

Worcester Economic Indicators

Fourth Quarter 2014

This report can be accessed online at:

<http://www1.assumption.edu/worcester-economic-indicators-project/>

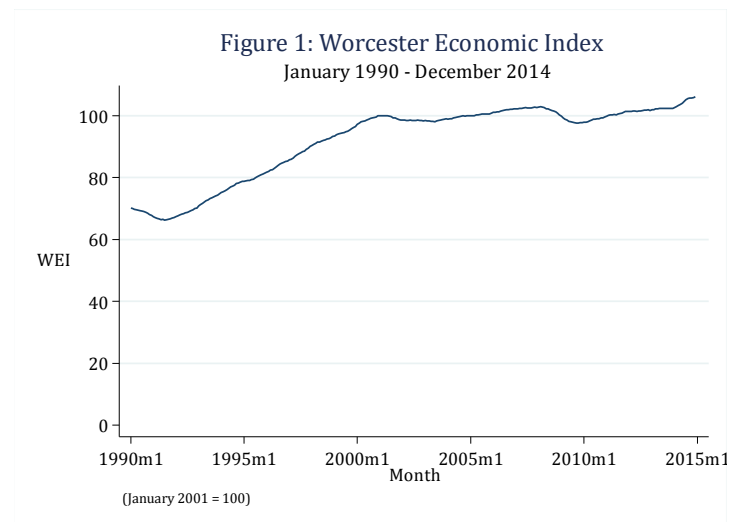
Growth Slows in Fourth Quarter

Moderate pace expected to continue over first half of 2015

Worcester Economic Index

The Worcester Economic Index (WEI) increased at a 1.7% annualized rate during the fourth quarter of 2014. This represents a slowdown in growth for the local economy compared to earlier in the year. The WEI is estimated using employment and unemployment figures for the Worcester area which are compiled and released each month by the Bureau of Labor Statistics. During the fourth quarter all three of the variables used in the calculation of the WEI improved. Total nonfarm employment in the Worcester region rose about 3% on a seasonally adjusted basis, while the survey of households indicated total employment increased by over 6%. In addition, the unemployment rate fell to its lowest level since early 2008 (5.2%, not seasonally adjusted).ⁱ

Figure 1 shows the long-run path of the Worcester Economic Index.



Looking back at all of 2014, the WEI increased 3.6% which was substantially above the 0.7% estimate from 2013.ⁱⁱ The second quarter was particularly strong, growing at a 5.4% annual pace. In addition, the unemployment rate showed dramatic improvement over the year, dropping a full two percentage points from 7.2% in December 2013 to 5.2% in December 2014. Table 1 shows the values of the WEI over the past year, its month-to-month change and quarterly growth rates (annualized). While month-to-month changes are reported it is best to look at trends over longer time periods. As the table shows, during most of the year the WEI grew at more than a 3% annualized rate, but in the fourth quarter it slowed considerably.

Worcester Economic Outlook

Over the coming six months the WEI is expected to grow at a slightly quicker pace than the 1.7% growth experienced during the final quarter of 2014. Based on the recent path of the WEI as well as four leading indicators of the national economy, the WEI

is expected to grow by 1.9-2.3% through the first half of 2015. Table 2 shows the December six-month forecast to be 2.3%, while the average of the October, November, & December forecasts is 1.9%.

Table 2 also shows the growth forecasts broken down into its 6 components. The first component is the long-run trend growth of the WEI which is about 1.1% on an annual basis. Including the trend component allows the other variables to be interpreted as the amount that each pushes the WEI above or below trend. Looking at both the forecast from December 2014 and the average of the fourth quarter forecasts we see that consumer expectations, interest rate spread, and the Leading Credit Index consistently contributing to the above trend growth forecasts for early 2015. While the S&P 500 has been down recently, it is not impacting the growth forecast significantly. The past values of the WEI are a modest drag on growth when looking at the fourth quarter averages due to the relatively low growth of the WEI in September, October, & November. In contrast, the December 2014 forecast shows the WEI making a more substantial positive contribution (+0.3%) to the above trend growth forecast, which is a result of the uptick in the WEI during December. Past values of the WEI are included in the model because economies tend to exhibit momentum and therefore recent economic performance is an indicator of future performance.

Turning to the local leading indicators that are tracked as part of this project we see a less optimistic picture. All four of the local leading indicators are down when compared to six months ago. In December, initial unemployment claims for Massachusetts were up slightly from six-month prior.^{iv} Increases in claims are normally a negative signal for future economic activity because the firms may be letting workers go due to slowing business conditions. Over the past several years the number of initial claims in Massachusetts has

Table 1
Worcester Economic Index (WEI)
December 2013 – December 2014

Month	Worcester Economic Index	Change from previous month	Quarterly Growth Rate, Annualized
December 2013	102.4	0.0	0.1%
January 2014	102.6	0.2	
February 2014	102.9	0.3	
March 2014	103.3	0.4	3.4%
April 2014	103.6	0.3	
May 2014	104.1	0.5	
June 2014	104.6	0.5	5.4%
July 2014	105.2	0.6	
August 2014	105.5	0.3	
September 2014	105.6	0.1	3.9%
October 2014	105.7	0.1	
November 2014	105.8	0.1	
December 2014	106.1	0.3	1.7%

Table 2
Breakdown of Projected Growth of WEIⁱⁱⁱ
6-month growth forecast, annualized basis

Component	December 2014	Quarter 4 Average
Trend	1.1%	1.1%
Consumer Expectations	0.2%	0.2%
S&P 500	-0.1%	0.0%
Interest Rate Spread	0.2%	0.2%
Leading Credit Index™	0.6%	0.5%
WEI	0.3%	-0.1%
Total	2.3%	1.9%

Components may not add to total due to rounding.

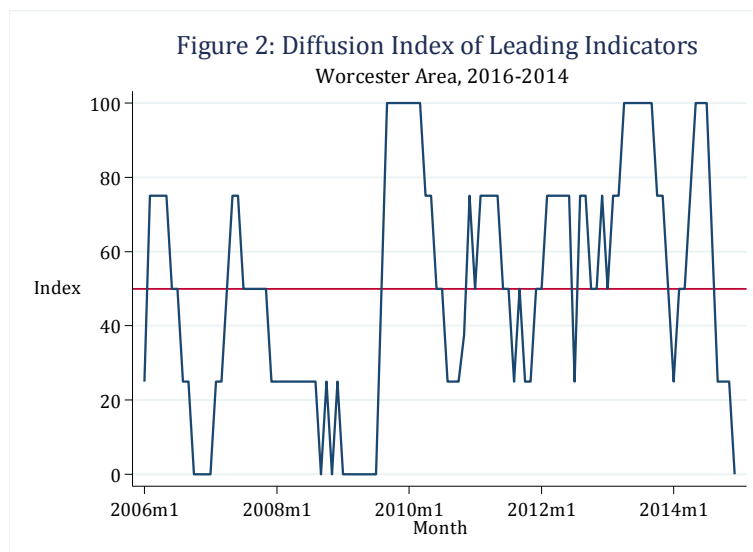
generally been declining, a sign of a recovering labor market. At this point the uptick in claims is fairly modest.

Another local indicator is the amount of online help-wanted advertising for the Worcester area.^v This series is down compared to six-months ago. After taking into account seasonal variation, December online help-wanted ads were down about 4% from six-months earlier. A drop in help-wanted advertising is a negative signal since it suggests a slowdown in hiring activity.

The third local leading indicator is the number of new business incorporations in the Worcester NECTA.^{vi} After taking into account seasonal variation new business incorporations fell in each of the past four months with December experiencing the most significant drop. In addition, December incorporations are down when compared to six months prior. A fall in new business incorporations is considered a negative signal because fewer new businesses mean less new business hiring.

The final local lead indicator is the value of new residential building permits.^{vii} Comparing the December estimate to six months earlier, there has been a decrease in the value of new building permits, another negative signal for future economic activity.

In order to combine the information provided by the local leading indicators into a single indicator, a six-month diffusion index is calculated. A diffusion index summarizes how many of the leading indicators are providing positive signals of the direction of the economy.^{viii} The maximum value that a diffusion index can take on is 100. A diffusion index above 50 suggests a growing economy, while an index of less than 50



indicates the leading indicators are on balance pessimistic. The six-month diffusion index of the four local indicators was only 25 in October and November and fell to 0 in December when all indicators were worse than six-months earlier. The diffusion index falling below 50 in a single month is not enough to indicate an economy in decline. Local data series can be very volatile over short periods of time and therefore it is important to assess the diffusion index over several months or quarters. In this case the diffusion index has been below 50 for four consecutive months which may signal a weakening economy. However, since we are evaluating changes in the local indicators using a 6-month timeframe this may be a situation where the local indicators are sending negative signals because we are comparing them to a particularly robust period of economic activity, the second quarter of 2014. As a result the diffusion index may be low because the economy is returning to a

more moderate pace, not an out-and-out decline. However, currently the diffusion index of local leading indicators is offering a pessimistic signal on the future path of the Worcester economy.

To sum up, the Worcester Economic Index (WEI) grew at an annual rate of 1.7% in the fourth quarter of 2014. The six-month forecast for the WEI indicates growth will continue at slightly above this pace during the first two quarters of 2015. On the other hand, the diffusion index of local leading indicators is currently sending a negative signal about future economic performance.

The next Worcester Economic Indicators report will be issued in early May 2015.

Additional information about this project is available at:

<http://www1.assumption.edu/worcester-economic-indicators-project/>.

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ⁱ Bureau of Labor Statistics. Payroll employment is obtained from the State and Area Employment Database (SAE) of the BLS. Household employment and the unemployment rate is obtained from the Local Area Unemployment Database (LAU) of the BLS. All employment data is for the Worcester NECTA which consists of the city of Worcester as well as 39 surrounding towns located in south central Massachusetts and northeastern Connecticut. Nonfarm payroll employment is available on a seasonally-adjusted from the BLS. Unfortunately, the BLS only provides household employment and the unemployment rate only on a not seasonally adjusted basis, so those data series are adjusted for seasonal variation using the X-12 ARIMA program developed by the U.S. Census Bureau.

ⁱⁱ Recent estimates of the WEI will be revised with each release. This is due to both revisions to the underlying data as well as the methodology utilized to estimate the index. The WEI is based on the methodology developed by Stock & Watson (1989), and employed by Clayton-Matthews & Stock (1998/99), Crone & Clayton-Matthews (2005), and Tebaldi & Kelley (2012) to estimate an index of the underlying economy using a state-space model. An explanation of how these methods were utilized for this project is available at:

<http://www1.assumption.edu/worcester-economic-indicators-project/>.

ⁱⁱⁱ The leading indicators used to forecast the WEI are:

Consumer expectations: From the University of Michigan Survey of Consumer Sentiments.

S&P 500: Monthly closing value of the index.

Leading Credit IndexTM: The Conference Board's index of credit market conditions.

Interest rate spread: The yield on a 10-year Treasury bond less the federal funds rate.

The above leading indicators are obtained from The Conference Board's Business Cycles Indicators database.

^{iv} Massachusetts Department of Employment and Training. Initial claims for the Worcester area were originally part of the index, but that data has not been available since June 2013. Since it is desirable to utilize information that is as local as possible, if initial claims for Worcester becomes available in the future the index will be revised to include that data.

^v The Conference Board Help Wanted Online® (HWOL)

^{vi} Secretary of the Commonwealth of Massachusetts

^{vii} U.S. Census Bureau, Building Permits Survey

^{viii} For a description of the methodology used to calculate a diffusion index go to: <http://www.conference-board.org/data/bci/index.cfm?id=2180>