

# Worcester Economic Indicators

Fourth Quarter 2016

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

*Local Economy grows 2.1% in Fourth Quarter*

*Overall 2016 strongest year since before the Great Recession*

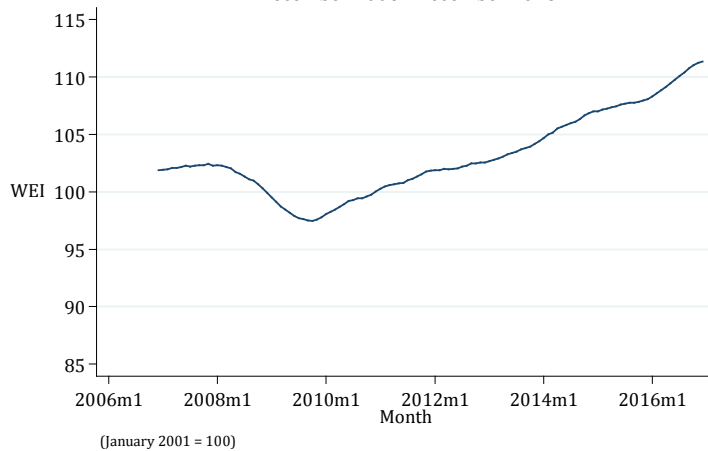
## Worcester Economic Index

The pace of economic activity in the greater Worcester economy tapered off during the final months of 2016. The Worcester Economic Index (WEI) grew at a 2.1% annualized rate during the fourth quarter which fell short of the revised 3.8% rate turned in during the previous quarter. The econometric model utilized to estimate the WEI makes use of Bureau of Labor Statistics data for the Worcester metropolitan area to estimate the path of the underlying economy that is most

consistent with recent employment and unemployment statistics. Over the course of 2016 all three of the variables used to compute the WEI moved in a positive direction. According to the BLS Current Population Survey of households, employment in the Worcester area has risen by about 2.3% since December 2015, while the BLS payroll survey found an employment growth rate of 1.6%. Most dramatically, the Worcester area unemployment rate fell from 4.8% in December 2015 all the way down to 3.0% in December 2016.<sup>1</sup> Figure 1 shows the WEI over the past 10 years and the progress made by the local economy since the recession of 2008-09.

Table 1 presents the Worcester Economic Index over the past 13 months, its month-to-month change, and annualized quarterly growth rate. As the table shows, the WEI grew throughout the year but slowed during the final months of 2016. Compared to December 2015 the WEI finished the year up 3.0% which marks the highest annual growth since before the Great Recession. In comparison, according to the Bureau of Economic Analysis January 27<sup>th</sup> news release, U.S. GDP grew by 1.6% in 2016, with the fourth quarter checking

Figure 1: Worcester Economic Index  
December 2006 - December 2016



in at a 1.9% annualized rate.<sup>ii</sup>

As discussed in past reports, there is a seasonal component to employment data. Typically there is an upswing in employment during the last few months of the year as firms hire workers during the holiday season. As table 2 shows, both the BLS payroll and household surveys

reported increases in employment (not seasonally adjusted) during the fourth quarter of 2016.<sup>iii</sup> However, adjusting the data to take into account regular seasonal fluctuations in the labor market suggests employment fell during the final 3 months of the year as did the labor force. In fact, on a seasonally-adjusted basis the fall in the unemployment rate since September was due to the drop in the labor force rather than an increase in the number of workers finding jobs. Seasonally-adjusted data is preferable when attempting to track the general direction of the economy because it removes some of the noise in the data. For that reason, the model used to estimate the Worcester Economic Index utilizes seasonally-adjusted values for payroll employment, household employment, and the unemployment rate. The decline in the labor market shown by the seasonally-adjusted data in table 2 is the reason why the Worcester Economic Index grew at a slower rate during the fourth quarter of 2016.

**Table 1**  
**Worcester Economic Index (WEI)**  
**December 2015 - December 2016**

Month	Worcester Economic Index	Change from previous month	Quarterly Growth Rate, Annualized
December 2015	108.1	0.1	1.1%
January 2016	108.3	0.2	
February 2016	108.6	0.3	
March 2016	108.9	0.3	2.9%
April 2016	109.1	0.3	
May 2016	109.4	0.3	
June 2016	109.7	0.3	3.3%
July 2016	110.1	0.3	
August 2016	110.4	0.3	
September 2016	110.8	0.4	3.8%
October 2016	111.0	0.3	
November 2016	111.2	0.2	
December 2016	111.3	0.1	2.1%

**Table 2**  
**BLS Employment Estimates**  
**Worcester NECTA, September-December 2016**

	Not Seasonally Adjusted <sup>iii</sup>			Seasonally Adjusted <sup>iv</sup>		
	September 2016	December 2016	Change Dec - Sept	September 2016	December 2016	Change Dec - Sept
Unemployment Rate	3.7%	3.0%	-0.7	3.7%	3.2%	-0.5
Payroll Employment	286,900	285,200	1700	284,475	283,776	-699
Household Employment	334,259	336,792	2533	336,798	336,331	-467
Labor Force	347,084	347,335	251	349,421	348,010	-1,411

## Worcester Economic Outlook

Each quarter following the estimation of the Worcester Economic Index a forecast is made concerning the future path of the WEI. This forecast is based on a model that uses past estimates of the WEI in combination with four national leading indicators. Based on data through December 2016, the model currently predicts modest growth over the first half of the new year. As table 3 shows, the December six-month forecast is 1.3%, while the average of the October, November and December forecasts is 1.7%.

Table 3 also shows the growth forecast broken down into its 6 components. The first component is the long-run trend growth of the WEI which is estimated to be about 1.3% on

an annualized basis. Each of the other components in the forecast are shown in table 3 as the amount that they push the WEI above or below trend. The recent slowdown in the WEI is the reason why the December forecast is lower than the fourth quarter average. Recent values of the WEI are included in the forecast model in order to capture short-term trends in the local economy which help improve economic projections.

**Table 3**  
**Breakdown of Projected Growth of WEI<sup>v</sup>**  
**6-month growth forecast, annualized basis**

Component	December 2016	Quarter 4 Average
Trend	1.3%	1.3%
Consumer Expectations	0.1%	0.0%
S&P 500	0.1%	0.1%
Interest Rate Spread	-0.1%	-0.1%
Leading Credit Index™	0.2%	0.1%
WEI	-0.2%	0.4%
<b>Total</b>	<b>1.3%</b>	<b>1.7%</b>

Components may not add to total due to rounding.

The other components of the WEI forecast are making relatively small contributions to the growth estimates. Looking at the fourth quarter averages we see that the S&P 500 and the Leading Credit Index™ are both boosting the forecast by 0.1%. While consumer expectations derived from the University of Michigan Survey of Consumer Sentiments have no real impact on the average forecast.

The one component that is pulling down the WEI forecast is the interest rate spread, which is the difference between the yield on a 10-year Treasury bond and the federal funds rate set by the Federal Reserve. A larger spread indicates a more accommodative monetary policy. In December, the Federal Reserve increased its target for the federal funds rate by 0.25% which represents a tightening of monetary policy. So even though Treasury bond yields have risen over the past several months the interest rate spread is still relatively low for an economy near full-employment and that is why it is has a small negative impact on the forecast.

As always, the forecast for the WEI is based on recent values of four leading economic indicators as well as the WEI itself. Currently, there is a great deal of uncertainty concerning the direction of government policy in the coming year. It appears that the Trump administration and Congress intend to make changes to economic policy that may affect the tax code, tariffs, infrastructure investment, health care, etc. Changes in any of these areas could have a substantial impact on local economic performance.

### Local Leading Indicators

While the forecast of the Worcester Economic Index is based on four national leading indicators it is important to also examine data that is more locally-focused. The three local leading indicators which are followed for this project are: online help-wanted advertisements for the Worcester NECTA, new business incorporations also for the Worcester NECTA, and statewide initial unemployment claims. Table 4 shows how these three leading indicators have performed over the past year. Currently, the three local leading indicators are offering mixed signals for the future direction of the economy.

Continuing its trend throughout 2016, online help-wanted advertisements fell substantially compared to a year ago and therefore this indicator is providing a negative signal at this

time. The number of help-wanted advertisements is a measure of the demand for labor by employers. It is considered a leading indicator of employment because advertisements usually precede hiring so an increase in help-wanted ads may signal additional employment down the road. On a seasonally-adjusted basis the number of online job openings is down over 21% since the fourth quarter of 2015.<sup>vi</sup> Online help-wanted advertisements have also fallen at the national level, down almost 9% since December 2015.<sup>vii</sup> Fewer job openings is a sign that firms are reluctant to hire and therefore is a pessimistic signal for the economy.

**Table 4**  
**Local Leading Indicators**  
**Percentage Change**  
**Quarter 4 2015 to Quarter 4 2016**

Indicator	Percent Change	Signal
Online Help Wanted Ads <sup>vi</sup>	-21.3%	Negative
New Business Incorporations <sup>viii</sup>	9.4%	Positive
Massachusetts Initial Claims <sup>ix</sup>	1.5%	Negative

New business incorporations in the greater Worcester area are providing a positive signal at this time. Compared to a year ago the number of incorporations is up about 9.4%.<sup>viii</sup> An increase in incorporations is considered a positive signal because new businesses may look to hire workers in the near future. While this data series is tracked for its potential as a leading indicator of employment, sometimes it is informative to look at where new business incorporations are taking place. Attached to this report are two maps that show the pattern of business incorporations in the greater Worcester region in 2016.

The final indicator is the number of initial unemployment claims in the Commonwealth of Massachusetts. Compared to the fourth quarter of 2015 initial claims are up 1.5%, so while technically a negative signal the rise in claims is still quite small and is therefore offering only a weak signal at this time.<sup>ix</sup>

To sum up, the Worcester Economic Index (WEI) increased 2.1% in the fourth quarter of 2016. The WEI is expected to grow at 1.3-1.7% over the coming six months. Both national and local leading indicators are providing mixed signals concerning future economic activity.

The next Worcester Economic Indicators report will be issued in early May 2017. Additional information about this project is available at:  
<http://www1.assumption.edu/worcester-economic-indicators-project/>.

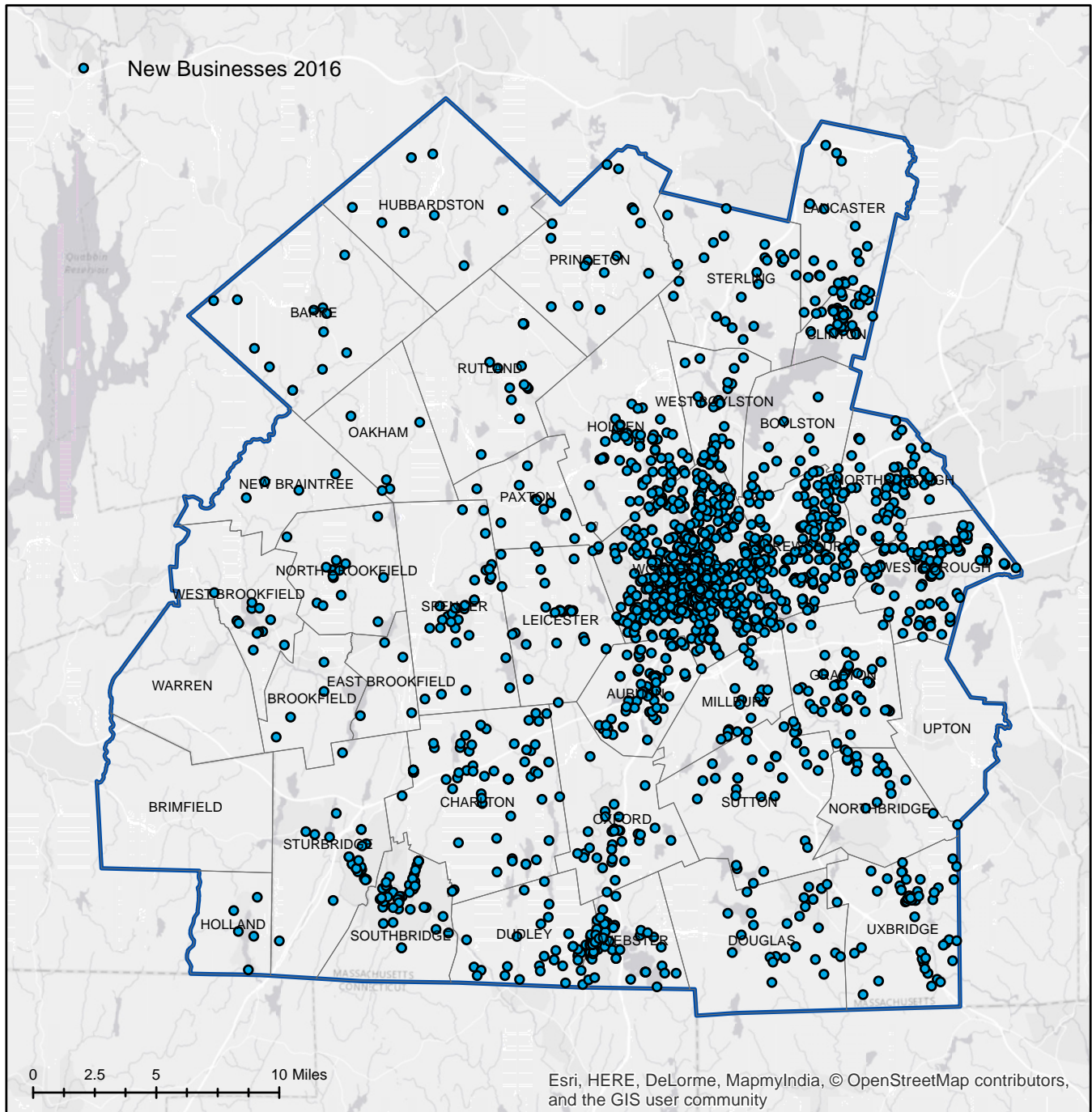
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# New Business Incorporations

The number of new businesses incorporated in the greater Worcester area is tracked each month as a leading indicator of economic activity. As a measure of business formation, new incorporations may anticipate future changes in employment as these new firms begin to hire employees.

In 2016, there were over 2000 new business incorporations in the Worcester region which was an increase of about 19% from 2015. Figure 2 shows the geographic distribution of the 2016 incorporations. Not surprisingly, these new businesses were concentrated in the most densely populated parts of the region, the city of Worcester and the towns of Shrewsbury, Westborough, and Northborough to the east.

**Figure 2: New Business Incorporations**  
Greater Worcester Region, 2016



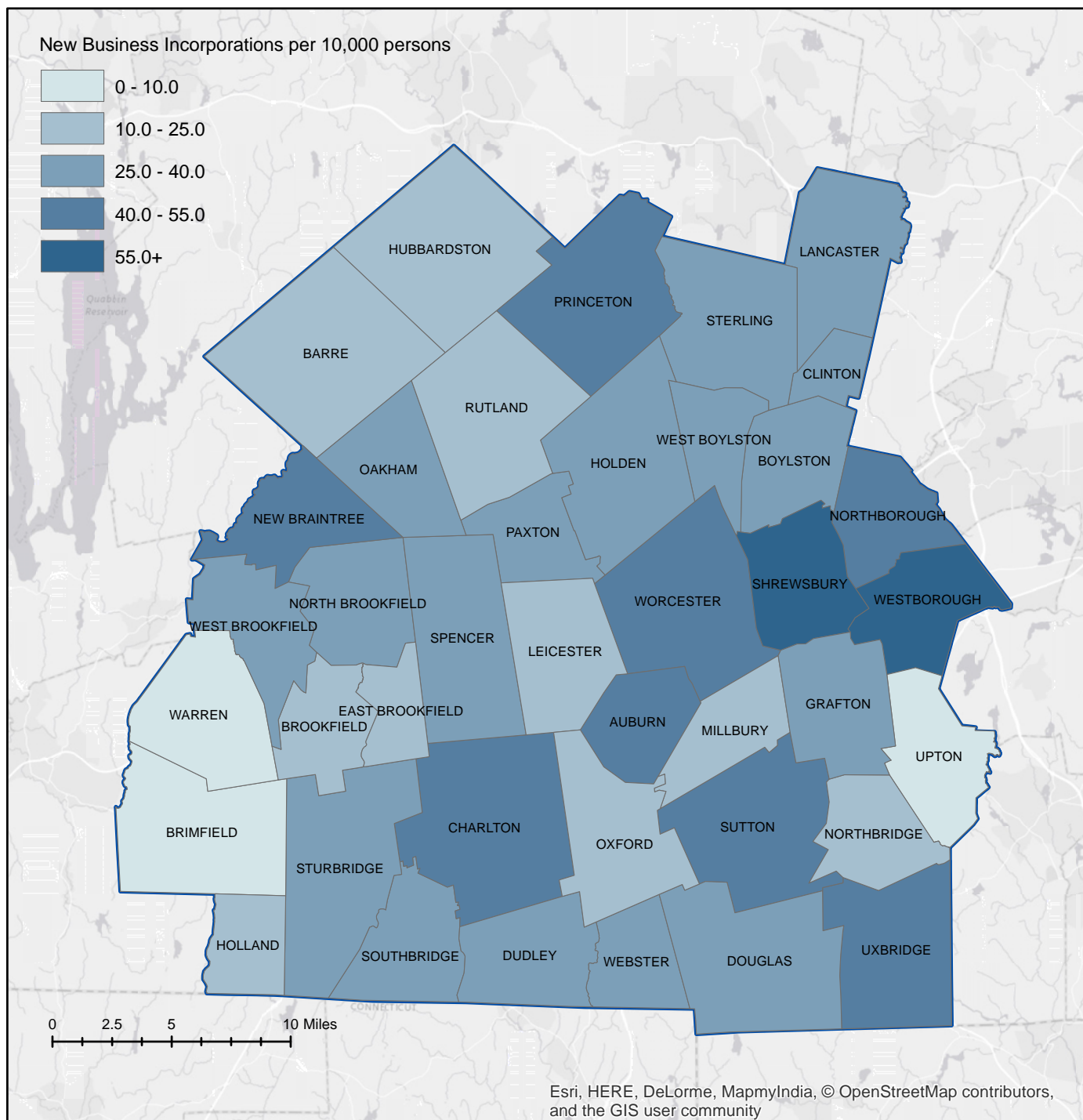


# New Business Incorporations

The geographic distribution of new business incorporations is correlated to population. In 2016, there were over 700 new businesses incorporated in the city of Worcester, far above any other town in the region. However, measured relative to population we find that Shrewsbury and Westborough were the two towns with the highest level of business formation per capita.

The map in figure 3 depicts the number of new businesses incorporated in each town per 10,000 persons. While the per capita distribution is not uniform, there does not seem to be any notable surprises in the 2016 data.

Figure 3: New Business Incorporations per capita  
Greater Worcester Region, 2016



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<sup>i</sup> Author's calculations based on data from the 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 48 surrounding towns located in south central Massachusetts and northeastern Connecticut.

<sup>ii</sup> U.S. Department of Commerce, Bureau of Economic Analysis,  
<http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm>.

<sup>iii</sup> Data obtained from the Bureau of Labor Statistics SAE and LAU databases.

<sup>iv</sup> The not seasonally adjusted BLS data is adjusted for seasonal variation by the author using the X-12 ARIMA program developed by the U.S. Census Bureau.

<sup>v</sup> 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 Index™: 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.

<sup>vi</sup> The Conference Board Help Wanted Online® (HWOL).

<sup>vii</sup> The Conference Board Help Wanted Online® (HWOL).

<sup>viii</sup> Secretary of the Commonwealth of Massachusetts

<sup>ix</sup> 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.