

Worcester Economic Indicators

Third Quarter 2014

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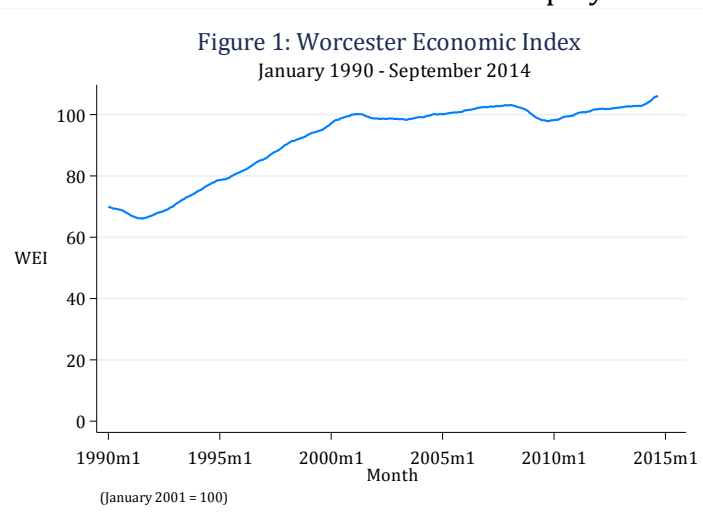
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Growth Moderates in Third Quarter

Leading indicators mixed

Worcester Economic Index

The Worcester Economic Index (WEI) increased at a 3.7% annualized rate during the third quarter of 2014. The WEI utilizes data from the Bureau of Labor Statistics to estimate the path of the local economy. Based on both current and historical values of employment and unemployment for the Worcester NECTA the latest estimates of the WEI show a continuation of the growth reported since the start of the year. Since September 2013, each of the variables included in the WEI has shown improvement. From the household survey total employment is up about 2.4% over the past year, while the unemployment rate has fallen from 7.5% to 6.7% during that time. The payroll survey also shows an increase in total



nonfarm employment of about 2.1% since September 2013.ⁱ These three variables are the inputs for the model used to estimate the WEI, and the positive trends in those values explain the growth in the index. Figure 1 shows the estimated WEI going back to 1990.

The 3.7% increase in the WEI during the third quarter is slower than the revised 5.3% growth estimate for the second quarter of 2014.ⁱⁱ The slowdown is not surprising given the sizable increases in the payroll and household employment estimates during that quarter. As with any survey results, employment statistics are subject to sampling error and the estimates for Worcester are based on smaller samples than the national employment figures which leads to greater volatility in local employment data. The model used to calculate the WEI incorporates both current and past data to arrive at an estimate for each month. As a result, the WEI is smoother than one might expect given the variation in the data. This is consistent with the assumption that the underlying economy which the WEI

attempts to track does not fluctuate dramatically from month-to-month but changes in a more gradual manner. Table 1 shows the Worcester Economic Index over the past 13 months, its month-to-month change, and quarterly growth rate. While the WEI is calculated on a monthly basis it is best not to read too much into changes in any single month, but rather examine how the index has changed over longer periods of time. Since September 2013, the WEI has increased about 3.1%.

Table 1
Worcester Economic Index (WEI)
September 2013 - September 2014

Month	Worcester Economic Index	Change from previous month	Quarterly Growth Rate, Annualized
September 2013	102.8	0.0	0.5%
October 2013	102.8	0.0	
November 2013	102.8	0.0	
December 2013	102.8	0.0	0.1%
January 2014	103.0	0.2	
February 2014	103.3	0.3	
March 2014	103.7	0.4	3.4%
April 2014	104.0	0.3	
May 2014	104.5	0.5	
June 2014	105.0	0.5	5.3%
July 2014	105.5	0.5	
August 2014	105.9	0.4	
September 2014	106.0	0.1	3.7%

Worcester Economic Outlook

Over the coming six months the WEI is expected to continue to grow but at a slower rate than the previous two quarters. 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 2-3% through the first quarter of 2015. Table 2 shows the September six-month forecast to be 2.0%, while the average of the July, August, & September forecasts is 3.0%.

Table 2 also shows the growth forecasts broken down into 6 components. The first component is the long-run trend growth of the WEI which is about 1.1% on an annual basis. The values associated with the other components represent the amount that each contributes to the forecast for the WEI being above or below trend. Looking at the average of the third quarter 2014 forecasts we see that the recent growth of the WEI is the primary contributor (+1.2%) to the above trend growth forecast over the coming months. In contrast, the September 2014 forecast shows the WEI making a smaller contribution (+0.2%) to above trend growth. 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. The strong growth during the second quarter is given more weight in the July and August forecasts than in the September forecast which is the primary reason the September forecast is below the average of the July, August, &

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

Component	September 2014	Quarter 3 Average
Trend	1.1%	1.1%
Consumer Expectations	-0.1%	0.0%
S&P 500	0.0%	0.0%
Interest Rate Spread	0.2%	0.2%
Leading Credit Index™	0.5%	0.5%
WEI	0.2%	1.2%
Total	2.0%	3.0%

Components may not add to total due to rounding.

September forecasts. Of the four indicators of the national economy included in the model, the Leading Credit Index™ makes the largest contribution to both WEI forecasts.

An examination of some local indicators provides a mixed picture of future prospects of the Worcester area economy. In September, initial unemployment claims for Massachusetts had fallen compared to the level six-months prior.^{iv} Such a decrease is viewed as a positive signal for the economy because it suggests fewer layoffs and may be a precursor to future hiring. Over the past several years the number of initial claims in Massachusetts has generally been declining, a sign of a recovering labor market. While there was an uptick in claims in August, September claims fell and compared to a year ago statewide initial unemployment claims are down about 13%.

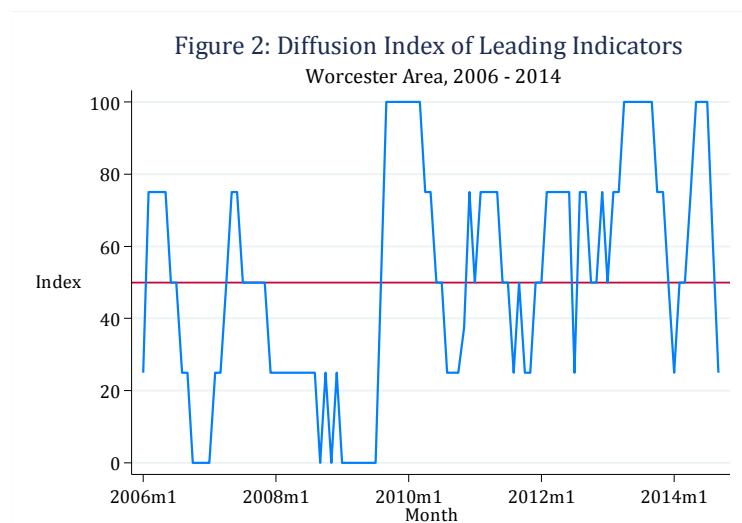
Another local indicator is the amount of online help-wanted advertising for the Worcester area.^v This series has been falling over the past few months. After taking into account seasonal variation, September online help-wanted ads were about 4% below the level from six-months earlier. A drop in help-wanted advertising is a negative signal since it suggests a slowdown in hiring.

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 two of the last three months, however the overall level has not changed dramatically. September incorporations are down modestly 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. However, the changes in new business incorporations is fairly small and therefore is not providing any real signal at this time.

The final local lead indicator is the value of new residential building permits.^{vii} On a seasonally adjusted basis, building permits have fallen during the third quarter of 2014 which is a negative signal. The value of building permits in September was down about 11% from September 2013.

In order to combine the information provided by the local leading indicators, 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, which was 100 in May, June and July fell to 62.5 in August and then to only 25 in September. A single month falling below 50 is not enough to indicate the economy is 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. Note in Figure 2 the diffusion index fell below 50 in July 2012 and January 2014 before bouncing back above 50 in the following months. If the diffusion index remains below 50 through the fourth quarter of 2014, that would be a signal of a downturn in the economy. So while the forecast for the WEI is for continued growth, the local leading indicators are currently not providing a strong signal on the direction of the economy.

To sum up, the Worcester Economic Index (WEI) grew at an annual rate of 3.7% in the third quarter of 2014. The six-month forecast for the WEI indicates growth will continue but at a somewhat slower pace. The diffusion index of local leading indicators is mixed at this time.

The next Worcester Economic Indicators report will be issued in early February 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>