

O A K L A N D C O U N T Y , M I C H I G A N

33rd
**Economic
Outlook**

S U M M A R Y

2018 - 2020



Presented by:

Dr. Gabriel Ehrlich and Donald R. Grimes,
*Research Seminar in Quantitative Economics,
University of Michigan*

Final Report Available June 2018 at:

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SUMMARY INTRODUCTION

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Oakland County is a fiscally responsible government partner with resources to support your success.

Welcome to our 33rd annual Oakland County Economic Outlook luncheon.

If this is your first time with us, we're glad you're here. If you're an Outlook "veteran," welcome back.

Chase and Oakland Community College, along with our Department of Economic Development & Community Affairs, have co-hosted this event for more than 20 years. I thank them and our other sponsors who help ensure the luncheon's success as well as the Oakland County Board of Commissioners for its continued support of our economic development programming. We are fortunate to have such long-standing relationships.

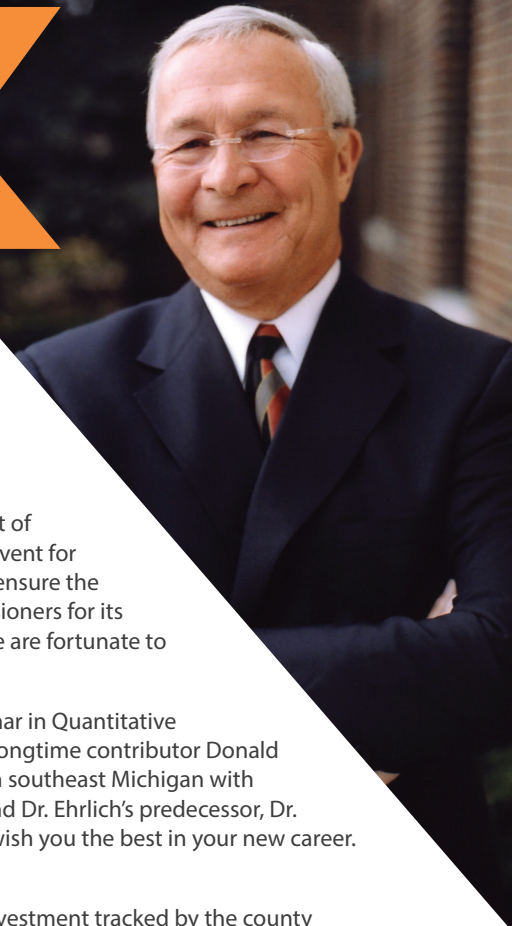
We welcome back Dr. Gabriel Ehrlich, director of the Research Seminar in Quantitative Economics at the University of Michigan, who joins economist and longtime contributor Donald R. Grimes to provide business, education and government leaders in southeast Michigan with a three-year projection of economic growth for the area. I understand Dr. Ehrlich's predecessor, Dr. George Fulton, is retiring to Las Vegas to write one liners. George, I wish you the best in your new career. And what do you have planned for next month?

Oakland County remains an economic powerhouse for Michigan. Investment tracked by the county for 2017 was an impressive \$1.4 billion. In simpler terms, nearly \$3.9 million each day — on average — was invested here last year, a substantial increase of \$1.5 million each day from the previous year. Our unemployment rate has hovered around 3.0 percent since April 2017 — its lowest level since 2000. Foreign direct investment for the past four years — investment from companies headquartered outside the U.S. — topped an incredibly robust \$1.1 billion. Nearly 1,100 foreign-owned firms from 39 countries: it's an international portfolio that not many states — let alone counties — can match.

Our Emerging Sectors[®] business diversification strategy topped \$4 billion in 2017. In less than a year, Oakland County businesses are on the cusp of generating \$5 billion total investment since inception in 2004 while creating or retaining more than 81,000 jobs. Tech248™ is connecting the 2,000+ tech/IT companies operating in our county. Our budget is balanced through 2022 as we continue to be among a select few counties nationally to have a AAA bond rating, saving taxpayers millions of dollars.

Oakland County continues to give businesses and entrepreneurs the tools and opportunity to succeed: a skilled and educated workforce, a business-friendly environment, access to capital and an enviable quality of life for our residents.

To the business community in Oakland County and Michigan, thank you for your hard work and for the dollars you put at risk. More importantly, thank you for the shimmering horizon of good economic news that we continue to enjoy.



The Economic Outlook Summary is presented at a luncheon by Dr. Gabriel Ehrlich and Donald R. Grimes, University of Michigan's Research Seminar in Quantitative Economics. Along with Oakland County, the event is hosted by Chase and Oakland Community College.

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O A K L A N D C O U N T Y

33rd

Economic Outlook

S U M M A R Y

2018 - 2020

PRESENTED BY

**Dr. Gabriel M. Ehrlich
and Donald R. Grimes**
University of Michigan

APRIL 2018



Gabriel Ehrlich



Donald Grimes

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The full report will be available in June on the web (updated annually) at:
AdvantageOakland.com | Isa.umich.edu/econ/rsqe

Research Seminar in Quantitative Economics (RSQE)

The Research Seminar in Quantitative Economics (RSQE) is a modeling and forecasting unit that has been in operation at the University of Michigan since 1952. Four times a year, RSQE provides forecasts of both the U.S. economy and the Michigan economy. RSQE hosts the University of Michigan's Annual Economic Outlook Conference, the longest-running such event in the U.S., in Ann Arbor each November. RSQE has twice received the prestigious Blue Chip Annual Economic Forecasting Award (AEFA) recognizing "accuracy, timeliness, and professionalism" in economic forecasting.

Dr. Gabriel M. Ehrlich

received his Ph.D. in economics from the University of Michigan. He is the director of the University's Research Seminar in Quantitative Economics (RSQE). His research focuses on several areas of housing and land economics as well as the effects of wage rigidity on labor market outcomes. His work has been discussed in *The Economist* magazine and *The Washington Post*, and his recent article, "Economic Effects of Medicaid Expansion in Michigan," was published in the *New England Journal of Medicine*. His article, "Metropolitan Land Values," is forthcoming in the *Review of Economics and Statistics*.

Prior to joining RSQE, Dr. Ehrlich worked in the Financial Analysis Division at the Congressional Budget Office (CBO), where he forecast interest rates and conducted analysis on monetary policy and the mortgage finance system. He has also worked as a financial analyst in the mortgage banking industry. He earned his undergraduate degrees in finance and economics at the University of Maryland, where he was chosen by the faculty as the outstanding graduate in finance during his senior year.

Dr. Ehrlich testifies twice per year to the state legislature on Michigan's fiscal and economic prospects, which the state uses as a guide to determining expected future revenues. He recently coauthored *The Michigan Economic Outlook for 2018–2019*.

Donald R. Grimes

received his master's degree in economics from the University of Michigan. He is a senior research area specialist at the University's Research Seminar in Quantitative Economics (RSQE) and at the Economic Growth Institute, where he is assistant director of the Center for Labor Market Research. His primary research interests are in labor economics and economic forecasting.

For 40 years, he has been engaged in economic forecasting for state and local governments and is frequently called upon for policy advice. He has worked for many years with the Michigan departments of Transportation and Treasury and the Michigan Economic Development Corporation on policy analysis and evaluating economic strategies. He is co-director of a project to generate long-term economic and demographic projections for all of the counties of Michigan. His past research includes a study looking at Michigan's industrial structure with a view to identifying sectors that will promote economic growth in the future.

He has been involved in 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. His recent publications include *The Michigan Economic Outlook for 2018–2019*; "Exploring Wage Determination by Education Level: A U.S. Metropolitan Statistical Area Analysis from 2005 to 2012," published in *Economic Development Quarterly*; and "Economic Effects of Medicaid Expansion in Michigan," published in the *New England Journal of Medicine*.

Dr. George A. Fulton

received his Ph.D. in economics from the University of Michigan. He is director emeritus of the Research Seminar in Quantitative Economics (RSQE), and research professor emeritus at the University's Economic Growth Institute.

Dr. Fulton's special expertise is in economic forecasting and regional economic development. For more than four decades, he has been forecasting labor market activity for the state of Michigan as a whole, as well as for the state's counties individually. He is currently one of three principals of the Detroit Revenue Estimating Conference, a panel formed to evaluate and approve revenue projections for the city that form the basis for their future budgets.

For his work, he has received many commendations and special tributes, including from Governor Snyder, the Michigan legislature, and University of Michigan President Mark Schlissel. In 2015, he received the inaugural Lifetime Achievement Award for Excellence in Economic and Demographic Analysis from REMI, a prominent national forecasting organization. The award has since been named in his honor.

Dr. Michael R. McWilliams

received his Ph.D. in economics from the University of Michigan. He is a Michigan forecasting specialist at the Research Seminar in Quantitative Economics (RSQE). His research focuses on a range of topics in environmental and natural resource economics, including land use change and its causes and environmental consequences, regulation of light-duty vehicles, and the impact of the ethanol mandates. His work has been published in the Proceedings of the National Academy of Sciences and Energy Policy.

Dr. McWilliams assists with RSQE's forecasts of the Michigan economy and tax revenues four times per year, and he recently coauthored *The Michigan Economic Outlook for 2018–2019*.

lsa.umich.edu/econ/rsqe

Table 1

Track Record over the Years

Year of Forecast	% Forecast Error for Total Private Jobs	Year of Forecast	% Forecast Error for Total Private Jobs	Year of Forecast	% Forecast Error for Total Private Jobs
1986	+ 1.4	1997	+ 0.6	2008	+ 2.2
1987	+ 0.7	1998	+ 1.3	2009	+ 5.5
1988	- 1.8	1999	- 1.2	2010	- 1.6
1989	- 1.9	2000	+ 0.6	2011	- 2.3
1990	+ 2.2	2001	+ 1.9	2012	- 2.2
1991	+ 3.9	2002	+ 2.5	2013	- 0.8
1992	- 2.0	2003	+ 1.6	2014	- 0.1
1993	+ 0.5	2004	+ 2.6	2015	0
1994	- 1.3	2005	+ 1.4	2016	- 0.3
1995	+ 0.2	2006	+ 3.3	2017	+ 0.8
1996	- 0.5	2007	0		

(Positive numbers indicate that the forecast was too high; negative numbers indicate that it was too low.)

Average absolute forecast error 1986–2017: 1.5%

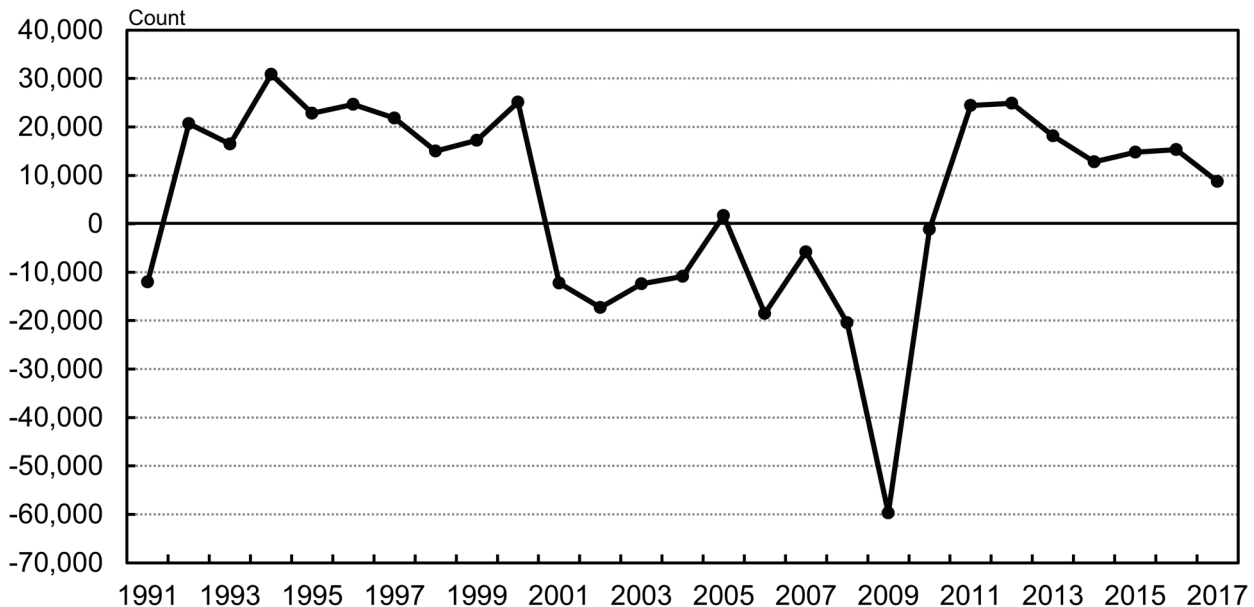
	Forecast 2017	Actual 2017
Unemployment rate	4.0%	3.5%
Consumer inflation rate	2.2%	2.1%

Forecast date: April 2017

- In last year's report, we forecast that private-sector job growth in Oakland County would slow a bit from its pace of 2.4 percent in 2016 to 2.1 percent in 2017. We now estimate that job growth registered only 1.3 percent last year, resulting in an overshoot of 0.8 percentage points, or eight workers per 1,000
- That forecast error is well below our average absolute error of 1.5 percent since 1986, but it is nonetheless our largest error since 2012. The good news is that much of the shortfall in job growth relative to last year's forecast appears to result from data revisions that we do not expect to carry into future years.
- In the first quarter of 2017 there was a major revision in how the U.S. Bureau of Labor Statistics assigned employment work sites by industry and geography. These changes appear to have led to a reported reduction of about 9,000 jobs in the professional, scientific, and technical services subcategory of the professional and business services industry in Oakland County between the fourth quarter of 2016 and the first quarter of 2017.
- It appears that some of these jobs were re-assigned to other industries within Oakland County, but that others were re-assigned to worksites outside of the county. This revision is the primary reason that our forecast of employment growth from 2016 to 2017 was too high.
- Among the major industry divisions, the largest shortfall in our forecast was in professional and business services, specifically in the professional, scientific, and technical subcategory. We had projected growth of about 3,300 jobs in that sector, roughly in line with its performance over the previous two years. Instead, the sector lost about 6,900 jobs, largely as a result of the data revisions.
- The unemployment rate for Oakland County fell to an average of just 3.5 percent in 2017, from 4.2 percent in 2016. We had forecast a more modest decline to 4.0 percent for the year, for a miss of one half of a percentage point.
- The local consumer inflation rate registered 2.1 percent in 2017, 0.1 percentage points lower than the 2.2 percent rate we had forecast last year.

Figure 1

Job Growth in Oakland County, 1991-2017



- Oakland County’s pattern of job growth since 1990 can be broken into three distinct periods, which coincide approximately with the decades of the 1990s, the 2000s, and the 2010s.
- The 1990s were generally a period of vigorous growth in the county, which added 182,700 payroll jobs from 1990 to 2000, an average pace of 2.8 percent per year.
- As was the case for Michigan overall, the 2000s were a much tougher time for Oakland County, which lost 156,500 jobs during the decade. That translates to an average growth rate of negative 2.2 percent per year.
- Oakland has returned to job growth in the current decade. By our estimate, the county has posted 119,100 job additions from 2010 to 2017. The county’s average growth pace of 2.6 percent per year well outpaced both the nation’s and the state’s average rate of 1.8 percent over the same period.
- The county added 8,772 payroll jobs in 2017. Although this represents the smallest calendar year gain since the recovery began, much of the shortfall relative to the past few years is attributable to data revisions. Therefore, we believe Oakland’s performance from 2014–16, when the county added an average of 14,300 jobs per year, is more informative for the county’s growth potential over the next few years.
- The continuing recovery in Oakland is consistent with sustained expansion of the U.S. and Michigan economies. Notably, growth has continued recently even with slight declines in Detroit Three vehicle sales in each of the past two years. Oakland’s recent growth reflects an economy that continues to diversify, a highly-educated labor force, and policy initiatives focused on future growth sectors.
- The major industry divisions that have added the greatest number of jobs in the recovery to date remain unchanged from last year. In order, the top four are professional and business services; trade, transportation, and utilities; manufacturing; and leisure and hospitality. Government remains the only major industry division that has lost jobs over the recovery period to date, although it has added jobs in each of the past two years.

Table 2

Job Change in Oakland County by Industry Wage Category, 2010–17

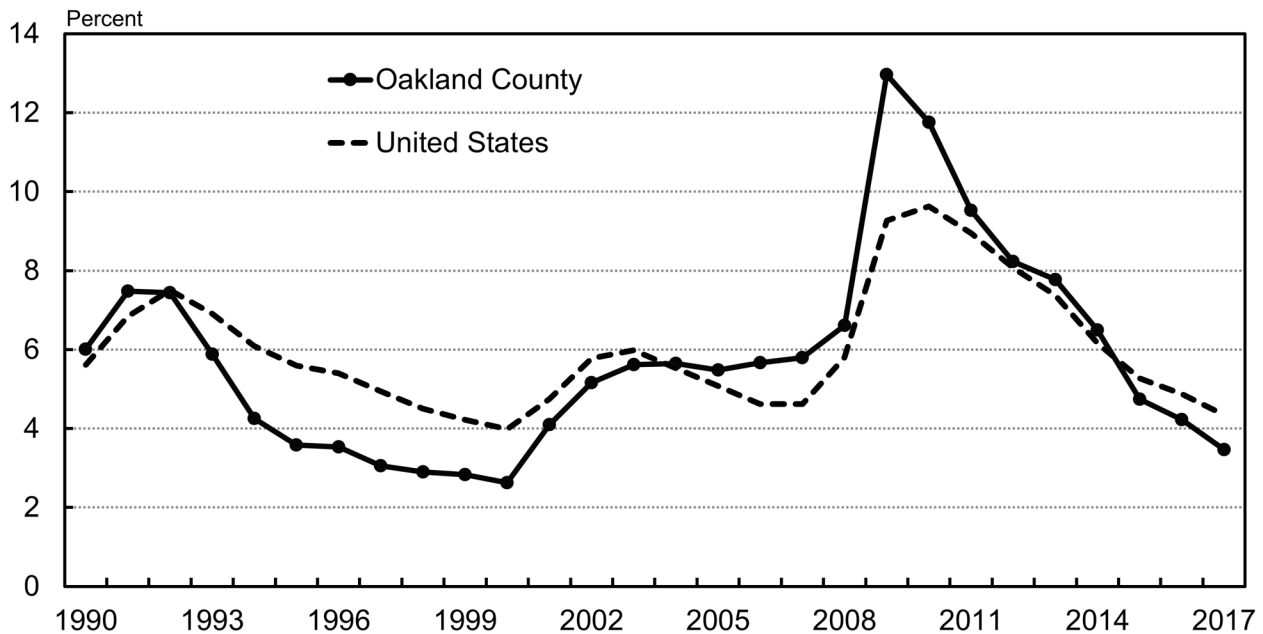
	2010	2017	Change 2010–17	% Change 2010–17
Total all industries	611,142	730,233	119,091	19.5
Higher-wage industries (\$75,000 or more)	190,510	232,979	42,468	22.3
Middle-wage industries (\$35,000 to \$74,999)	282,381	325,885	43,504	15.4
Lower-wage industries (under \$35,000)	138,250	171,370	33,119	24.0

Source: BLS, Quarterly Census of Employment and Wages. Higher-wage industries have an average wage in 2016 at least 40 percent above the U.S. average (\$53,621) and lower-wage industries at least 30 percent below the U.S. average.

- We have broken out job growth in Oakland County over the recovery period into three categories based on the average wages paid in each of the 151 unique industries in our dataset.
- The three categories are higher-wage industries, which paid an average of \$75,000 or more in 2016; middle-wage industries, which paid on average between \$35,000 and \$74,999; and lower-wage industries, which paid less than \$35,000 on average.
- For comparison, the average annual wage in the United States was \$53,621 in 2016, versus \$59,968 in Oakland.
- Higher-wage industries grew faster than average on a percent basis in Oakland County from 2010 to 2017. The 42,468 job additions in this category came to total growth of 22.3 percent.
- Middle-wage industries grew more slowly in Oakland County on a percent basis, 15.4 percent. Because the 2010 employment level in middle-wage industries was so large, however, that growth rate translated into 43,504 job additions, about the same number as for the higher-wage industries.
- Lower-wage industries added 33,119 jobs in Oakland County from 2010 to 2017, the fewest of the three wage categories. However, because the 2010 employment level in lower-wage industries was relatively small, that translated into a healthy growth rate of 24.0 percent.
- One factor behind the relatively slow growth in the middle-wage industries in Oakland County during this time is job losses in the government sector.

Figure 2

Unemployment Rates for Oakland County and for the United States, 1990-2017



- From 1990 to 2008, Oakland County's unemployment rate never averaged an annual rate greater than 7.5 percent, the rate it reached in 1991.
- The county's unemployment rate shot upward in 2009, to an average of 13.0 percent. The national unemployment rate also spiked that year, but to a lower level of 9.3 percent.
- The unemployment rate has fallen more sharply in Oakland County than in the nation as a whole since then, and Oakland's unemployment rate fell below the national average on a calendar-year basis in 2015.
- Oakland's unemployment rate averaged 3.5 percent in 2017, down nearly three-quarters from its peak in 2009. The average rate in 2017 was the lowest annual reading since the 2.6 percent rate recorded in 2000. It was also 0.9 percentage points below the average U.S. rate for the year.
- The drop in unemployment came despite continued growth in the labor force, which grew by 1.4 percent last year. That was its sixth consecutive year of growth, as improving opportunities have drawn more workers into the labor market.

Table 3

Oakland County Compared with 37 U.S. Counties of Similar Size*

(Ranking based on selected Indicators of prosperity)

County	State	Population 2017	Associate's Degree or More	Child Poverty	Median Family Income**	High-Income Persons Aged 65 or Older	Managerial, Professional	Sum of Rankings	Rank of Sum
Fairfax	VA	1,148,433	1	1	1	1	1	5	1
Montgomery	MD	1,058,810	2	5	3	2	2	14	2
Collin	TX	969,603	4	2	2	12	3	23	3
Nassau	NY	1,369,514	10	3	4	3	12	32	4
Bergen	NJ	948,406	6	4	12	9	7	38	5
Wake	NC	1,072,203	3	14	5	14	4	40	6
DuPage	IL	930,128	8	7	6	13	13	47	7
Westchester	NY	980,244	11	11	11	5	10	48	8
Oakland	MI	1,250,836	9	13	7	15	6	50	9
Fairfield	CT	949,921	13	8	9	6	14	50	9
Hennepin	MN	1,252,024	5	17	8	19	8	57	11
Contra Costa	CA	1,147,439	17	10	15	4	15	61	12
Travis	TX	1,226,698	16	19	10	11	9	65	13
Fulton	GA	1,041,423	7	29	14	16	5	71	14
St. Louis	MO	996,726	15	15	13	17	16	76	15
Suffolk	NY	1,492,953	21	9	16	7	24	77	16
Allegheny	PA	1,223,048	12	18	17	31	11	89	17
Mecklenburg	NC	1,076,837	14	21	18	20	17	90	18
Honolulu	HI	988,650	20	6	23	8	35	92	19
Salt Lake	UT	1,135,649	25	12	19	24	19	99	20
Prince George's	MD	912,756	35	16	22	10	22	105	21
Erie	NY	925,528	18	24	20	25	25	112	22
Franklin	OH	1,291,981	19	30	24	23	18	114	23
Gwinnett	GA	920,260	23	20	21	22	32	118	24
Palm Beach	FL	1,471,150	24	22	28	18	34	126	25
Sacramento	CA	1,530,615	32	28	26	21	23	130	26
Cuyahoga	OH	1,248,514	27	31	25	30	20	133	27
Duval	FL	937,934	28	25	29	28	28	138	28
Hillsborough	FL	1,408,566	26	26	32	34	26	144	29
Pinellas	FL	970,637	30	23	31	33	27	144	29
Orange	FL	1,348,975	22	27	35	32	31	147	31
Pima	AZ	1,022,769	33	32	33	27	30	155	32
Shelby	TN	936,961	34	35	27	26	33	155	32
Milwaukee	WI	952,085	29	33	30	35	29	156	34
Philadelphia	PA	1,580,863	36	36	37	37	21	167	35
Marion	IN	950,082	31	34	34	36	36	171	36
Fresno	CA	989,255	37	37	36	29	37	176	37
Bronx	NY	1,471,160	38	38	38	38	38	190	38

*All counties in the United States with a population between 900,000 and 1,600,000 in 2017.

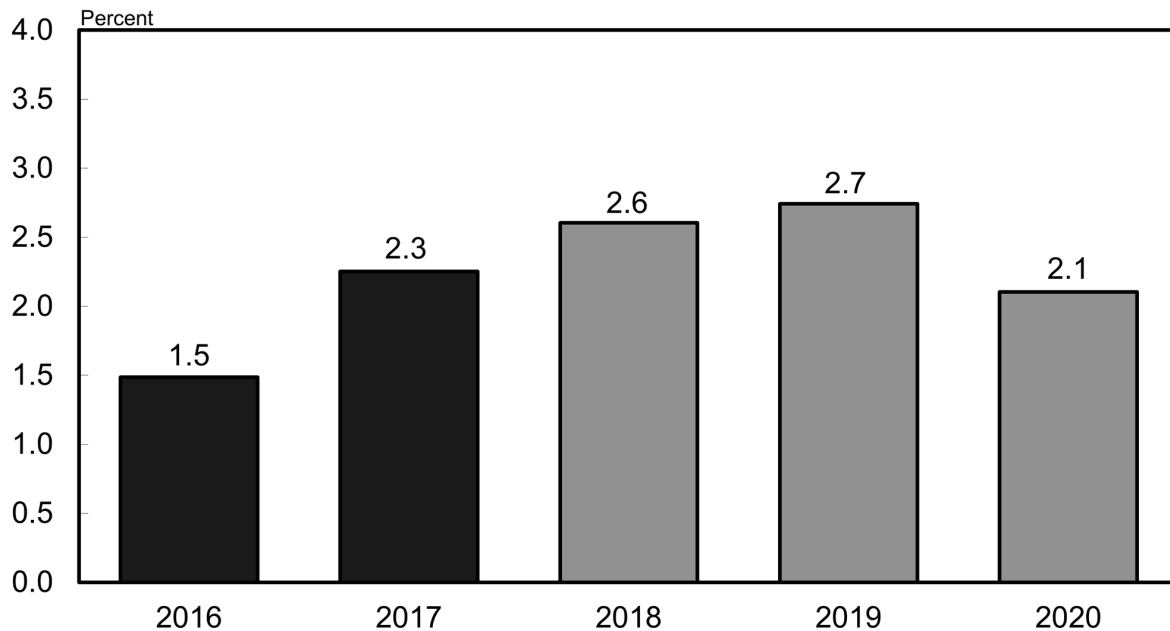
**Adjusted for cost of living.

Source: American Community Survey 2016. Census Bureau Population Estimates, April 2018.

- It is useful to compare Oakland County’s economic foundation with that of its peer counties in order to identify Oakland’s relative strengths and to assess the county’s prospects in the future.
- To form a peer group, we include all counties that have a population within 350,000 of Oakland’s 2017 level of 1.25 million, i.e. all counties with between 900,000 and 1.6 million residents. There were 37 such counties other than Oakland in 2017.
- Many of the nation’s most prosperous and successful counties are included in this group. Like Oakland, many are also among the select group of U.S. counties that have a AAA bond rating with multiple rating agencies.
- We ranked Oakland County and these 37 other counties on five measures that we consider to be indicative of economic prospects moving forward. (The data underlying the rankings are provided in appendix B.)
- We consider the following measures: (1) educational attainment—share of the population aged 25 to 64 with at least an associate’s degree in 2016; (2) child poverty—share of the population aged 17 and under who lived within families whose income was below the poverty level in 2016; (3) median family income adjusted for the cost of living in 2016; (4) high income seniors—share of persons aged 65 and older with income at least five times the poverty line in 2016; and (5) professional occupations—share of employed county residents working in professional and managerial occupations in 2016.
- A lower number for the rank indicates a better position among the counties; that is, a rank of 1 is best and 38 is worst. We order the 38 counties, including Oakland, by the summation of the rankings across the five measures. This order is not meant to be a rigorous measure of overall ranking, but it does give a sense of the relative standings.
- On this basis, Oakland moved up one place in the ranking since last year and is now tied for 9th overall among the 38 counties, an impressive achievement considering that a number of these counties constitute some of the healthiest local economies in the nation.
- Oakland County now ranks between 6th and 15th across the measures. Oakland’s standing is especially notable for its share of professional occupations, in which it now ranks 6th, and for its median family income, in which it ranks 7th. Oakland’s ranking of 9th on our educational attainment measure is also worth highlighting.
- These rankings suggest that Oakland County is strongly positioned for the future. The combination of an educated populace, a high share of managerial and professional jobs, and an attractive standard of living should serve Oakland well over the next three years and beyond.

Figure 3

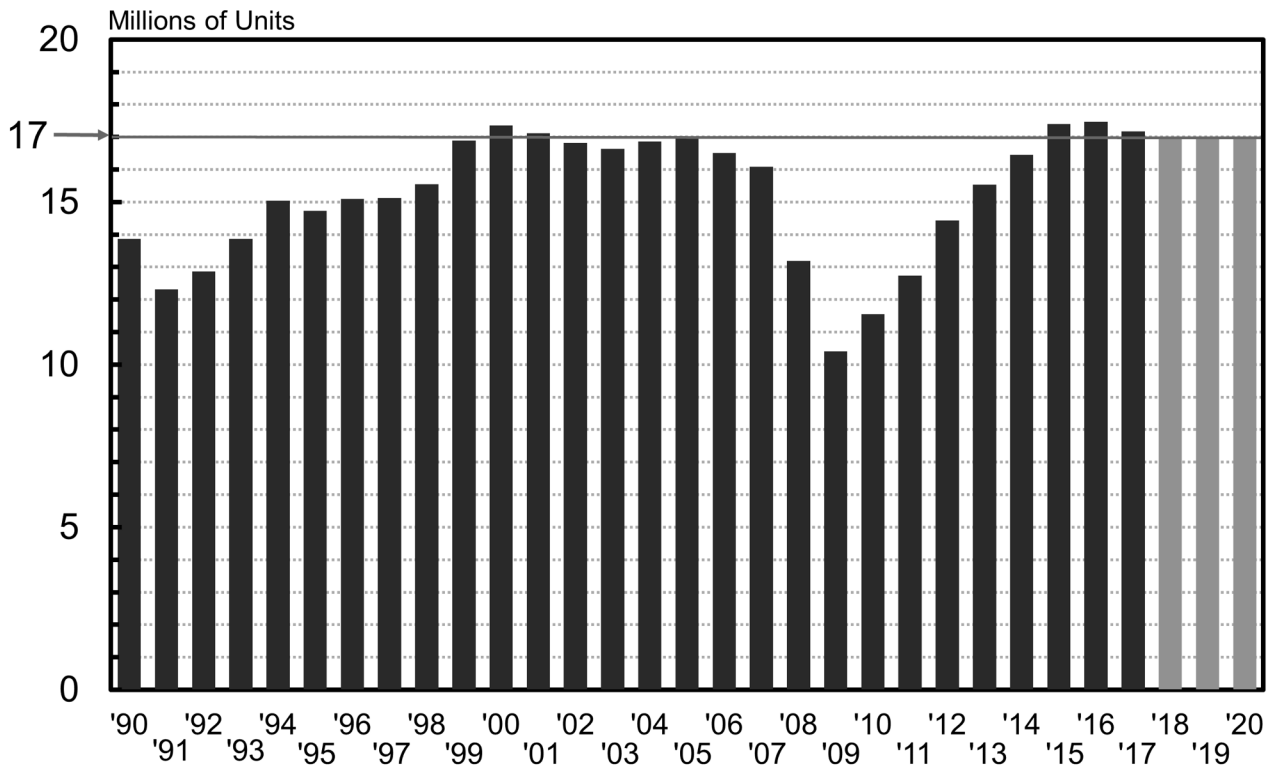
Growth in U.S. Real GDP, 2016–20



- The future course of the Oakland County economy depends in part on the overall health of the national economy.
- The best single measure of the U.S. economy is inflation-adjusted, or real, Gross Domestic Product, which comprises all of the goods, services, and structures produced in the economy.
- Real GDP growth picked up from its disappointing pace of 1.5 percent in 2016 to a more respectable 2.3 percent rate in 2017. The year ended on a relatively strong note, with domestic final demand, a measure that strips out the volatile net exports and inventory investment categories, registering a healthy 4.4 percent annualized growth rate in the fourth quarter.
- The major story over the next couple of years is federal fiscal stimulus, which will likely end up being quite substantial. We estimate that the Tax Cuts and Job Acts of 2017 will add approximately two-tenths of a percentage point to real GDP growth in each of 2018 and 2019. The spending authorized by the Bipartisan Budget Act of 2018 should add another two-tenths of a percentage point to growth in 2018 and four-tenths of a percentage point in 2019, before fading to one-tenth of a percentage point in 2020.
- This scale of fiscal stimulus in an economy near full employment is very unusual: one has to go back to the Johnson administration in the mid-1960s, with its Great Society programs and Vietnam ground war funding, to find a similar historical episode. It is also, we must note, completely unsustainable, as we project the federal debt-to-GDP ratio to rise 9.2 percentage points from the end of 2017 to the end of 2020.
- Overall, we are projecting real GDP growth of 2.6 percent in 2018, 2.7 percent in 2019, and 2.1 percent in 2020 as the fiscal stimulus fades.
- We view the most prominent risk to our forecast as the possible eruption of an international trade war. Although the recently enacted tariffs on steel and aluminum, and the proposed tariffs on Chinese imports, should not have a significant macroeconomic effect on our forecast on their own, an escalating cycle of retaliatory tariffs between the United States and its trading partners certainly would.
- The same can be said of a possible withdrawal from the North American Free Trade Agreement: the effects of a relatively cordial withdrawal on the national economy are likely to be minor, but if a retaliatory cycle ensues, the effects would be substantially worse.
- In summary, we see reasonably healthy growth over the next few years, but at the potential cost of storing up trouble down the road.

Figure 4

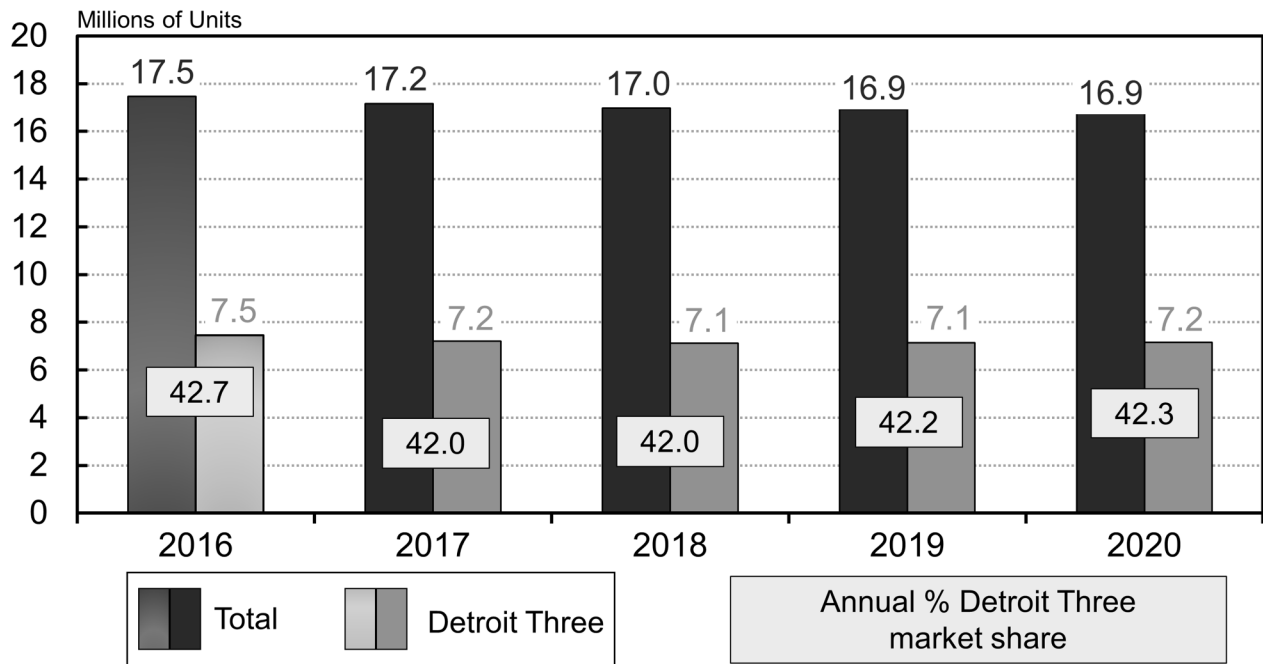
U.S. Light Vehicle Sales, 1990–2020



- Total U.S. light vehicle sales grew every year from their recession low point of 10.4 million units in 2009 through 2016, when they set an all-time record of 17.5 million units.
- Sales then downshifted a bit last year, to a pace of 17.2 million units, which we nonetheless consider to be a healthy year.
- We see sales decelerating a bit further from here, to 17.0 million units this year and 16.9 million in each of 2019 and 2020.
- We see a relatively large supply of two- to three-year-old vehicles in the pre-owned market putting some downward pressure on new vehicle sales over the forecast period.

Figure 5

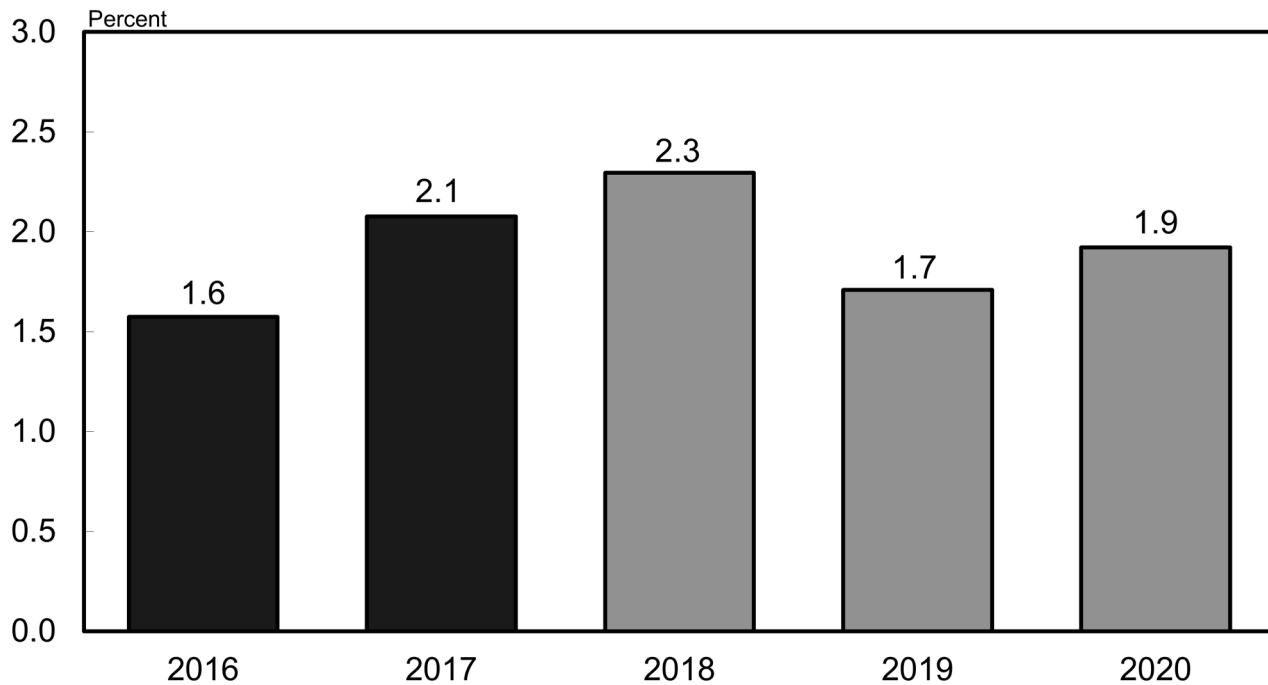
U.S. Light Vehicle Sales, Total vs. Detroit Three, 2016–2020



- The Detroit Three’s share of the light vehicle market fell from 42.7 percent in 2016 to 42.0 percent in 2017, as total Detroit Three sales fell by roughly 250,000 units.
- We see the Detroit Three share holding steady at 42.0 percent in 2018, and inching up to 42.2 percent in 2019 and 42.3 percent in 2020.
- This projection assumes that the United States does not withdraw from NAFTA, which remains our baseline forecast as of the writing of this report.
- The projections for total sales and the Detroit Three’s share of that market, taken together, yield our outlook for Detroit Three sales, which stay in the 7.1–7.2-million-unit range throughout the forecast period, a bit lower than in the past few years.
- The dip in Detroit Three sales reflects the slight decline in total U.S. sales, which is itself a reflection of the maturing economic recovery and slightly higher gasoline prices.

Figure 6

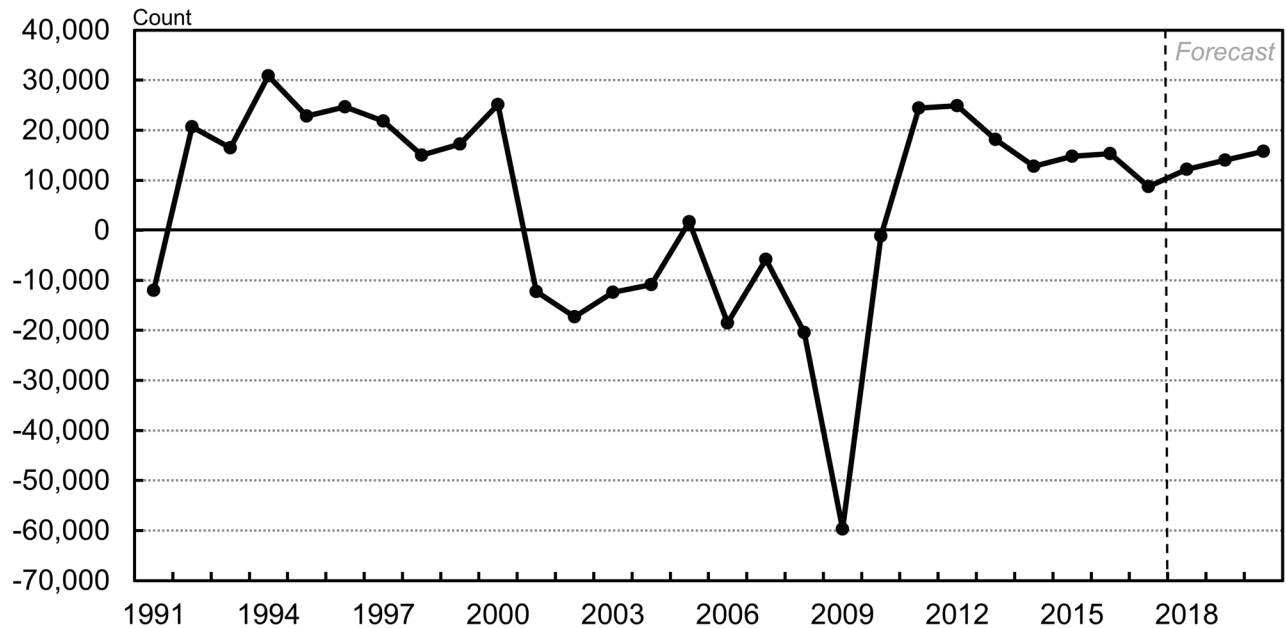
Inflation Rate, Detroit CPI, 2016–2020



- We measure local inflation by the growth rate of the Detroit Consumer Price Index (CPI), as county-level consumer price data are not available.
- Local prices rose 1.6 percent in 2016 and firmed to an inflation rate of 2.1 percent last year with higher gas prices and stronger national inflation.
- Based on a sharp uptick at the end of 2017 and the data so far this year, we are forecasting local prices to rise by 2.3 percent in 2018, the fastest pace since 2011.
- Local inflation then moderates to 1.7 percent in 2019 and 1.9 percent in 2020 as the recent run-up in energy prices fades into the rearview mirror.

Figure 7

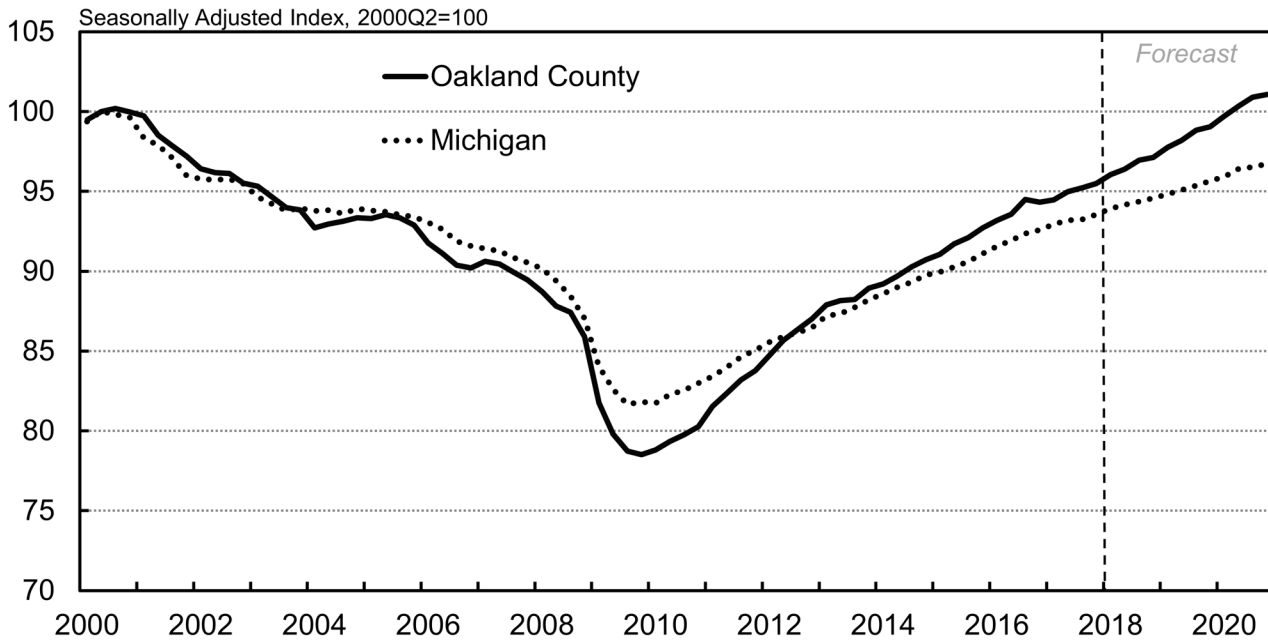
Job Growth in Oakland County, 1991-2020



- On a quarterly basis, using our estimates for the end of 2017, Oakland County has now completed eight consecutive years of job growth since the recession's low point at the end of 2009. (The small number of job losses recorded in 2010 is a statistical artifact that results from calendar-year averaging. The county actually gained jobs in each quarter of the year, but not quickly enough to take the annual average above its level the previous year.)
- We are forecasting that the slowdown in job growth to the rate of 1.2 percent in 2017 will prove to be a temporary hiccup brought on by statistical revisions, and that the pace of growth will bounce back over the forecast period.
- We expect growth of 1.7 percent in 2018, 1.9 percent in 2019, and 2.1 percent in 2020. That growth translates into gains of 12,200 jobs this year, 14,000 in 2019, and 15,800 in 2020.
- In total, we are forecasting 42,000 job additions over our forecast period, an average pace of 1.9 percent per year. That is a substantially faster pace than we currently anticipate for the United States or the state of Michigan over our forecast period.

Figure 8

Total Jobs in Oakland County vs. Michigan, Seasonally Adjusted, First Quarter of 2000 to Fourth Quarter of 2020



- To put Oakland County’s recovery from the Great Recession in perspective, we plot the quarterly path of the county’s total employment from the beginning of 2000 to the end of our forecast period in 2020. We include the same path for the state of Michigan. We index both employment paths to equal 100 in the second quarter of 2000, when Michigan reached its peak employment level.
- Oakland County reached its peak employment level in the third quarter of 2000 and fell to its low point in the fourth quarter of 2009. The county lost 166,463 jobs in that time period, about half of those from the end of 2007 to the end of 2009.
- We estimate that Oakland recovered 130,330 of those jobs through the end of 2017, based on the published data through the third quarter of the year.
- We forecast that Oakland will create an additional 42,974 jobs from the end of 2017 to the end of 2020. (That total differs slightly than the total using calendar-year averages reported alongside Figure 7 because it is from the end of 2017 to the end of 2020.)
- In our forecast, Oakland County sets a new employment peak in the spring of 2020. By contrast, the state as a whole is forecast to remain more than 3 percentage points below its peak employment level by the end of 2020.
- Although the employment decline over the first decade of the millennium was steeper in Oakland than in Michigan overall, the recovery has been more robust as well. Oakland’s more vigorous recovery continues over the forecast period, so that the gap in the two employment indexes widens from 1.9 index points in the county’s favor at the end of 2017 to 4.3 index points by the end of 2020.

Table 4

Job Change in Oakland County by Industry Wage Category, 2017–2020

	2017	2020	Change 2017–20	% Change 2017–20
Total all industries	730,233	772,259	42,026	5.8
Higher-wage industries (\$75,000 or more)	232,979	246,754	13,775	5.9
Middle-wage industries (\$35,000 to \$74,999)	325,885	345,368	19,484	6.0
Lower-wage industries (under \$35,000)	171,370	180,137	8,768	5.1

Source: BLS, Quarterly Census of Employment and Wages. Higher-wage industries have an average wage in 2016 at least 40 percent above the U.S. average (\$53,621) and lower-wage industries at least 30 percent below the U.S. average.

- This table splits job growth in Oakland County over the forecast period into the same industry categories based on average wages as in Table 2.
- On a percentage basis, we are forecasting that job growth will be skewed somewhat toward the higher- and middle-wage industries over the next three years. Total growth in the higher-wage industries registers 5.9 percent, and total growth in the middle-wage industries registers 6.0 percent.
- Growth in the lower-wage industries lags a bit behind, at 5.1 percent total over the three years.
- One factor we see boosting growth in the middle-wage industries is the government sector's return to growth in Oakland County. Government employment started increasing in the county in 2016, and we expect its growth to continue at a modest pace over the forecast period.
- The higher- and middle-wage industries make up almost 80 percent of the net new jobs created in the county from 2017 to 2020.
- In summary, we forecast job growth in Oakland County to be skewed toward the better-compensated end of the wage scale, consistent with the trend in the current recovery period to date.

Table 5

Forecast of Jobs in Oakland County by Major Industry Division, 2017–20*

(*Some subtotals do not add to totals due to rounding of annual average computations.)

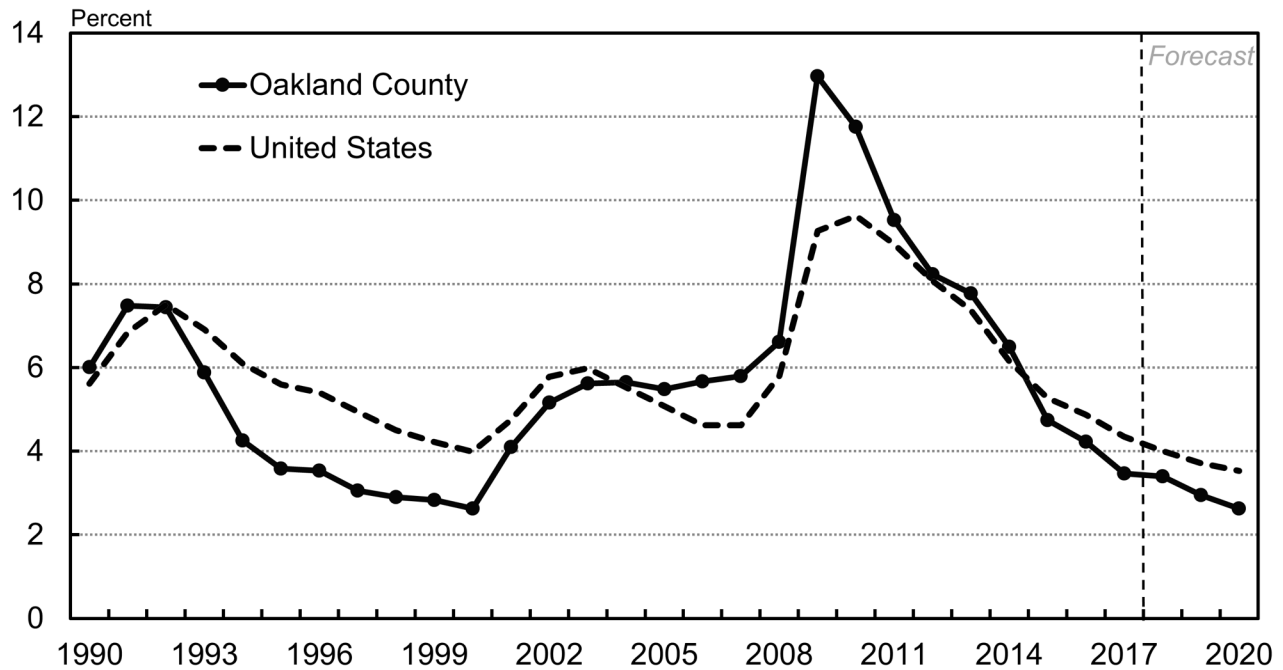
	Estimate	Forecast Employment Change				Average Annual Wage
	2017	'17-'18	'18-'19	'19-'20	'17-'20	2016
TOTAL JOBS (Number of persons)	730,233	12,213	14,043	15,770	42,026	59,324
(Annual percentage change)	(1.2)	(1.7)	(1.9)	(2.1)	(1.9)	N.A.
TOTAL GOVERNMENT	45,177	500	403	1,002	1,905	52,943
TOTAL PRIVATE	685,056	11,713	13,640	14,768	40,121	59,747
GOODS-PRODUCING	93,597	2,244	1,558	1,492	5,293	74,196
Natural resources, mining, construction	26,563	1,078	1,034	1,027	3,139	68,363
Manufacturing	67,034	1,166	524	464	2,154	76,471
Fabricated metal products	11,089	195	-52	-75	68	60,554
Machinery	11,205	307	114	94	516	80,778
Transportation equipment (motor vehicles)	21,921	301	145	135	582	95,864
Other manufacturing	22,819	363	316	309	988	64,530
PRIVATE SERVICE-PROVIDING	591,459	9,469	12,083	13,276	34,828	57,543
Trade, transportation and utilities	129,553	820	1,324	1,662	3,805	52,929
Wholesale trade	36,639	332	451	532	1,314	93,551
Retail trade	79,708	217	499	735	1,452	33,662
Transportation, warehousing and utilities	13,206	271	374	395	1,039	58,043
Information	15,007	121	198	238	556	78,065
Financial activities	53,571	830	1,077	1,215	3,122	83,299
Finance and insurance	36,842	400	569	648	1,617	97,738
Real estate and rental and leasing	16,730	430	507	567	1,504	50,976
Professional and business services	184,008	4,119	5,144	5,019	14,283	72,536
Professional, scientific, and technical	102,512	2,855	3,069	3,185	9,110	82,964
Management of companies and enterprises	15,677	601	364	21	986	130,818
Administrative support and waste management	65,819	663	1,711	1,812	4,187	41,565
Private education and health services	113,578	2,037	2,539	2,975	7,551	49,662
Private education services	11,273	-6	156	194	344	44,837
Health care and social assistance	102,305	2,043	2,383	2,781	7,207	50,199
Leisure and hospitality	71,744	1,514	1,581	1,816	4,911	20,962
Other services	22,612	28	220	350	599	34,858
Unclassified	1,384	0	0	0	0	48,502

- Table 5 distributes our projected total job movements for Oakland County from 2017 to 2020 among 28 major industry divisions.
- The government sector turned the corner in 2016, adding 444 jobs after ten consecutive years of job losses from 2006 to 2015. Government then added another 262 jobs in 2017. We believe the rebound in government employment is here to stay, and expect job gains of around 1.4 percent per year over the forecast period, for a total of 1,905 job additions from 2017–2020. Nonetheless, the growth that we foresee in the government sector does not keep pace with growth in the private sector.
- Private-sector employment grew 3.1 percent per year in the first four years of the economic recovery, from 2009 to 2013. The pace of growth then slowed to 2.2 percent per year between 2013 and 2016. In 2017, the number of private-sector jobs in the county only grew by 1.3 percent, partly because of statistical revisions that reassigned some professional and technical services jobs to locations outside the county. We foresee job growth accelerating from here, cumulating to 40,121 jobs over the three-year period.
- The construction industry accounts for 97 percent of the jobs in the aggregate industry category of natural resources, mining, and construction. The category adds 3,139 jobs over the next three years, as residential construction continues to pick up. Specialty trades contractors account for 2,001 job additions over the three years. Residential building contractors account for another 398 job gains.
- Job growth in the manufacturing sector had been slowing prior to 2016, from 5,756 job additions in 2011 to just 655 in 2015. The sector rebounded nicely with 2,185 new jobs in 2016 and 2,622 new jobs in 2017, but we expect the trend toward slower growth to return, with 1,166 job additions in 2018, 524 in 2019, and 464 in 2020.
- Transportation equipment (motor vehicle) manufacturing led growth in the early stages of the recovery, with a total of 5,328 job additions in 2011 and 2012 combined. Growth then slowed, averaging only 263 job additions per year between 2012 and 2016. The industry unexpectedly added 1,611 jobs in 2017, but we do not believe that this jump portends a new job boom in motor vehicle manufacturing. We see job additions of 301 in 2018, 145 in 2019, and 135 in 2020.
- Employment growth in all other manufacturing industries has averaged 3.4 percent per year from 2012 to 2017, compared with 2.6 percent per year in transportation equipment. We see job growth in the non-auto manufacturing industries slowing from there, to a total of 1,572 jobs over the next three years (1.1 percent per year).
- Machinery and chemicals account for about one-half of these job gains over the forecast period, adding 516 and 260 jobs, respectively. We expect the chemicals industry to set a new employment record in 2018, and to continue growing from there.
- Employment in wholesale trade is forecast to grow 1.2 percent per year over the next three years, cumulating to 1,314 job additions. Motor vehicle and parts merchant wholesalers account for 947 of those job gains.
- Retail trade is a much larger sector than wholesale trade. We are bearish on the growth prospects for retail in light of the many job cuts and store closings that have been announced recently both nationally and in Michigan. Online competition, technological advances, and the growth of big-box retailers that are less labor-intensive than smaller stores all weigh on employment growth in retail trade. We see growth averaging just 0.6 percent per year over the forecast period, for a total of 1,452 new jobs.
- Transportation and warehousing grow at a relatively strong average rate of 2.6 percent per year from 2017 to 2020, producing a total of 948 new jobs. Strong growth in construction supports growth in these industries.
- The information sector adds a total of 556 jobs over the next three years, a modest pace of 1.2 percent per year. Newspaper and book publishers lose 189 jobs between 2017 and 2020, reflecting a long-term decline that has claimed more than half of the industry's jobs since its peak in 2003. In contrast, software publishing adds 266 jobs (3.5 percent per year).

- The finance and insurance industry was slow to recover in Oakland County after the Great Recession, losing 771 jobs from 2010 to 2014. Employment in the industry then grew at a robust pace of 1,124 jobs (3.3 percent) per year between 2014 and 2017. Growth continues over the forecast period, but slows to an average pace of 539 jobs per year, for a total of 1,617 jobs over the next three years. We expect commercial banking to expand by 307 total jobs, an average rate of 1.5 percent per year. More rapid growth over the next three years is expected in non-depository credit intermediation (2.4 percent per year), activities related to credit intermediation (3.6 percent per year) and insurance agencies and brokerages (2.4 percent per year).
- The real estate and rental and leasing industry grows by a total of 1,504 jobs over the next three years, for an average growth rate of 2.9 percent per year, as the residential real estate market continues to improve. Most real estate agents are self-employed, and thus are not included in the payroll employment statistics presented here.
- From 2009 to 2017, employment in the professional and business services super-sector grew by 47,710 jobs, an average rate of 3.8 percent per year. This aggregate category contains three divisions: professional, scientific, and technical services; management of companies and enterprises; and administrative support and waste management. Many of the jobs associated with the knowledge economy are in this sector, which in Oakland County is closely identified with the motor vehicle industry. We see this sector growing at an average rate of 2.5 percent per year over the next three years, cumulating to a total of 14,283 job additions.
- The professional, scientific, and technical services division supplies most of that job growth: 9,110 jobs from 2017 to 2020, or 2.9 percent per year. Engineering services add 1,500 jobs in those years, while testing laboratories contribute another 2,244 jobs, and specialized design services add 855 jobs. Other industries in this division that deliver strong performances over the forecast period are computer systems design and related services, which grows by 1,580 jobs, and management and technical consulting services, which adds 695 new jobs.
- Management of companies is another core part of the white-collar auto industry in Oakland County. This division grows by 986 jobs from 2017 to 2020.
- Administrative support and waste management services add 4,187 jobs over the next three years, an average rate of 2.1 percent per year. Business support services gains 520 jobs (2.0 percent per year), and office administrative services adds 439 jobs (3.9 percent per year). The greatest job gains are in employment services, including temporary help, which grows by 2,199 jobs over the forecast period, an average rate of 2.3 percent per year.
- Employment growth in private education services has been moderate since 2009, averaging 0.8 percent per year through 2017. We foresee it accelerating slightly, to 1.0 percent per year from 2017 to 2020. That growth translates into 344 new jobs over the forecast period.
- Health care and social assistance adds 7,207 jobs over the next three years, an average growth rate of 2.3 percent per year. That pace is faster than the sector's average annual growth rate of 1.4 percent since 2009. The aging of the baby boomers will increase demand for health care workers. We forecast hospitals to add 2,207 jobs, ambulatory health care services to add 2,073 jobs, and social assistance to add 1,783 jobs.
- The leisure and hospitality services industry has been on a tear lately, growing at an average rate of 4.2 percent per year from 2011 to 2017. We expect the good times to moderate but continue going forward, with average growth of 2.2 percent per year from 2017 to 2020. That growth path would yield a total of 4,911 new jobs by 2020. Full-service restaurants account for about 40 percent of those job gains (1,987), reflecting in part the increasing affluence of the county's population.
- The "other services" sector covers a wide variety of industries: repair services (including auto repair), personal services (such as hair salons and dry cleaners), membership organizations, and private household services. These industries grow by a total of 599 jobs over the forecast period.

Figure 9

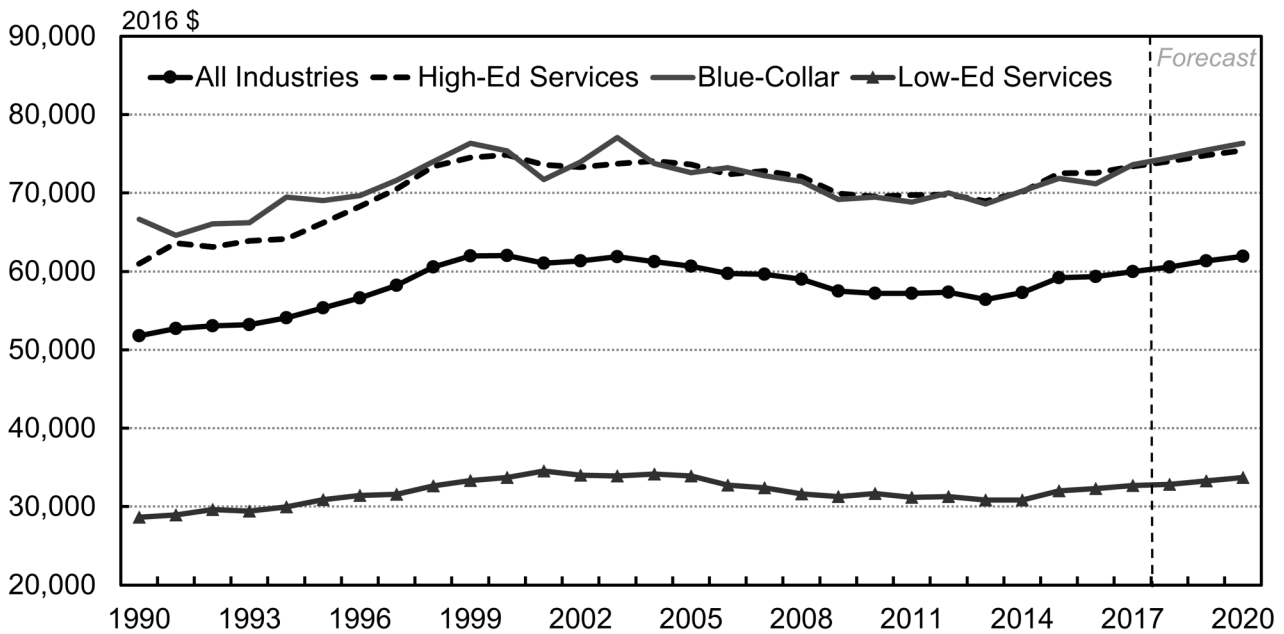
Unemployment Rates for Oakland County and for the United States, 1990–2020



- Despite the already low level of unemployment in Oakland County, the sustained job growth in our forecast leads to continued declines in the county’s unemployment rate from 2017 to 2020. The rate falls from 3.5 percent in 2017 to 3.4 percent in 2018, 2.9 percent in 2019, and 2.6 percent in 2020.
- The 2.6 percent unemployment rate we are forecasting for 2020 would equal the lowest rate on record for the county, reached in the year 2000.
- The county’s labor force has grown every year since 2011, averaging a 0.9 percent pace per year from 2011 to 2015. Growth then picked up sharply to 2.3 percent in 2016 and 1.5 percent in 2017, as improving job opportunities encouraged more people to reenter the labor force. We are projecting that labor force growth will slow to a more sustainable, but still healthy, average rate of 1.3 percent per year from 2017 to 2020, as the tight labor market encourages previously discouraged workers to seek out jobs.
- A major risk to the pace of future job growth is that our projection of the rate of labor force expansion may prove challenging due to retirements of aging baby boomers. Because the unemployment rate is already so low in Oakland County, the job growth we anticipate is only possible if it is accompanied by growth in the labor force.
- Oakland’s unemployment rate ran nine-tenths of a percentage point below the U.S. rate in 2017 (3.5 percent vs. 4.4 percent).
- We are forecasting that the gap will narrow a bit over the next two years, before returning to nine-tenths of a percentage point in 2020. By then, the unemployment rate will be at or near historical lows in both Oakland and the United States.

Figure 10

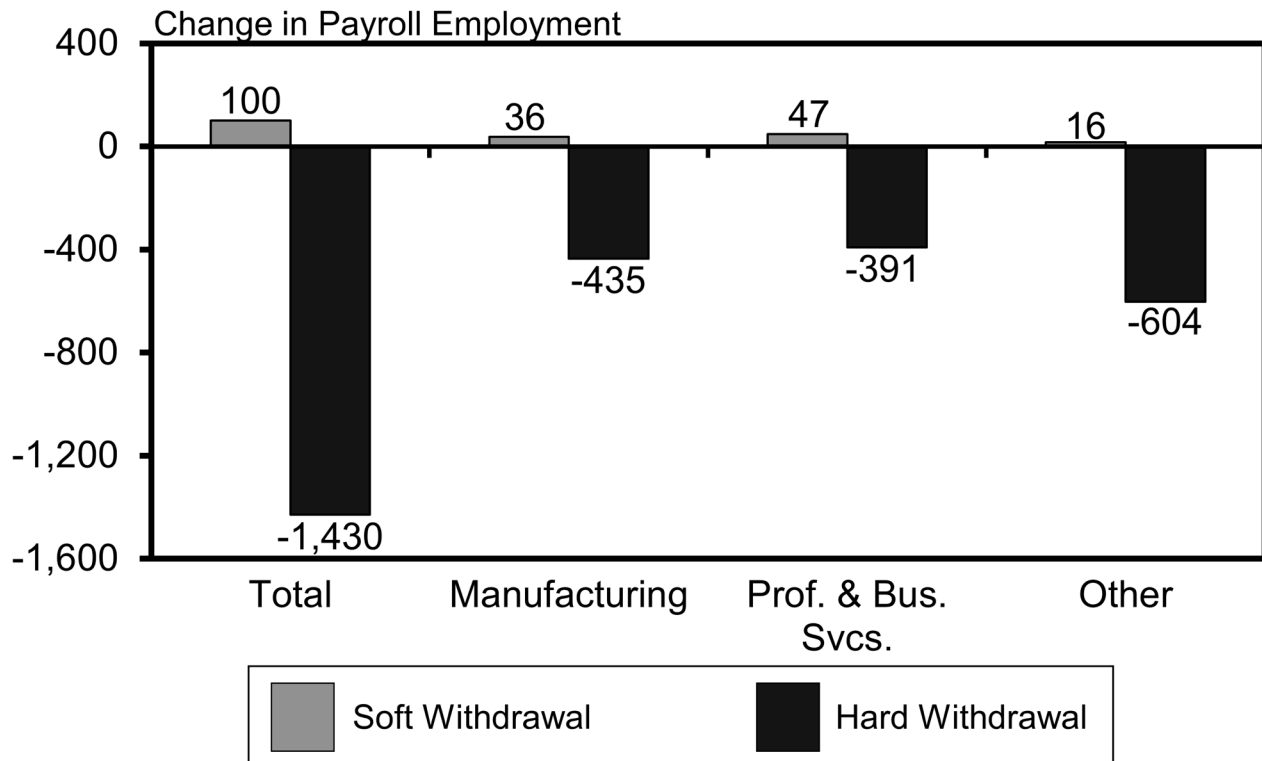
Average Real Wage in Oakland County by Selected Industry Group, 1990–2020



- Here we present the average real wage in Oakland County for the years 1990–2020, adjusted for inflation and expressed in 2016 dollars. We display the average real wage across all industries as well as for three broad industry categories: (1) traditional blue-collar industries such as manufacturing, construction, mining, and transportation; (2) service-providing industries that tend to employ workers with higher educational attainment, such as government, health services, professional services and corporate headquarters, wholesale trade, financial activities, and information; and (3) lower-educational-attainment service-providing industries such as retail trade, leisure and hospitality, business services such as temporary help, and repair and personal services.
- The average inflation-adjusted wage across all sectors in Oakland rose from \$51,782 in 1990 to \$62,043 in 2000, an increase of 19.8 percent. Wage gains were weakest in the blue-collar industries, at 13.1 percent. The lower-education service industries saw wage gains of 17.6 percent, while the higher-education service industries saw the strongest wage gains of 22.7 percent.
- Average real wages then entered a long period, from 2000 to 2013, in which they trended downwards, hitting a low point of \$56,416 in 2013. That level was 9.1 percent lower than in 2000. Average real wages in blue-collar industries declined slightly more than wages in the other industry groupings.
- From 2013 to 2017, real wages increased by an average of 1.5 percent per year, buoyed by low consumer price inflation. The total increase in that time came to a brisk 6.3 percent, bringing average real wages to \$59,968 in 2017.
- Price inflation of 2.3 percent in 2018 converts a nominal wage increase of 3.3 percent into a real wage gain of 1.0 percent. Real wage growth accelerates to 1.2 percent in 2019 with the slowdown in inflation to 1.9 percent, before settling in at 1.0 percent in 2020 as inflation edges up.
- Real wage gains average 1.1 percent per year from 2017 to 2020 in our forecast. That may not sound like much, but between 1969 and 2000 real wages only increased at an average annual rate of 0.4 percent per year. Real wage growth of one percent or more per year has been the exception, not the rule, over the past 50 years.
- Real wage gains are distributed fairly evenly across the industry groupings over the forecast period. The smallest increases accrue to the higher-education service industries, an average of 0.9 percent per year. Real wages in lower-education service industries are forecast to grow 1.0 percent per year, while blue-collar industries enjoy the fastest average real wage gains, of 1.2 percent per year.

Figure 11

Simulating the Effects of a Potential NAFTA Withdrawal, 2020



- Our baseline forecast of Oakland County’s economy assumes that the North American Free Trade Agreement (NAFTA) will be renegotiated successfully with minor changes. Nonetheless, the possibility of a more acrimonious outcome has prompted us to analyze the potential effects of a NAFTA withdrawal. We have modeled two scenarios, which we believe span the range of likely outcomes from any withdrawal.
- The first scenario considers a “soft withdrawal,” in which tariffs between Mexico and the United States go to their standard levels under Most Favored Nation (MFN) status under World Trade Organization (WTO) rules, and neither nation engages in retaliatory behavior.
- The second scenario considers a “hard withdrawal,” in which Mexico and the United States enact retaliatory tariffs on each other’s goods. In both scenarios, we would expect minimal disruptions to trade relations between the United States and Canada in light of the Canada-United States Free Trade Agreement, which predated NAFTA.
- Our assumptions in the “soft withdrawal” scenario are as follows:
 - Tariffs on Mexican imports would go to their MFN levels under WTO rules. The tariff on light trucks is a notable exception at 25 percent.
 - We would anticipate roughly 520,000 light truck assemblies per year to leave Mexico, with approximately 450,000 coming to the United States. We would not expect a substantial shift in the production of automobiles away from Mexico.
 - We would expect Mexican tariffs on imports from the United States to average 7.4 percent.
 - We project that the Mexican peso would depreciate by roughly 4 percent and that Mexican real GDP growth would be roughly half a percentage point lower in 2018.
 - The share of U.S. light vehicle sales with Detroit Three nameplates produced in North America would be 0.6 percentage points lower.

- Our assumptions in the “hard withdrawal” scenario differ in a few key ways:
 - We assume that the United States and Mexico would place 25 percent tariffs on imports of each other’s automobiles and parts.
 - We assume that Mexico would impose a tariff of 15 percent on all other U.S. exports.
 - We would expect the imposition of a 25 percent tariff to spark a shift of between 900,000 and 1,000,000 automobile assemblies away from Mexico, primarily to China and elsewhere in Asia. We would not expect any of that production to be moved to the United States.
 - We estimate that the assembly of approximately 600,000 light trucks per year would move from Mexico to the United States.
 - We project that the Mexican peso would depreciate by roughly 10 percent following NAFTA withdrawal.
 - We estimate that Mexican real GDP growth would be roughly one percentage point lower in 2018. Overall, U.S. import prices would rise by roughly half a percentage point over the forecast horizon.
 - The share of U.S. light vehicle sales with Detroit Three nameplates that are produced in North America would fall by 1.8 percentage points relative to our baseline forecast, as small car assemblies left Mexico.
- Figure 11 displays the simulated impacts of the two withdrawal scenarios on Oakland County’s economy in 2020. Our analysis is intended to reflect the “long-run” impact of a potential NAFTA withdrawal; it is possible that short-run disruptions would lead to larger impacts than we have estimated.
- We estimate that Oakland County would gain 100 jobs in the soft withdrawal scenario, with about half of those coming in the professional and business services sector and a third in the manufacturing sector. Average real wages in the county are approximately unchanged in this scenario. Oakland’s economy benefits in this scenario from the tariff protection applied to light trucks and the lack of retaliation from Mexico and Canada, which offsets the loss in general economic efficiency from the new trade barriers.
- We estimate that the county would lose 1,430 jobs in the hard withdrawal scenario, with 435 of those coming from the manufacturing sector. Another 391 job losses would come from the professional and business services sector, which includes the white-collar engineering sector. The loss of small car assemblies in Mexico would hurt suppliers of automotive content located in Oakland County. We estimate that the average real wage in Oakland County would decline by 0.2 percent in a hard NAFTA withdrawal.
- While the loss of 1,430 jobs would certainly be substantial, it is important to place that number in perspective. From its peak in 2000 to its trough in 2010, the manufacturing sector in Oakland County lost 58,775 jobs, more than half of the peak level. In that context, our analysis suggests that Oakland County’s economy is likely to be more resilient to a negative shock from international trade than it has been in the past. That being said, we would prefer not to find out whether our analysis is correct.

Forecast of Jobs in Oakland County by Detailed Industry Division

	Estimate	Forecast			Average Annual Wage
	2017	2018	2019	2020	2016
TOTAL PAYROLL JOBS (Number of persons)	730,233	742,446	756,490	772,259	59,324
(Annual percentage change)	1.2	1.7	1.9	2.1	N.A.
TOTAL GOVERNMENT	45,177	45,677	46,079	47,081	52,943
Federal government	4,789	4,824	4,866	5,253	70,162
Postal service	3,854	3,904	3,954	4,009	65,061
Federal government NEC	935	920	911	1,244	89,785
State and local government	40,388	40,853	41,214	41,828	50,934
Local libraries	560	576	593	613	20,961
Local education and health services	22,359	22,603	22,771	23,137	52,024
Elementary and secondary schools	20,530	20,859	21,032	21,399	53,145
Other education and health services	1,828	1,744	1,739	1,738	40,380
Local public administration	12,842	12,980	13,101	13,266	48,626
State and other local government	4,627	4,694	4,749	4,812	55,711
TOTAL PRIVATE	685,056	696,770	710,410	725,178	59,747
GOODS-PRODUCING	93,597	95,841	97,399	98,891	74,196
Natural resources and mining	837	822	821	827	33,043
Agriculture, forestry, fishing, and hunting	666	658	655	658	25,831
Mining, quarrying, and oil and gas extraction	172	164	166	169	59,959
Construction	25,725	26,819	27,853	28,875	69,469
Construction of buildings	6,789	6,988	7,157	7,344	71,276
Residential	3,143	3,260	3,400	3,541	60,306
Nonresidential	3,646	3,728	3,758	3,803	81,988
Heavy and civil engineering construction	2,125	2,211	2,323	2,443	77,065
Specialty trade contractors	16,811	17,620	18,373	19,088	67,748
Building foundation and exterior	2,508	2,621	2,731	2,836	61,433
Building equipment	9,573	10,005	10,411	10,791	73,112
Building finishing	2,756	2,909	3,060	3,201	54,966
Other specialty trade contractors	1,975	2,085	2,172	2,260	67,236
Manufacturing	67,034	68,201	68,725	69,189	76,471
Food	1,678	1,709	1,737	1,773	32,378
Textile products	171	175	177	180	27,375
Wood products	158	151	144	140	60,154
Paper products	362	368	368	367	69,835
Printing and related support activities	2,106	2,140	2,165	2,187	62,419
Chemicals	3,559	3,640	3,730	3,819	89,488
Plastics and rubber products	3,880	3,905	3,979	4,035	54,017
Nonmetallic mineral products	1,082	1,077	1,072	1,067	59,149
Primary metals	1,315	1,292	1,253	1,222	92,583
Fabricated metals	11,089	11,284	11,232	11,157	60,554
Forging and stamping	1,093	1,118	1,107	1,097	58,051
Architectural and structural metals	759	775	765	754	51,143
Machine shops and threaded products	3,899	3,939	3,891	3,828	66,517
Coating, engraving, and heat treating metals	2,090	2,179	2,200	2,214	48,717
Other fabricated metals	1,720	1,775	1,799	1,821	65,572
Fabricated metals NEC	1,528	1,499	1,471	1,444	61,333

Forecast of Jobs in Oakland County by Detailed Industry Division (cont'd.)

	Estimate	Forecast			Average Annual Wage
	2017	2018	2019	2020	2016
Machinery	11,205	11,512	11,626	11,721	80,778
Industrial machinery	698	727	717	709	82,604
Commercial and service industry machinery	707	765	800	838	57,903
Metalworking machinery	6,004	6,113	6,181	6,237	77,624
Turbine and power transmission equipment	472	472	461	450	79,735
Other general purpose machinery	3,017	3,135	3,172	3,198	93,959
Machinery NEC	306	300	295	289	61,766
Computer and electronic products	2,941	2,993	2,998	3,000	73,638
Electrical equipment, appliances, components	1,231	1,263	1,275	1,285	71,642
Transportation equipment	21,921	22,222	22,368	22,503	95,864
Motor vehicle bodies and trailers	755	780	802	832	95,264
Aerospace products and parts	1,057	1,053	1,051	1,048	88,257
Transportation equipment NEC	20,109	20,389	20,514	20,623	96,349
Furniture and related products	529	538	539	538	52,528
Miscellaneous manufacturing	2,961	3,065	3,166	3,267	57,021
Medical equipment and supplies	587	591	592	592	54,484
Other miscellaneous manufacturing	2,374	2,474	2,574	2,674	57,695
Manufacturing NEC	848	867	896	930	51,537
PRIVATE SERVICE-PROVIDING	591,459	600,928	613,011	626,287	57,543
Trade, transportation, and utilities	129,553	130,373	131,697	133,359	52,929
Wholesale trade	36,639	36,971	37,421	37,954	93,551
Merchant wholesalers, durable goods	24,678	24,955	25,323	25,761	94,029
Motor vehicles and parts	6,358	6,655	6,969	7,305	93,930
Commercial equipment	4,515	4,348	4,251	4,168	112,161
Electric goods	4,198	4,181	4,192	4,208	103,924
Machinery and supply	5,423	5,548	5,648	5,769	86,319
Merchant wholesalers, durable goods NEC	4,185	4,223	4,263	4,311	72,739
Merchant wholesalers, nondurable goods	7,033	7,108	7,197	7,297	76,211
Wholesale electronic markets, agents, brokers	4,927	4,908	4,901	4,895	115,610
Retail trade	79,708	79,925	80,424	81,160	33,662
Motor vehicle and parts dealers	11,258	11,398	11,584	11,789	62,443
Furniture and home furnishings stores	2,695	2,711	2,730	2,757	37,892
Electronics and appliance stores	4,277	4,233	4,218	4,214	51,156
Building material and garden supply dealers	6,748	6,717	6,739	6,779	39,041
Food and beverage stores	13,454	13,536	13,630	13,759	22,891
Health and personal care stores	6,872	7,112	7,287	7,472	36,863
Gasoline stations	2,159	2,180	2,192	2,209	20,003
Clothing and clothing accessories stores	7,733	7,645	7,696	7,791	19,767
Sporting goods, hobby, book, and music stores	3,725	3,673	3,668	3,685	23,895
General merchandise stores	14,803	14,539	14,377	14,284	24,165
Miscellaneous store retailers	4,846	5,029	5,148	5,260	26,921
Nonstore retailers	1,139	1,152	1,155	1,161	60,394
Transportation and warehousing	11,694	11,930	12,276	12,642	48,203
Truck transportation	3,668	3,745	3,866	3,988	58,884
Couriers and messengers	2,098	2,126	2,136	2,154	44,315
Warehousing and storage	1,484	1,515	1,525	1,537	61,635
Transportation and warehousing NEC	4,444	4,543	4,750	4,964	36,708
Utilities	1,512	1,547	1,575	1,603	135,737

Forecast of Jobs in Oakland County by Detailed Industry Division (cont'd.)

	Estimate	Forecast			Average Annual Wage
	2017	2018	2019	2020	2016
Information	15,007	15,128	15,326	15,564	78,065
Publishing (except Internet)	3,867	3,897	3,922	3,944	94,422
Newspaper, book, and directory publishers	1,441	1,372	1,311	1,252	74,620
Software publishers	2,426	2,525	2,611	2,692	107,124
Motion pictures and sound recording	2,016	2,077	2,102	2,137	35,980
Motion picture and video production	596	656	672	688	66,620
Motion picture and video exhibition	1,276	1,282	1,289	1,304	12,337
Motion pictures and sound recording NEC	144	138	142	145	68,294
Broadcasting (except Internet)	1,435	1,427	1,431	1,441	93,297
Telecommunications	5,012	4,975	5,004	5,049	80,011
Data processing, hosting, and related services	1,699	1,731	1,786	1,843	73,837
Information NEC	980	1,022	1,080	1,151	84,018
Financial activities	53,571	54,401	55,478	56,693	83,299
Finance and insurance	36,842	37,241	37,811	38,459	97,738
Credit intermediation and related activities	16,034	16,234	16,511	16,782	96,900
Depository credit intermediation	8,876	8,870	8,953	9,043	91,828
Commercial banking	6,823	6,978	7,052	7,130	91,826
Depository credit intermediation NEC	2,054	1,892	1,901	1,912	91,831
Nondepository credit intermediation	5,789	5,952	6,090	6,215	110,909
Real estate credit intermediation	2,777	2,896	2,989	3,074	82,610
Nondepository credit intermediation NEC	3,012	3,056	3,101	3,141	133,591
Activities related to credit intermediation	1,369	1,412	1,468	1,524	76,165
Securities, commodity contracts, investments	4,402	4,443	4,477	4,526	149,253
Insurance carriers and related activities	16,250	16,413	16,672	17,001	84,558
Insurance carriers	8,412	8,433	8,538	8,691	90,024
Direct property and casualty insurers	2,471	2,488	2,500	2,515	93,055
Insurance carriers NEC	5,941	5,945	6,037	6,176	88,795
Insurance agencies, brokerages, and related	7,838	7,980	8,134	8,310	78,453
Insurance agencies and brokerages	5,494	5,619	5,759	5,914	80,930
Other insurance-related activities	2,344	2,361	2,375	2,396	72,615
Finance and insurance NEC	155	152	151	150	90,130
Real estate and rental and leasing	16,730	17,160	17,667	18,234	50,976
Real estate	13,170	13,633	14,070	14,550	50,938
Lessors of real estate	5,524	5,561	5,631	5,706	46,870
Offices of real estate agents and brokers	1,628	1,660	1,699	1,747	52,602
Activities related to real estate	6,018	6,412	6,740	7,097	54,421
Rental and leasing services	3,318	3,342	3,387	3,447	46,877
Lessors of nonfinancial intangible assets	242	185	210	237	95,960
Professional and business services	184,008	188,127	193,272	198,291	72,536
Professional and technical services	102,512	105,368	108,437	111,623	82,964
Legal services	12,427	12,631	12,848	13,075	88,634
Accounting and bookkeeping services	6,638	6,714	6,753	6,836	67,803
Architectural and engineering services	37,501	38,739	40,054	41,408	82,248
Architectural services	1,396	1,437	1,483	1,530	84,926
Engineering services	20,250	20,730	21,258	21,750	82,240
Testing laboratories	15,400	16,115	16,842	17,644	82,450
Engineering services NEC	455	457	470	483	68,604

Forecast of Jobs in Oakland County by Detailed Industry Division (cont'd.)

	Estimate	Forecast			Average Annual Wage
	2017	2018	2019	2020	2016
Specialized design services	2,634	2,906	3,175	3,489	105,543
Computer systems design and related services	22,671	23,079	23,685	24,251	89,577
Management and technical consulting services	8,691	8,906	9,146	9,387	74,907
Scientific research and development services	1,262	1,283	1,317	1,344	121,422
Advertising, PR, and related services	4,586	4,594	4,619	4,634	86,149
Other professional and technical services	6,101	6,517	6,840	7,199	56,905
Management of companies and enterprises	15,677	16,277	16,641	16,663	130,818
Administrative support and waste management	65,819	66,482	68,193	70,005	41,565
Administrative and support services	64,414	65,082	66,788	68,590	41,177
Office administrative services	4,099	4,198	4,351	4,538	53,778
Employment services	29,438	29,829	30,708	31,557	47,879
Business support services	8,296	8,452	8,639	8,815	41,070
Investigation and security services	5,419	5,409	5,458	5,515	29,128
Services to buildings and dwellings	13,219	13,152	13,372	13,644	27,259
Other support services	2,726	2,885	3,079	3,314	46,699
Administrative and support services NEC	1,218	1,158	1,180	1,207	44,034
Waste management and remediation services	1,405	1,400	1,405	1,416	58,903
Private education and health services	113,578	115,616	118,155	121,129	49,662
Education services	11,273	11,267	11,423	11,617	44,837
Elementary and secondary schools	3,774	3,725	3,684	3,654	41,443
Colleges and universities	2,163	2,126	2,115	2,117	39,816
Education services NEC	5,336	5,417	5,624	5,846	49,526
Health care and social assistance	102,305	104,348	106,731	109,512	50,199
Ambulatory health care	40,902	41,365	42,095	42,975	57,386
Offices of physicians	14,425	14,505	14,672	14,869	82,361
Offices of dentists	6,489	6,541	6,638	6,772	51,693
Offices of other health practitioners	5,819	5,984	6,315	6,709	44,148
Outpatient care centers	2,509	2,548	2,631	2,726	50,835
Medical and diagnostic laboratories	1,667	1,697	1,734	1,772	44,004
Home health care services	8,353	8,393	8,383	8,380	36,687
Other ambulatory health care services	1,640	1,696	1,722	1,747	42,304
Hospitals	33,872	34,602	35,299	36,079	60,191
Nursing and residential care facilities	15,802	16,191	16,605	17,094	28,671
Nursing care facilities	4,754	4,847	4,964	5,121	35,420
Residential mental health facilities	2,604	2,578	2,593	2,628	27,196
Community care facilities for the elderly	6,506	6,688	6,849	7,015	25,652
Other residential care facilities	1,938	2,079	2,199	2,330	23,654
Social assistance	11,729	12,190	12,733	13,365	23,561
Individual and family services	6,258	6,600	7,033	7,572	23,158
Child day care services	4,134	4,211	4,279	4,328	21,876
Social assistance NEC	1,338	1,380	1,420	1,465	30,839

Forecast of Jobs in Oakland County by Detailed Industry Division (cont'd.)

	Estimate	Forecast			Average Annual Wage
	2017	2018	2019	2020	2016
Leisure and hospitality	71,744	73,259	74,840	76,656	20,962
Arts, entertainment, and recreation	10,952	11,014	11,219	11,508	35,590
Golf courses and country clubs	2,430	2,438	2,472	2,531	26,859
Fitness and recreational sports centers	4,348	4,463	4,611	4,780	18,306
Arts, entertainment, and recreation NEC	4,174	4,114	4,136	4,197	59,854
Accommodation and food services	60,792	62,244	63,621	65,148	18,324
Accommodation	4,957	5,283	5,541	5,863	24,409
Food services and drinking places	55,835	56,962	58,079	59,284	17,814
Restaurants and other eating places	49,260	50,287	51,353	52,493	17,607
Full-service restaurants	26,035	26,580	27,299	28,022	19,675
Limited-service restaurants	19,743	20,171	20,396	20,649	14,617
Cafeterias, grill buffets, and buffets	714	673	663	664	21,168
Snack and nonalcoholic beverage bars	2,767	2,864	2,995	3,158	16,589
Special food services	4,366	4,379	4,412	4,449	20,180
Drinking places, alcoholic beverages	2,209	2,295	2,314	2,343	17,582
Other services	22,612	22,641	22,861	23,211	34,858
Repair and maintenance	5,833	5,790	5,790	5,829	44,855
Automotive repair and maintenance	4,006	3,943	3,944	3,976	43,027
Repair and maintenance NEC	1,828	1,846	1,847	1,853	49,038
Personal and laundry services	10,171	10,190	10,322	10,512	25,333
Personal care services	5,354	5,437	5,572	5,735	22,616
Personal and laundry services NEC	4,817	4,753	4,750	4,777	28,554
Membership associations and organizations	5,464	5,519	5,601	5,714	43,164
Private households	1,144	1,141	1,147	1,156	24,967
Private unclassified service-providing	1,384	1,384	1,384	1,384	48,502
<u>Addendum</u>					
Unemployment rate	3.5	3.4	2.9	2.6	N.A.

Oakland County Compared with 37 U.S. Counties of Similar Size Indicator Values*

County	State	Population 2017	Associate's Degree or More	Child Poverty	Median Family Income**	High- Income Persons Aged 65 or Older	Managerial, Professional
Fairfax	VA	1,148,433	67.7%	7.1%	110,882	61.2%	57.0%
Montgomery	MD	1,058,810	64.8%	8.2%	100,240	58.0%	56.2%
Collin	TX	969,603	61.3%	7.2%	102,085	41.0%	52.7%
Nassau	NY	1,369,514	57.2%	7.6%	98,686	48.6%	44.9%
Bergen	NJ	948,406	59.9%	7.7%	90,964	43.4%	48.8%
Wake	NC	1,072,203	64.4%	11.7%	97,672	39.7%	51.7%
DuPage	IL	930,128	58.8%	9.6%	97,522	40.9%	44.9%
Westchester	NY	980,244	57.1%	10.6%	91,662	47.1%	46.3%
Oakland	MI	1,250,836	57.7%	10.6%	96,181	37.3%	49.4%
Fairfield	CT	949,921	55.5%	9.9%	93,214	46.8%	44.3%
Hennepin	MN	1,252,024	60.3%	14.2%	94,566	34.4%	48.5%
Contra Costa	CA	1,147,439	50.3%	10.2%	85,376	47.2%	43.6%
Travis	TX	1,226,698	53.2%	16.5%	91,930	41.9%	48.0%
Fulton	GA	1,041,423	59.0%	24.3%	89,067	35.9%	50.3%
St. Louis	MO	996,726	54.6%	12.3%	89,284	35.6%	43.4%
Suffolk	NY	1,492,953	46.7%	10.1%	84,398	45.6%	38.4%
Allegheny	PA	1,223,048	56.7%	14.9%	82,327	25.3%	45.4%
Mecklenburg	NC	1,076,837	55.4%	18.0%	80,708	33.8%	43.2%
Honolulu	HI	988,650	47.4%	9.6%	74,804	43.6%	35.6%
Salt Lake	UT	1,135,649	43.8%	10.6%	77,767	29.9%	39.7%
Prince George's	MD	912,756	38.7%	12.3%	76,596	42.3%	38.6%
Erie	NY	925,528	49.1%	19.9%	77,691	28.8%	38.3%
Franklin	OH	1,291,981	48.2%	24.4%	73,219	30.1%	42.6%
Gwinnett	GA	920,260	44.8%	16.8%	77,314	31.9%	36.5%
Palm Beach	FL	1,471,150	44.7%	19.1%	65,828	35.5%	35.6%
Sacramento	CA	1,530,615	39.9%	23.8%	68,228	31.9%	38.6%
Cuyahoga	OH	1,248,514	41.4%	26.3%	70,033	25.5%	39.1%
Duval	FL	937,934	40.8%	20.0%	65,504	27.1%	36.9%
Hillsborough	FL	1,408,566	43.6%	20.2%	64,396	24.5%	38.0%
Pinellas	FL	970,637	40.7%	19.7%	64,771	24.7%	37.9%
Orange	FL	1,348,975	46.0%	22.7%	61,424	24.8%	36.5%
Pima	AZ	1,022,769	39.8%	27.2%	61,996	27.9%	36.6%
Shelby	TN	936,961	39.7%	34.5%	66,621	28.1%	36.0%
Milwaukee	WI	952,085	40.8%	28.0%	65,131	22.9%	36.7%
Philadelphia	PA	1,580,863	36.7%	37.3%	48,198	18.3%	38.8%
Marion	IN	950,082	40.6%	28.5%	61,693	21.7%	34.7%
Fresno	CA	989,255	28.5%	37.9%	55,505	26.9%	29.4%
Bronx	NY	1,471,160	27.7%	40.1%	36,143	17.0%	24.9%
<i>State of Michigan</i>			39.7%	20.7%	72,011	25.1%	35.8%
<i>United States</i>			41.7%	19.5%	71,062	28.9%	37.6%

*All counties in the United States with a population between 900,000 and 1,600,000 in 2017.

**Adjusted for cost of living.

Source: American Community Survey 2016. Census Bureau Population Estimates, April 2018. Median Family Income adjusted using BEA price parity indices for 2015 and extended to counties by relative gross rent.