ASSUMPTION COLLEGE
Department of Economics
& Global Studies

Worcester Economic Indicators

Fourth Quarter 2015
This report can be accessed online at:
http://www1.assumption.edu/worcester-economic-indicators-project/

Local Economy Stalls in Fourth Quarter

WEI down, sluggish economy to continue

Worcester Economic Index

The Worcester area economy slowed substantially in the fourth quarter of 2015. Since September, the Worcester Economic Index (WEI) declined at a 0.7% annualized rate due to a weakening labor market. The Worcester Economic Index is estimated using Bureau of Labor Statistics (BLS) data on employment and unemployment for the Worcester metropolitan area (NECTA). According to the BLS Current Population Survey, which surveys households, December employment in the Worcester area was down slightly (-0.1%) from the December 2014 level. While the BLS Current Employment Statistics Survey, which surveys employers, shows employment up by about 2.0% since December 2014. In addition, the Worcester unemployment rate fell over course of the year, from 5.3% in December 2014 to 4.8% in December of 2015.[i]

Figure 1: Worcester Economic Index
January 1990 - December 2015

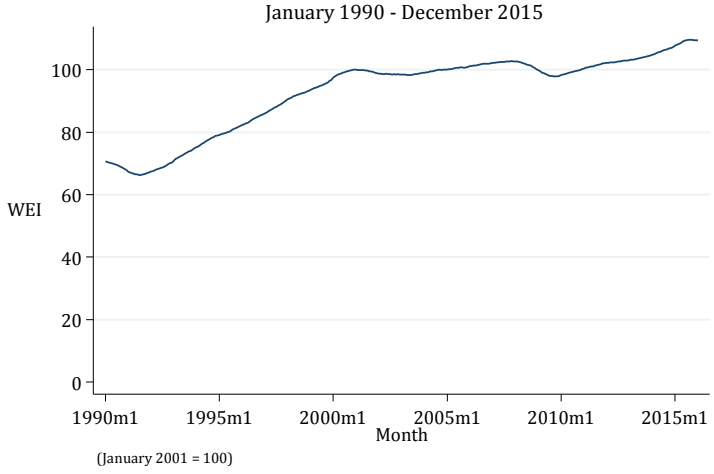

Table 1 shows the Worcester Economic Index over the past 13 months, its month-to-month change, and quarterly growth rate. While the WEI is calculated on a monthly basis it is best not to read too much into changes in any single month, but rather examine how the index has changed over longer periods of time. As the table shows, the WEI was growing well above 3% during the first half of 2015 but slowed down significantly in the latter part of the year. Taken as a whole the WEI increased about 2.0% during 2015 in spite of the weak fourth quarter. In comparison, according to the Bureau of Economic Analysis January 29th news release, U.S. GDP grew at a 1.8% rate in 2015, with the fourth quarter increasing 0.7%.[ii]

According to both BLS surveys employment in the Worcester area increased in the fourth quarter of 2015. However, once seasonal variation is taken into account the picture is less promising. Table 2 shows the not seasonally adjusted BLS values along with seasonally adjusted estimates that are used in the estimation of the WEI. As the table shows, the seasonally adjusted data indicate a smaller increase in the level of employment according to the payroll survey, while the household survey actually shows a decrease in employment during the fourth quarter of 2015. In addition, while the reported unemployment rate was essentially unchanged, the seasonally adjusted unemployment rate actually rose from 4.8% in September to 5.3% in December. Typically, there is an upswing in employment during that last few months of the year as firms hire workers to help with the end-of-the-year holiday season. So while the non-seasonally adjusted data shows employment increasing since September, the increases were less than is typical and therefore the seasonally adjusted data tells a more pessimistic story.[iii] The Worcester Economic Index is based on the seasonally adjusted employment and unemployment data and the fall in the WEI in the fourth quarter is due to the weak labor market which is not apparent in the unadjusted data.

Table 1
Worcester Economic Index (WEI)
December 2014 – December 2015

Month	Worcester Economic Index	Change from previous month	Quarterly Growth Rate, Annualized
December 2014	107.3	0.3	2.8%
January 2015	107.6	0.3	
February 2015	108.0	0.4	
March 2015	108.3	0.3	3.8%
April 2015	108.7	0.4	
May 2015	109.0	0.3	
June 2015	109.3	0.3	3.7%
July 2015	109.5	0.2	
August 2015	109.6	0.1	
September 2015	109.6	0.0	1.1%
October 2015	109.6	0.0	
November 2015	109.5	-0.1	
December 2015	109.4	-0.1	-0.7%

Table 2
BLS Employment Estimates
Worcester NECTA, September-December 2015

	Not Seasonally Adjusted			Seasonally Adjusted		
	September 2015	December 2015	Change Dec-Sept	September 2015	December 2015	Change Dec-Sept
Payroll Employment	282,000	284,800	+2,800	281,246	281,963	+717
Household Employment	328,058	329,149	+1,091	329,969	327,955	-2,014
Unemployment Rate	4.8%	4.8%	0.0	4.8%	5.3%	+0.5

Worcester Economic Outlook

Each quarter following the calculation of the Worcester Economic Index a forecast is made concerning the future path of the WEI. This forecast is based on an econometric model that uses past values of the WEI in combination with four national leading indicators. Based on data through December 2015, the model currently forecasts a fairly stagnant local economy over the coming months. As Table 3 shows, the December six-month growth forecast is -0.3%, while the average of the October, November, and December forecasts is 0.1%.

Table 3 shows the growth forecasts broken down into its 6 components. The forecast builds on the long-run trend growth of the WEI which is estimated to be 1.3% on an annual

basis. Each of the other components in the forecast are expressed in terms of the amount that they push WEI above or below its long-run trend.

Of the four national leading indicators used in the model, two are providing positive signals and two negative. The recent downward trend in the stock market has had the most impact on the WEI forecast. The S&P 500 which as of January 31 was down about 5 percent since the start of the year brought down the most recent WEI forecast by 3 tenths of a percent, but had a smaller impact on the average forecast. The other indicator providing a negative signal was the Index of Consumer Expectations based on the University of Michigan Survey of Consumers, which fell from 87.8 in June to 82.7 in December[v], and therefore brought down the WEI forecast by a tenth of a percent.

Table 3
Breakdown of Projected Growth of WEI[iv]
6-month growth forecast, annualized basis

Component	December 2015	Quarter 4 Average
Trend	1.3%	1.3%
Consumer Expectations	-0.1%	-0.1%
S&P 500	-0.3%	-0.1%
Interest Rate Spread	0.1%	0.1%
Leading Credit Index™	0.2%	0.2%
WEI	-1.4%	-1.2%
Total	-0.3%	0.1%

Components may not add to total due to rounding.

Financial market conditions continue to provide positive contributions to the WEI forecast. The Leading Credit Index™ compiled by The Conference Board each month is a composite of six financial sector variables that are measures of credit market conditions in the United States. Currently, the Leading Credit Index is adding 0.2% to the WEI forecast.

The interest rate spread, which is the difference between the yield on a 10-year Treasury bond and the federal funds rate, is included as a measure of monetary policy. The larger the spread the more growth-oriented the policy. The 0.25% increase in the Federal Reserve's target rate in December was not enough to have much of an impact on the interest rate spread, which continues to provide a small positive contribution to the WEI forecast.

Local Leading Indicators

The above forecast for the Worcester Economic Index is based on national leading indicators of economic activity. As a supplement to this forecast it is helpful to look at several data series that are more locally-based. The three 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. Currently, all three of these indicators are providing positive signals for future economic performance.

The number of online 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 and therefore an increase in help-wanted ads may signal additional employment down the road. The Conference Board's Help Wanted Online Data

Series® totals the number of unique advertised job openings from thousands of online job-boards. The data shows that over the past year there has been a modest increase in the number of online advertisements for Worcester area employment. As table 4 shows, on a seasonally-adjusted basis the number of online job openings is up about 1.7% in the fourth quarter of 2015 compared to the fourth quarter of 2014.[vi] More job openings suggests additional hiring and is therefore a positive signal for the local economy.

Table 4
Local Leading Indicators
Percentage Change from 4th Quarter 2014

Indicator	Percent Change	Signal
Online Help Wanted Ads[vi]	1.7%	Positive
New Business Incorporations[vii]	21.9%	Positive
Massachusetts Initial Claims[viii]	-13.0%	Positive

New business incorporations is the second indicator providing a positive signal at this time. Compared to the fourth quarter of 2014, the number of incorporations is up almost 22%.[vii] An increase in incorporations is considered a positive signal because new businesses may look to hire workers down the road. 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 2015.

The final indicator is the number of initial unemployment claims in the Commonwealth of Massachusetts. Since the fourth quarter of 2014 initial claims are down about 13% statewide. This is a positive signal because it implies fewer people are being laid-off and forced to apply for unemployment compensation. The number of initial claims in December was 42,487 (not seasonally adjusted) which was substantially less than December 2014 when initial claims totaled 48,839.[viii]

To sum up, the Worcester Economic Index (WEI) fell -0.7% in the fourth quarter of 2015. The WEI is not expected to grow appreciably over the next six months, with the model predicting growth in the -0.3% to 0.1% range. However, all three local leading indicators are currently providing positive signals about the future direction of the economy.

The next Worcester Economic Indicators report will be issued in early May 2016. Additional information about this project is available at: http://www1.assumption.edu/worcester-economic-indicators-project/.

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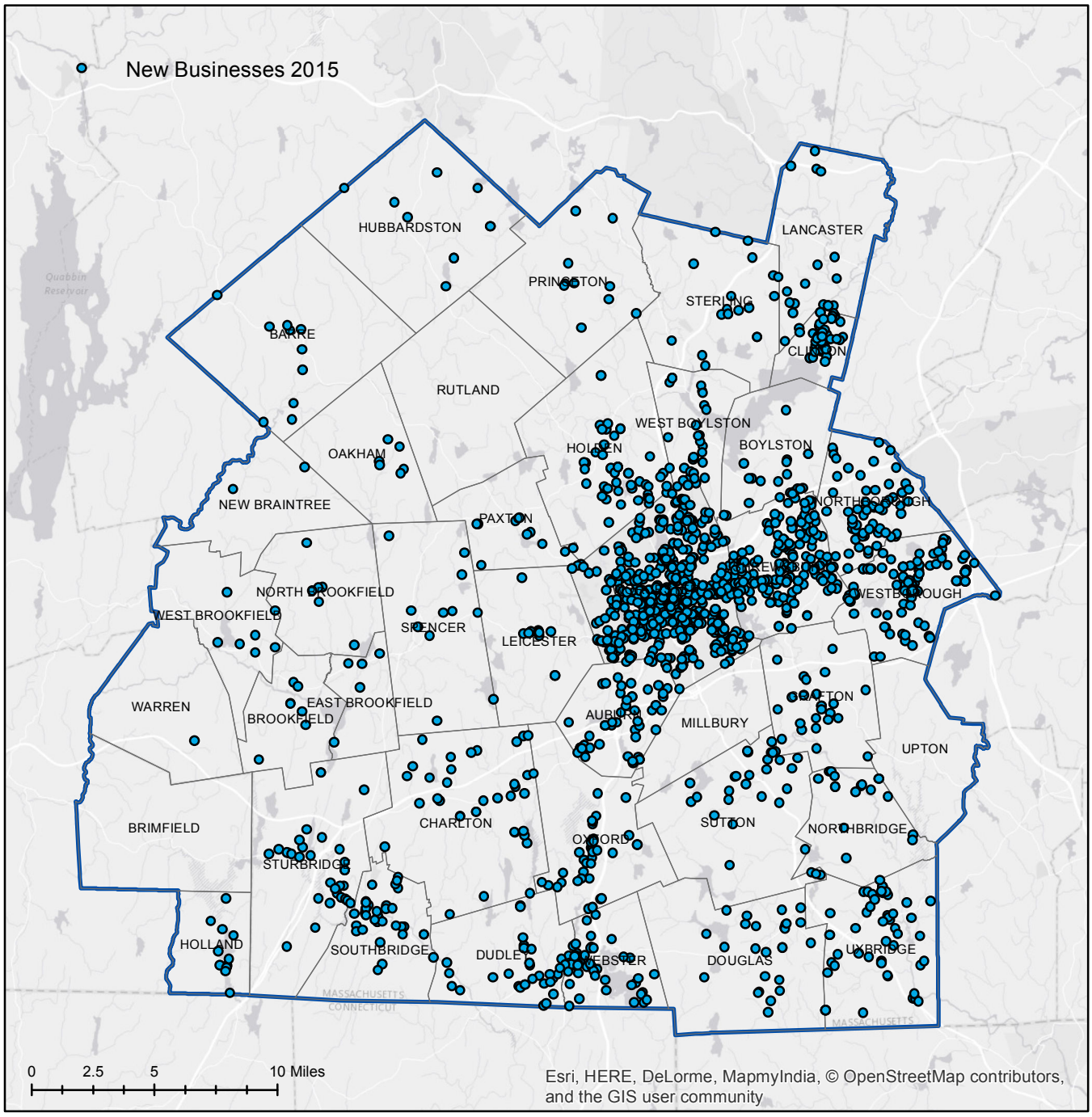
New Business Incorporations

One of the local leading indicators regularly tracked as part of this report is the number of new business incorporations in the Worcester region. As a measure of business formation, incorporations data is considered a leading indicator because an increase in incorporations may lead to an increase in employment in the future as those new firms begin to hire.

In 2015, there were over 1700 new business incorporations in the greater Worcester area. Figure 2 shows how these incorporations were spread across the region. Not surprisingly, new buiness incorporations were concentrated in the city of Worcester but the map shows some other pockets of activity as well.

Figure 2: New Business Incorporations

Greater Worcester Region, 2015

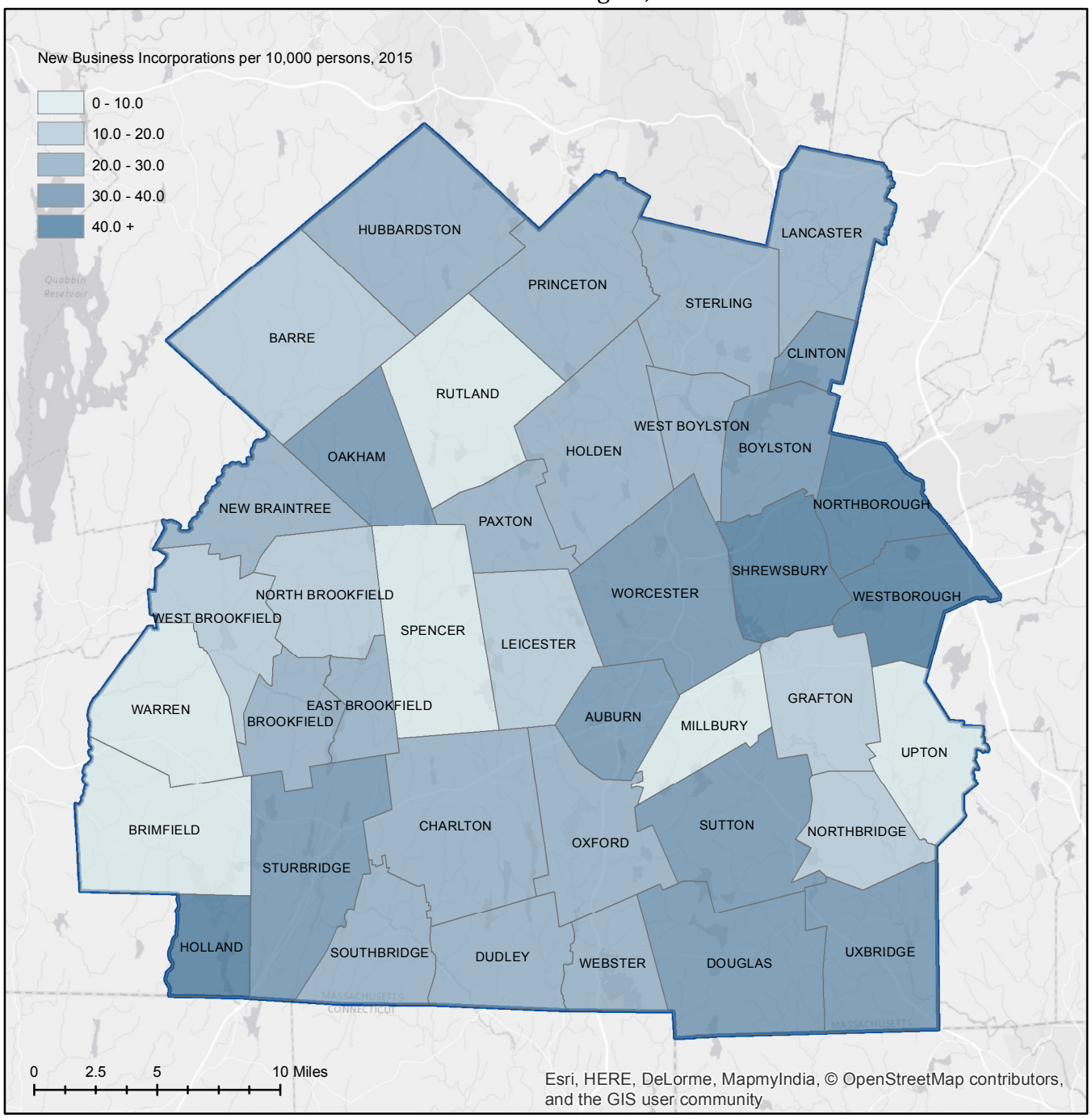


New Business Incorporations

The concentration of new business incorporations around the city of Worcester is largely due to greater population density in that area. In order to account for population differences Figure 3 shows the number of incorporations per 10,000 persons for each town in the region.

This map shows that in 2015 the towns to the east of Worcester along routes 9 & 20 along with Holland to the southwest had the highest rates of business formation per capita.

Figure 3: New Business Incorporations
per 10,000 persons
Greater Worcester Region, 2015



[i] 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.

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

[iii] The BLS data is seasonally adjusted by the author using the X-12 ARIMA program developed by the U.S. Census Bureau.

[iv] 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.

[v] University of Michigan, Survey of Consumers, http://www.sca.isr.umich.edu/

[vi] The Conference Board Help Wanted Online® (HWOL).

[vii] Secretary of the Commonwealth of Massachusetts

[viii] 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.