THE ECONOMIC OUTLOOK FOR WASHTENAW COUNTY IN 2018–20

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Introduction: the Current State of Washtenaw County's Economy

Based on data through the third quarter, we are confident that Washtenaw County extended its stretch of payroll employment growth to eight consecutive calendar years in 2017. We currently expect growth of 1.9 percent for the year, right in line with the average growth rate during the current expansion. Such a strong performance so deep into Washtenaw's economic expansion provides encouragement that the county can continue to deliver solid growth even in the mature phase of the business cycle.

Figure 1 displays payroll employment growth in Washtenaw County over the years 1991 to 2017. After losing more than 13,000 jobs total from 2005 to 2009, Washtenaw entered a robust recovery and expansion period that continues today. Based on our estimated total for 2017, Washtenaw added nearly 29,000 jobs from 2009 to 2017, an average of 3,600 jobs per year. Those additions brought Washtenaw's payroll job count to an all-time high of 210,000 last year.

Figure 1
Job Growth in Washtenaw County, 1991–2017

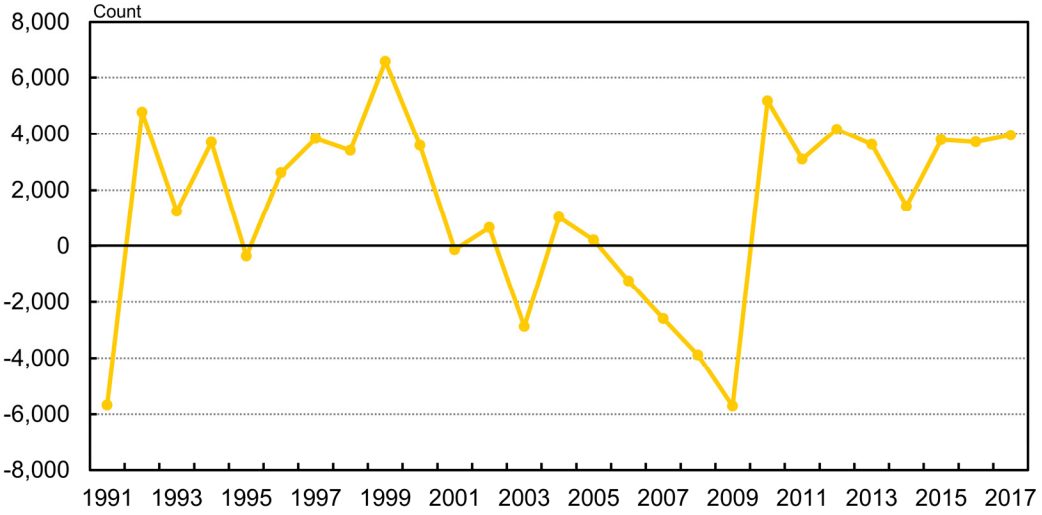
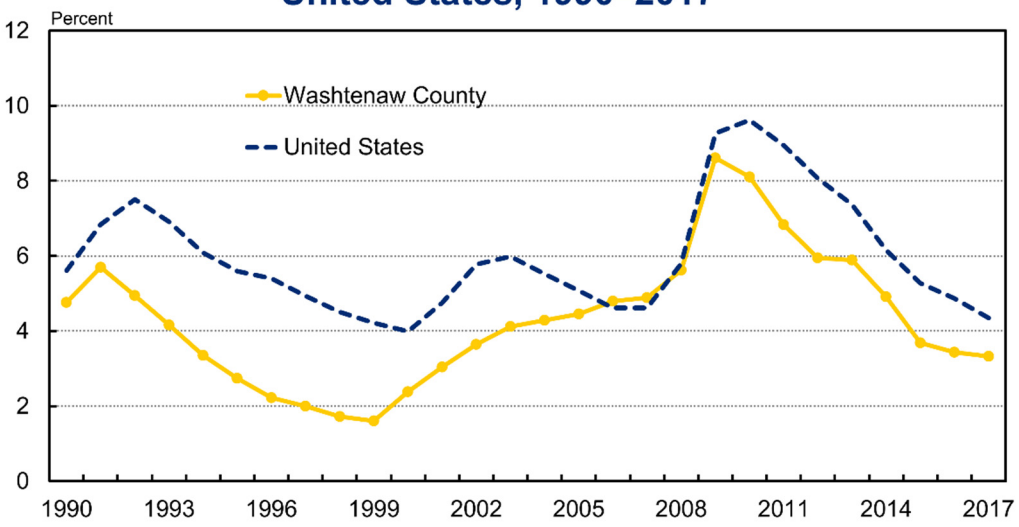


Figure 2 shows that Washtenaw's unemployment rate, which had fallen rapidly earlier in the expansion, ticked down modestly in 2017. The average rate of 3.3 percent for the year was only one-tenth of a percentage point lower than the rate in 2016, although it was less than half the peak rate of 8.6 percent averaged in 2009. Of course, some slowdown in the unemployment rate's decline was to be expected given its already low level, and it is natural to wonder how much further it can fall. The history provided in Figure 2 helps to provide context for this question. Washtenaw County's unemployment rate averaged below 3.0 percent for six straight years from 1995 through 2000, reaching a low of 1.6 percent in 1999. That history suggests that the drop in the county's employment rate still has some room to run despite a reduction in labor market slack.

Figure 2
Unemployment Rates for Washtenaw County and for the United States, 1990–2017



Consistent with that interpretation, the missing piece of the puzzle in Washtenaw's economic success story over the past eight years has been the uneven pace of wage growth. Average real (inflation-adjusted) wages picked up by a brisk 3.2 percent in 2015, leading to hopes that we might finally see a sustained pickup. Real wages have disappointed since then, however,

growing just 0.7 percent in 2016 and 1.0 percent in 2017. We continue to believe that real wage growth should begin to pick up as the local labor market approaches full employment. The solid job growth we saw in 2017 represents tangible and important progress toward that goal.

The central question we will address in this report is whether Washtenaw County can continue its economic growth streak over the next three years. Before considering our outlook for 2018 to 2020, though, we first look back at our forecast from one year ago to assess how well we foresaw the economic developments of the past year.

Review of the Forecast for 2017: A Report Card

A year ago, we presented our thirty-second annual economic outlook for Washtenaw County. We can now compare last year's forecast of employment, unemployment, and inflation for 2017 to the currently estimated outcomes.

In our forecast last March, we expected that Washtenaw would add 3,523 payroll jobs in 2017, for a growth rate of 1.7 percent. We now estimate that the county added 3,953 jobs, for a growth rate of 1.9 percent. Our forecast of job growth was therefore 0.2 percentage points too low, an underestimate of 430 jobs. As shown in Table 1, that miss compares favorably with our average absolute forecast error over the past 32 years of 0.6 percentage points, or six workers per every thousand.

We always examine where among the major industry divisions our forecast error came from to get a better sense of current trends in the economy. It turns out that all of the error, and then some, can be traced to a much stronger performance by state government, which in Washtenaw is dominated by the University of Michigan and Eastern Michigan University. Last year we forecast that employment in state government would grow by 1,462; instead employment increased by 2,188. We actually slightly overestimated job growth in the private sector. We

forecast the private sector would grow by 1,904 jobs, instead of the slightly smaller increase of 1,581 jobs that we actually observed. Within the private sector, our biggest errors were in administrative support services, which declined by 3 jobs instead of our projected gain of 165 jobs; professional and technical services, which added 500 jobs instead of our forecast gain of 635; and retail trade, which lost 2 jobs instead of our forecast gain of 103 jobs. Overall, though, we view the forecast record for employment as being quite favorable, especially in view of how difficult it is to forecast at this level of detail for a small, open economy such as Washtenaw's.

The bottom of Table 1 shows the forecast and actual values for the unemployment rate and the local consumer price inflation rate in 2017. We had forecast an average unemployment rate of 3.2 percent for the year, one-tenth of a percentage point lower than the actual rate of 3.3 percent. The direction of that miss, though small, may seem puzzling in light of our small under-prediction of job growth. Part of the explanation is that the unemployment rate data for 2016 has since been revised upward, from 3.2 percent to 3.5 percent.

We did similarly well in our forecast of the local consumer inflation rate for 2017. We had forecast a rate of 2.2 percent for the year, one-tenth of a percentage point higher than the realized rate of 2.1 percent. The local inflation rate of 2.1 percent in 2017 represents a significant pickup from the rate of negative 1.4 percent in 2015 and the rate of 1.6 percent in 2016. It reflects a smaller pickup in national inflation over the same period along with a tighter local labor market.

Table 1
Report Card: Track Record over the Years

Year of forecast	Percentage forecast error for total jobs[1]	Year of forecast	Percentage forecast error for total jobs[1]
1986	-1.4	2002	+0.3
1987	-0.8	2003	+1.0
1988	-1.2	2004	+0.2
1989	-0.6	2005	+0.4[2]
1990	+0.8	2006	+0.7
1991	+1.4	2007	0
1992	+0.5	2008	+0.6
1993	+1.3	2009	+1.0
1994	n.a.	2010	-2.3
1995	+0.2	2011	-0.6
1996	+0.3	2012	-0.4
1997	+0.4	2013	0
1998	-0.5	2014	+1.1
1999	0	2015	+0.2
2000	0	2016	-0.4
2001	+0.3	2017	-0.2

[1] Positive numbers indicate that the forecast was too high; negative, too low.
[2] Estimate.

Average absolute forecast error 1986–2017: 0.6%

	Forecast 2017	Actual 2017
Unemployment rate	3.2%	3.3%
Consumer inflation rate	2.2%	2.1%

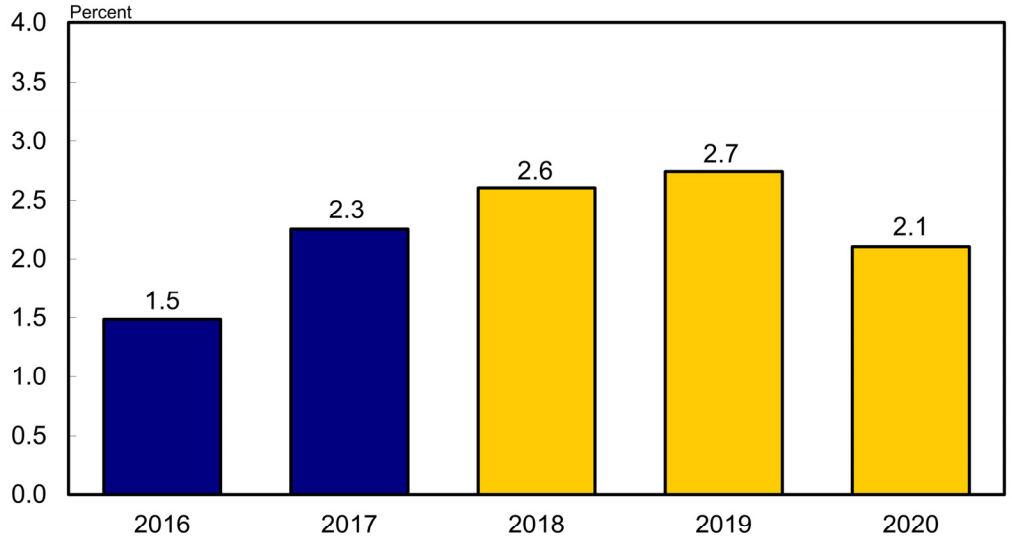
Overall, the trends we saw in place a year ago have carried on in Washtenaw County. They show a local economy that continues to exhibit solid growth and a labor market that continues to heal from the Great Recession. Before we examine whether those same trends will hold over the

next few years, we turn to our forecast for the national economy, which frames the backdrop for our outlook for Washtenaw.

National Outlook: 2018–20

The best single measure of the U.S. economy is inflation-adjusted, or real, Gross Domestic Product (GDP), which comprises all of the goods, services, and structures produced in the economy. Figure 3 shows that 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 of GDP, registering a healthy 4.4 percent annualized growth rate in the fourth quarter.

Figure 3
Growth in Real U.S. GDP, 2016–2020



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 (TCJA) 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 (BBA) 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 a one-tenth of a percentage point effect 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, 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 do not have a macroeconomically significant effect on our forecast on their own, an escalating cycle of retaliatory tariffs between the United States and its trading partners certainly would.[1] The same can be said of a possible withdrawal from the North American Free Trade Agreement (NAFTA): the effects of a relatively cordial withdrawal on the national economy are likely to be minor, but if a retaliatory cycle of tariffs and regulatory barriers to trade ensues, the effects would be substantially worse.

Figure 4 shows annual historical and projected U.S. light vehicle sales from 1990 through the conclusion of our forecast in 2020. After climbing back impressively from the Great Recession to set new all-time sales records of 17.4 million units in 2015 and 17.5 million units in 2016, the industry downshifted a bit last year to a sales 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-

[1] As of the writing of this report, we did not have enough information regarding the proposed tariffs on Chinese goods to quantify their likely impact.

to three-year-old vehicles in the pre-owned market putting some downward pressure on new vehicle sales over the forecast period.

Figure 4
U.S. Light Vehicle Sales, 1990 – 2020

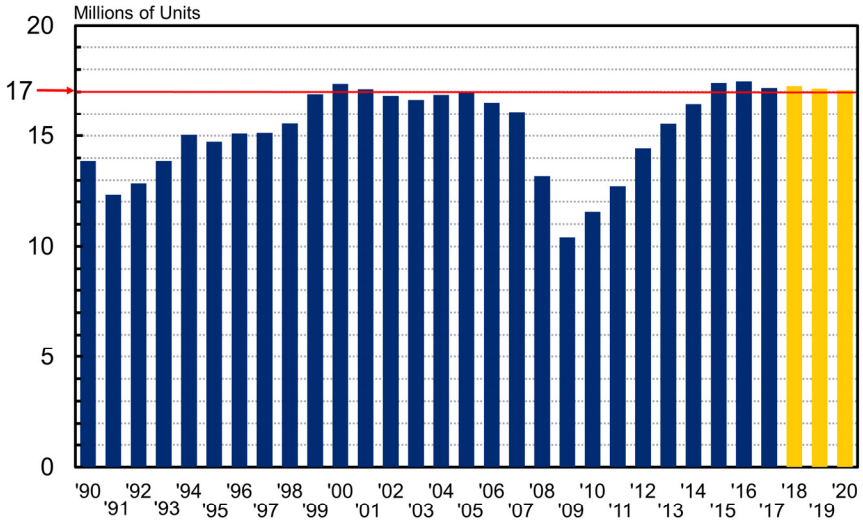
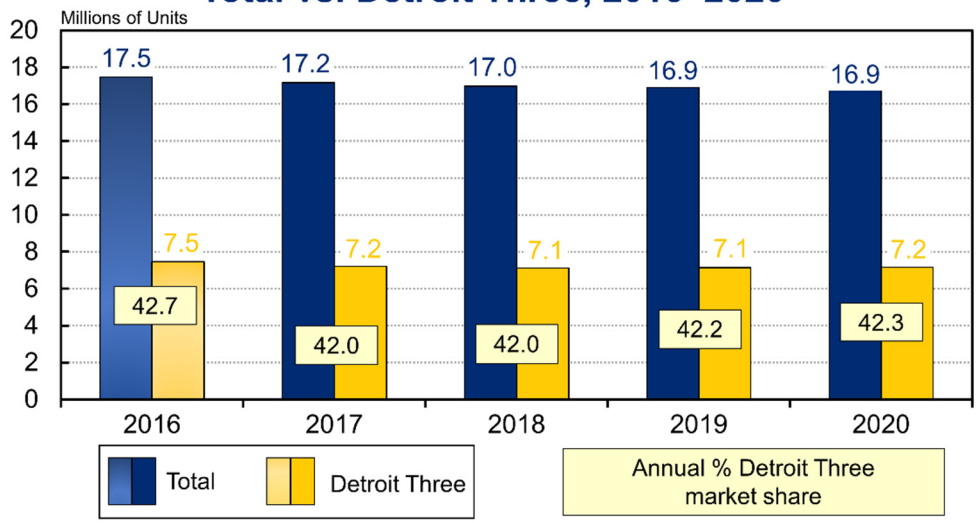


Figure 5 displays a short-term perspective on light vehicle sales, along with the prospects for the Detroit Three share of the light vehicle market. The Detroit Three's share of the light vehicle market fell from 42.7 percent in 2016 to 42.0 percent in 2017, as total Detroit Three sales fell by roughly 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.

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 flattening out of 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 5
U.S. Light Vehicle Sales
Total vs. Detroit Three, 2016–2020



We now turn to our view of the prospects for the county economy through 2020.

Washtenaw County Outlook: 2018–20

The economic outlook for Washtenaw County through 2020 is measured using information on employment, unemployment, inflation, and the real wage. First, we evaluate the county's prospects for job growth in total, putting that in context with recent job market developments.

Employment

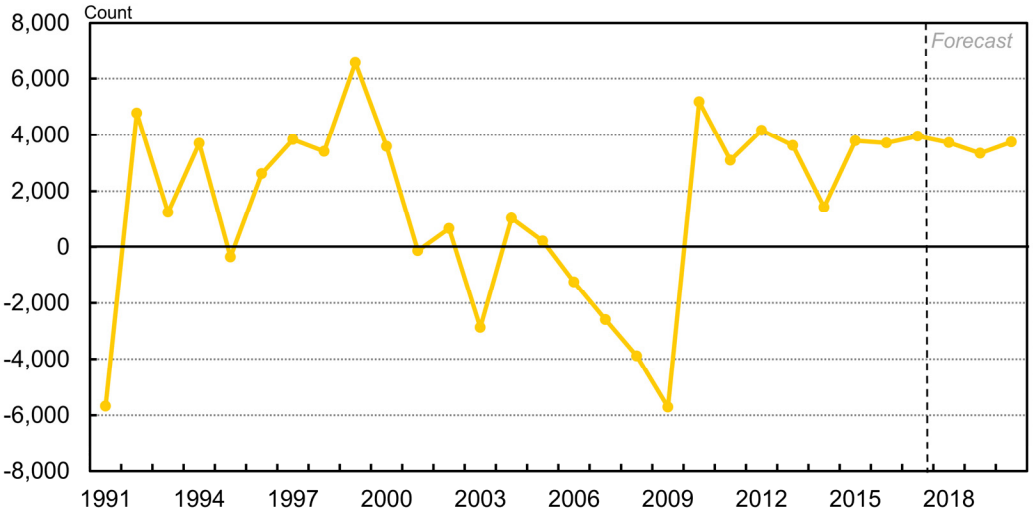
The Washtenaw County economy is now well into its ninth year of recovery since the previous recession's low point in the summer of 2009. The recovery to date has been brisk, with 28,945 job additions from calendar year 2009 to 2017, a growth rate of 1.9 percent per year. Over that same period, the county's job growth outpaced both the nation's average rate of 1.4 percent per year and Michigan's 1.5 percent per year.

The county economy added another 3,953 jobs in 2017, for an increase of 1.9 percent, matching the average growth rate over the entire post-recession period. We see the local and

national economic fundamentals in place to support the extension of solid growth in the county through 2020, bringing the span of the expansion to eleven years. That would be the longest sustained employment expansion in the county's history since at least 1969, when annual employment data was first collected at the county level.

As the labor market approaches full employment, we see job growth slowing a bit from its previous pace to an average of 1.7 percent per year over the next three years. Figure 6 shows that we are forecasting that the county will add a total of 10,806 jobs over the next three calendar years. Job growth slips from 3,953 in 2017 to 3,721 in 2018 and to 3,344 in 2019, before rebounding to 3,740 in 2020.

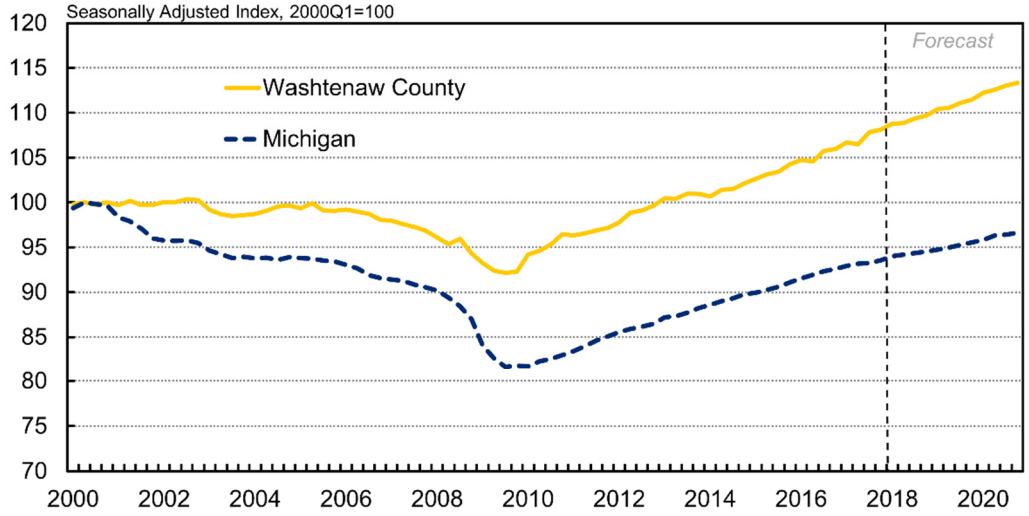
Figure 6
Job Growth in Washtenaw County, 1991–2020



To provide additional context for the current recovery and our forecast, Figure 7 shows the historical and forecast quarterly path of total jobs from the start of 2000 to the end of 2020. For comparison purposes, we include the same profile for Michigan with both the county and state

employment paths indexed to equal 100 in the second quarter of 2000, which represents Michigan's previous peak employment level.[2]

Figure 7
Total Jobs in Washtenaw County, 2000Q1–2020Q4



From its peak employment quarter in the spring of 2001 (index value of 100) to its trough in the summer of 2009, the county lost 15,705 jobs, with 64 percent of the losses occurring in the two-year period summer 2007 to summer 2009. Washtenaw recovered to its previous peak employment level in the first quarter of 2013; it added 30,714 jobs from the employment trough in summer 2009 to the end of the currently published data in the third quarter of 2017. From then to the end of 2020, we are forecasting that the county will create an additional 10,791 jobs, thus cumulating to 41,505 job additions from the quarterly bottom of the downturn through the end of 2020.

[2] Using index values permits us to compare on the same figure two regions with widely different employment scales. An index value of 90 indicates that employment in a given period is 90 percent of its level in the base period (in this case, the second quarter of 2000), that is, 10 percent less than the base-period value. An index value of 110 indicates a level of employment that is 10 percent higher than its level in the base period. Both series in the figure are seasonally adjusted.

The state as a whole, on the other hand, is forecast to remain below the employment level it enjoyed at its peak in the spring of 2000 (index value of 100) through the end of our forecast period in 2020. Employment in the state fell by much more on a proportional basis than employment in Washtenaw, with the state index reaching a low point of 81.7 in the summer of 2009, relative to Washtenaw's 92.2. The state has also experienced a less vigorous employment recovery to date than has Washtenaw. As of the end of 2017, the state's employment level was still 6.4 percent below its peak; in contrast, Washtenaw's employment level exceeded its previous peak by 8.1 percent. We expect the gap to continue to widen over the forecast period through the end of 2020, as employment grows more quickly in Washtenaw than in the state as a whole. Nonetheless, we are forecasting that by the end of 2020, the state will recover just over 700,000, or 82 percent, of the jobs lost from the spring of 2000 to the summer of 2009. That would return the state to the job level it posted at the end of 2001.

Real Wage

Figure 8 shows the average real wage for all workers in Washtenaw County from 1990 to 2020. All wages reported in this section have been adjusted for inflation using the national Consumer Price Index and are expressed in 2016 dollars.[3] Real wage growth for all workers in the county averaged 1.2 percent per year between 1990 and 2000, before slowing to only 0.3 percent per year between 2000 and 2007, in which year the average real wage reached an all-time high of $57,214. Average real wages then began to fall during the Great Recession, reaching a low of

[3] The wage series are averages per worker, and do not include variations in hours worked, a measure that is not available to us in the necessary detail. This is likely less of a consideration over the longer term than at the business cycle frequency. On the other hand, these data include all payroll income, including profit sharing bonuses, overtime and holiday pay, and other irregular income, which is not included in the more commonly cited Bureau of Labor Statistics Current Employment Statistics hourly and weekly wage data. Wages are adjusted for inflation using the U.S. Consumer Price Index for all urban consumers.

$53,069 in 2011 (a decline of 7.2 percent over that four-year period). Real wages grew slowly (0.5 percent per year) over the next three years, to an average of $53,949 in 2014. Between 2014 and 2017, real wages grew more rapidly (1.7 percent per year), helped by very modest price inflation. The average real wage reached $56,683 in 2017, slightly below the peak in 2007. We estimate that the real wage will increase by 1.0 percent in 2018, to $57,258, slightly above 2007 levels. We are forecasting that average real wage growth will accelerate to 1.6 percent in 2019 and 1.5 percent in 2020, so that the average real wage will reach $59,063 in 2020.

Figure 8
Average Real Wage in Washtenaw County, 1990–2020

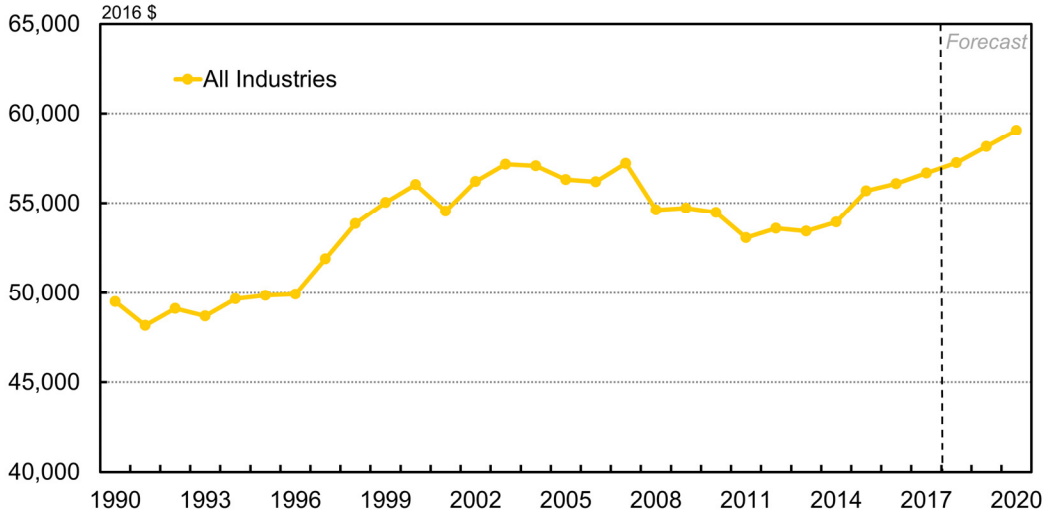


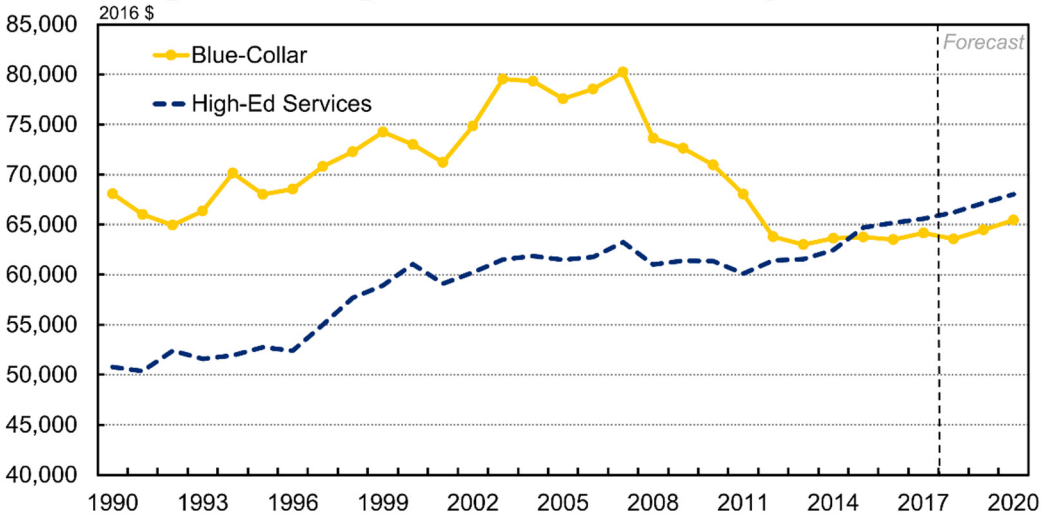
Figure 9 shows the average real wage from 1990 to 2020 for two industry group combinations. The first is traditionally blue-collar industries, and second is service-providing industries that tend to employ highly-educated workers, which we will call high-education service industries.[4] In 1990, the average real wage in the blue-collar industries ($68,090) was about one-

[4] Blue-collar industries include natural resources and mining, construction, manufacturing, and transportation. High-education service industries include government, education and health services, professional services and corporate headquarters, wholesale trade, financial activities, and information services.

third higher than the average real wage in the high-education service industries ($50,772). The average real wage in the blue-collar industries increased by 1.0 percent per year on average from 1990 through 2007, reaching a peak of $80,220 in 2007. With the onset of the Great Recession, the average blue-collar wage began to fall sharply, partly because of job losses in high-paying industries such as motor vehicle manufacturing. Average real wages reached a low of $63,008 in 2013, 7.5 percent below 1990 levels. Since 2013, the average blue-collar wage has increased slowly, by 0.5 percent per year on average, so that in 2017 average wages in these industries ($64,160) remain below 1990 levels. We expect that over the next three years the average blue-collar wage will grow at a slightly faster clip (0.7 percent per year), but that by 2020 real wages will still remain below 1990 levels.[5]

[5] The average wage in any industry group reflects both the wages in a detailed industry and the share of the group accounted for by the detailed industry. Thus, a change in the mix of industries over time can cause a change in the average wage, apart from any change in actual wage levels. For example, suppose that an aggregate industry is composed of two detailed industries, A and B. In time period **1,** industry A accounts for 60 percent of the aggregate category and pays an average wage of $70,000 a year. Industry B accounts for 40 percent of the aggregate and pays an average wage of $30,000 a year. Then the aggregate industry category has an average wage of $54,000 (0.6 X $70,000 + 0.4 X $30,000). In the second time period, wages in the individual industries remain the same, but industry A loses jobs and industry B gains jobs, so that both industries now account for 50 percent of the aggregate category. Then the average wage in the aggregate category falls to $50,000 (0.5 X $70,000 + 0.5 X $30,000). As in this example, part of the reason for the large decline in the average wage in the blue-collar industries after 2007 was the disproportionate loss of jobs in relatively high-wage industries such as motor vehicle manufacturing. Another reason for the decline in blue-collar wages is that the wages in the auto industry itself also fell sharply.

Figure 9
Average Real Wage in Washtenaw County, 1990–2020



In contrast, the average wage in the high-education service industries grew relatively steadily during the historical period. In fact, the average wage in those industries overtook the average wage in the blue-collar industries for the first time in 2015, reaching $64,711. The average wage in the high-education service industries is forecast to grow by an average of 1.2 percent per year between 2017 and 2020, to $68,043 at the end of our forecast period.

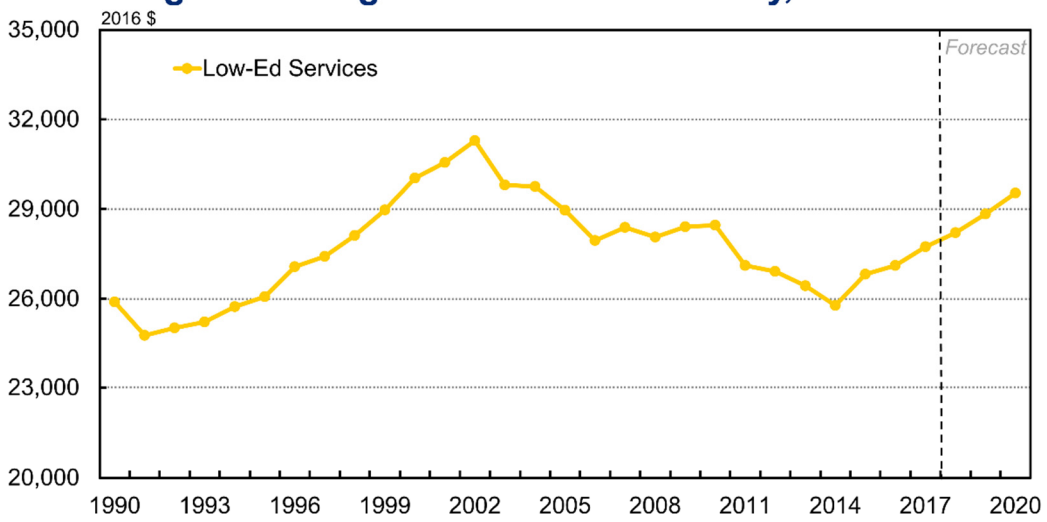
Figure 10 shows the average real wage for service-providing industries that tend to employ workers with less education, which we will call low-education service industries.[6] Wages for this industry group are shown on a separate graph because they are substantially lower than wages in the other two industry groups.

The average real wage in the low-education service industries grew steadily from 1992 through 2002, reaching a peak of $31,286. Wages in these industries then generally declined through 2014, when the average real wage was just $25,777. Between 2014 and 2017, real wages

[6] Such industries include retail trade, leisure and hospitality services, business support services such as temporary help services, and the miscellaneous other services category, which includes repair and personal services.

grew at an impressive average clip of 2.5 percent per year, helped by low price inflation and increases in Michigan's minimum wage. We anticipate that wage gains will continue over the next three years, with real wage growth averaging 2.1 percent per year. Nonetheless, we forecast that by 2020 the average real wage ($29,536) in the low-education service industries will remain 5.6 percent below the peak level in 2002.

Figure 10
Average Real Wage in Washtenaw County, 1990–2020



In summary, the 2000s have been a mixed bag for real wages in Washtenaw County. We estimate that the average real wage across all industries increased by a total of 1.2 percent from 2000 to 2017, an average of less than 0.1 percent per year. This weak growth reflects the fact that the average real wage actually fell during that time interval in two broad industry groups, blue-collar industries (-0.8 percent per year) and low-education service industries (-0.5 percent per year). High-education service industries (the largest of the three industry groups), on the other hand, experienced sustained real wage growth of 0.4 percent per year. The good news, however,

is that we are forecasting real wage growth in all three industry groups over the forecast period, with the most rapid growth expected in the low-education service industries.

Employment by Industry

Table 2 divides our projected total job movements among twenty-three major industry divisions.[7] The table also includes, for each industry, our preliminary estimates of the level of employment in 2017; the forecast change for 2018, 2019, and 2020; and the cumulative change over the three-year period 2017–20. The table also includes the average annual wage for each industry category in 2016, as does the appendix.[8] Total employment is forecast to grow by 3,721 jobs, or 1.8 percent, in 2018. Job gains then slip a bit to 3,344 in 2019, before rebounding to 3,740 in 2020.

Nearly one-half (46 percent) of the total job gains in Washtenaw County over the next three years are expected to occur in the government sector. We expect that federal government employment will increase by 156 over the next three years, with most of the gains occurring in 2020 due to the temporary employment of census workers in the county. Employment in local government, which includes public K-12 education and Washtenaw Community College, lost jobs every year between 2010 and 2016, even as the economy overall was adding jobs. This period of job loss finally came to an end in 2017, when local government posted added 194 jobs. We anticipate that local government will continue to grow over the next three years, cumulating to 335 job additions, for an average growth rate of 1.0 percent per year.

[7] The appendix divides the job movements into 145 finer divisions.

[8] The historical employment data are from the Bureau of Labor Statistics Quarterly Census of Employment and Wages. The average annual wage includes both full- and part-time workers, weighted equally. Consequently, the average wages for industries that employ a disproportionately large number of part-time workers, such as retail trade and leisure and hospitality, are much lower than they would be if the wages were calculated only for full-time workers.

Table 2

Forecast of Employment in Washtenaw County by Major Industry Division
2018–20

	Estimate 2017	Employment Change Forecast '17–'18	'18–'19	'19–'20	'17–'20	Average Annual Wage 2016
TOTAL JOBS (Number of persons)	210,116	3,721	3,344	3,740	10,806	$56,094
(Annual percentage change)	(1.9)	(1.8)	(1.6)	(1.7)		
TOTAL PRIVATE	130,700	1,665	1,961	2,156	5,783	53,993
GOODS-PRODUCING	18,560	176	203	167	545	62,576
Natural resources, mining, construction	4,294	168	217	200	586	57,900
Manufacturing	14,267	8	-14	-34	-40	63,926
Motor vehicles	4,018	-91	-69	-72	-231	62,843
Other manufacturing	10,249	99	54	38	191	64,367
PRIVATE SERVICE-PROVIDING	112,139	1,489	1,759	1,990	5,238	52,561
Trade, transportation, and utilities	25,086	230	246	279	755	43,837
Wholesale trade	5,200	148	139	151	438	74,426
Retail trade	16,328	-2	26	44	69	29,431
Transportation, warehousing, and utilities	3,558	84	81	84	249	68,510
Information	4,367	48	35	33	116	90,048
Financial activities	6,372	22	48	33	103	70,486
Professional and business services	27,149	555	655	695	1,905	75,315
Professional, scientific, and technical	16,391	500	533	560	1,592	92,840
Management of companies and enterprises	1,125	10	12	1	24	167,025
Administrative support and waste management	9,632	46	110	134	290	35,045
Private education and health services	26,552	358	419	534	1,310	52,507
Leisure and hospitality	17,543	267	334	364	965	18,847
Other services	4,890	9	21	52	82	31,404
Unallocated private services	180	0	0	0	0	56,741
GOVERNMENT	79,416	2,056	1,383	1,584	5,023	59,617
State government	63,932	1,973	1,263	1,296	4,532	60,262

State government is the "big kahuna" in terms of job growth in Washtenaw County over the next three years. The sector, which includes the University of Michigan and Michigan Medicine, as well as Eastern Michigan University, is forecast to grow by 1,973 jobs in 2018 (3.1 percent), before slowing a bit to 1.9 percent job growth in both of 2019 and 2020. In all three years, employment in state government is forecast to grow faster than in the local economy overall. This is not a new phenomenon. In the eight years since the end of the recession in 2009, state government employment in Washtenaw County has grown by 2.6 percent per year, substantially faster than the overall rate (1.9 percent per year). The University of Michigan has been the major driver of the county's prosperity over the past few decades, and we expect that this trend will continue for at least the next three years.

The private goods-producing sector is forecast to add only 545 jobs over the next three years, as job losses in transportation equipment manufacturing (–231) partially offset modest job gains other manufacturing (191) and relatively strong job gains in construction (584).

The manufacturing industries that we anticipate will gain the most jobs over the next three years are fabricated metals manufacturing (131), plastic products manufacturing (81), and machinery manufacturing (69). In addition to transportation equipment, manufacturing industries that we expect to lose jobs include book printing (–191) and medical equipment and supplies (–64).

Job growth in the private service-providing sector in 2018 is forecast to register 1,489 (1.3 percent), roughly in line with the gain of 1,477 in 2017. Job gains then increase to 1,759 in 2019 and 1,990 in 2020. The job growth is widespread across most of the private service-providing industries, but the rate of job growth varies substantially.

Retail trade sees the weakest job growth among the major industry groups, adding only 69 jobs over the next three years (0.1 percent per year). Job losses are expected at general merchandise stores (-210), sporting goods, hobby and book stores (-66), gasoline stations (-11), non-store retailers (-11) and electronics stores (-8). We are forecasting job growth over the next three years at food and beverage stores (110), health and personal care stores (93), motor vehicle dealers (64), clothing stores (57), furniture stores (24), miscellaneous store retailers (22), and building materials stores (6). Job growth in the retail sector is limited by technological change, for instance e-commerce replacing brick-and-mortar stores, and rising labor costs driven by growing labor shortages and an increasing minimum wage.

Elsewhere in the Trade, Transportation, and Utilities super-sector, wholesale trade is forecast to see above-average growth, with 438 job gains over the next three years (an average gain of 2.7 percent per year), as is transportation services (260 jobs over the period, also an average gain of 2.7 percent per year). On the other hand, employment at utilities is forecast to decrease by 12 jobs over the next three years.

Information services is forecast to see relatively weak job growth over the next three years, cumulating to 116 jobs (0.9 percent per year). Financial activities is forecast to have even weaker job, growth cumulating to 103 jobs (0.5 percent per year). The weakness in the financial sector is caused by a substantial decline in employment in the credit intermediation industry. This industry, which includes both depository (banking) and non-depository credit granting establishments, is forecast to lose 190 jobs over the next three years. The rest of the financial activities sector, including insurance and real estate, should see moderate job growth over the next three years.[9]

[9] Note that these job gains do not show all of the improvement in the local residential real estate industry, because real estate agents are predominantly self-employed, and thus are not counted in the data on establishment employment shown here.

The professional and technical services industry adds 500 jobs this year, followed by job gains of 533 in 2019 and 560 in 2020. Over the three-year forecast period, professional services is forecast to add 1,592 jobs (3.1 percent growth per year). With this gain, professional services accounts for about one in every seven jobs created in the county, almost double its share of the county's employment base in 2016.

Within the professional and technical services industry category, the largest job gains over the next three years are in testing laboratories (590), computer systems design (361), other professional services (207), and physical, engineering, and biological research (197). The professional and technical services industry category pays very well, averaging $92,840 in 2016. It also tends to employ relatively well- educated workers, those with at least a bachelor's degree. Washtenaw County's success in creating jobs in this industry category has been an important driver, along with the significant growth of state government, of the county's economic prosperity over the past several decades.

The management and corporate headquarters industry (average pay in 2016 of $167,025) is quite small in Washtenaw County and is forecast to add only 24 jobs over the next three years. The administrative support and waste management industry adds 290 jobs over the next three years (1.0 percent per year). Within this industry category, over two-thirds of the job growth is in employment services, which mostly consists of the temporary help services industry.

The private education and health services industry is forecast to add jobs at an accelerating pace over the next three years, with job gains of 358 in 2018, 419 in 2019, and 534 in 2020, cumulating to a total job gain of 1,310 over the next three years. Private education services account for 137 of these new jobs while most of the job gains are in private health care and social assistance (1,173).

Over one-half of the employment gains in private health care over the next three years are in physicians' offices (623 jobs or 4.4 percent per year). Nursing and residential care facilities are forecast to add 237 jobs over the next three years. In contrast, employment in private hospitals, is forecast to decline by 35 and employment in home health care services by 31.

Employment in the leisure and hospitality sector is forecast to grow by 965 jobs over the next three years (1.8 percent per year). This sector includes arts and recreation, food services and drinking places, and hotels. The arts and recreation industry, which is projected to gain 133 jobs over the forecast horizon, includes businesses such as golf courses, fitness facilities, and the performing arts.[10]

Employment at local hotels and other lodging places jumped by 104 jobs in 2016 and 152 in 2017 as some new hotels opened. Over the next three years, however, we expect employment at local lodging places to see only modest growth, cumulating to 58 jobs. Full-service restaurants add 419 jobs over the next three years (2.1 percent per year). Limited-service restaurants, better known as fast-food restaurants, grow 1.4 percent per year, cumulating to a total gain of 205 jobs.

The miscellaneous other services sector includes a grab bag of individual industries such as repair services, including motor vehicle repair shops; personal services, such as hair salons and dry cleaners; membership organizations; and private household services. Collectively these industries add 82 jobs (an increase of 0.6 percent per year) over the forecast period.

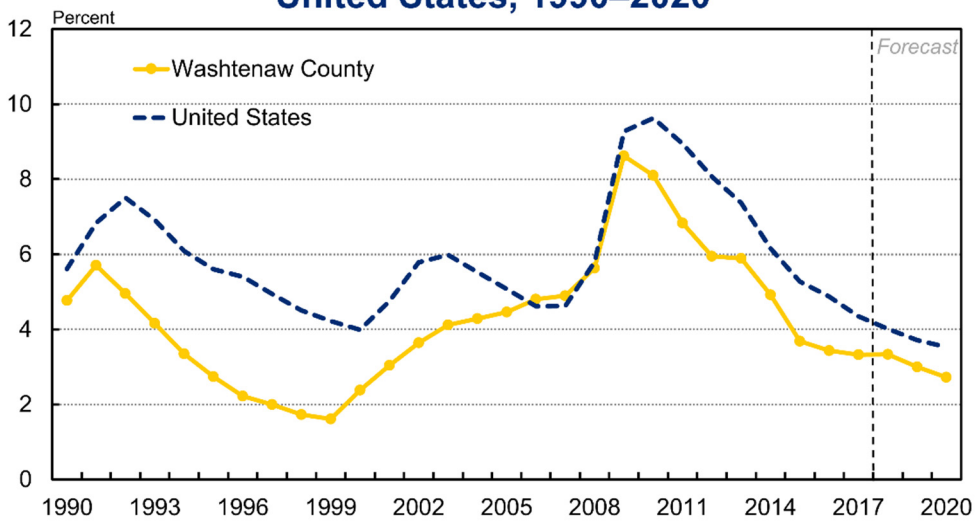
Unemployment

Figure 11 shows that the unemployment rate declined from 3.4 percent in 2016 to 3.3 percent in 2017. We expect that the unemployment rate will remain at 3.3 percent in 2018 as

[10] Much of the last category resides in public universities in Washtenaw County, and thus is not counted in the private sector.

growth in the labor force matches the growth in total jobs. We forecast that the unemployment rate will then fall to 3.0 percent in 2019 and 2.7 percent in 2020. Those unemployment rates would be in the neighborhood of Washtenaw's levels in the mid-1990s, but still above the county unemployment rate's historical low of 1.6 percent in 1999. Nonetheless, if our forecast of the unemployment rate proves correct, the county labor market will achieve what we consider to be full employment over the next three years.

Figure 11
Unemployment Rates for Washtenaw County and for the United States, 1990–2020



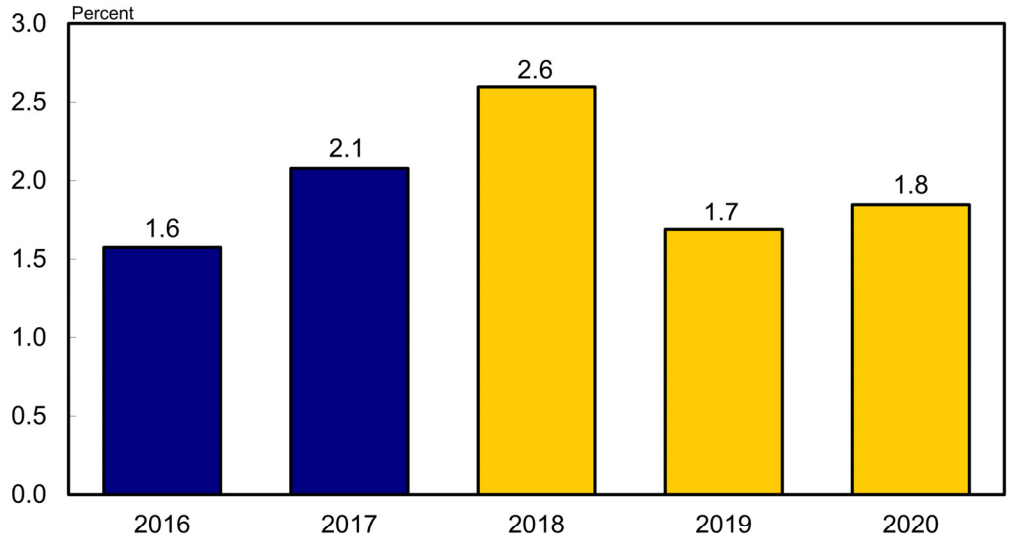
Inflation

Figure 12 displays our forecast of local inflation, measured by the growth rate of the Detroit Consumer Price Index (CPI).[11] Local prices rose 1.6 percent in 2016, more than reversing their puzzling decline of 1.4 percent the previous year. Local inflation then firmed to 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 2.6 percent this year,

[11] Consumer price data are compiled at the regional level; they are not available for the county in isolation.

the fastest pace since 2011. Local inflation then moderates to 1.7 percent in 2019 and 1.8 percent in 2020 as the recent run-up in energy prices fades into the rearview mirror.

Figure 12
Inflation Rate, Detroit CPI, 2016–2020



Advanced Educational Attainment in Washtenaw County

As the home of the University of Michigan-Ann Arbor and Eastern Michigan University, Washtenaw County has historically boasted educational attainment rates among the highest in the nation. A well-educated populace has in turn made the county an attractive location for professional and high-tech industries, propelling Washtenaw's favorable economic performance relative to the state as a whole. In light of the centrality of workforce education levels to Washtenaw's economic success, we decided to examine how the county's educational profile compares to the state's and the nation's and how those comparisons have changed over time.

Table 3 displays various measures of educational attainment for the population aged 25 to 64 for two time periods: 2012 to 2016 and the year 2000. The data for the more recent period come from the American Community Survey, which reports the necessary data as five-year averages;

they are therefore the most recent data available. The data for the year 2000 come from that year's Decennial Census, and allow us to assess trends in Washtenaw County's educational attainment over the recent past.

Table 3
Educational Attainment by Age in Washtenaw County, Michigan, and United States

	Average 2012-2016[1]		2000[2]	
	Share of Age Group	U.S. County Rank	Share of Age Group	U.S. County Rank
Bachelors Degree or Higher				
25 to 64				
United States	31.8%		26.5%	
State of Michigan	28.9%		23.9%	
Washtenaw County	54.9%	30	50.7%	18
25 to 44				
United States	33.9%		26.7%	
State of Michigan	31.7%		24.2%	
Washtenaw County	58.4%	30	52.9%	19
45 to 64				
United States	29.6%		26.4%	
State of Michigan	26.6%		23.5%	
Washtenaw County	51.1%	30	47.3%	22
Graduate Degree				
25 to 64				
United States	11.6%		9.4%	
State of Michigan	10.7%		8.6%	
Washtenaw County	28.1%	12	24.7%	11
25 to 44				
United States	11.6%		8.0%	
State of Michigan	10.9%		7.2%	
Washtenaw County	28.4%	16	23.0%	12
45 to 64				
United States	11.5%		11.4%	
State of Michigan	10.6%		10.6%	
Washtenaw County	27.7%	13	27.3%	13

1. Data from American Community Survey.
2. Data from Decennial Census.

More than half, or 54.9 percent, of 25- to 64-year-olds in Washtenaw County possess a Bachelor's degree or higher. That share well exceeds the Michigan and U.S. averages of 28.9 percent and 31.8 percent, respectively. An even larger proportion of Washtenaw County residents aged 25 to 44, 58.4 percent, have a Bachelor's degree or higher, while the proportion of 45- to 64-year olds is slightly lower, at 51.1 percent (the 25 to 44 population is also slightly better educated than the 45 to 64 population in the state and nation).

Those proportions place Washtenaw County in an enviable position nationally, ranking 30th out of 3,142 U.S. counties and county equivalents. Educational attainment in Washtenaw County has also increased since the year 2000, when 50.7 percent of residents aged 25 to 64 had a Bachelor's degree or higher. The one blot on Washtenaw's record in this category is that the state of Michigan and the United States as a whole both experienced slightly larger increases in the share of 25- to 64-year-olds with a Bachelor's degree or higher. Indeed, Washtenaw's rank among U.S. counties slipped slightly, from 18th to 30th between 2000 and 2012–16.

Where Washtenaw truly shines is in the large share of the population with graduate degrees. More than one-quarter, or 28.1 percent, of 25- to 64-year-olds in the county possess a graduate degree, more than double the averages for the Michigan (10.7 percent) or the United States (11.6 percent).[12] Washtenaw ranks 12th out of U.S. counties in this proportion, and has essentially maintained its rank from the year 2000. In fact, Washtenaw saw a larger increase in the proportion of 25- to 64-year-olds with graduate degrees than Michigan or the United States.

Figures 13 and 14 help to put Washtenaw County's educational attainment profile into geographical context. Both figures show every county and county equivalent in the continental United States, shaded according to the educational attainment of their 25- to 64-year-olds for the

[12] There is much less dispersion in the proportion of graduate degree holders across age groups than for Bachelor's degree holders, so we do not discuss age patterns here.

years 2012 to 2016. Figure 13 looks at the share with a Bachelor's degree or higher. Perhaps unsurprisingly, the Northeast and West Coast dominate the highest shares, along with other some other major metropolitan areas including Minneapolis-St. Paul, Atlanta, and Denver. Oakland and Washtenaw counties are the only counties in Michigan in the most-educated group on the map, with shares above 40 percent. Figure 14 looks at the share with a graduate degree. The geographical pattern is similar to the one in Figure 13, but shows even greater geographical concentration along the coasts. Washtenaw County is the only county in Michigan in the most-educated group on the map, with shares above 20 percent. Notably, no county in the Chicago metro area is included in that group.

Finally, Table 4 contextualizes Washtenaw's educational profile by comparing it to a group of peer or competitor counties identified by Ann Arbor SPARK in a 2017 report on the region's economic competitiveness.[13] The competitor regions are all home to (or nearby) major research universities and thriving technology sectors. We examined the share of 25- to 64-year-olds both with a Bachelor's degree or higher, and with a graduate degree, during 2012 to 2016. Washtenaw compared favorably with its peers in both categories. Looking at the share with a Bachelor's degree or higher, Washtenaw is in second place among its peer group; only Boulder, CO does better, with 61.1 percent of 25- to 64-year-olds possessing a Bachelor's degree or higher. Wake County, NC is in third place among this group with a share of 52.4 percent. Looking at the share of graduate degree holders, Washtenaw County leads all of its competitors. Boulder County is a close second, with 27.6 percent of 25- to 64-year-olds possessing a graduate degree, but then there is a steep drop-off to 21.3 percent in Monroe County, IN, home of Indiana University, Bloomington.

[13] That report is available at http://annarborusa.org/sites/default/files/ann_arbor_spark_benchmarking_study_0.pdf. The competitor counties were Alameda County, CA; Alleghany County, PA, Boulder County, CO; Dane County, WI; Greenville County, SC; Hennepin County, MN; Monroe County, IN; Multnomah County, OR; Travis County, TX; and Wake County, NC.

Figure 13: Share of Population 25–64 with a Bachelor's Degree or Higher, 2012–16

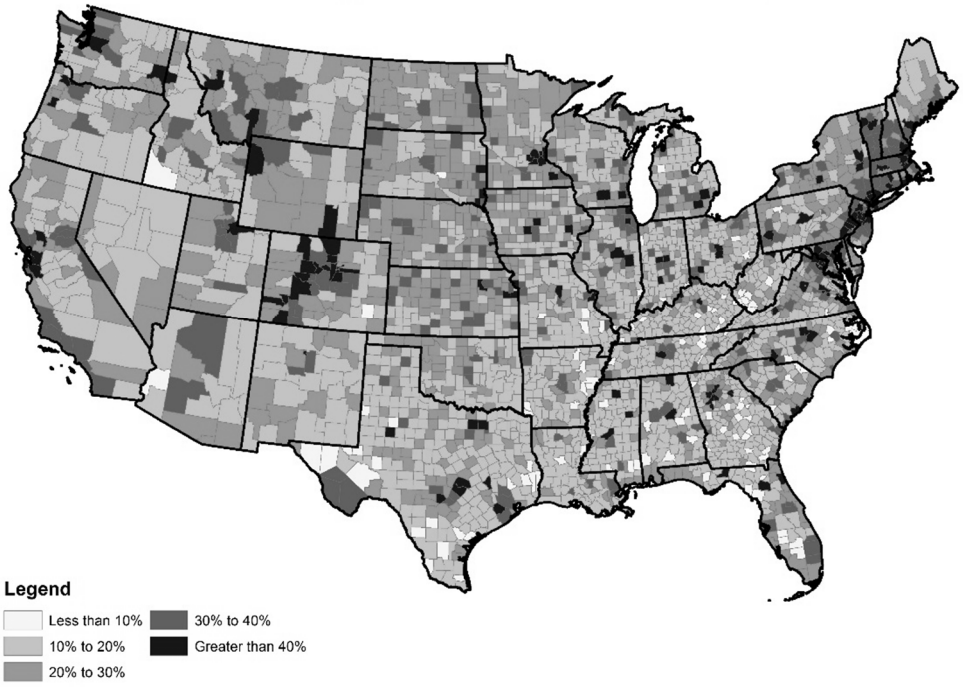
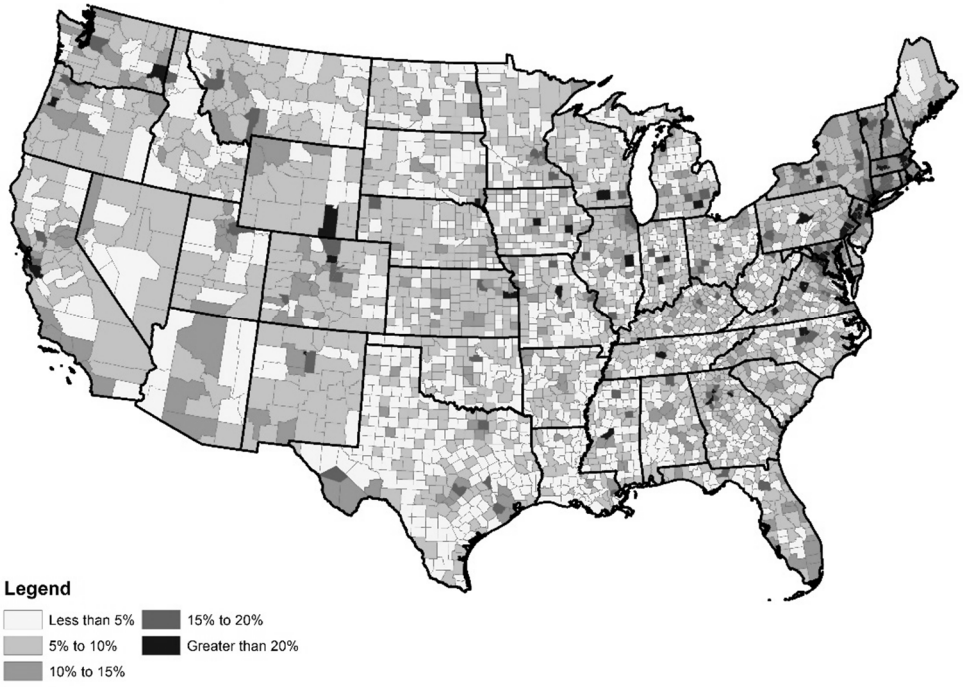


Figure 14: Share of Population 25–64 with a Graduate Degree, 2012–16



Of course, it probably comes as no surprise that Washtenaw boasts high levels of educational attainment, but we were nonetheless pleasantly surprised by the results of this analysis. In our judgment, some of the most encouraging results are that Washtenaw is in the top one percent of U.S. counties for the share of 25- to 64-year-olds with a Bachelor's degree or higher and the top half a percent for the share with graduate degrees; that the share with graduate degrees has increased more since the year 2000 in Washtenaw than in the nation or the state; and that Washtenaw compares very favorably on these measures to a group of its peers in the high-tech world. We believe that Washtenaw's high education levels will provide a solid foundation for its continued economic prosperity in the years to come.

Table 4
Educational Attainment in Washtenaw County and Competitor Regions
25 to 64 year olds, 2012 to 2016

	Bachelor's or Higher		Graduate Degree	
	Share of Age Group	U.S. County Rank	Share of Age Group	U.S. County Rank
Alameda County, California	45.8%	93	18.9%	79
Allegheny County, Pennsylvania	43.6%	112	17.4%	101
Boulder County, Colorado	61.1%	9	27.6%	16
Dane County, Wisconsin	51.1%	54	20.0%	59
Greenville County, South Carolina	34.9%	292	12.2%	298
Hennepin County, Minnesota	49.8%	60	17.5%	100
Monroe County, Indiana	46.9%	83	21.3%	42
Multnomah County, Oregon	44.1%	109	16.6%	119
Travis County, Texas	47.1%	81	16.4%	126
Wake County, North Carolina	52.4%	41	18.6%	82
Washtenaw County, Michigan	***54.9%***	***30***	***28.1%***	***12***

Data from American Community Survey.

Conclusion

After eight consecutive years of employment growth, it would be easy for business, government, and community leaders to take Washtenaw County's continued prosperity for granted. Yet one only needs to consider Michigan's experience so far in this millennium to be reminded that economic fortunes can change unexpectedly. It is very encouraging, therefore, that Washtenaw continues to rank among the national elite in terms of educational attainment, especially in terms of the graduate degree holders who are increasingly important in driving the high-tech economy.

Fortunately, we believe the economic outlook for Washtenaw County over the next few years is quite positive, with continued job gains, falling unemployment, and rising real wages ahead. As we approach full employment, job growth slips a bit from its average pace of 1.9 percent over the expansion to date to 1.7 percent over the forecast period. The unemployment rate falls below 3 percent in 2020 for the first time since the year 2000. The tight labor market helps average real wages grow by a healthy 1.4 percent per year over the next three years, compared with an average of just 0.5 percent per year from 1991 to 2017.

There are certainly a number of risks to our forecast. Most prominent are the possibilities that our international trade relations will deteriorate substantially and that the current softness in the motor vehicle sector turns into a more substantial downturn. That being said, our baseline forecast is that Washtenaw County will enjoy at least three more years of economic expansion, extending its current growth streak to eleven calendar years.

Appendix
Forecast of Jobs in Washtenaw County by Detailed Industry Division

	Estimated 2017	2018	Forecast 2019	2020	Average Wage 2016
Total wage and salary employment	210,116	213,837	217,181	220,922	$56,094
Total government	79,416	81,472	82,855	84,439	59,617
Federal government	4,045	4,051	4,067	4,201	79,927
Post office	574	575	573	572	65,070
Hospital	2,590	2,594	2,608	2,623	78,218
Other federal government	881	882	886	1,006	94,061
State government	63,932	65,905	67,167	68,463	60,262
Local government	11,439	11,517	11,620	11,774	48,753
Education and health services	7,031	7,053	7,116	7,208	47,195
Other local government	4,408	4,464	4,505	4,566	51,202
Total private	130,700	132,365	134,326	136,482	53,993
Goods-producing	18,560	18,736	18,939	19,106	62,576
Natural resources and mining	250	250	249	251	30,767
Construction	4,044	4,212	4,430	4,628	59,633
Buildings	1,137	1,202	1,256	1,293	55,708
Residential	689	730	771	798	43,597
Nonresidential	448	471	485	495	72,387
Heavy and civil engineering construction	430	465	503	544	73,688
Specialty trade contractors	2,477	2,545	2,671	2,791	59,187
Building foundation and exterior	424	435	444	454	51,287
Building equipment	1,277	1,315	1,401	1,480	66,336
Building finishing	499	508	528	547	50,676
Other specialty trade	277	288	298	310	54,486
Manufacturing	14,267	14,275	14,260	14,226	63,926
Food	852	868	884	900	43,289
Printing and related support activities	1,720	1,649	1,588	1,528	39,690
Chemicals	673	682	685	687	68,963
Plastics and rubber products	1,503	1,539	1,562	1,584	93,000
Fabricated metal products	1,329	1,385	1,425	1,460	55,916
Machinery	993	1,028	1,049	1,063	72,101
Computer and electronic products	1,166	1,177	1,192	1,206	74,604
Transportation equipment	4,018	3,927	3,858	3,787	62,843
Miscellaneous manufacturing	1,314	1,307	1,299	1,292	77,862
Medical equipment and supplies	777	755	734	713	89,777
Other miscellaneous manufacturing	536	552	565	579	58,093
Other manufacturing	700	712	718	720	56,605
Private service-providing	112,139	113,628	115,387	117,377	$52,561
Trade, transportation, and utilities	25,086	25,316	25,562	25,841	43,837
Wholesale trade	5,200	5,348	5,487	5,638	74,426
Merchant wholesalers, durable goods	2,736	2,850	2,939	3,028	80,322
Merchant wholesalers, nondurable goods	1,747	1,766	1,805	1,855	62,559
Electronic markets and agents and brokers	717	732	743	755	82,200
Retail trade	16,328	16,326	16,352	16,396	29,431
Motor vehicles	1,768	1,787	1,809	1,832	55,000
Furniture and home furnishings	574	583	594	597	37,656
Electronics and appliances	670	667	664	661	43,224
Building materials and garden supplies	1,393	1,389	1,391	1,399	38,562
Food and beverages	3,474	3,507	3,544	3,584	23,021
Health and personal care stores	1,111	1,141	1,171	1,204	35,752
Gasoline stations	464	461	456	452	20,316

Appendix (continued)
Forecast of Jobs in Washtenaw County by Detailed Industry Division

	Estimated 2017	Forecast 2018	2019	2020	Average Wage 2016
Retail trade (continued)					
Clothing and accessories	1,424	1,437	1,458	1,481	18,043
Sporting goods, hobby, book, music stores	687	664	642	621	17,708
General merchandise	3,230	3,156	3,088	3,021	22,897
Miscellaneous store retailers	927	940	944	949	20,418
Nonstore retailers	606	594	592	595	35,089
Transportation and warehousing	3,106	3,195	3,280	3,366	56,822
Truck transportation	749	762	770	779	62,735
Other transportation and warehousing	2,357	2,433	2,510	2,588	54,819
Utilities	452	447	443	440	140,318
Information	4,367	4,415	4,450	4,483	90,048
Publishing industries, except Internet	1,650	1,651	1,645	1,642	80,068
Newspaper, book, and directory publishers	313	300	287	275	62,983
Software publishers	1,337	1,351	1,358	1,366	84,014
Telecommunications	381	369	360	352	59,438
Data processing, hosting, and related services	974	991	1,000	1,010	87,658
Other information	1,361	1,404	1,445	1,480	115,017
Financial activities	6,372	6,394	6,442	6,475	70,486
Finance and insurance	3,957	3,941	3,932	3,903	79,838
Credit intermediation and related activities	2,209	2,159	2,114	2,049	72,115
Depository credit intermediation	1,173	1,153	1,136	1,120	62,336
Other credit intermediation and related	1,036	1,006	978	929	82,159
Insurance carriers and related activities	971	983	998	1,012	69,175
Other finance	777	798	820	842	118,794
Real estate and rental and leasing	2,415	2,452	2,510	2,572	$53,603
Real estate	2,108	2,137	2,185	2,238	48,631
Lessors of real estate	944	945	950	957	46,460
Offices of real estate agents and brokers	210	218	228	240	61,177
Activities related to real estate	954	975	1,007	1,041	47,975
Rental and leasing services	227	234	243	249	37,524
Lessors of nonfinancial intangible assets	80	81	83	84	204,752
Professional and business services	27,149	27,704	28,359	29,054	75,315
Professional and technical services	16,391	16,891	17,424	17,983	92,840
Legal services	939	944	949	956	82,476
Accounting and bookkeeping	620	627	626	625	59,053
Architectural and engineering	4,615	4,834	5,016	5,214	109,088
Engineering	1,139	1,129	1,107	1,084	95,578
Testing laboratories	3,064	3,270	3,453	3,654	119,346
Other architectural and engineering	412	435	456	477	72,287
Specialized design	299	276	287	299	104,329
Computer systems design and related services	3,027	3,150	3,275	3,387	93,909
Management and technical consulting	2,419	2,486	2,554	2,630	93,811
Scientific research and development	2,827	2,887	2,957	3,027	96,766
Physical, engineering, and bio. research	2,612	2,670	2,740	2,809	99,193
Social science and humanities research	216	217	218	218	63,173
Advertising, PR, and related services	216	216	218	220	63,173
Other professional and technical services	1,417	1,471	1,541	1,624	49,527
Management of companies and enterprises	1,125	1,135	1,147	1,148	167,025
Administrative and waste services	9,632	9,678	9,788	9,922	35,045
Administrative and support services	9,069	9,123	9,239	9,374	32,993

Appendix (continued)
Forecast of Jobs in Washtenaw County by Detailed Industry Division

	Estimated 2017	2018	Forecast 2019	2020	Average Wage 2016
Administrative and support services (continued)					
Office administrative services	588	595	604	613	105,643
Employment services	5,517	5,571	5,647	5,729	23,691
Business support	364	375	387	399	55,181
Services to buildings and dwellings	1,755	1,743	1,761	1,787	29,009
Other administrative and support services	845	838	840	846	39,084
Waste management and remediation services	563	555	549	548	67,363
Private education and health services	26,552	26,910	27,328	27,862	52,507
Private educational services	3,248	3,300	3,342	3,385	34,921
Private elementary and secondary schools	1,056	1,065	1,070	1,076	38,224
Other private educational services	2,192	2,234	2,273	2,309	33,318
Private health care and social assistance	23,304	23,610	23,986	24,478	54,935
Ambulatory health care services	10,076	10,314	10,610	10,960	75,673
Offices of physicians	4,470	4,645	4,856	5,093	115,748
Offices of dentists	1,261	1,282	1,307	1,337	55,904
Offices of other health practitioners	730	763	792	825	42,450
Home health care services	1,960	1,939	1,929	1,929	27,169
Other ambulatory health care services	1,655	1,684	1,725	1,776	58,134
Nursing and residential care facilities	4,550	4,594	4,673	4,787	29,161
Community care facilities for the elderly	2,064	2,082	2,107	2,145	31,949
Other nursing and residential care facilities	2,485	2,512	2,566	2,642	26,787
Individual and family services	909	917	920	926	22,726
Child day care services	1,204	1,222	1,245	1,275	20,945
Hospitals, emergency relief, and vocational rehabilitation services	6,565	6,563	6,538	6,531	$52,176
Leisure and hospitality	17,543	17,810	18,144	18,508	18,847
Arts, entertainment, and recreation	2,293	2,286	2,344	2,426	22,833
Amusements, gambling, and recreation	1,823	1,814	1,856	1,914	18,544
Golf courses and country clubs	568	547	543	542	21,610
Fitness and recreational sports centers	974	988	1,032	1,086	16,899
Other amusements, gambling, recreation	280	279	282	286	18,399
Performing arts, spectator sports, museums, and parks	470	472	488	512	39,630
Accommodation and food services	15,250	15,524	15,800	16,082	18,225
Accommodation	1,343	1,367	1,386	1,401	23,882
Food services and drinking places	13,907	14,156	14,414	14,681	17,728
Special food services	1,090	1,110	1,130	1,149	21,791
Drinking places, alcoholic beverages	773	787	806	832	18,303
Restaurants and other eating places	12,044	12,260	12,478	12,700	17,309
Full-service restaurants	6,516	6,656	6,796	6,935	19,703
Limited-service restaurants	4,673	4,735	4,805	4,878	14,621
Cafeterias and nonalcoholic beverage bars	855	868	877	887	13,532
Other services	4,890	4,899	4,920	4,972	31,404
Repair and maintenance	957	964	966	968	39,184
Personal and laundry services	1,360	1,328	1,322	1,325	29,219
Membership associations and organizations	1,797	1,809	1,815	1,828	34,923
Private households	776	799	817	851	16,347
Unallocated private services	180	181	181	181	56,741
Addendum					
Unemployment rate	3.3	3.3	3.0	2.7	