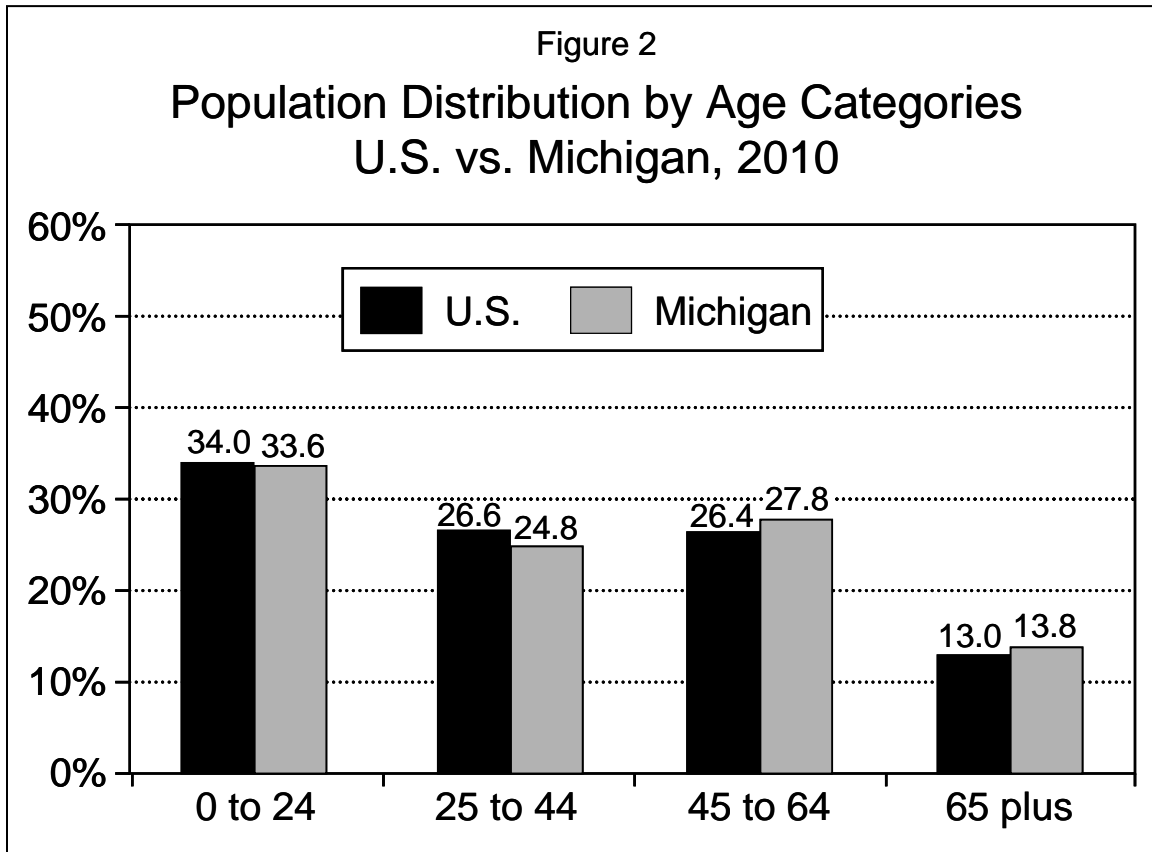
First, we consider the demographic profile, starting with the age structure of the population. One of the factors influencing the growth of the labor force in the long term is changes in the working-age population.

The current age structure of the U.S. population, as well as the past and projected future age distribution, are shown in figure 1. Between 1990 and 2010, there was a very sharp increase nationally in the older working-age population, those aged 45 to 64. This age group's share of the population increased from 18.6 percent to 26.4 percent, while the younger population groups saw a significant decline in their population share. During that same period, the share of the population aged 65 and older remained relatively stable, rising from 12.5 percent to 13 percent. This is about to change.



The impact of the aging of the baby boomer generation is already beginning to be felt, as the first of the post-World War II babies reached the Social Security Administration's full retirement age in mid-2011. The share of the population aged 65 and older is set to increase from 13 percent in 2010 to 19.6 percent in 2040. To put this in perspective, people 65 and older currently account for 17.3 percent of the population in Florida, the state known for its concentration of retirees. In Michigan, we already have a county with the closest approximation today to what the age structure of the United States will look like in 2040—Alpena County, where the share of the population 65 and older is 19.5 percent. The share of the other age cohorts will decline, with the greatest decline occurring in the 45 to 64 age group.

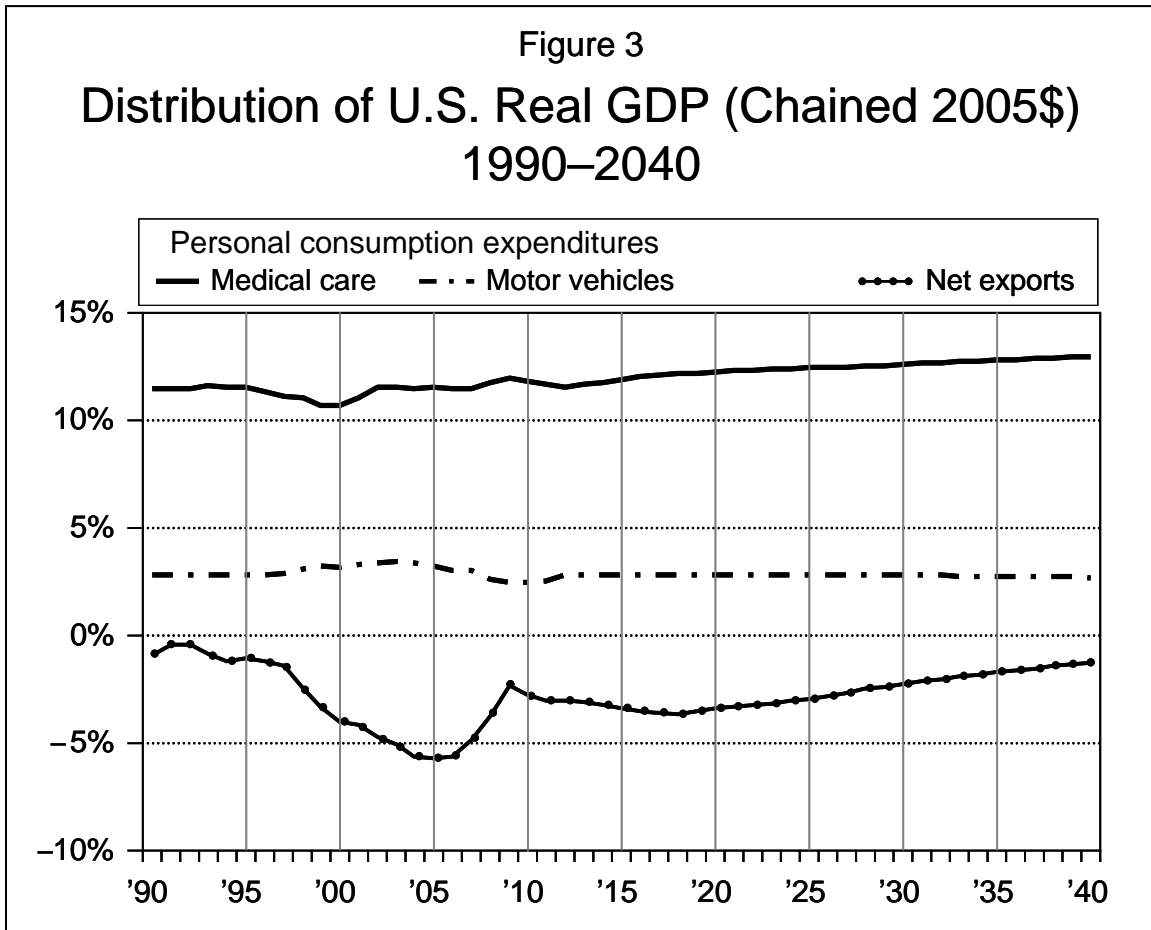
How does the age distribution of the U.S. population compare at this time with that of Michigan? Michigan currently has a disproportionately large share of baby boomers, as can be seen in figure 2. People aged 45 to 64 account for 27.8 percent of Michigan's population, compared with 26.4 percent nationally. The share of the population 65 and older is also larger than in the United States, 13.8 percent and 13 percent, respectively. In comparison, the younger age cohorts, that is, those under 45, constitute a smaller share in the state than in the nation. Those aged 25 to 44 account for only 24.8 percent of the state's population compared with 26.6 percent nationally; and those under 25 make up 33.6 percent of Michigan's population compared with 34 percent nationally. As will be shown, this means that the over-65 population share will grow much more dramatically in Michigan than in the nation.



Inputs Related to the Economy

The most comprehensive measure of output for the U.S. economy is inflation-adjusted (real) Gross Domestic Product (GDP), that is, the value of all goods, services, and structures produced in the economy. Real GDP can be broken out into subcomponents, which are expected to grow at different rates over the forecast period. The changing shares of these subcomponents over time have direct implications for the Michigan forecast. We will focus on three of these subcomponents, which are shown in figure 3.

The consumer services share of national output increases steadily over the forecast horizon, reflecting a movement toward a more service-oriented, information-based economy. The dramatic aging of the U.S. population, especially the increase in the



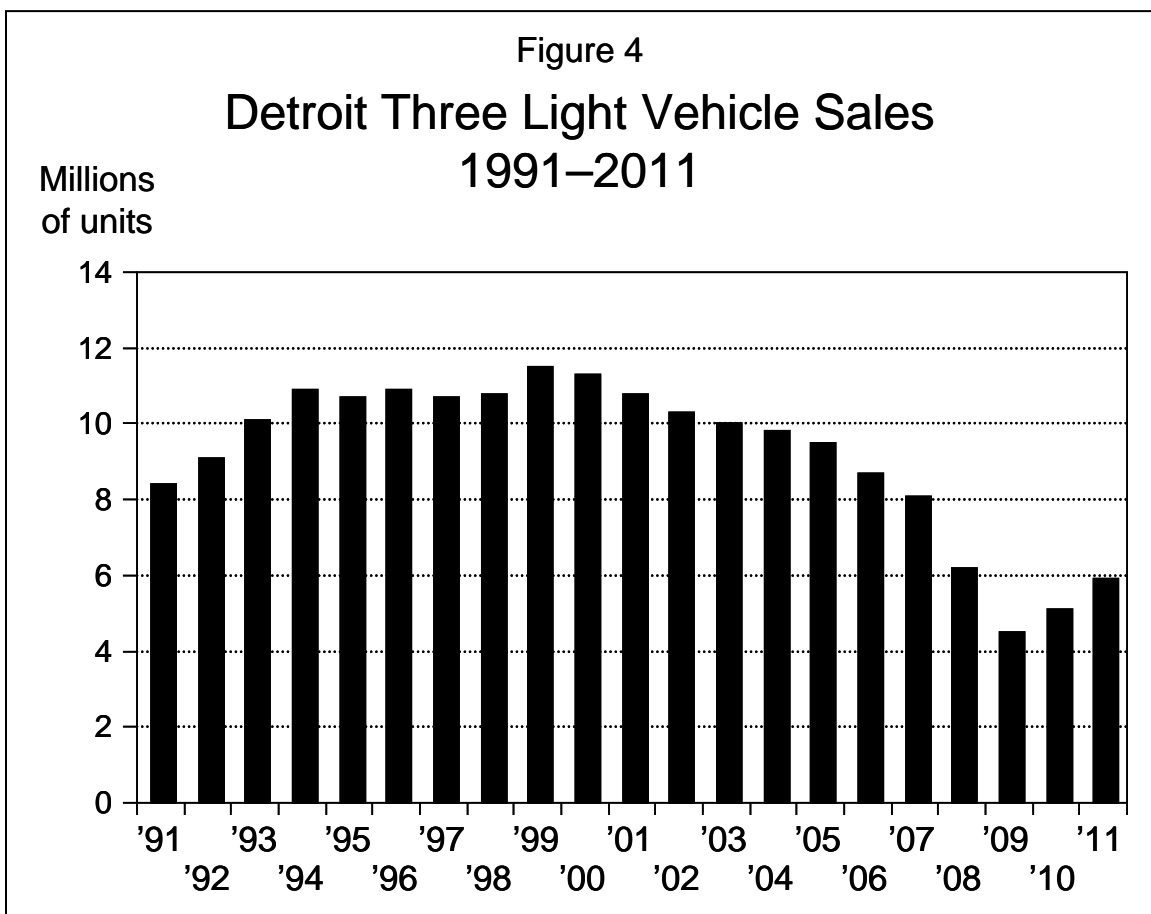
population aged 75 and older, accelerates this trend, particularly with an increasing diversion of spending toward health care services: The proportion of real GDP accounted for by consumer expenditures on medical care services increased by one-half of one percentage point from 1990 to 2009, from 11.5 percent to 12 percent. We are forecasting that the share will increase by an additional percentage point between 2009 and 2040, reaching 13 percent of real GDP then. The expanding demand for services is less subject to global competition in much (but not all) of the service-producing economy compared with the goods-producing economy. The increase in demand for services supports growth in service employment, dampened somewhat by an increase in productivity, but less so than what occurs in the goods-producing economy.

America's trade deficit (the excess of imports over exports) deteriorated sharply between 1997 and 2005, as the reduction in real GDP from net exports went from 1.4 percent to 5.7 percent. American consumers went on a spending spree that drove the saving rate to nearly zero. As these excesses began to correct, helped along by the Great Recession,³ the saving rate was sent back up and the trade deficit retreated, reducing real GDP by a smaller 2.3 percent by 2009. As the economy recovers from the recession, the trade deficit is forecast to increase once again, but reducing real GDP by only 3.7 percent by 2018. The trade deficit then begins to improve slowly, reducing real GDP by 1.3 percent by 2040. This improvement in the trade account would be favorable for Michigan and its exporting activities.

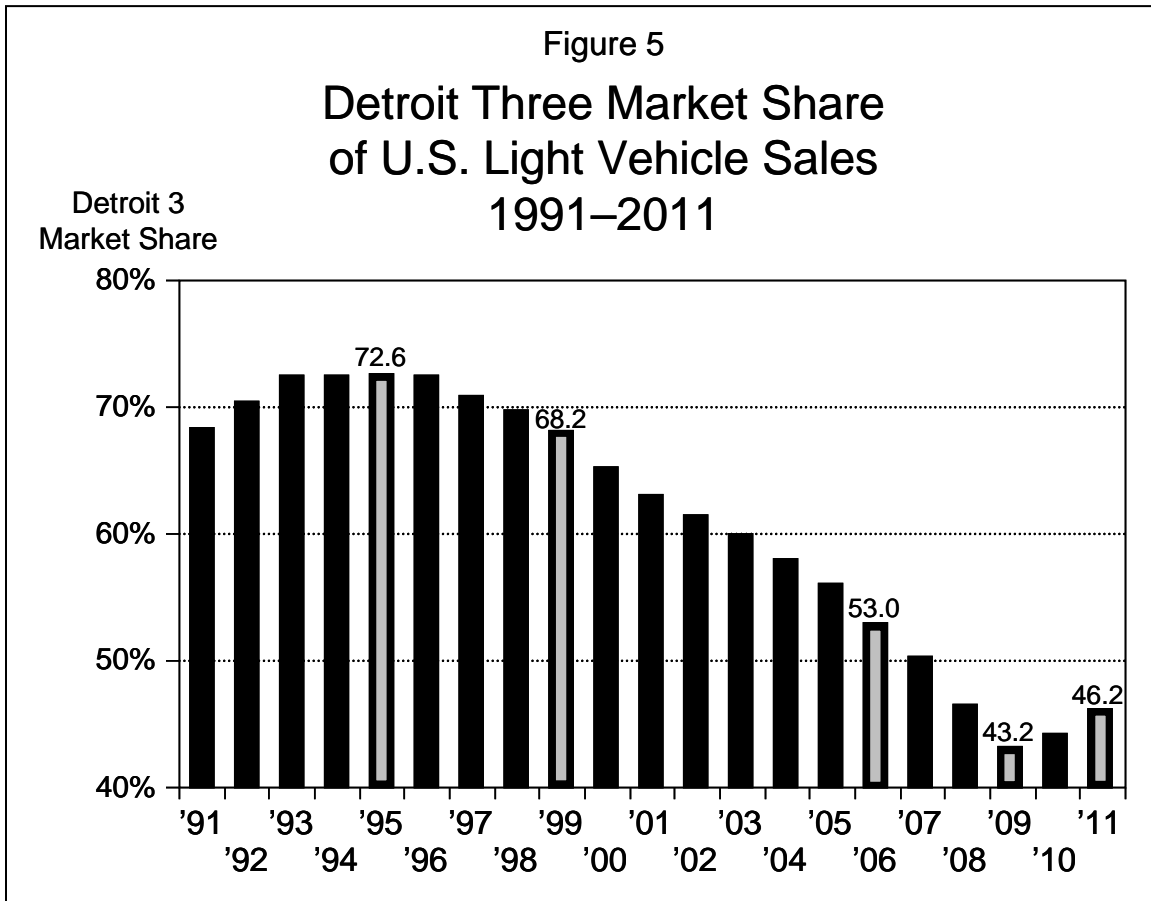
The auto industry benefited greatly from the consumer spending boom. Consumer spending on motor vehicles and parts grew from 2.8 percent of real GDP in the first half of the 1990s to 3.4 percent in 2003. Its share then slipped to 3 percent of real GDP in 2007, and collapsed to 2.4 percent in 2009. Consumer spending on motor vehicles and parts recovers to around 2.8 percent of real GDP by 2012, where we expect it to remain through 2031—a level comparable to the first half of the 1990s. During the 2030s, we are forecasting consumer spending on autos as a share of real GDP to decline slowly, reaching 2.7 percent in 2040. Given Michigan's heavy dependence on the manufacture of motor vehicles, any shift away from spending on the state's dominant product would have adverse consequences for the local economy.

³The Great Recession was a severe global economic downturn sparked by the late-2000s financial crisis. In the United States, the recession began officially in December 2007, with the trough month for business activity pegged as June 2009. Peak to trough, output fell 5.1 percent, and the subsequent pace of recovery was atypically slow as well.

As shown in figure 4, U.S. sales of light vehicles⁴ by the Detroit Three peaked in 1999 at 11.5 million units, and then declined systematically thereafter until 2009, when sales hit bottom at 4.5 million units. Total employment in Michigan, highly correlated with Detroit Three sales, followed suit with a collapse of its own. Through 2005, the plummet in Detroit Three sales was almost solely due to a rapid decline in market share, which shrank from 68.2 percent in 1999 to 53 percent in 2006, as shown in figure 5. By the second half of the decade of the 2000s, total sales were in decline as well, and that augmented the negative effects of a still-declining market share, which hit bottom in 2009 at 43.2 percent.



⁴Light vehicles include cars, minivans, sport utility vehicles, crossovers, and pickup trucks.



Possibly the best single statistic to answer the “why” question on the retrenchment of the Michigan economy is found in the market share numbers—those and data on the concentration of the auto industry in the state, which remains off the charts. The uptick in market share in 2010 and 2011, now at 46.2 percent, together with some rebound in total sales, has opened the door for a moderately improving state economy. Detroit Three sales came in at 5.9 million for 2011, and we see sales increasing slowly for the next several years. Given that the average age of a vehicle on the road today is a record 10.8 years old, replacement purchases will not likely be delayed much longer.

The revival in Detroit Three sales, albeit subdued so far, bodes well for the near-term outlook for the state. In the longer term, we don’t view autos as a growth industry,

but past evidence shows that the local economy can expand so long as there is stability in the auto sector, at least in an output sense. The prospects for employment in the auto industry, and in manufacturing in general, are less favorable in our view, as we expect fairly robust long-term productivity growth over time.

We now turn to a detailed analysis of our economic and demographic forecast for Michigan.

Forecast for Michigan through 2040

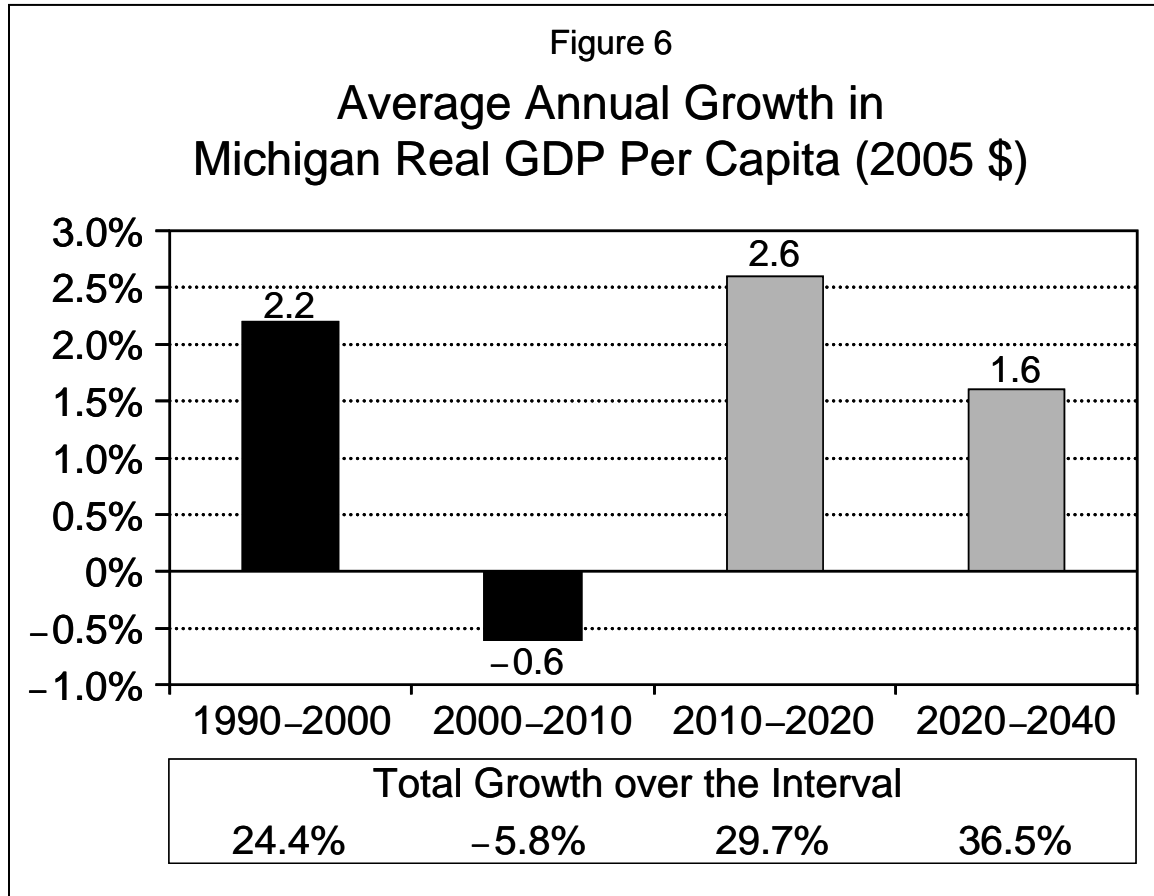
Current conditions locally as well as anticipated future trends nationally portend growth, but only at a moderate pace, for Michigan's population and labor market over the next thirty years. This impression is supported by the results of our demographic and economic forecast through 2040 for Michigan and its counties. We should recognize from the outset that long-term forecasts are intended to identify economic trends, not to predict movements in the business cycle. These forecasts are also unable to capture major one-time events for which there is no prior knowledge, such as a terrorist attack or an oil embargo.

With these caveats in mind, we now review the headline items for our Michigan forecast.

Michigan Real GDP Per Capita

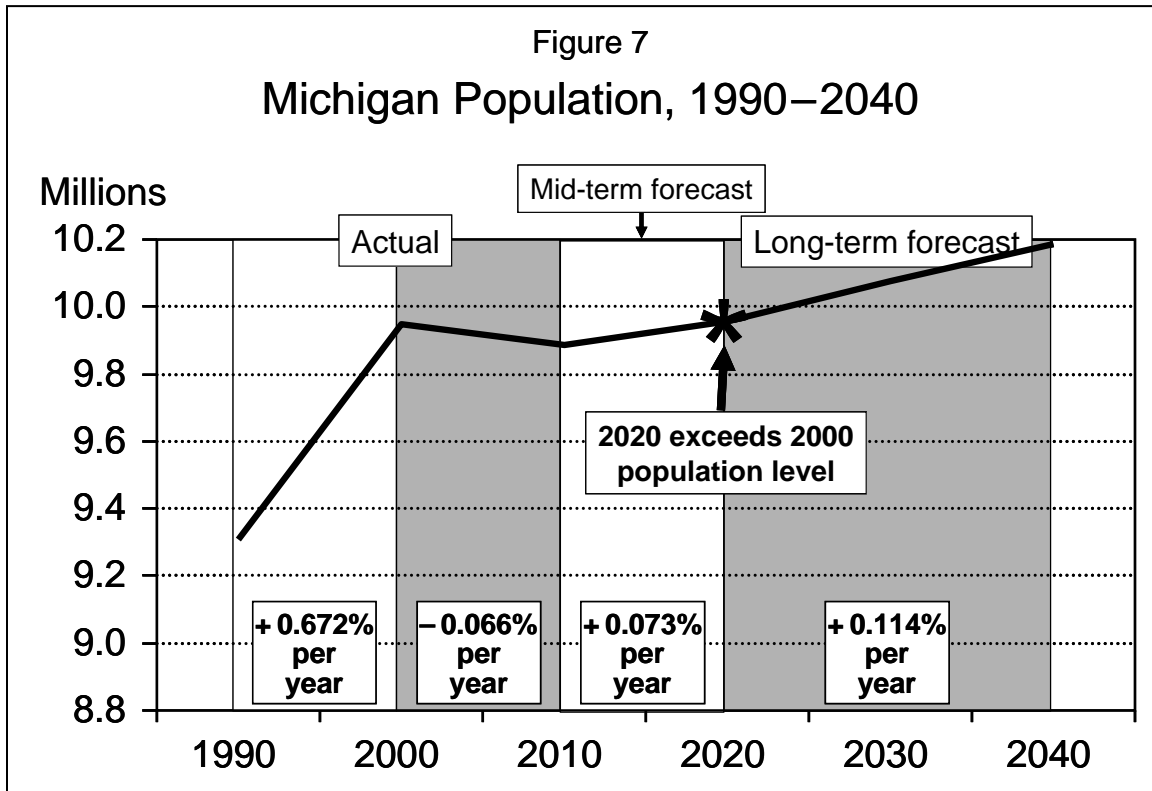
We start with the most comprehensive measure of economic activity for a region. In Michigan, inflation-adjusted (real) Gross Domestic Product (GDP) per capita is forecast to show healthy growth between 2010 and 2020, as shown in figure 6, exceeding its performance during the 1990–2000 period. The relative strength in the current decade reflects the bounce-back from the weak performance of the troubled prior decade, which

was capped by the severe recession in 2008 and 2009. After 2020, real GDP per capita in Michigan slows to a more sustainable growth rate, averaging about 1½ percent per year.



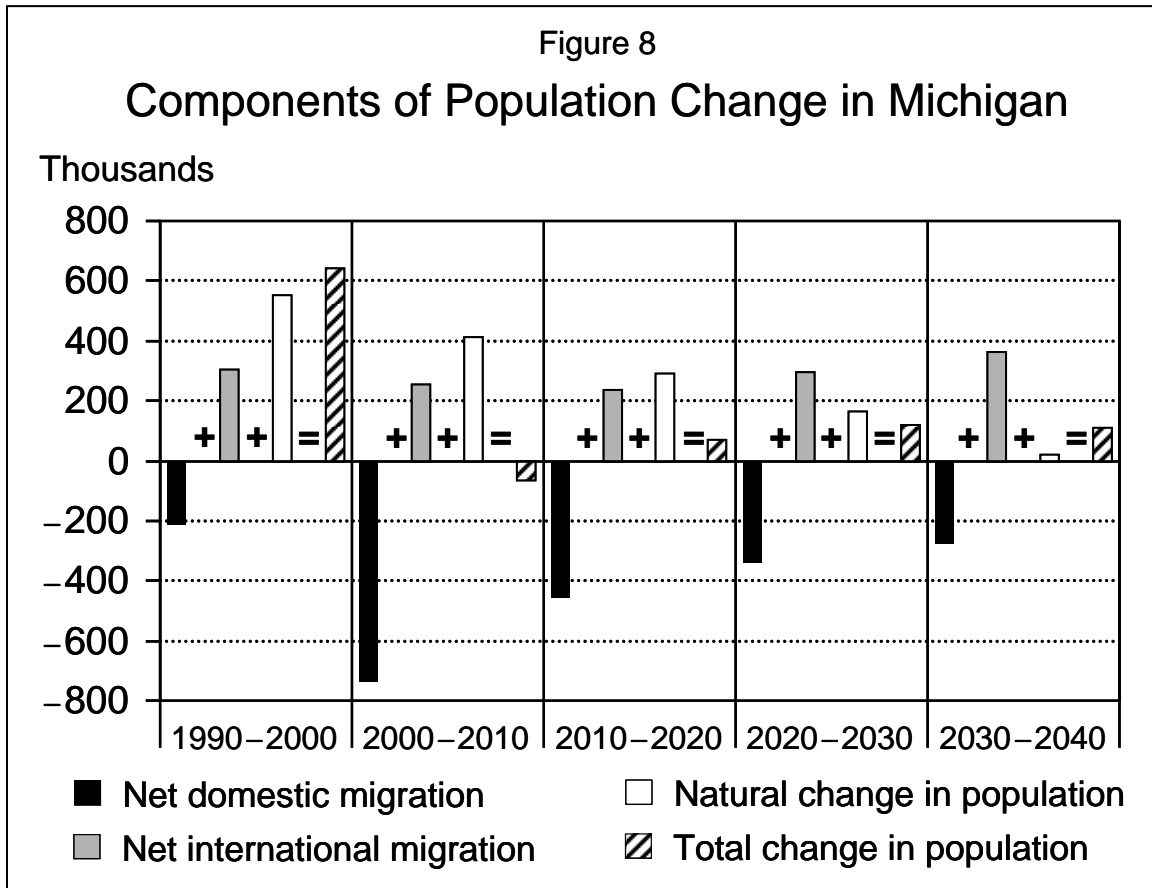
Population

We consider first our forecast of the state's total population trajectory, which is central to the speed limits imposed on Michigan's employment in the long run. The path of total population in Michigan from 1990 to 2040 is shown in figure 7. Data from 1990 to 2010 are provided by the U.S. Bureau of the Census [5], and the extension through 2040 is generated by our forecast. Note that the line segments shown for each decade represent changes over the decade and not year-to-year changes. This format was chosen to align with the forecasts provided in the rest of the report.



Population for the state as a whole reverses its decline of the past decade to grow between 2010 and 2020. Growth is very slow, though, increasing at less than 1/10 of a percent per year, considerably below what we saw during the 1990s when population grew at 2/3 of a percent per year. Michigan doesn't return to 2000 population levels until 2020. Population growth for the state shows some pickup from 2020 to 2040 but remains modest, averaging just over 1/10 of a percent per year.

The impetus behind these movements in population is shown in figure 8, which breaks out the total change in population into its primary components: natural change (births minus deaths) and net migration (the number of in-migrants minus the number of out-migrants), with total migration consisting of domestic migration (movements to or from locations in the United States outside of Michigan) and international migration (movements to or from foreign countries).



During the prosperous 1990s, Michigan's population increased by 644,000 residents, as the excess of births over deaths (553,000) and net gains in international migrants (306,000) more than made up for a net loss in domestic migrants (215,000). Between 2000 and 2010, however, the state lost 65,000 people, reflecting a combination of large declines in net domestic migration (735,000) with the dismal economy, a little lower net international migration (256,000), and smaller natural increases (414,000).

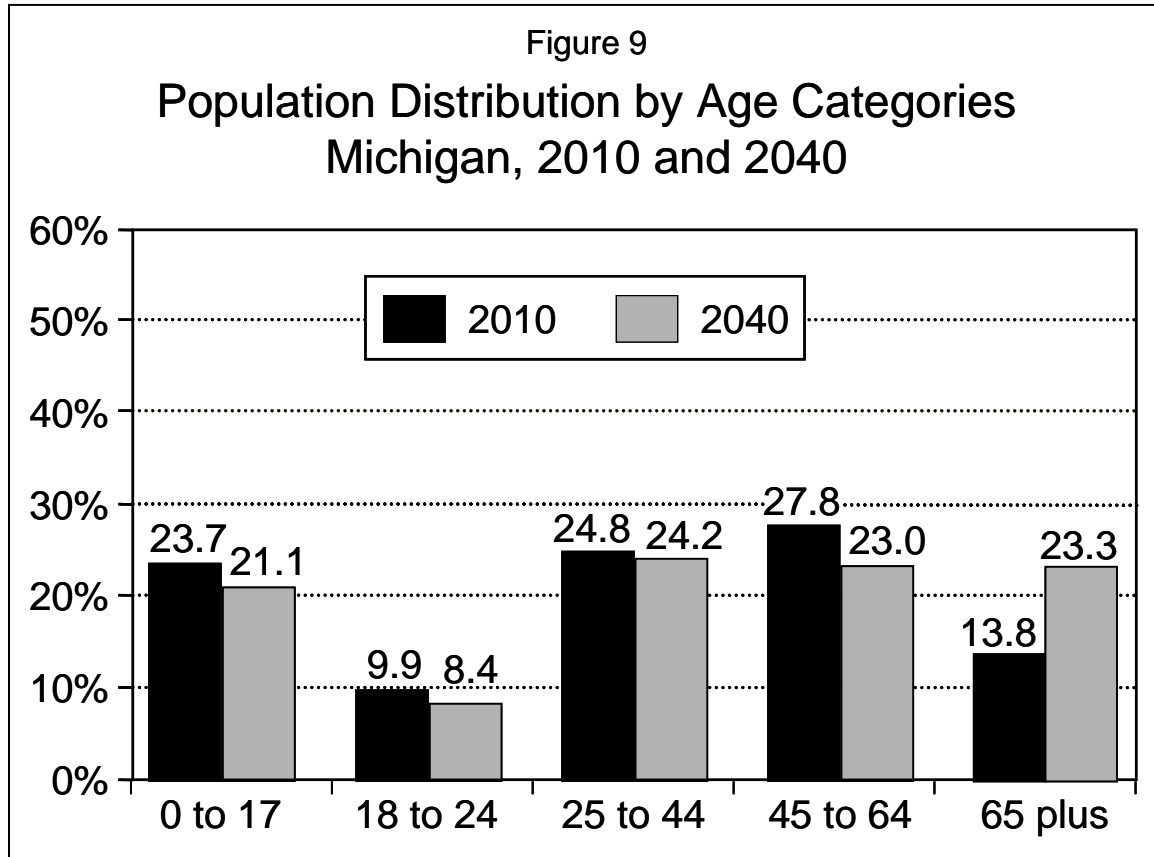
With the economic recovery after 2010, population growth turns from the small loss of the previous decade to a small gain from 2010 to 2020 (72,000), due to smaller declines in net domestic migration (456,000). During the 2020s and 2030s, continuing

smaller declines in net domestic migration and larger gains in net international migration offset ever-shrinking gains in natural growth, maintaining small gains in total population.

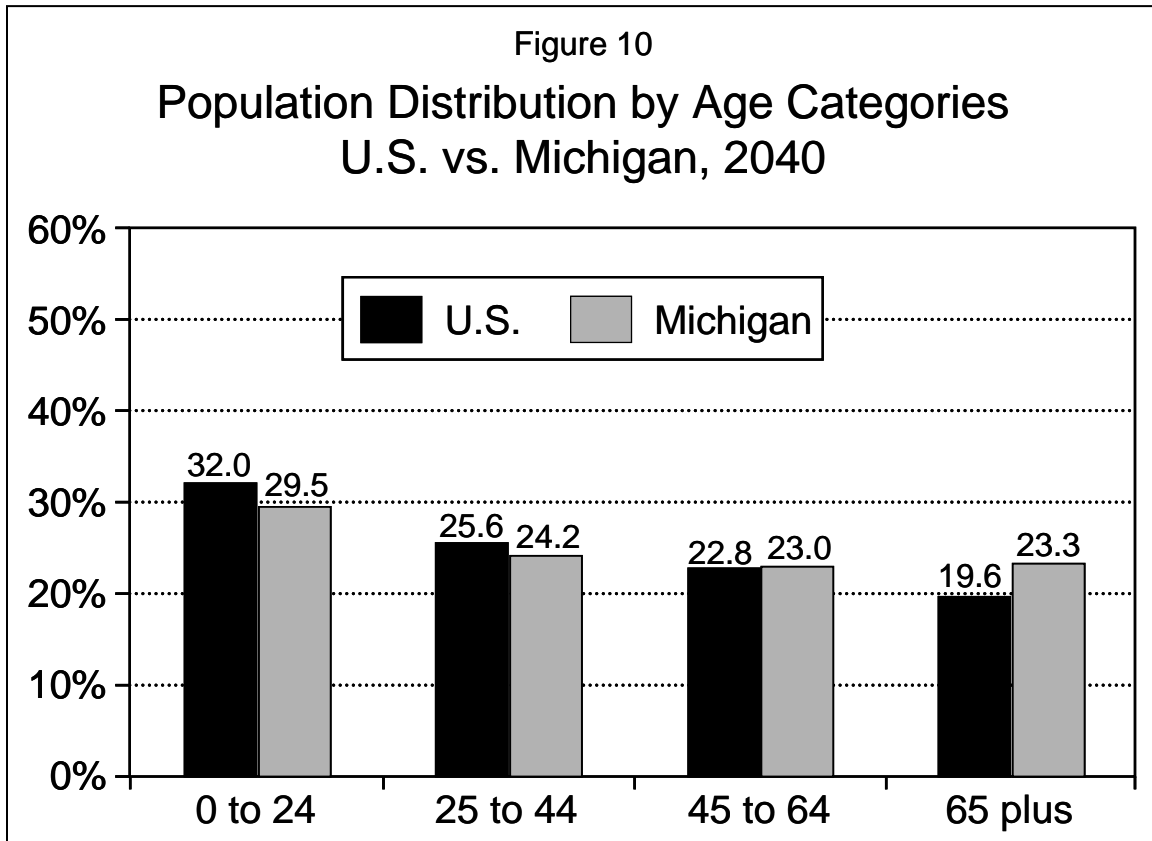
Summarizing the behavior of the three components of population change: The natural increase slows dramatically and consistently over the next three decades as the population ages, shrinking from 414,000 in the 2000–10 period to a mere 21,000 over the decade of the 2030s. Net domestic migration remains negative from 2010 to 2040, but at a slowing rate over the decades. Net international migration continues to show moderate growth over the forecast period, with some pickup in the post-2020 period. Without international migration, Michigan’s population would be shrinking at an accelerating pace over the next thirty years, which would lead to a weaker employment profile as well.

The aging of the baby boomer generation and the relatively low rate of in-migration of young adults will result in a dramatic aging of the state’s population. As shown in figure 9, the share of the population aged 65 or older is forecast to increase from 13.8 percent in 2010, roughly one person in seven, to 23.3 percent in 2040, about one person in four. Correspondingly, the share of the population in cohorts under 65 shrinks. The cohort now occupied by the baby boomer generation, those aged 45 to 64, sees a fall in share from 27.8 percent to 23 percent over the period 2010–40. For a statistic where even a one- or two-percentage-point change is notable, this represents a dramatic transformation in the age distribution of the state’s population. The components contributing to sluggish population growth among the working-age population—the low rate of in-migration of young adults and the aging of a disproportionately large share of

the population into the typical retirement years—will put an increasing strain on the supply of available labor in Michigan.



As noted previously (see figure 2), Michigan currently has a disproportionately large share of baby boomers. This cohort is about to move into senior citizen status. Along with the expected continuation of net out-migration of residents until the 2030s, this means that Michigan will age much more dramatically than the nation as a whole. By 2040, 23.3 percent of Michigan's population will be 65 or older, compared with 19.6 percent nationwide (figure 10). These demographic trends have an important influence on economic trends, as we'll now see.



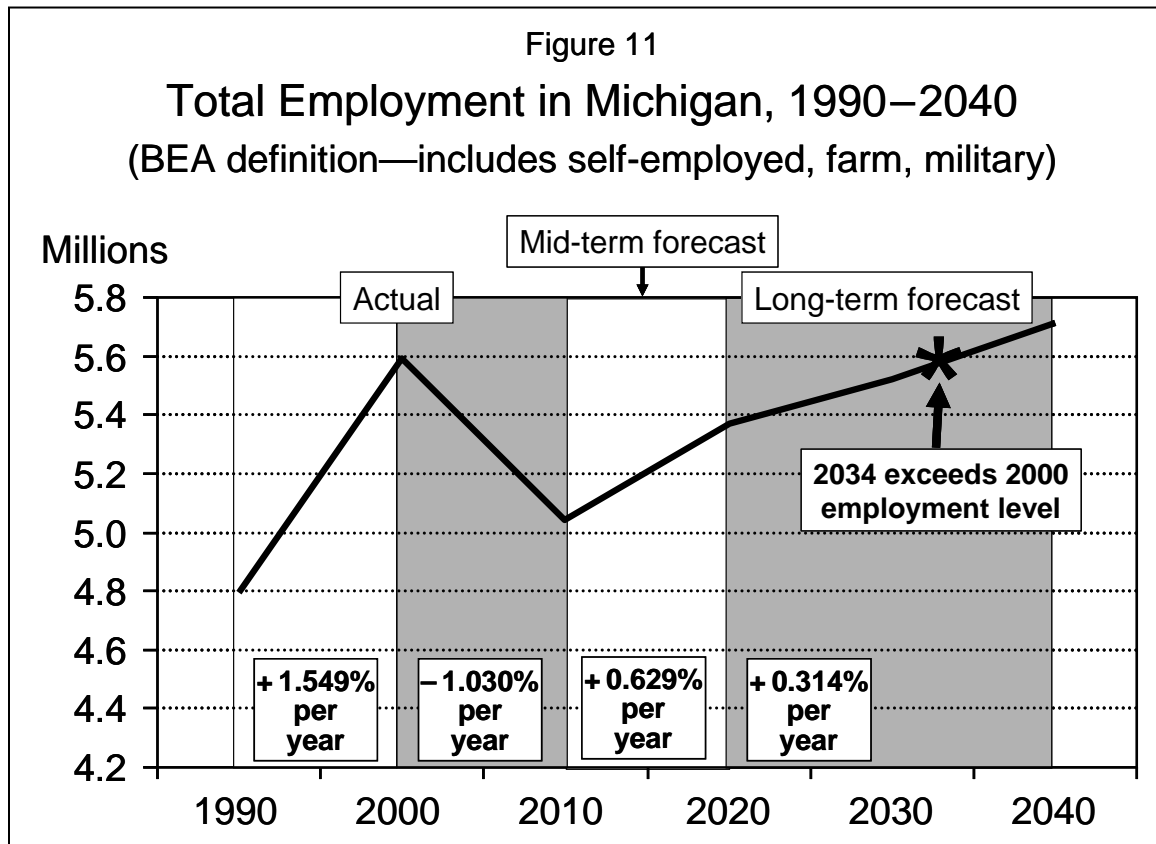
Employment

Our forecast of total employment through 2040 for Michigan is shown in figure 11. Data from 1990 to 2010 are from the U.S. Bureau of Economic Analysis [6], and the extension through 2040 is our forecast.⁵ The line segments shown for each decade represent changes over the decade and not year-to-year changes, similar to the graphic for total population (figure 7).

Employment for the state as a whole reverses its decline of the past decade, when it shrank by an average of one percent per year, to grow by about 6/10 of a percent per year between 2010 and 2020. Although welcome, this growth is considerably below

⁵This measure includes military, farm, and self-employed workers, as well as wage and salary workers. The estimate of self-employed workers includes all persons who had any self-employment earnings in the year. It is a much broader estimate than the U.S. Bureau of Labor Statistics [7] estimate of self-employed workers, which counts as self-employed only individuals who claim self-employment status as their main job.

what we saw during the 1990s when employment expanded at more than 1½ percent per year. After 2020, the increase slows to about 3/10 of a percent per year as the growth of the labor force becomes a binding constraint on employment gains. The state returns to 2000 peak employment levels by 2034.

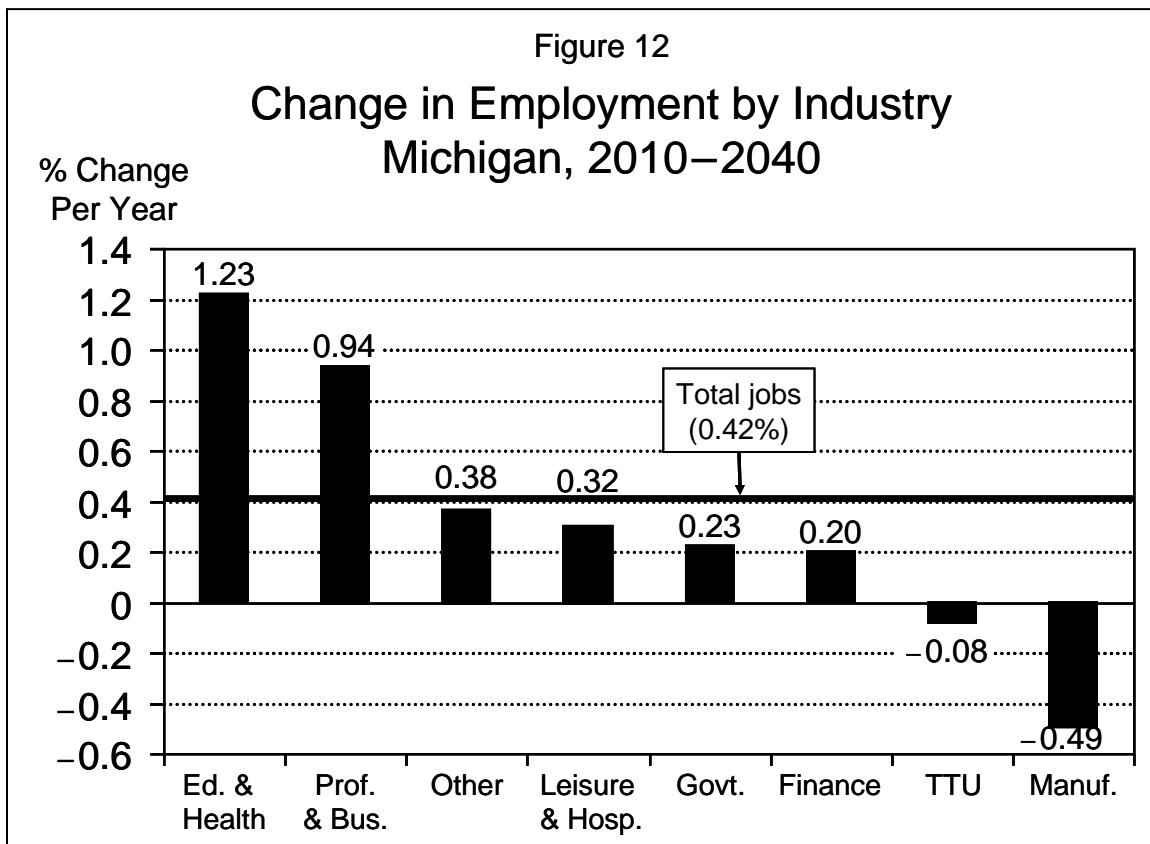


Measured in number of jobs, employment climbs from 5.04 million in 2010 to 5.71 million in 2040, an addition of 673,000 jobs. As confirmed in table 1, the largest gains do occur in the early years of the forecast period, averaging 32,582 jobs per year between 2010 and 2020, slowing to 17,343 jobs per year from 2020 to 2040.

Table 1
Total Employment in Michigan

| <u>2000</u> | <u>2010</u> | <u>2020</u> | <u>2040</u> |
|---------------|------------------|------------------|------------------|
| 5,586,893 | 5,037,608 | 5,363,424 | 5,710,278 |
| | Change | | |
| | <u>2000-2010</u> | <u>2010-2020</u> | <u>2020-2040</u> |
| Total change | - 549,285 | + 325,816 | + 346,854 |
| Avg. per year | - 54,929 | + 32,582 | + 17,343 |

The future path of employment in the region is, of course, the net result of the outlooks for the industries that make up the state economy. Over the entire period 2010 to 2040, total employment is forecast to grow by an average of 0.42 percent per year in Michigan, as shown in figure 12, but there is a wide variation in the performance of the constituent industries. The strongest growth is in the private education and health services industry category, dominated by the health care segment and expected to expand at a rate of 1.23 percent per year. This industry has been the most robust over the past difficult decade, and since we are on the threshold of a surge in the number of people reaching retirement age, the longer-term prospects are very favorable as well. The professional and business services category also sees comparatively rapid employment growth of 0.94 percent per year.



At the other end of the spectrum is manufacturing, which declines on average by 0.49 percent per year. This does not mean that the output of local manufacturing firms will decline; indeed, we are forecasting an increase in manufacturing output. But because productivity growth in manufacturing is relatively high, employment declines despite the expansion of output.⁶

Employment is also forecast to decline in the trade, transportation, and utilities (TTU) sector over the next thirty years. The sector's entire job loss is anticipated to occur in trade and utilities, while the local transportation industry (for example, trucking) adds jobs. The losses are particularly large in retail trade, where brick-and-mortar jobs

⁶The manufacturing industry only includes jobs at production facilities. White-collar jobs in pre-production, including research, development, design, and other engineering functions, are classified as professional services in our data from the federal government. Likewise, those at corporate headquarters are designated as headquarters employees. This is the case even if the employer is a manufacturing firm such as General Motors or Ford.

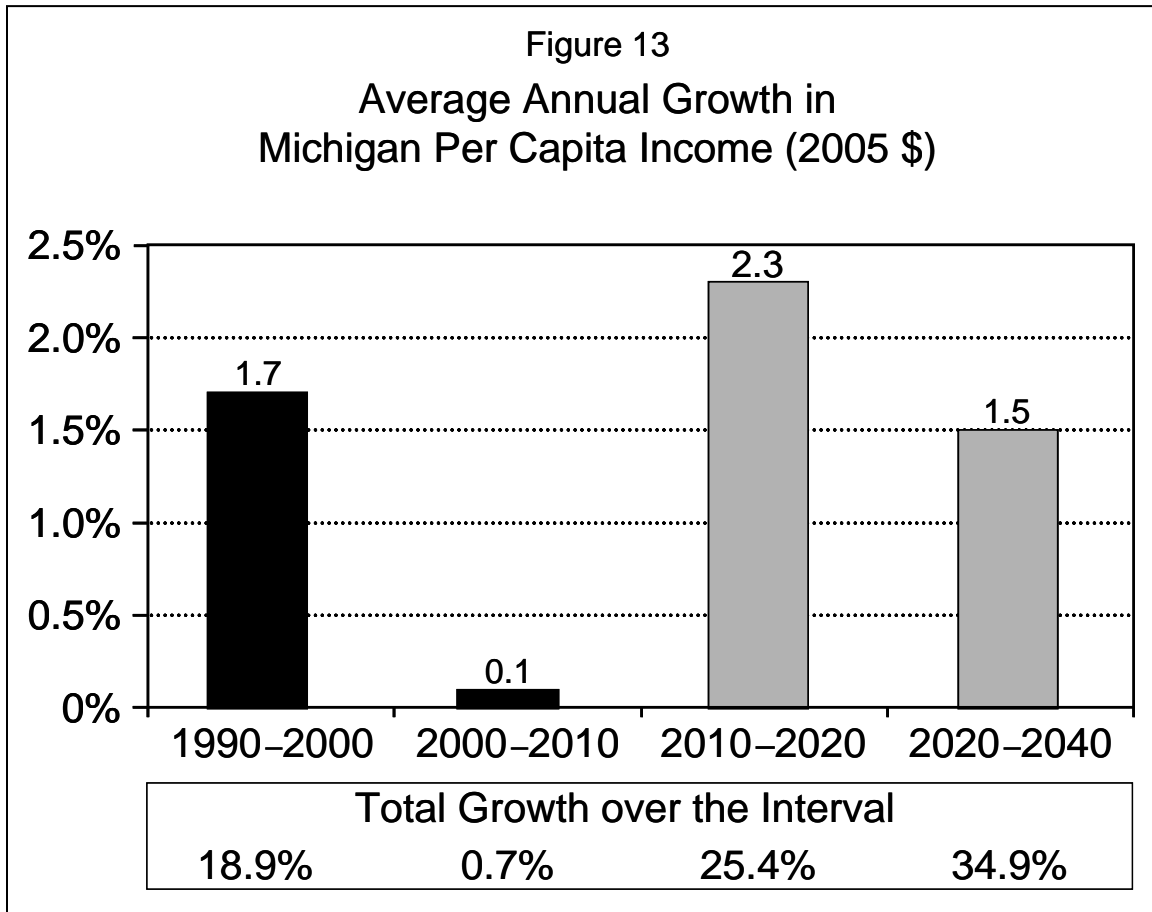
continue to be negatively affected by the growth in Internet shopping, along with evolving labor-saving technology (for example, self-service checkouts), and the trend away from labor-intensive stores and toward discount stores and warehouse clubs.

Modest job growth is projected for leisure and hospitality services, government, and financial activities. Slightly faster growth is anticipated for the grab bag “other industries” category, which includes farming and natural resources, construction, information, and miscellaneous other services (largely personal and repair services).

Income

Income is another important dimension of Michigan’s economic profile. Inflation-adjusted (real) personal income per capita is generally regarded by economists as the best single measure of economic well-being for a region. The standard of living for a region can rise even with sluggish employment growth if the incomes of residents are rising sufficiently. The average annual growth in real personal income per capita for Michigan is shown in figure 13, with the period 1990 to 2040 broken out into four intervals: 1990–2000, 2000–10, 2010–20, and 2020–40.

Real income per capita grew at an average annual rate of 1.7 percent during the 1990s, followed by the lean years of 2000 to 2010, when the income measure recorded negligible growth over the period. The recovery from the Great Recession revives growth in per capita income to 2.3 percent per year in the 2010–20 period. The series then settles in to a more sustainable pace of 1.5 percent per year in the 2020–40 period. It should be noted in passing that it is difficult to forecast income growth with a high degree of accuracy; this is the softest part of our overall forecast.



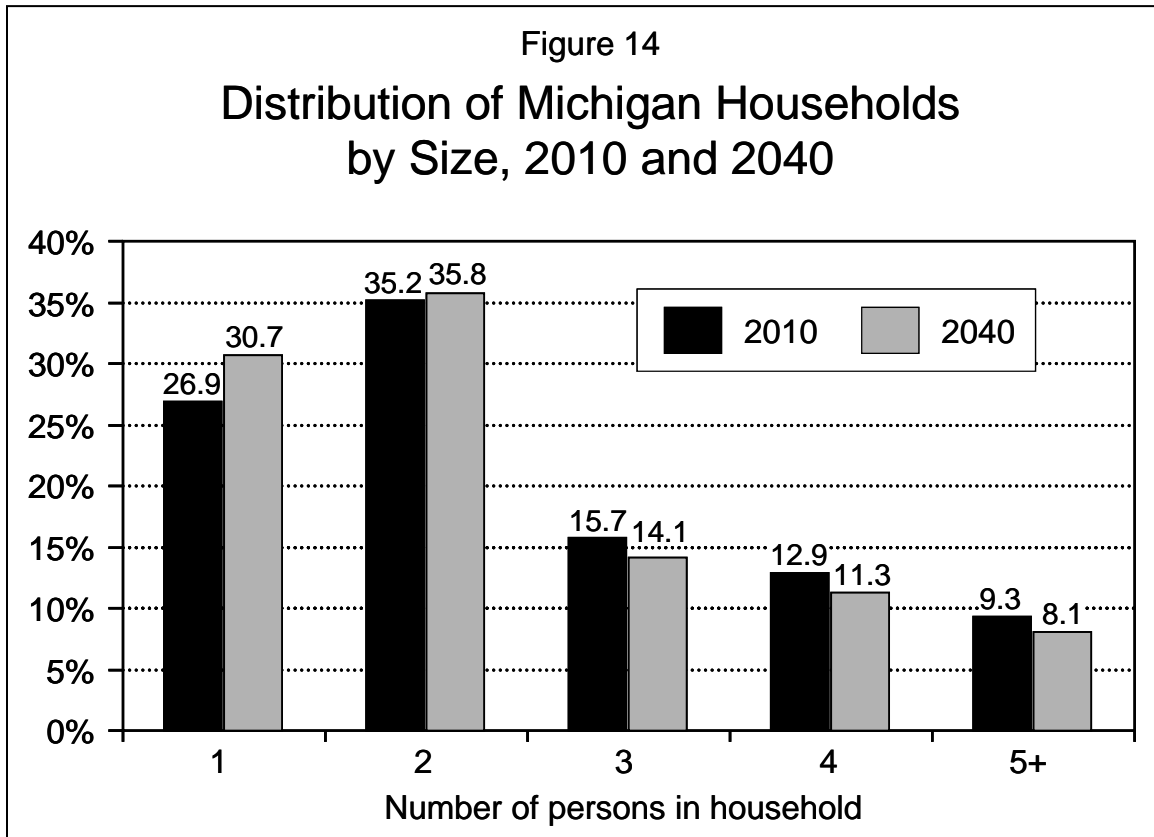
Households

Another dimension of Michigan's demographic and economic profile is the future growth and composition of the number of households in the state. Although total population in Michigan is forecast to increase by 3.1 percent between 2010 and 2040, the population residing in group quarters expands by a much more robust 27.8 percent over this period, as shown in table 2. This is largely due to an aging population entering assisted-living facilities, including nursing homes. The rest of the population—those living in households—grows by 2.5 percent between 2010 and 2040. In contrast to this population growth in households, the *number* of households increases by a more vigorous 10.8 percent. This implies that the average household size declines over the period, and

as shown in table 2, it does, motivated by a proclivity for smaller-sized households among older residents.

| | 2000 | 2010 | 2040 | % Change 2000–2010 | % Change 2010–2040 |
|------------------------------|-----------|-----------|------------|-----------------------|-----------------------|
| Total population | 9,949,955 | 9,884,549 | 10,187,138 | –0.7% | 3.1% |
| Group quarters population | 220,412 | 228,626 | 292,186 | 3.7% | 27.8% |
| Population in households | 9,729,543 | 9,655,923 | 9,894,952 | –0.8% | 2.5% |
| Households | 3,733,351 | 3,875,445 | 4,294,386 | 3.8% | 10.8% |
| Average house- hold size | 2.61 | 2.49 | 2.30 | NA | NA |

Indeed, the *share* of one- and two-person households is expected to increase over the next thirty years. This is shown in figure 14, which also shows our anticipation that the *share* for each category of larger-size households (three, four, and five-plus residents) declines without exception. Except as related to age, we have not made any other assumptions about household size preferences. If preferences unrelated to age for living in smaller households continue to change in the same direction as they have over the past fifty years, growth in the number of households in Michigan will be even greater than we are forecasting.



Forecast for Michigan Counties through 2040

County Population

The population outlook for regions of Michigan can best be summarized by the map in figure 15, which shows the state broken out into its eighty-three counties. The map represents the forecast change in population from 2010 to 2040 for each of the counties, where change is subdivided into three categories: growth greater than the statewide average, growth less than the statewide average, and population decline. Much of the variation reflects the differing age structures of the local population, as well as disparate economic trends.

The fastest-growing counties in population are forecast to be clustered in:

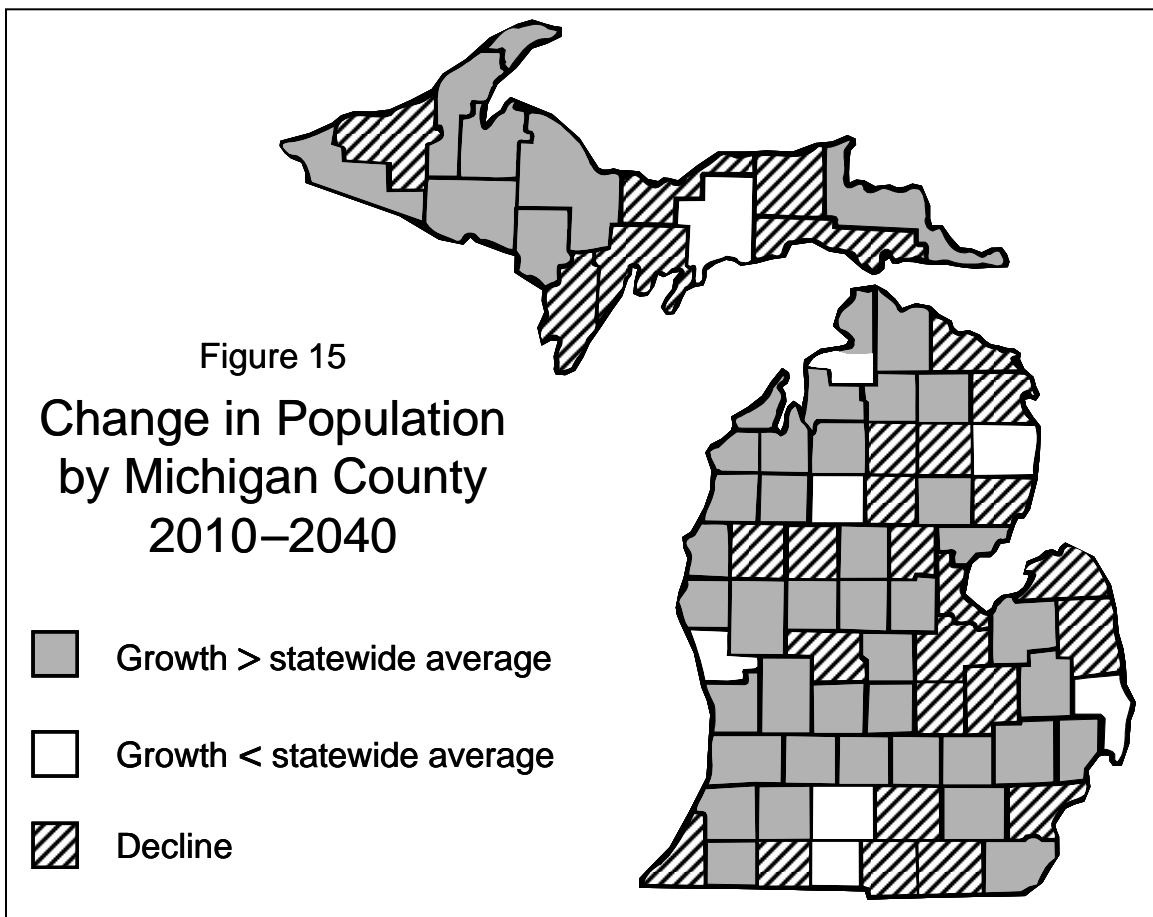
- The western Upper Peninsula

- The tourist-oriented and retiree-friendly northwestern Lower Peninsula, including the Traverse City area
- The area along the shores of Lake Michigan
- The Grand Rapids, Lansing, Ann Arbor, suburban Detroit corridor

Several counties in the state will see declines in population from 2010 to 2040.

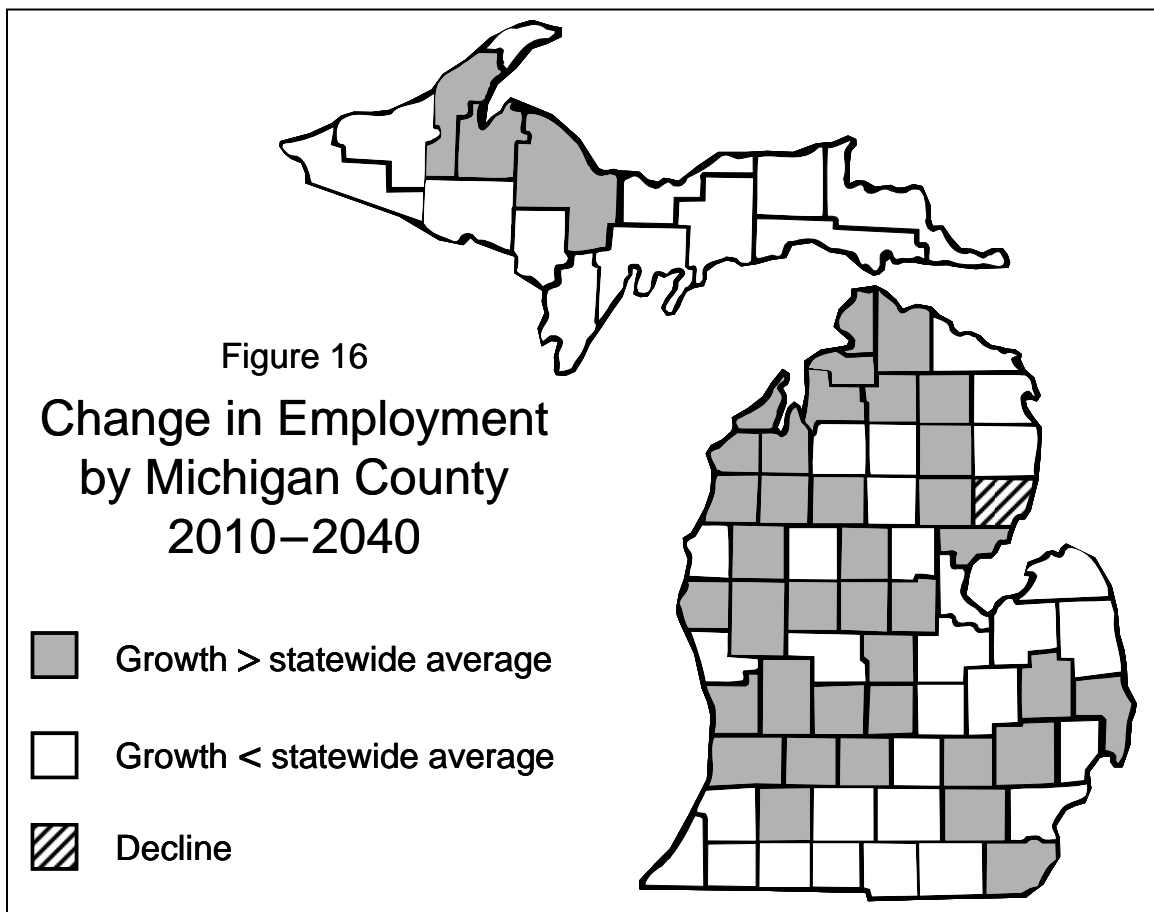
Although they are scattered throughout the state, there are a few areas of greater concentration:

- The rural eastern Upper Peninsula
- The area along the shores of Lake Huron
- The strip of counties along the state's southern border



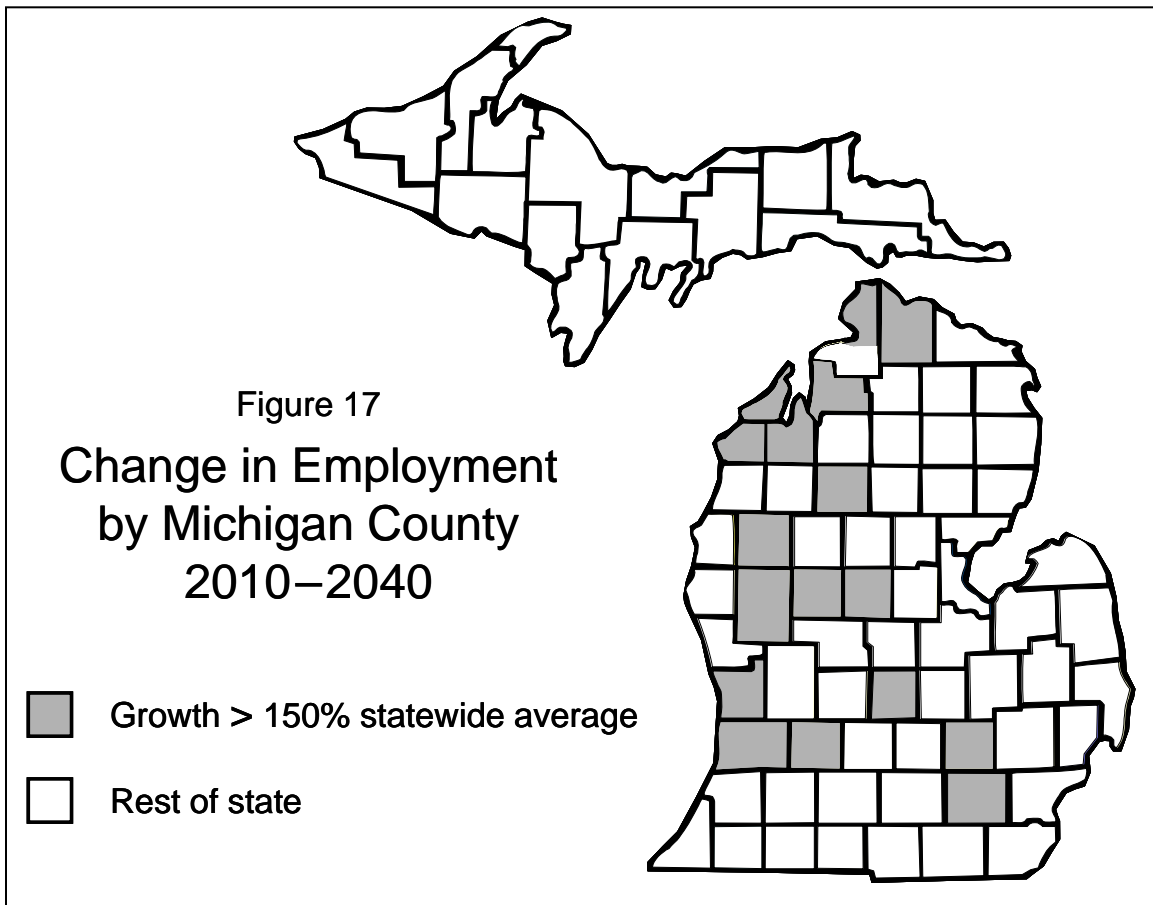
County Employment

The employment outlook for the counties of Michigan is summarized by the maps in figures 16 and 17. The first map, figure 16, represents the change in employment forecast from 2010 to 2040 for each of the counties, where the layout is the same as for population in figure 15. Almost all Michigan counties are forecast to enjoy some gain in jobs over the next thirty years—the one exception is Iosco County in the Lake Huron area.



The second map, figure 17, shows the counties where job growth is expected to be the strongest over the next thirty years—specifically, county job growth greater than 150 percent of the statewide average. In general, the most favorable outlook is for counties

with a large share of employment in industries with the best growth prospects (see figure 12) accompanied by supporting growth in their working-age population. The most rapid job growth will occur in the northwest corner of the Lower Peninsula, suburban Grand Rapids, and the Ann Arbor area.



To consolidate the information in the three maps, we include here the geographic comparisons in tabular form (table 3). The rows of the table show for each county the population or employment growth category it falls into. Alternatively, the columns indicate how the growth categories are distributed across counties.

| County | Population Growth | | | Employment Growth | | | | |
|----------------|-------------------|-----------------|---------|-------------------|-----------------|---------|----------------|----|
| | > State Average | < State Average | Decline | > State Average | < State Average | Decline | >150% St. Avg. | |
| | | | | | | | Yes | No |
| Alcona | | X | | | X | | | X |
| Alger | | | X | | X | | | X |
| Allegan | X | | | X | | | X | |
| Alpena | | | X | | X | | | X |
| Antrim | X | | | X | | | X | |
| Arenac | X | | | X | | | | X |
| Baraga | X | | | X | | | | X |
| Barry | X | | | X | | | X | |
| Bay | | | X | | X | | | X |
| Benzie | X | | | X | | | X | |
| Berrien | | | X | | X | | | X |
| Branch | | X | | | X | | | X |
| Calhoun | | X | | | X | | | X |
| Cass | X | | | | X | | | X |
| Charlevoix | | X | | X | | | | X |
| Cheboygan | X | | | X | | | X | |
| Chippewa | X | | | | X | | | X |
| Clare | X | | | X | | | | X |
| Clinton | X | | | X | | | X | |
| Crawford | | | X | | X | | | X |
| Delta | | | X | | X | | | X |
| Dickinson | X | | | | X | | | X |
| Eaton | X | | | X | | | | X |
| Emmet | X | | | X | | | X | |
| Genesee | | | X | | X | | | X |
| Gladwin | | | X | | X | | | X |
| Gogebic | X | | | | X | | | X |
| Grand Traverse | X | | | X | | | X | |
| Gratiot | X | | | X | | | | X |
| Hillsdale | | | X | | X | | | X |
| Houghton | X | | | X | | | | X |
| Huron | | | X | | X | | | X |
| Ingham | X | | | | X | | | X |
| Ionia | X | | | X | | | | X |
| Iosco | | | X | | | X | | X |
| Iron | X | | | | X | | | X |
| Isabella | X | | | X | | | X | |
| Jackson | | | X | | X | | | X |
| Kalamazoo | X | | | X | | | | X |
| Kalkaska | X | | | | X | | | X |
| Kent | X | | | X | | | | X |
| Keweenaw | X | | | | X | | | X |

| Table 3 continued | | | | | | | | |
|--|-------------------|-----------------|---------|-------------------|-----------------|---------|----------------|----|
| Michigan Population and Employment Growth by County, 2010–2040 (cont'd.) | | | | | | | | |
| County | Population Growth | | | Employment Growth | | | | |
| | > State Average | < State Average | Decline | > State Average | < State Average | Decline | >150% St. Avg. | |
| | | | | | | | Yes | No |
| Lake | | | X | X | | | X | |
| Lapeer | X | | | X | | | | X |
| Leelanau | X | | | X | | | X | |
| Lenawee | | | X | | X | | | X |
| Livingston | X | | | X | | | X | |
| Luce | | | X | | X | | | X |
| Mackinac | | | X | | X | | | X |
| Macomb | X | | | | X | | | X |
| Manistee | X | | | X | | | | X |
| Marquette | X | | | X | | | | X |
| Mason | X | | | | X | | | X |
| Mecosta | X | | | X | | | X | |
| Menominee | | | X | | X | | | X |
| Midland | X | | | X | | | | X |
| Missaukee | | X | | X | | | X | |
| Monroe | X | | | X | | | | X |
| Montcalm | | | X | | X | | | X |
| Montmorency | X | | | X | | | | X |
| Muskegon | | X | | | X | | | X |
| Newaygo | X | | | X | | | X | |
| Oakland | X | | | X | | | | X |
| Oceana | X | | | X | | | | X |
| Ogemaw | X | | | X | | | | X |
| Ontonagon | | | X | | X | | | X |
| Osceola | | | X | | X | | | X |
| Oscoda | | | X | X | | | | X |
| Otsego | X | | | X | | | | X |
| Ottawa | X | | | X | | | X | |
| Presque Isle | | | X | | X | | | X |
| Roscommon | | | X | | X | | | X |
| Saginaw | | | X | | X | | | X |
| St. Clair | | X | | X | | | | X |
| St. Joseph | | | X | | X | | | X |
| Sanilac | | | X | | X | | | X |
| Schoolcraft | | X | | | X | | | X |
| Shiawassee | | | X | | X | | | X |
| Tuscola | X | | | | X | | | X |
| Van Buren | X | | | | X | | | X |
| Washtenaw | X | | | X | | | X | |
| Wexford | X | | | X | | | | X |
| Wayne | | | X | | X | | | X |

Conclusion

Application of the Forecasts

MDOT, the MPOs, and the regional planning agencies will use the forecasts for Michigan and its eighty-three counties to develop estimates and forecasts of travel. Specifically, the forecasts will be used to develop the Statewide Transportation Plan, Regional Plans, and Urbanized Area Plans, as well as to provide input into MDOT's State Transportation Improvement Program (STIP) and the Urbanized Areas' Transportation Improvement Programs (TIPs). The projections are the basis of the Statewide Model's trip generation file updating (county control totals), the Statewide Goods Movement/Truck Model Program, and development of the Border Crossing model. The current forecasts now supersede those released in February 2008 to support these planning, development, and data-updating activities.

Summing Up

We do appear to be emerging from the tunnel that was the most catastrophic period for the Michigan economy in our lifetime. There is growing evidence that the state economy is returning to positive growth. The economy is far from being back to normal, however, and many residents will not be vested in the recovery for some time to come. But the state has made a good start, and we see job growth being sustained.

We won't be traveling the same route as before, however, after exiting the tunnel. We see long-term growth, to be sure, but only at a moderate pace for Michigan's population and labor market over the next thirty years, much more subdued than what transpired in the 1990s prior to the extended downturn. The biggest issue facing Michigan in the future is on the supply side.

Population is central to the speed limits imposed on local employment in the long run. If, over the longer term, unemployment and labor force participation settle in at

fairly stable rates, work force gains would largely need to come from increases in the working-age population, which in turn would derive from young residents becoming of working age or from net in-migration. But because Michigan has a disproportionately large share of baby boomers, it will age much more dramatically than the nation as a whole. That leaves net in-migration, which has typically been low for young adults and who to date have not altered the region's profile in a meaningful way. The looming problem down the road will be labor shortages, particularly of workers with skills that mesh with the evolving knowledge- and information-based economy.

Our forecast and the underlying data suggest that there are challenges that need to be addressed. But they are now on our radar screen, and we remain optimistic that we can and will do better.

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