

Retrenchment and Renewal: The Economic and Demographic Outlook for Southeast Michigan Through 2040

March 2012



Mission

SEMCOG, the Southeast Michigan Council of Governments, is the only organization in Southeast Michigan that brings together all of the region's governments to solve regional challenges.

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- Delivering direct assistance to member governments in the areas of transportation, environments, and community and economic development;
- Solving regional issues that go beyond the boundaries of individual local governments; and
- Advocating on behalf of Southeast Michigan in Lansing and Washington.

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March 2012

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Abstract

The Southeast Michigan economy is now emerging from its most catastrophic period in our lifetime – during the first decade of the 2000s, the region lost virtually all of the jobs it had garnered during the robust 1990s. There is evidence that the regional economy has now made a good start in returning to positive job growth from this retrenchment, and our view is that its competitive position has turned around and job growth will be sustained. According to our economic and demographic outlook for Southeast Michigan through 2040, growth will be much more subdued than what we anticipated several years ago. We now expect that by 2040, employment in the region will still remain slightly below its peak level achieved in 2000. One consequence of the poor performance of the local economy from 2001-2009 is a permanent loss of population. Accelerating growth in the over-65 population and low in-migration rates for young adults will limit the region's ability to expand, and these demographics will hang over the longer-term renewal of the economy. It's hard to fathom in our current high unemployment environment, but the looming problem down the road will be labor shortages, particularly of workers with skills that mesh with the emerging knowledge- and information-based economy.

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Introduction

First, the bad news. Over the past decade the Southeast Michigan region,¹ and the state of Michigan as a whole for that matter, have suffered through the worst economic crisis in our lifetime. From 2000 to 2009, the Southeast Michigan region lost an astounding 351,000 jobs,² unfathomable at the beginning of the decade. Indeed, the region gained almost 357,000 jobs in the robust growth era between 1990 and 2000, and subsequently lost virtually all of them, in number, over the following nine years. Just shy of 198,000 of the job losses – over half of them – occurred in a single year, during the devastating crash of 2009. Some of those losses are likely permanent.

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.

We view the past decade as a period of retrenchment consistent with the dictionary definition of the word: a reduction, a cutting down, a paring away. This was certainly the case with the activity still most integral to the economic fortunes of the region, the domestic automotive industry. The Detroit Three (General Motors, Ford, and Chrysler) were engaged in restructuring activities since the mid-2000s, and accelerated those efforts later in the decade, spurred by looming bankruptcy proceedings which then materialized for Chrysler and General Motors.

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 region as a whole; all three of them are now making a profit, albeit with a smaller work force. Retrenchment can also be the precursor to an era of renewal, if we have the wherewithal and the motivation to get there. We remain optimistic that we can and will do better.

This point of view is reflected in our forecast for the region. But this assessment also has support from the data that have come in since the crash of 2009, particularly from the most recent numbers. 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, 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. Obviously, the region has assets that create opportunities within, and recognition outside, its borders.

¹Throughout this report we use the same definition of Southeast Michigan as does the Southeast Michigan Council of Governments: Livingston, Macomb, Monroe, Oakland, St. Clair, Washtenaw, and Wayne Counties.

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. The exception is the employment data reported in Table 1, which are published by the U.S. Bureau of Labor Statistics [7].

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 we anticipated several years ago. The details are in the numbers, which make up much of the rest of this report.

To better understand the recent path of the regional economy, the first set of numbers we consider is the private-sector employment trends annually for the region from 2001 to 2010 (Table 1). These data also isolate the manufacturing sector and its automotive industry component.³ In addition to summarizing the employment path annually in the first row of each entry, the table contains a breakout of those paths into two subcomponents. The breakouts are unique to this study, and allow us to gain greater insight into the employment outcomes reflected in the total changes for each year. The first of the breakouts identifies the effect of national economic change on the respective local employment outcome, and the second isolates the effect of local economic events and policy, that is, the locally influenced change. An analogy to the national control change would be the quality of the horse the region draws for a race, and for the locally influenced change, the region's skills as a jockey. Another analogy would be, respectively, the cards the region draws in a game, and how it plays them.

Specifically, the national change component is a control scenario that shows what would have happened if employment in the local industries had changed year to year at exactly the same rate as the corresponding national industry, defined at the six-digit NAICS code level. Thus, total private-sector employment in the SEMCOG region would have declined by 32,943 jobs between 2001 and 2002 if local employment in all of the private-sector industries had changed at the same rate as they did nationally – the cards the region was dealt. (Table 1)

Total private-sector employment in the region actually declined by 51,948 jobs between 2001 and 2002. The difference between this change and the national control change is the locally influenced change, in this case a decline of 19,005 jobs. A negative value (decline) indicates that the region underperformed, while a positive number (increase) indicates that the region did better than what would be expected from what was happening to the industry in question at the national level. In other words, the locally influenced change indicates the relative competitive position of the region: how well the region plays the cards, or rides the horse.

The bad news we highlighted earlier for the 2001-09 period is reinforced by the data in the table. The SEMCOG region significantly underperformed the rest of the country between 2001 and 2009, even controlling for industry structure. If it had tracked the employment performance of the nation, the region would have lost 85,834 private-sector jobs, but instead it lost a much larger 407,240 jobs during that eight-year period. Much of this change reflects the declining market share then of the Detroit Three automakers, which are highly concentrated in the SEMCOG region, and thus there is a significant multiplier effect spurred by their shrinking activity.

The good news we referred to earlier for the post-2009 period also draws some support from the data in this table. That is, the region's competitive position turned around in 2010. According to what was happening in the national economy in 2010, the region should have lost 9,129 private-sector jobs, but instead it gained 9,293 jobs. That suggests that the region's competitive position

³These data are from the U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages [7], in addition to unpublished data estimated by the authors. The data reported here are a summation of both the published and estimated data at the six-digit NAICS code level, and may differ slightly from the published totals.

turned positive to the tune of 18,422 jobs. The news for 2011 should be better still when these data are posted. Results for the first half of the year appear to be strong, and alternate data sources indicate that 2011 turned out to be a very solid year of growth for the state.

Table 1

Analysis of Private-Sector Employment Change, Seven-County SEMCOG Region, 2001-2010

	2001 Employment	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2001-09	2009-10
Total private											
Total change	1,978,872	-51,948	-37,370	-15,284	1,189	-40,609	-35,093	-63,168	-164,957	-407,240	9,293
National control change		-32,943	-10,178	21,457	29,686	28,660	13,471	-26,324	-109,664	-85,834	-9,129
Locally influenced change		-19,005	-27,192	-36,741	-28,497	-69,269	-48,564	-36,844	-55,293	-321,406	18,422
Manufacturing (private)											
Total change	391,294	-29,317	-24,164	-16,495	-12,908	-17,725	-14,513	-26,124	-53,673	-194,919	3,908
National control change		-24,126	-15,189	-4,461	-2,979	-4,658	-9,977	-16,107	-43,066	-120,563	-2,674
Locally influenced change		-5,191	-8,975	-12,034	-9,929	-13,067	-4,536	-10,017	-10,607	-74,356	6,582
Motor vehicle mfg. (3361 to 3363)											
Total change	192,033	-13,839	-16,060	-10,042	-10,886	-12,132	-7,044	-19,585	-25,260	-114,848	150
National control change		-7,383	-6,407	-2,427	-4,111	-5,592	-7,881	-12,943	-23,549	-70,293	111
Locally influenced change		-6,456	-9,653	-7,615	-6,775	-6,540	837	-6,641	-1,710	-44,555	39

The turnaround in the region's competitive position occurred in a wide variety of sectors, including manufacturing and its auto industry component. In 2010, most of the improvement in the region's competitive position, at least as measured by jobs, occurred outside of motor vehicle manufacturing plants, a hopeful sign going forward.

So, where does the Southeast Michigan regional economy go from here? In part, that will be determined by where the U.S. economy is headed, in part by where the auto industry is headed, and in part by the investments the local community makes, particularly in its human capital, to diversify its economy into areas that show promise for future growth and prosperity, and for which the region has supporting assets. The other fundamental driver in determining the longer-term prospects for the region is the demographic trends. These trends are a constraining factor on labor force size and growth, as well as an influence on the extent and distribution of consumer purchases. Triggering the dynamics of the labor force is the changing age structure and the migration patterns of the populace. 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. So, not only does the economy influence some of the labor force trends, such as attracting workers from outside the region when employment opportunities are the magnet, but the demographic movements also shape the composition and forward momentum of the economy. A comprehensive long-term outlook considers the economic and demographic trends in tandem, as we do in this study, with our economic and demographic outlook for the SEMCOG region running through 2040.

Even if we accurately capture the workings of the economy, it is also the case that all forecasts are conditional, that is, they are conditional on the assumptions that guide the results. In this study, we focus on the forecast results that we judge to represent the most likely outcome, which we identify as the baseline forecast. Because we recognize that different outcomes are possible, we also provide two alternative scenarios, one with a more pessimistic outcome than our baseline forecast, and one with a more optimistic outcome. The more pessimistic scenario incorporates a more negative trajectory for the auto industry and the auto manufacturing work force. For the more positive scenario, we model what the local economy would look like if it performed as well as Pittsburgh has done. The Pittsburgh region is often held up as the standard to reach for by regions hard hit by structural change and that are striving for a revitalized economy.⁴

In the next two sections, we discuss our use of an economic model to generate the forecasts for the region, and we provide a schematic outline of the basic demographic and economic relationships. Following that, we discuss the inputs underlying the forecast. We then present in detail our baseline economic and demographic forecast for Southeast Michigan, followed by a summary overview of our two alternative forecasts and how they compare with the baseline results. We close with a brief concluding section on our findings.

⁴The Pittsburgh region is defined in this report to be the Pittsburgh-New Castle Combined Statistical Area (CSA), made up of the seven-county Pittsburgh Metropolitan Statistical Area (Allegheny, Armstrong, Beaver, Butler, Fayette, Washington, and Westmoreland Counties), and the New Castle micropolitan area (Lawrence County).

Method

The 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 various 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].

The REMI model used in this study was an 84-region model that includes 82 counties, the City of Detroit, and the balance of Wayne County. We developed forecasts for each of the seven counties in the SEMCOG region, which were summed to the regional forecast totals, with the model accounting for trade flows among the counties in the process. 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:

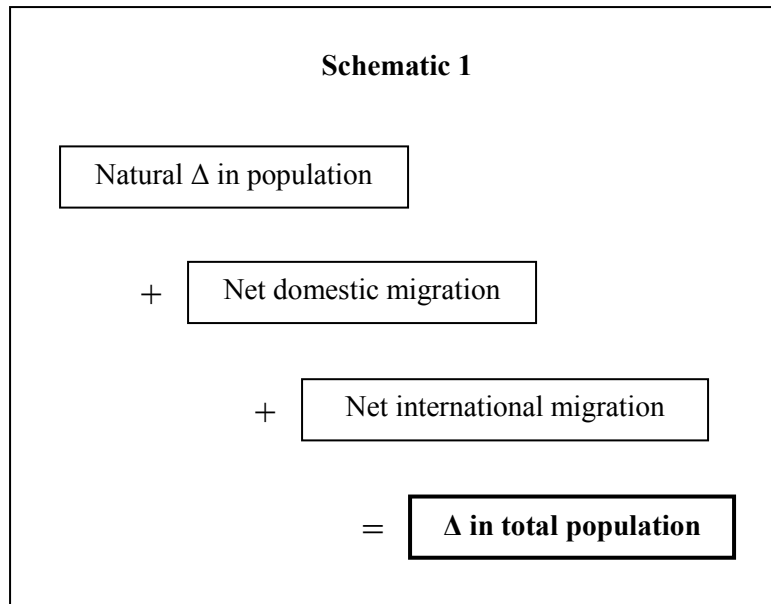
- It is a state-of-the-art model that has been extensively peer-reviewed in the professional literature.
- It has been field-tested for over thirty years.
- The model is sufficiently comprehensive to incorporate both an economic and a demographic module that interact.
- The model accounts for trade flows 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.

Schematic Outline of the Demographic and Economic Structure

One advantage of using an economic model to forecast is that it imposes a logical and structural consistency. A model ensures the integrity of certain fundamental relationships that hold true in tracing

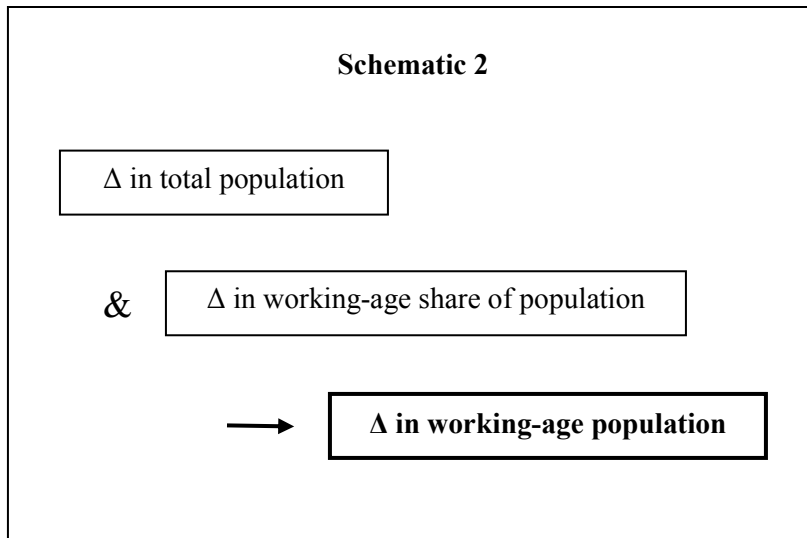
through the complex interactions of an ever-evolving demography and economy. To give a simple example, the model will not allow an illogical outcome such as a number for total employment that doesn't match the sum for all the constituent industries. We provide the following schematics to illustrate some of these basic demographic and economic relationships, to serve as a guide as we wind through the details of our forecast inputs and outlook. Pictures also help by highlighting events that can feasibly be changed to achieve a different outcome.

We feature a few basic relationships related to population movements, portrayed in the three schematics that follow. In each of them, we use the universal symbol for change (Δ).

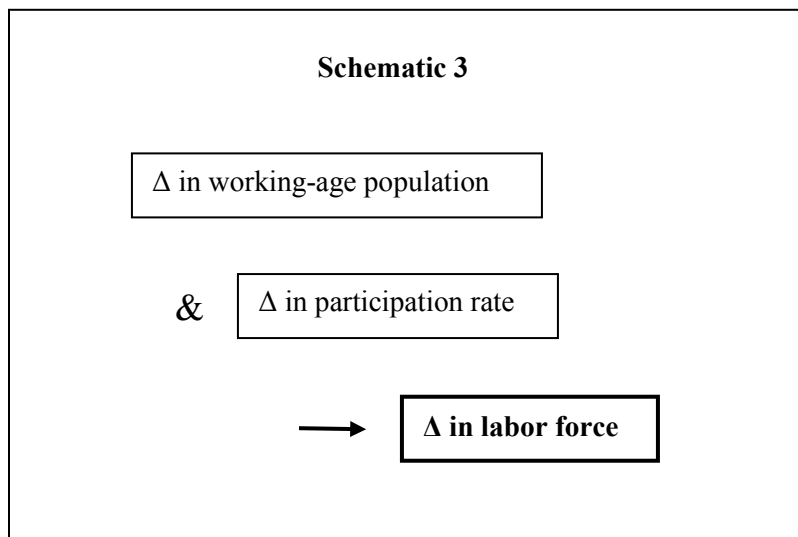


The natural change in the population is the number of births minus the number of deaths in a given period. Both domestic migration and international migration refer to the number of in-migrants minus the number of out-migrants. Domestic migration is defined as movements to or from locations in the United States outside of Southeast Michigan, and international migration is associated with movements to or from foreign countries. This relationship is inviolate, what economists and mathematicians refer to as an identity relationship. That is, these are the only sources of population change, and the arithmetic holds exactly.

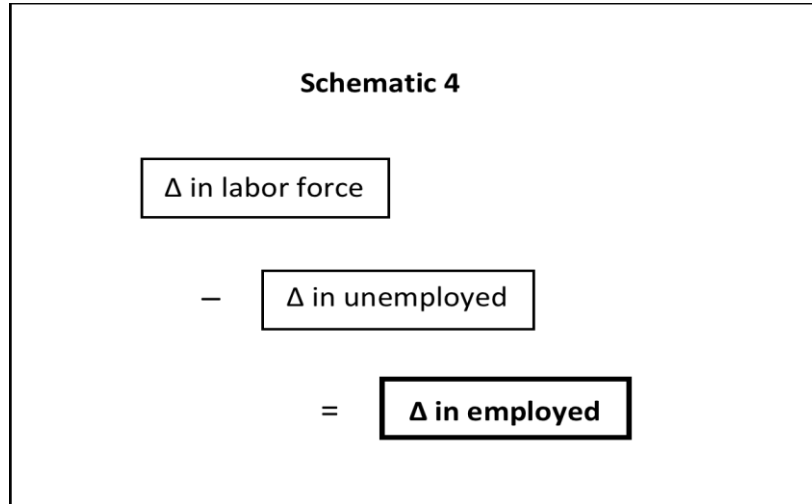
The next relationship involves the change in the working-age population. Logically, a change in this cohort comprises a combined change in total population and in the proportion of the total population that is of working age. (Underlying the change in the working-age population are changes in the age, race, and gender distribution of that population.) This relationship is set forth in Schematic 2.



Changes in the working-age population are important because they are a major potential source of long-run strength (or weakness) in labor force growth. Another source of labor force change is variations in the labor force participation rate, that is, a proportion of current residents who are either working or actively seeking work. Labor force participation can vary considerably across age, race, and gender cohorts in the population. For example, the participation rates of persons aged 16-24, or 65 and older, tend to be much lower than the cohort aged 25-64 – which is why the size of the 25-64 group is critical to labor force availability. The same is true for race and gender, manifested in different ways. The relationships underlying change in the labor force are represented pictorially as follows:



The labor force is the link between population and the labor market. The labor force consists of the employed and the unemployed, where the unemployed are defined as only those actively seeking employment. Expressed in terms of employment change, the identity relationship is:



These schematics can be used to trace through the interactions and implications of our forecast results. For instance, the question has been raised of where the supply of workers will come from to meet an increase in demand. Additional workers could come from the unemployed, an increase in the labor force participation rate, or an increase in the working-age population. If over the longer term unemployment and participation settle in at fairly stable rates, work force gains would largely need to come from increases in population, which in turn would derive from young residents becoming of working age or from net in-migration. Are these promising sources of labor? We will address that question later. For now, we simply observe that the flows underlying the schematics establish what sets the limits on work force supply in the region, regardless of the demand for workers. That demand would be determined by the state of the economy, which in turn will affect demographics such as population migration rates and labor force participation rates.

Inputs to the Forecast

Clearly, the structure of the model, 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 the series of assumptions that serve as inputs to the model. As we have mentioned, all forecast outcomes are conditional on these initial inputs. 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 this study, we also provide our two alternative scenarios, generated by adjusting selected input assumptions.

The other key element influencing the forecast outcomes is recent and current conditions in the regional economy. This 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 the rest of this section, we touch on several of the overarching assumptions on the national demography and economy. We also review recent outcomes for the region's economy and the historical relationship between its performance and that of the national economy.

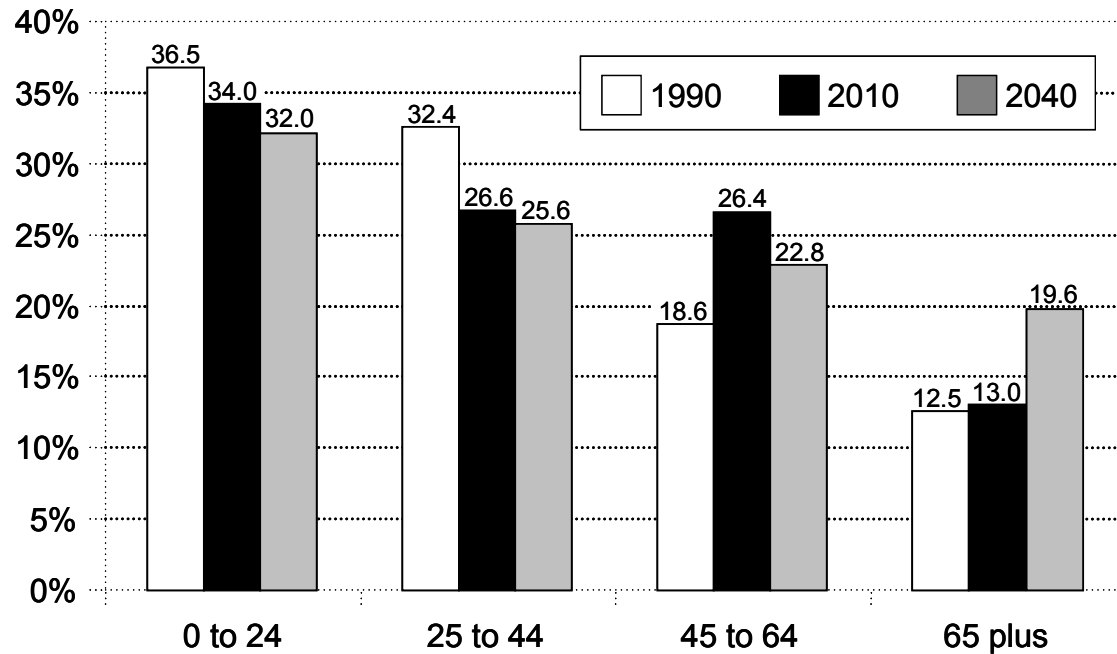
Inputs Related to the Demographics

First, we consider the demographic profile, starting with the age structure of the population. As shown in Schematic 3 in the previous section, one of the factors influencing the growth of the labor force in the long term is changes in the working-age population. (In addition to setting some limits on the growth of the labor force, the changing age structure is also an important influence on the distribution of consumer purchases across goods and services, which we will discuss later.)

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 45-64. 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 stable, rising from 12.5 percent to 13 percent. This is about to change.

Figure 1

Distribution of U.S. Population by Age Categories, 1990, 2010, 2040

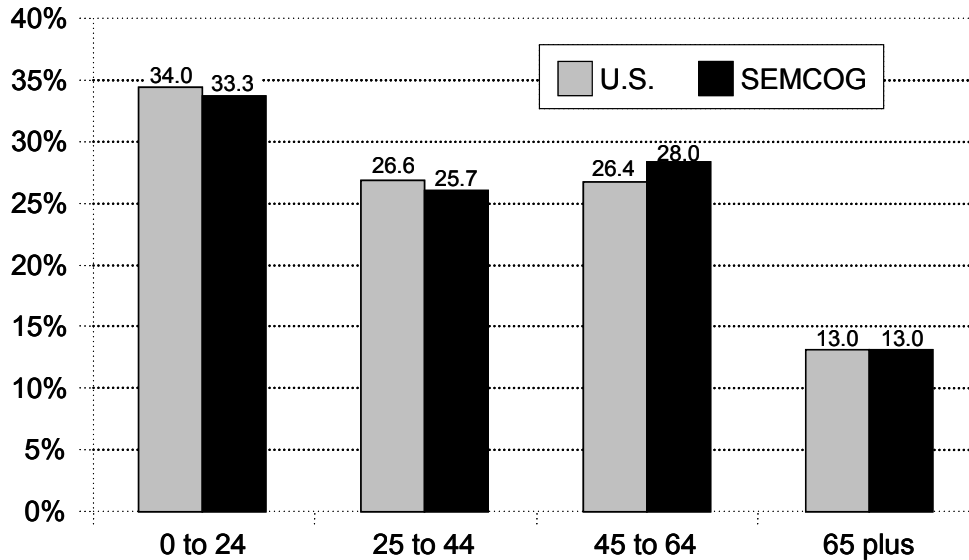


The share of the population aged 65 and older is set to increase from 13 percent in 2010 to 19.6 percent in 2040. To put this in perspective, people 65 and older currently account for 17.3 percent of the population in Florida, the state known for its concentration of retirees. In Michigan, we already 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 the seven-county SEMCOG region? The SEMCOG region’s population is more heavily distributed toward baby boomers than is the United States as a whole, as can be seen in Figure 2. People aged 45 to 64 account for 28 percent of the SEMCOG region’s population, compared with 26.4 percent nationally. The share of the population 65 and older is 13 percent in both the SEMCOG region and the United States. In comparison, the younger age cohorts, that is, those under 45, constitute a smaller share in the region than in the United States. Those aged 25 to 44 account for only 25.7 percent of the region’s population compared with 26.6 percent nationally; and those under 25 make up 33.3 percent of the region’s population compared with 34 percent nationally. As will be shown, this means that the over-65-year-old population share will grow much more dramatically in the SEMCOG region than in the nation.

Figure 2

Distribution of Population by Age Categories, U.S. vs. SEMCOG Region, 2010

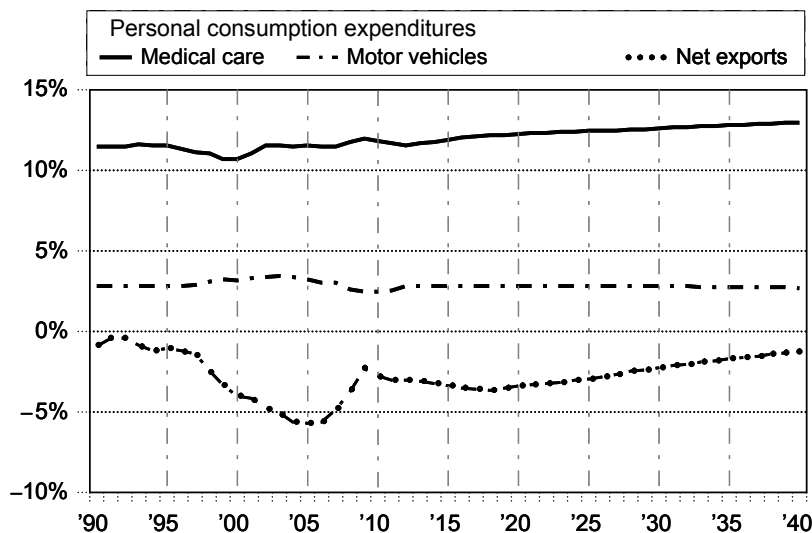


Inputs Related to the Economy

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 SEMCOG region forecast. We will focus on three of these subcomponents (Figure 3).

Figure 3

Distribution of U.S. Real GDP (Chained 2005\$), 1990-2040



The share of national output for consumer services 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 years 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,⁵ 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 Southeast 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 Southeast Michigan's heavy dependence on the manufacture of motor vehicles, any shift away from spending on the region's dominant product would have adverse consequences for the local economy.

U.S. sales of light vehicles⁶ 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 (Figure 4). Total employment in the SEMCOG region, 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 (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.

⁵The 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.

⁶Light vehicles include cars, minivans, sport utility vehicles, crossovers, and pickup trucks.

Figure 4
Detroit Three Light Vehicle Sales, 1991-2011

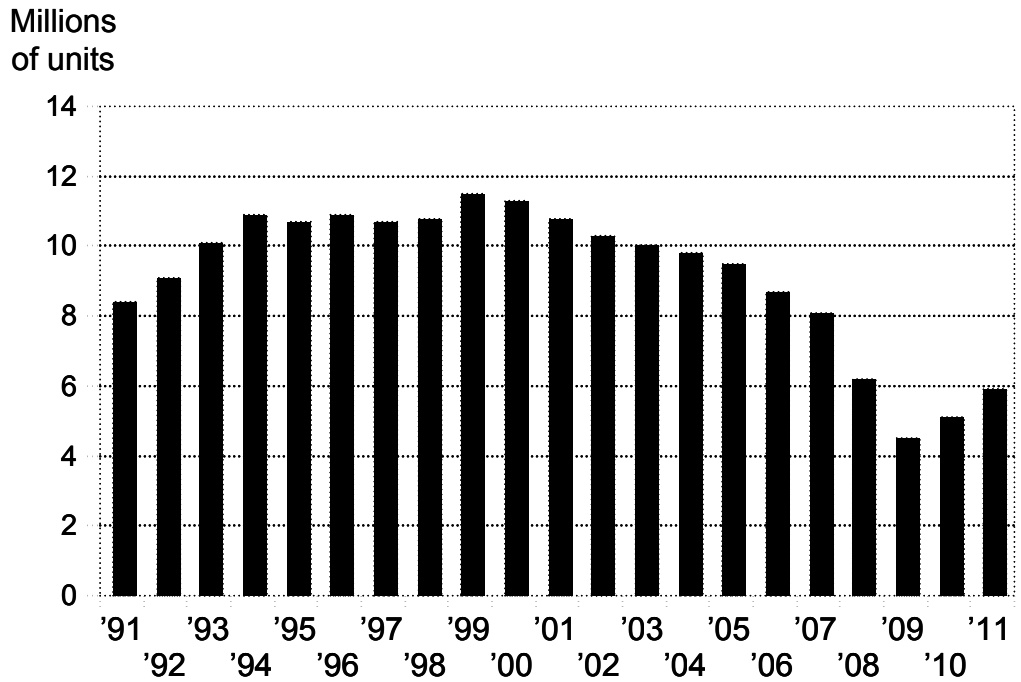
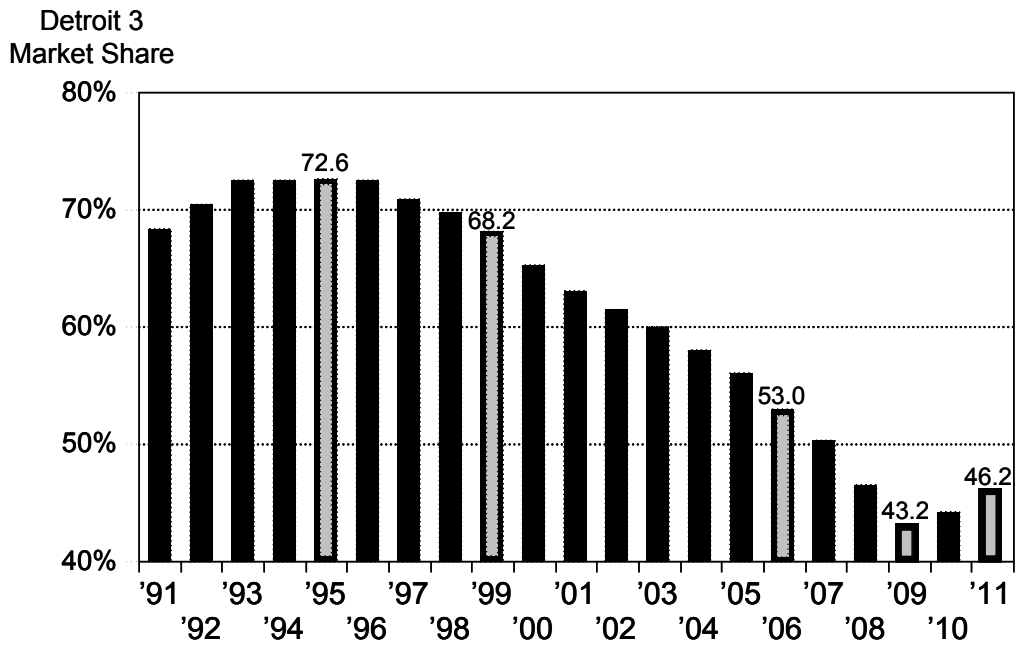


Figure 5
Detroit Three Market Share of U.S. Light Vehicle Sales, 1991-2011



Possibly the best single statistic to answer the “why” question on the retrenchment of the Southeast Michigan economy is found in the market share numbers – those and data on the concentration of the auto industry in the region, 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 local 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 region. 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 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 baseline economic and demographic forecast for the SEMCOG region.

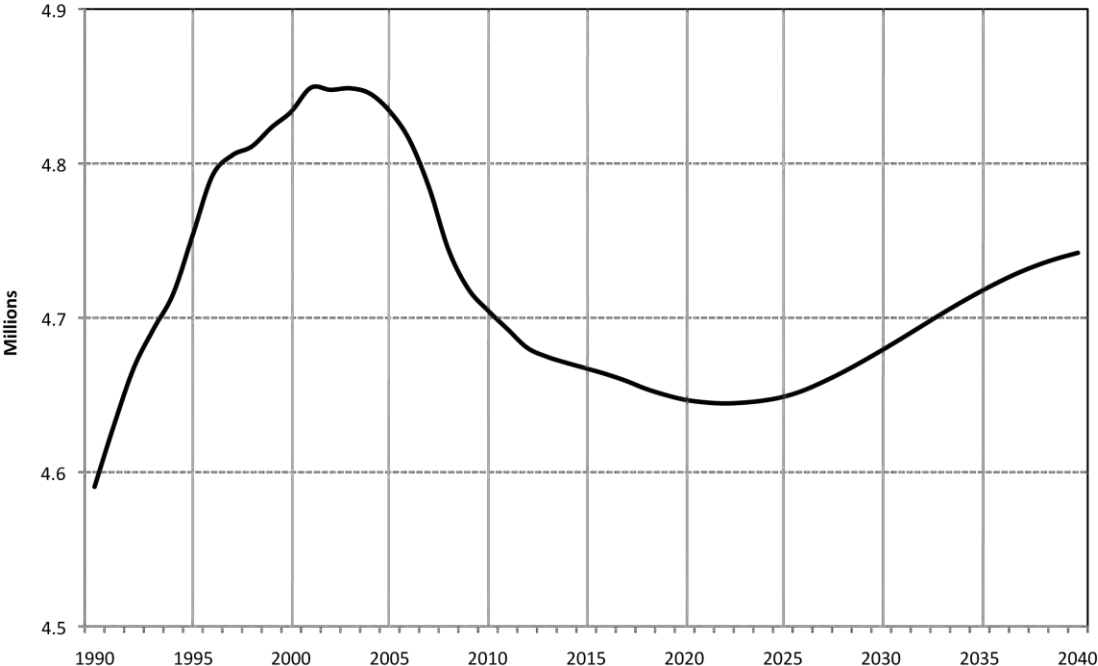
Forecast for Southeast Michigan through 2040

Current conditions locally as well as anticipated future trends nationally portend growth, but only at a moderate pace, for Southeast Michigan’s population and labor market over the next 30 years. This impression is confirmed by the results of our demographic and economic forecast through 2040 for the seven-county SEMCOG region. 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 regional forecast.

Demographics

We follow the pattern established by our schematics, and consider first our forecast of the region’s population trajectory, which is central to the speed limits imposed on local employment in the long run. Figure 6 shows the path of total population in the SEMCOG region from 1990 to 2040 with data from 1990 to 2010 provided by the U.S. Bureau of the Census [5] and the extension through 2040 generated by our forecast. Population in the region increased steadily from 4.59 million in 1990 to 4.85 million in 2001, and then began to decline, dropping to 4.71 million in 2010. The population is forecast to continue to decline at a very modest rate over the next few years, reaching a low of 4.64 million in 2022. Population then expands slowly, reaching 4.74 million in 2040. According to our forecast, the relatively poor performance of the local economy between 2001 and 2009 has resulted in a permanent loss of population.

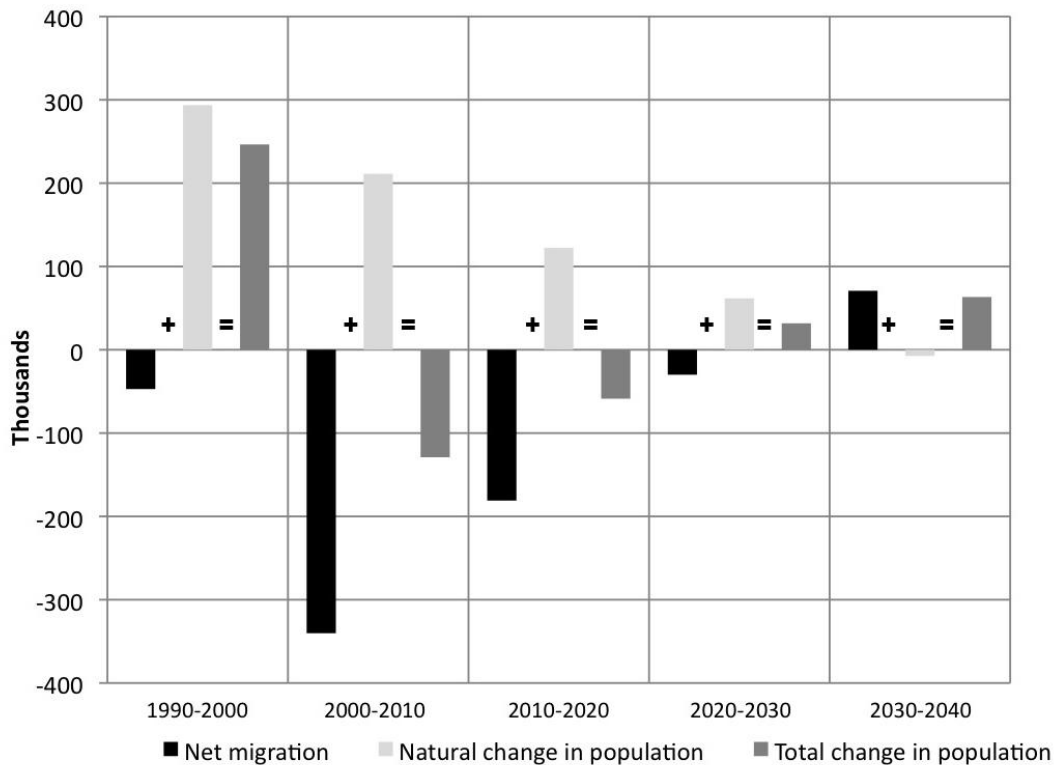
Figure 6
Population of SEMCOG Region, 1990-2040



These population movements are a product of natural change (births minus deaths) and net migration patterns (international plus domestic migration), as illustrated in Schematic 1. The trajectory for total regional population through 2040 shown in Figure 6 is dissected by decade into its two component parts in Figure 7. Even during the prosperous 1990s, the SEMCOG region suffered a net loss of migrants (47,168), but the excess of births over deaths (293,620) allowed the region to grow by almost a quarter of a million people ($-47,168 + 293,620 = 246,452$).⁷ Between 2000 and 2010, however, the region lost about 129,000 people, reflecting net out-migration of 340,229. If the rate of natural population growth had not slowed to 211,188 but instead had remained the same as during the 1990s, the population loss would have been only about 47,000.

Figure 7

Components of Population Change, SEMCOG Region, 1990-2040



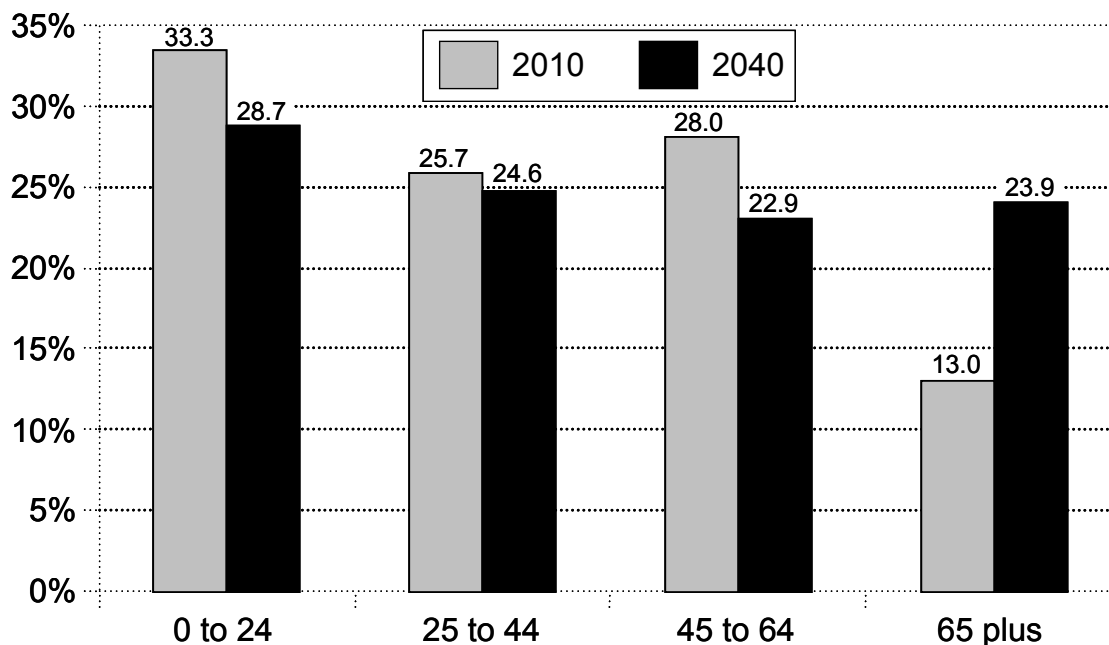
The business cycle recovery after 2010 reduces the migration loss to 181,005 between 2010 and 2020, and cuts the aggregate population loss over the decade to about 60,000. Between 2020 and 2030, the region’s net migration mitigates to a loss of only about 30,000. That is better than the migration statistics during the 1990s, but because births exceed deaths by only 61,729, the region’s population barely expands.

In the decade after 2030, the region’s deaths exceed its births, but by a mere 7,421. Thus, the sole source of population growth after 2030 is net migration, especially international migration. If the net migration to the region does not turn positive after 2030, as we are forecasting, the region’s population will shrink once again.

⁷To reiterate, the natural increase in population reflected the difference in the number of births and deaths between July 1, 1990 and July 1, 2000. Net migration included both domestic and international groups.

The aging of the baby boomer generation and the low rate of in-migration of young adults, either foreign or domestic, results in a dramatic aging of the region’s population. The share of the population aged 65 or older is forecast to increase from 13 percent in 2010, roughly one person in eight, to 23.9 percent in 2040, almost one person in four (Figure 8). Correspondingly, the share of the population in cohorts under 65 shrinks. Children and college-age adults, those aged 24 and under, decline from 33.3 percent of the population today to 28.7 percent in 2040. The cohort now occupied by the baby boomer generation, those aged 45 to 64, sees a fall in share from 28 percent to 22.9 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 region’s population.

Figure 8
Population Distribution by Age Categories, SEMCOG Region, 2010 and 2040

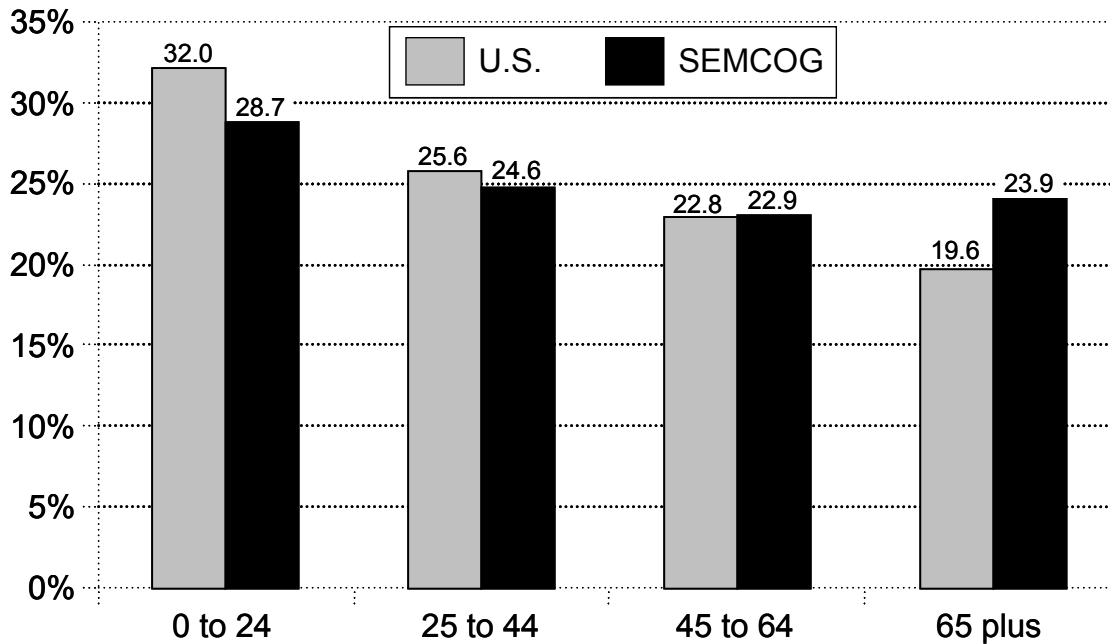


The components contributing to sluggish regional population growth among the working-age group – the low rate of in-migration of young adults and the aging of a disproportionately large share of the population into the typical retirement years – will put an increasing strain on the supply of available labor in Southeast Michigan. As shown in Schematic 3, growth in the labor force is dependent on the pace of change in the working-age population, unless there are alterations in the rate of participation in the labor force among residents.

As noted previously, the SEMCOG region has a disproportionately large share of baby boomers. This cohort, many of whom are the children of people who migrated to Southeast Michigan to work in the auto factories in the 1950s, 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 the SEMCOG region will age much more dramatically than the nation as a whole. Currently the region and the country have the same share of the population aged 65 and older (13 percent), but over the next few years they will diverge. By 2040, 23.9 percent of the SEMCOG region’s population will be 65 or older, compared with 19.6 percent nationwide (Figure 9).

Figure 9

Population Distribution by Age Categories, U.S. vs. SEMCOG Region, 2040



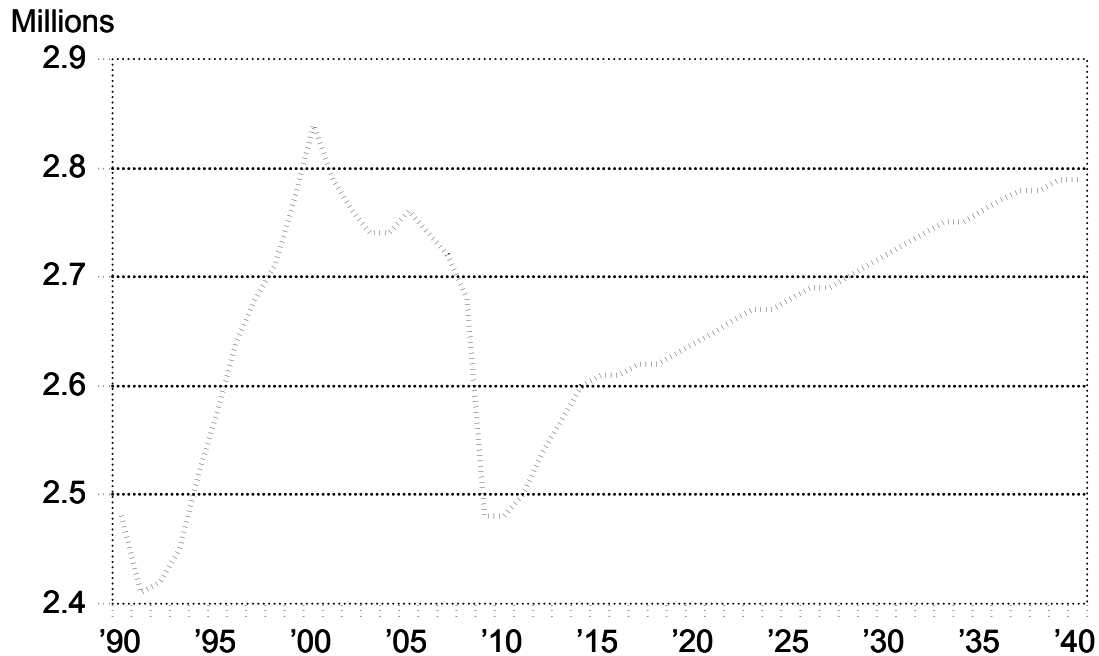
Virtually every part of the country will age dramatically over the next 30 years, but more so in Southeast Michigan. By 2040, the age gap between the SEMCOG region and the rest of the country, as measured by the share of the population 65 and older, will be about the same as it is today between Florida and the rest of the country.

Employment

The change in employment is equal to the change in the labor force, after accounting for changes in the number of unemployed (Schematic 4). Our forecast of total employment for the SEMCOG region is shown in Figure 10.⁸ Employment peaked in 2000 at 2.835 million, and then fell through 2009, except for 2005 when the region added almost 19,000 jobs. The catastrophic year of 2009 stands out, when employment plunged by almost 200,000 jobs. The region did rebound in 2010 with a modest job gain of about 100 by our estimate.

⁸The measure used in this study is the U.S. Bureau of Economic Analysis (BEA) [6] estimate of total employment. This 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 BLS count of self-employed workers, which counts as self-employed only individuals who claim self-employment status as their main job.

Figure 10
Total Employment in SEMCOG Region, 1990-2040

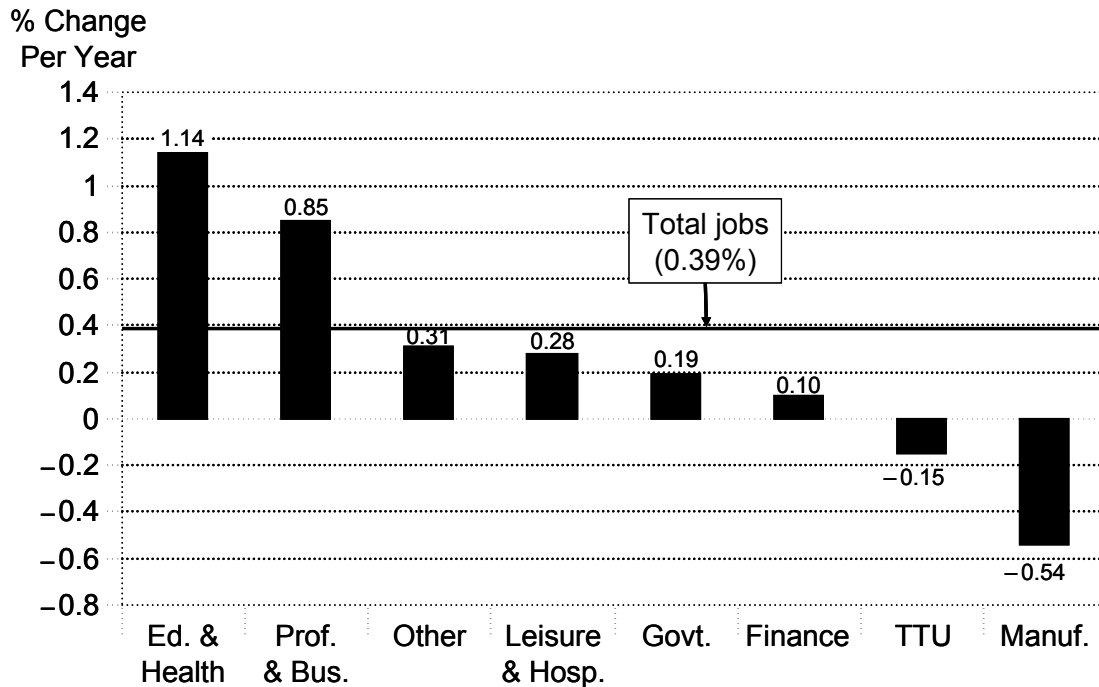


We are forecasting that the SEMCOG region will enjoy job gains through 2040 (Figure 10). The most rapid growth is projected to occur in the early years of the forecast period. Between 2010 and 2014, the region grows by about 27,000 jobs per year (1.1 percent per year). Growth then slows to about 7,600 jobs per year between 2014 and 2040 (0.3 percent per year). Positive growth is most welcome after an extended period of downturn, but the growth is not robust, so that by 2040, employment in the region still remains slightly below the levels achieved in 2000.

The future path of employment in the region is, of course, the net result of the outlooks for the industries that make up the local economy. Over the entire period 2010 to 2040, total employment is forecast to grow by an average of 0.39 percent per year in the SEMCOG region (Figure 11), with 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 1.14 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 0.85 percent per year.

Figure 11

Change in Employment by Industry, SEMCOG Region, 2010-2040



At the other end of the spectrum is manufacturing, which declines on average by 0.54 percent per year.⁹ This does not mean that the output of local manufacturing firms will decline; indeed, we are forecasting an increase in manufacturing output of 2.1 percent per year. But because productivity growth in manufacturing is relatively high – we are forecasting that real output per employee will increase by 2.6 percent per year – employment declines along with that pace of output growth.¹⁰

Employment is also forecast to decline in the trade, transportation, and utilities sector over the next 30 years. The sector’s entire job loss is anticipated to occur in trade and utilities, while the transportation industry adds jobs.

Modest job growth is projected for leisure and hospitality services, financial activities, and government. 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).

⁹The manufacturing industry only includes jobs at production facilities. White-collar workers 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.

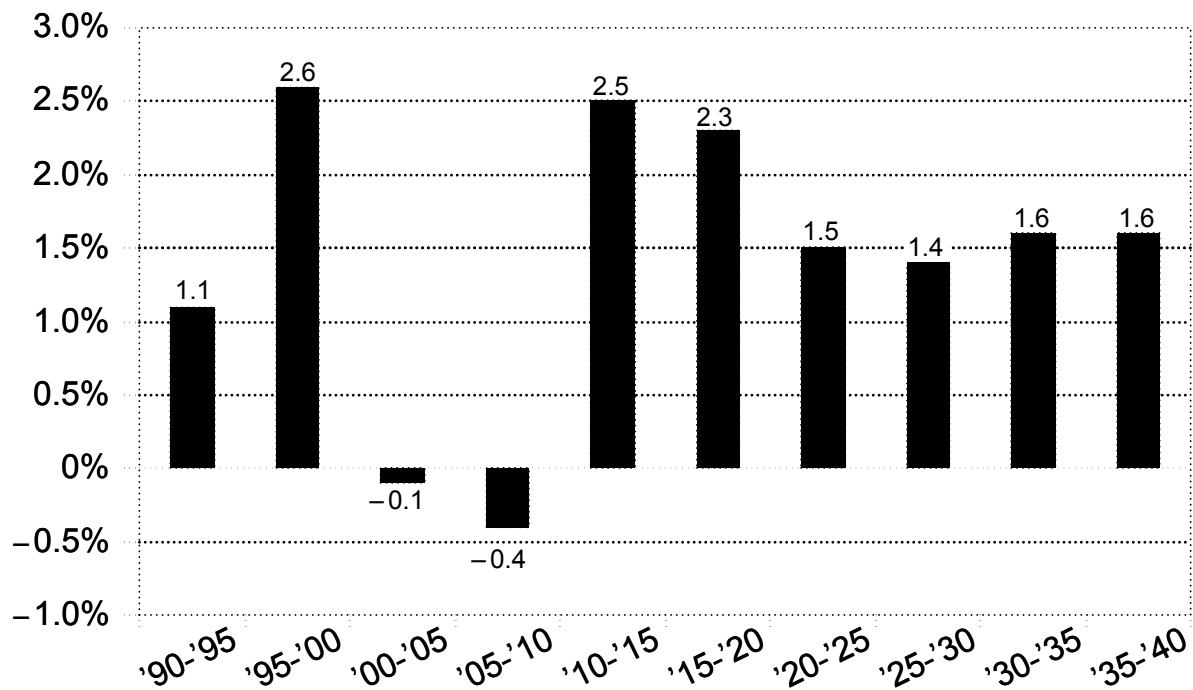
¹⁰For comparison, the local manufacturing sector saw productivity growth of 3.6 percent per year during the past two decades.

Income

Income is another important dimension of the region'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. Figure 12 shows the average annual growth in real personal income per capita for the SEMCOG region, with the period 1990 to 2040 broken out into five-year increments.

Figure 12

Average Annual Growth in Inflation-Adjusted Personal Income Per Capita, SEMCOG Region, 1990-2040



In the first five years of the 1990s, real income per capita increased by an average of 1.1 percent per year. The next five years, 1995 to 2000, were even stronger, with per capita income growing by 2.6 percent per year. Those fat years were then followed by the lean years of the 2000-10 period, when real income per capita actually declined. The recovery from the Great Recession revives growth in per capita income, to a range of 2.3 to 2.5 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.

The baseline forecast we have reviewed in this section is our best estimate of where Southeast Michigan goes from here if current trends continue. The prospects for the regional economy would be less favorable if the auto situation turns uglier, and prospects would be more favorable if we are able to emulate the Pittsburgh experience. To understand more fully the implications of these possibilities, we have generated two alternative scenarios to our baseline forecast, and we turn to that analysis now.

Alternative Forecast Scenarios

In choosing alternative scenarios to the baseline forecast, we settled on one potential hot spot and one potential cold spot in our forecast that could alter the outlook for the region in a meaningful way. As such, these alternative scenarios do not represent outcomes that we judge to be most likely – the baseline forecast does that – but they do explore possibilities we judge to be feasible if some of our assumptions are off the mark. Another qualifier: the two scenarios should not be interpreted as confidence intervals, or likelihood brackets, around our baseline forecast. They are simply as advertised: alternative scenarios based on a modified set of assumptions.

The cold spot we explore is: What happens in Southeast Michigan if the auto industry statewide suffers another period of rapid loss in employment similar, on a percentage basis, to the one that occurred between 2000 and 2010? And the hot spot is: What happens in Southeast Michigan if the region performs as well post-2012 as Pittsburgh has done over recent history? In our opinion, both of these are instructive scenarios to consider when assessing the prospects for the Southeast Michigan economy, and we'll examine each in turn.

Alternative Scenario 1: Regional Auto Industry Takes Another Big Hit

We estimate that in the year 2000, the SEMCOG region accounted for 15.9 percent of motor vehicle manufacturing employment in the United States.¹¹ Over the next five years, the industry lost jobs throughout the nation, but the largest loss occurred in the SEMCOG region. By 2009, the region is estimated to have had 65,285 jobs in motor vehicle manufacturing, or about 10.2 percent of all such jobs in the nation. The economic recovery and the resulting increase in vehicle sales, along with the small improvement in Detroit Three market share (Figures 4 and 5), leads to an increase in industry employment in the region to 73,939 by 2012, or 11.3 percent of all motor vehicle manufacturing jobs in the United States. Recent information suggests that the recovery in motor vehicle jobs might be coming in somewhat stronger than this, but not enough so to alter the scenario fundamentally.

After 2012, employment in motor vehicle manufacturing in the SEMCOG region declines slowly in our baseline scenario, gravitating to 44,263 jobs in 2040. This would amount to 10.0 percent of all motor vehicle manufacturing jobs in the United States.

In the first, and more pessimistic, alternative scenario, we explore what the outcome would be in the SEMCOG region if the local auto industry went through another round of rapid decline in employment along the lines of what occurred between 2000 and 2010. We set this repeat event to take place in the decade between 2020 and 2030. Specifically, we calibrated the forecast so that the *percentage decline* in auto industry employment in Michigan as a whole during the 2020 to 2030 period would be approximately the same as the percentage decline that occurred in the state, by our estimate, during the 2000 to 2010 period, that is, a 58 percent decline in auto manufacturing jobs statewide.

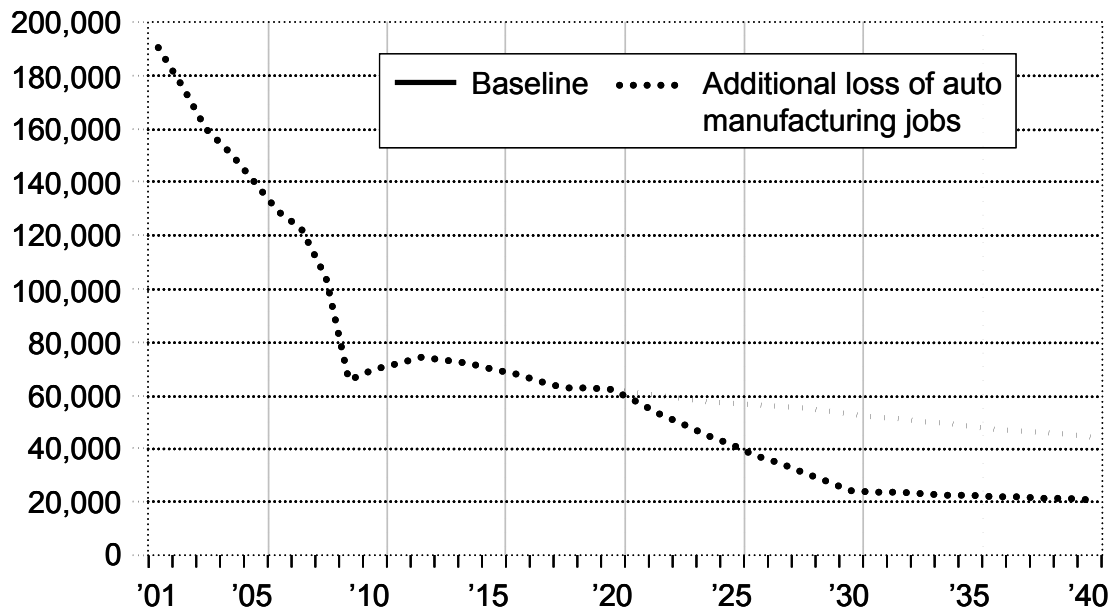
This translated into a somewhat larger hit in the SEMCOG region in the 2020 to 2030 period – a drop of 61 percent in auto industry jobs. An implication of this perturbation is that the SEMCOG region's share of U.S. motor vehicle manufacturing employment declines during the decade of the 2020s, from 11.2

¹¹The motor vehicle manufacturing industry is defined throughout this report to include NAICS industries 3361, 3362, and 3363.

percent to 4.8 percent, rather than from 11.2 percent to 10.6 percent as in our baseline forecast. Figure 13 shows the results, with the alternative forecast for vehicle manufacturing employment in the SEMCOG region shown by the dotted line, and the baseline forecast path (solid line) included for comparison.

Figure 13

Alternative Forecast of Employment in Motor Vehicle and Parts Manufacturing, SEMCOG Region, 2001-2040



The main observation from this experiment is that with the much smaller base of auto manufacturing jobs by 2020 than existed in 2000, the decline in auto jobs during the 2020s in the alternative scenario is much smaller in number compared with the job loss we saw in the first decade of the 2000s. In the baseline run, the local motor vehicle manufacturing industry is forecast to employ 52,904 workers by 2030, while under the alternative scenario, employment would be 23,998, a shortfall of 28,906. This number compares favorably with what we saw in the 2000-10 period, when the industry lost almost five times as many jobs, with employment falling by 139,507 by our estimate. By 2040, the industry employment gap between the baseline run and the alternative scenario shrinks to 23,367 workers, compared with the shortfall of 28,906 for 2030.

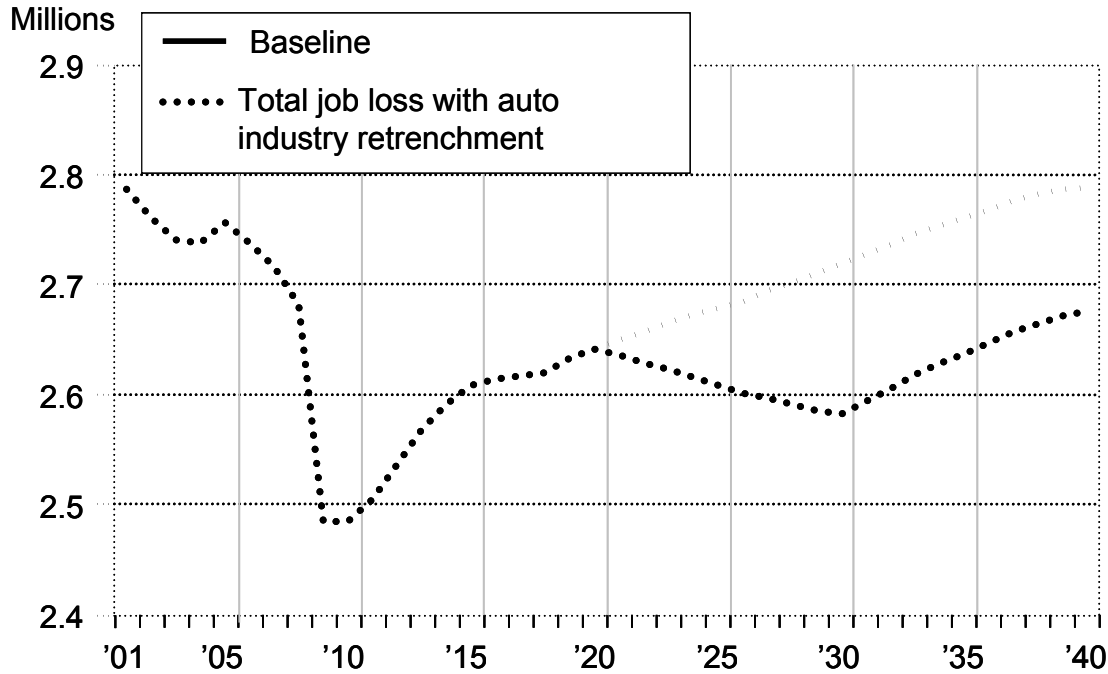
That even a repeat of the 2000-10 episode for the Detroit Three would have much more modest negative employment effects on the region is illustrated for total local employment in Figure 14. Again, the employment path for the alternative scenario is represented by the dotted line, and the baseline forecast path by the solid line. In this case, the alternative path for total employment reflects the same perturbation of motor vehicle manufacturing employment illustrated in Figure 13, but this time the results include as well the spinoff job losses associated with the decline in auto jobs.

In the baseline forecast, employment in the region would reach 2.714 million by 2030. In the alternative scenario, total employment is estimated to be 2.583 million that year, a net loss of about 131,000 jobs (including the loss of about 29,000 jobs in vehicle manufacturing and about 102,000 non-vehicle manufacturing spinoff jobs). By 2040, the loss in the alternative scenario would shrink to about 111,000

jobs, or 4 percent. The total number of jobs in 2040 in the alternative scenario exceeds by 33,709 the level for 2020, that is, prior to our imposition of job loss between 2020 and 2030 in the auto manufacturing industry. In contrast, a similar loss, on a percentage basis, of auto manufacturing jobs during the 2000-10 period resulted in a major job hit, spurring a total loss of 350,905 jobs that are not completely recovered by 2040 in our baseline forecast.

Figure 14

Alternative Forecasts of Total Employment (auto scenario), SEMCOG Region, 2001-2040



Alternative Scenario 2: Growing Like Pittsburgh

For the second, and more optimistic, alternative scenario, we model what the SEMCOG region would look like if it performed after 2012 as well as Pittsburgh has done over recent history. As mentioned previously, Pittsburgh is often held up as the standard to reach for by regions hard hit by structural change and that are striving for a revitalized economy. Between 1986 and 2009, employment in the Pittsburgh Combined Statistical Area (CSA) grew at 60 percent of the U.S. growth rate (0.84 percent per year compared with 1.40 percent).¹² So, in this alternative scenario, we adjust the forecast to ensure that employment in the Detroit CSA (a somewhat larger area than the SEMCOG region) grows at 60 percent of the U.S. growth rate between 2012 and 2040.¹³

As shown in Figure 15, where we continue the convention of displaying the alternative scenario with a dotted line and the baseline forecast with a solid line, the result of our perturbation is somewhat more

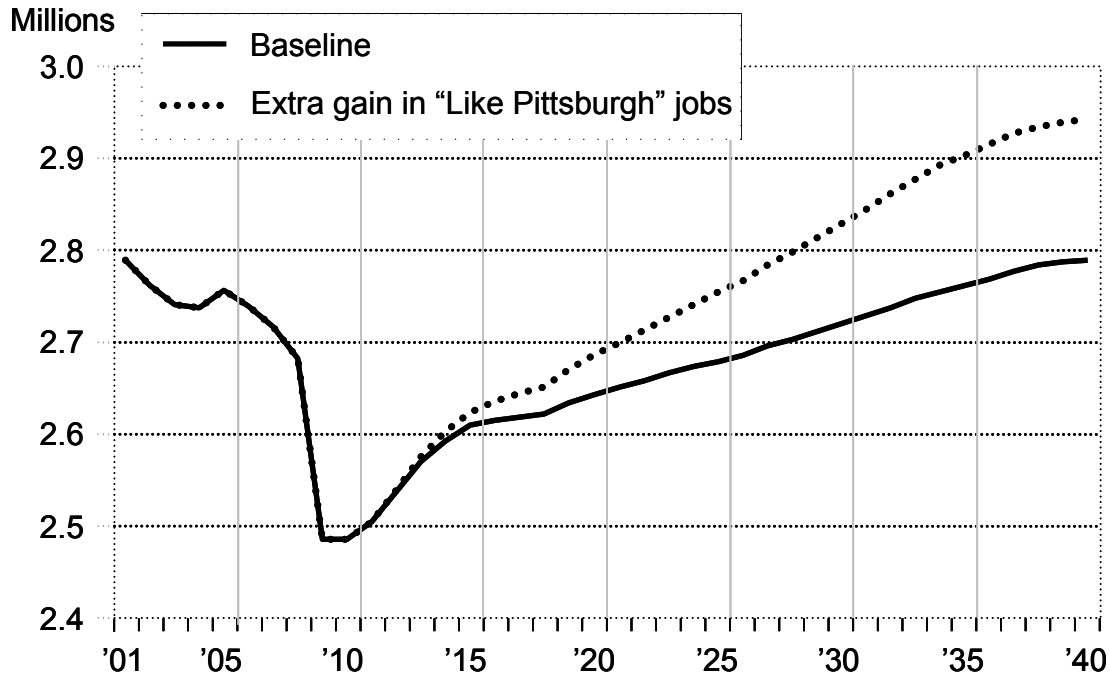
¹²See footnote 4 for the definition of the Pittsburgh region used in this report.

¹³In addition to the seven-county SEMCOG region, the Detroit CSA includes Genesee and Lapeer Counties.

rapid employment growth in the SEMCOG region. If employment in the region were to match Pittsburgh's recorded performance, its level by 2040 would be 2.941 million instead of the 2.786 million generated in our baseline forecast – a gain of about 155,000 jobs, or 5.6 percent.

Figure 15

Alternative Forecasts of Total Employment (“like Pittsburgh” scenario), SEMCOG Region, 2001-2040



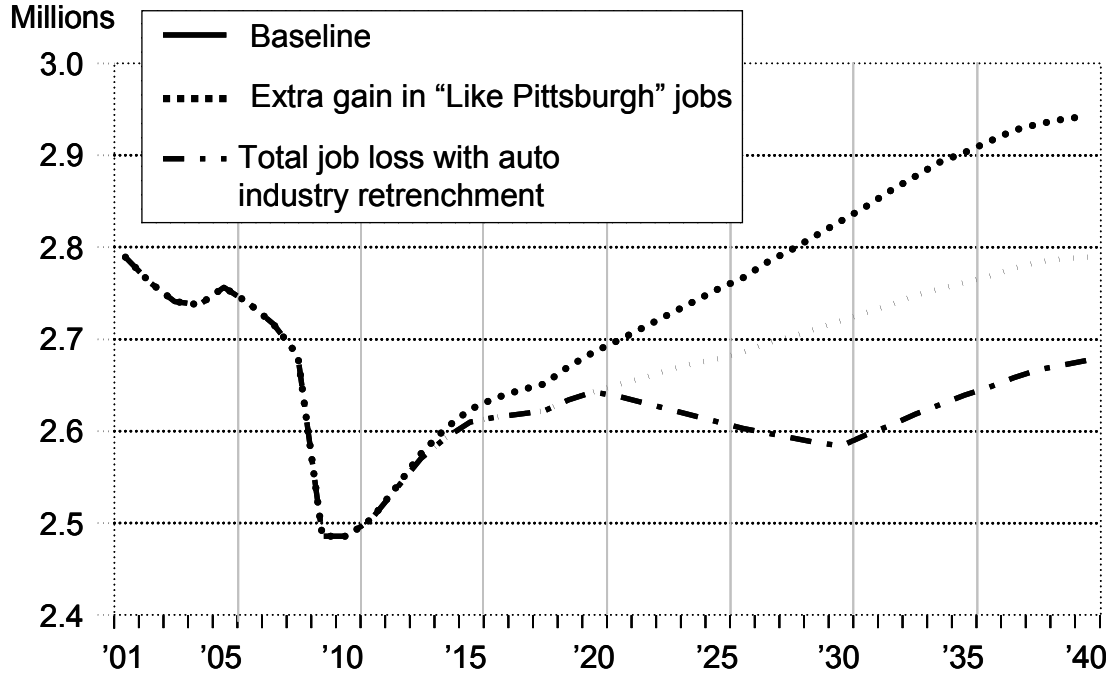
Under this alternative scenario, the region’s employment in 2040 would exceed its 2000 peak level by about 106,000 jobs. Thus, the region would certainly benefit from following in Pittsburgh’s footsteps, but the benefits would take a very long time to accrue.

For illustrative purposes, we have consolidated the effects on total employment of the two alternative scenarios, together with the baseline forecast (solid line), in a single display (Figure 16). Obviously, any comparisons between the auto (dashed line) and Pittsburgh (dotted line) scenarios are shaped by the scale and timing we settled on to design the two experiments. With that qualifier in mind, the outcomes for the two alternatives trace out a relatively small range of difference in impact considering the large variance in the events – total employment by 2040 of 2.675 million in the more pessimistic scenario and 2.941 million in the more optimistic alternative.

The caution issued at the beginning of this section bears repeating here – this range is not intended to represent a confidence interval around our baseline forecast. Instead, the dashed and dotted lines simply represent two different scenarios that we consider feasible, but less likely than our baseline forecast.

Figure 16

**Alternative Forecasts of Total Employment (autos and “like Pittsburgh”),
SEMCOG Region, 2001-2040**



Looming Labor Shortages

We raised the issue earlier of where the supply of workers will come from in the decades to come. The schematics in the third section of the report identify an exhaustive list of the potential sources of labor:

1. Increases in the working-age population as young residents come of age,
2. Increases in net in-migration of the working-age cohort,
3. Increases in the labor force participation rate of current residents¹⁴, and
4. Drawing from the unemployed.

Our forecast and its underlying architecture suggest that the number of additional workers from any of these sources will be severely limited. The fundamental problem, of course, is the rapid aging of the population over the next thirty years. According to our forecast (Figure 8), the share of SEMCOG's population aged 65 or older will increase from 13 percent in 2010 to 23.9 percent in 2040 – a much more dramatic aging profile than in the nation as a whole. Sluggish population growth among SEMCOG's working-age group stems from a dramatic slowing (and after 2030, a decline) in natural population growth with the aging of the population, and the low rate of in-migration of young adults that we anticipate (the first two sources of labor listed above, and shown in Figure 7).

One factor that could compensate somewhat for weak growth in the working-age population would be increases in the labor force participation rate, identified above as the third source of labor. In our forecast, we are estimating a fairly large increase in participation rates across each age category, ranging from a two-percentage-point increase to an eleven-percentage-point increase from 2010 to 2040. For example, in the 30 to 34 age category, we see an increase in the rate from 79.0 percent in 2010 to 83.7 percent in 2040; in the 65 to 69 age category, we project an increase from 26.8 percent to 37.9 percent over the period.

Even though every individual age component shows an increase, however, the labor force participation rate overall falls from 60.5 percent in 2010 to 57.8 percent in 2040. How so? Because the total participation rate is a weighted average of the rates across age groups, and over time the older cohorts with the lowest rates gain significantly in their proportion of the population. Indeed, if we are off the mark here, it is more likely that we have been too generous on the increases in participation rates among the age cohorts, suggesting that labor supply could be even more squeezed from this source.

The last source of labor supply listed above is drawing from the unemployed, but in our forecast we have assumed a low and stable unemployment rate approaching an equilibrium position over the period, leaving little room to add workers from this source.

So, among the four sources of labor supply listed above, where is the potential to squeeze out significantly greater numbers of workers? Realistically, there is only one: The trends most subject to influence would be the migration rates. Employment opportunities are the strongest magnet for these people, but educational opportunities, quality of life, and family ties also matter. Otherwise, the labor supply constraints outlined here ultimately impose a serious speed limit on economic growth. The prospects for labor shortages in the future, particularly of workers with skills that mesh with the emerging knowledge- and information-based economy, is an issue that should be on our radar screen today.

¹⁴Examples of people not participating would be those who do not work outside of the home, retirees, full-time students, or those on welfare.

Conclusion

So, where does this leave us? We appear to be emerging from the tunnel that was the most catastrophic period for the Southeast Michigan economy in our lifetime. The tunnel was frightening – during the first decade of the 2000s, the region lost virtually all of the jobs gained in the robust growth decade of the 1990s – and seeing daylight ahead is refreshing, but in fact are we actually leaving the tunnel? And if so, are we going to traverse the same landscape as before?

On the first question, the near-term outlook, there does appear to be growing evidence that the economy of Southeast Michigan, and for that matter Michigan in general, is returning to positive growth. This observation is supported by the recent flow of data releases, in news reports, and by our forecast of the local economy contained in this report. Growth is more subdued, however, than what is commonly expected coming out of a recession. The local economy is far from being back to normal, and many residents will not be vested in the recovery for some time to come. But the region has made a good start, its competitive position turned around after 2009, and we see job growth being sustained. So, our answer to the first question is, yes, we are leaving the tunnel.

On the second question, the longer-term outlook, the answer is no, we won't be traveling the same route as before after exiting the tunnel. We see long-term growth to be sure, but only at a moderate pace for Southeast Michigan's population and labor market over the next 30 years, much more subdued than what transpired in the 1990s prior to the extended downturn. And growth is more muted going forward than we anticipated several years ago – now our view is that by 2040 the region's employment will still remain slightly below its peak level achieved in 2000. One consequence of the poor performance of the local economy between 2000 and 2009 is a permanent loss of population and a deep hole for the economy to dig out of. On the demand side, we don't see especially strong growth nationally and we don't view the region's dominant sector – the domestic automotive industry – as a long-term growth sector, particularly in terms of employment given the solid productivity gains we anticipate.

The bigger issue 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 coming of working age or from net in-migration. But because the SEMCOG region has a disproportionately large share of baby boomers, it will age much more dramatically than the nation as a whole. By 2040, the age gap between the region and the rest of the country, as measured by the share of the population aged 65 and older, will be about the same as it is today between Florida and the rest of the country. 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. It's hard to fathom in our current high unemployment environment, but 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.

The hope, of course, is that the retrenchment the region has suffered through can also be the precursor to an era of renewal. Our policy prescription remains the same as the last time we engaged in this exercise – investment in a more highly skilled and educated work force, and retention of greater numbers of our high-income retirees. Our forecast and the underlying data suggest that there are challenges that need to be addressed, but the Southeast Michigan region has the assets, the wherewithal, and the motivation to get there. Again, we remain optimistic that we can and will do better.

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About the Authors

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For the past two decades, he has worked on forecasting labor market activity in the metropolitan areas of Michigan. He has worked for many years with the Michigan Departments of Commerce and Treasury and the Michigan Economic Development Corporation on policy analysis and evaluating economic strategies. He has also participated in economic studies designed to assist firms in their location and expansion decisions. He is co-director of a project to generate long-term economic and demographic projections for all of the counties of Michigan. He has been involved in other research projects sponsored by the U.S. Department of Commerce, the U.S. Department of Labor, the Federal Reserve Bank of Chicago, and the Robert Wood Johnson Foundation.

Among his publications, he has co-authored a paper on the changing concentration of computer service industry employment, "Change in the Concentration of Employment in Computer Services: Spatial Estimation at the U.S. Metro County Level" (*Growth and Change*, March 2007). He also co-authored a chapter on the location of technology firms in *Michigan at the Millennium*.

George A. Fulton received his Ph.D. in Economics from the University of Michigan. He is currently the director of the Research Seminar in Quantitative Economics in the Department of Economics at the University of Michigan. He also holds an appointment as research professor at the University's Institute for Research on Labor, Employment, and the Economy, where he is director of the Center for Labor Market Research.

Dr. Fulton has been forecasting economic and fiscal activity in the State of Michigan for over three decades. In addition, he is co-director of a project to generate long-term economic and demographic projections for all the counties of Michigan. He is a principal advisor to the university administration and to the state government on the economic situation in Michigan. He has written a book on the Michigan regional economies, co-authored with former University of Michigan President Harold T. Shapiro. His research crosses disciplines, having been published in diverse professional journals and sponsored research reports.

Appendix

2040 Baseline Regional Forecast Totals:

Employment by Industrial Class

Population by Age

Table 2

Employment by Industrial Class, Southeast Michigan, 2010-2040

	2010	2020	2030	2040	Numeric Change '10-'40	Percent Change '10-'40
Total Employment	2,484,251	2,635,157	2,713,957	2,786,082	301,831	12.1%
Farm	6,458	5,900	5,298	5,010	-1,448	-22.4%
Forestry, Fishing, and Other	2,304	2,391	2,698	2,954	650	28.2%
Mining	3,258	2,699	2,270	2,241	-1,017	-31.2%
Utilities	8,178	6,750	5,285	4,297	-3,881	-47.5%
Construction	91,112	106,471	114,147	111,307	20,195	22.2%
Manufacturing	209,698	205,081	190,325	178,823	-30,875	-14.7%
Motor Vehicles and Parts Manufacturing	69,304	61,796	52,904	44,263	-25,041	-36.1%
Non-Motor Vehicle Manufacturing	140,394	143,285	137,421	134,560	-5,834	-4.2%
Wholesale Trade	91,008	88,228	87,365	83,107	-7,901	-8.7%
Retail Trade	244,842	225,755	220,459	215,939	-28,903	-11.8%
Transportation & Warehousing	72,486	79,347	85,814	94,433	21,947	30.3%
Information	36,922	36,880	32,863	29,155	-7,767	-21.0%
Finance & Insurance	113,620	118,952	119,499	117,063	3,443	3.0%
Real Estate, Rental, & Leasing	117,520	120,902	120,389	120,190	2,670	2.3%
Professional & Technical Services	242,393	297,596	313,263	329,290	86,897	35.8%
Management of Companies	39,005	39,029	40,113	40,777	1,772	4.5%
Administrative, Support, & Waste Services	187,228	208,053	221,097	233,613	46,385	24.8%
Private Education	50,802	59,332	57,795	57,921	7,119	14.0%
Health and Social Services	319,614	381,926	423,146	462,018	142,404	44.6%
Arts & Recreation	59,247	61,515	64,914	70,550	11,303	19.1%
Accommodation & Food Services	164,605	160,850	165,755	172,922	8,317	5.1%
Other Services	132,582	140,481	144,366	147,914	15,332	11.6%
Federal Government, civilian	33,871	29,291	27,994	27,220	-6,651	-19.6%
Federal Government, military	10,520	10,911	9,708	8,591	-1,929	-18.3%
State Government	83,212	84,095	89,760	95,457	12,245	14.7%
Local Government	163,766	162,722	169,634	175,290	11,524	7.0%

Table 3

Population by Age, Southeast Michigan, 2010-2040

	2010	2020	2030	2040	Numeric Change 10-40	Percent Change 10-40
Total	4,704,743	4,646,938	4,678,718	4,742,083	37,340	0.8%
0-4	282,840	261,570	263,140	257,662	-25,178	-8.9%
5-9	307,000	266,669	264,807	267,917	-39,083	-12.7%
10-14	328,001	282,411	268,859	277,676	-50,325	-15.3%
15-17	213,194	185,364	168,643	172,644	-40,550	-19.0%
18-19	136,394	123,167	108,124	109,265	-27,129	-19.9%
20-24	298,948	311,657	280,309	275,029	-23,919	-8.0%
25-29	282,741	309,041	290,155	270,777	-11,964	-4.2%
30-34	280,912	266,271	300,347	282,960	2,048	0.7%
35-39	310,431	266,659	309,443	302,068	-8,363	-2.7%
40-44	334,638	267,837	266,860	309,030	-25,608	-7.7%
45-49	363,041	295,570	264,713	313,580	-49,461	-13.6%
50-54	369,245	316,135	261,154	265,751	-103,494	-28.0%
55-59	321,915	338,740	282,540	257,962	-63,953	-19.9%
60-64	264,778	336,319	295,438	248,486	-16,292	-6.2%
65-69	186,948	275,326	296,961	251,990	65,042	34.8%
70-74	132,320	208,784	270,137	242,586	110,266	83.3%
75-79	108,531	137,102	206,886	227,730	119,199	109.8%
80-84	93,485	86,979	142,486	188,790	95,305	101.9%
85-89	59,762	57,678	77,921	122,476	62,714	104.9%
90-94	23,281	35,691	36,998	64,818	41,537	178.4%
95-99	5,594	14,444	15,784	23,783	18,189	325.1%
100+	744	3,524	7,011	9,106	8,362	1123.9%

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