

TO: Lisa Katz, Executive Director

FROM: Colby Spencer Cesaro, Sr. Director for Research and Strategy

MEMO: Phase 3 preliminary findings for WIN's hiring and posting analysis, county-by-county

This memo summarizes preliminary findings from WIN's analysis of the predictive nature of job postings on hiring for a portion of the 3<sup>rd</sup> phase of research.

## Data

WIN succeeded in purchasing job posting data from Burning Glass Technologies in late August of 2016. This contract for data comes eight months after discussions of a data purchase resumed. The data received are not comparable to job posting data previously gathered by WIN. Burning Glass Technologies updated their algorithms and data parser in April 2016 causing a retroactive change in the historical data as well as a shift moving forward. Because of this, the WIN team waited to receive the full data set until the update was made so that the data in this analysis would be as up-to-date as possible.

## Process

Since receiving the data, the WIN team ran county-by-county analysis for several southeast Michigan counties including, Genesee and Shiawassee (these are combined), Jackson, Macomb, Monroe, Oakland, Washtenaw, and Wayne. The amount of data for other counties in the WIN partnership region is too small or variable to be useful in the analysis. The team is still working on an industry-by-industry analysis as well as industry-by-county analysis.

The findings for the current county-by-county analysis follow.

## Findings

### All Hires

On average, between quarter one 2011 and quarter two 2015, each online job ad resulted in 2.37 hires during the subsequent quarter. This coefficient is statistically significant. The overall model is statistically significant but each county is different. Note that each county on its own has fewer observations than the overall model. Thus, the data may not be adequate for predictive power.

### Predictive Power of Postings on All Hires

The variation in hiring that is explained by postings, in addition to the statistical significance of the coefficient relating postings to hires, shows the predictive power of postings. For example, the overall model has an R-squared of 66.27 percent. This means that 66.27 percent of the variation in hiring each quarter is explained by job postings. The other 33.73 percent is explained by other factors. These could include inflation, weather, purchasing behavior, and other factors.

For the counties without statistically significant results for all hires, the percentage of variation in hiring is dramatically smaller than the geographies for which postings have predictive power.

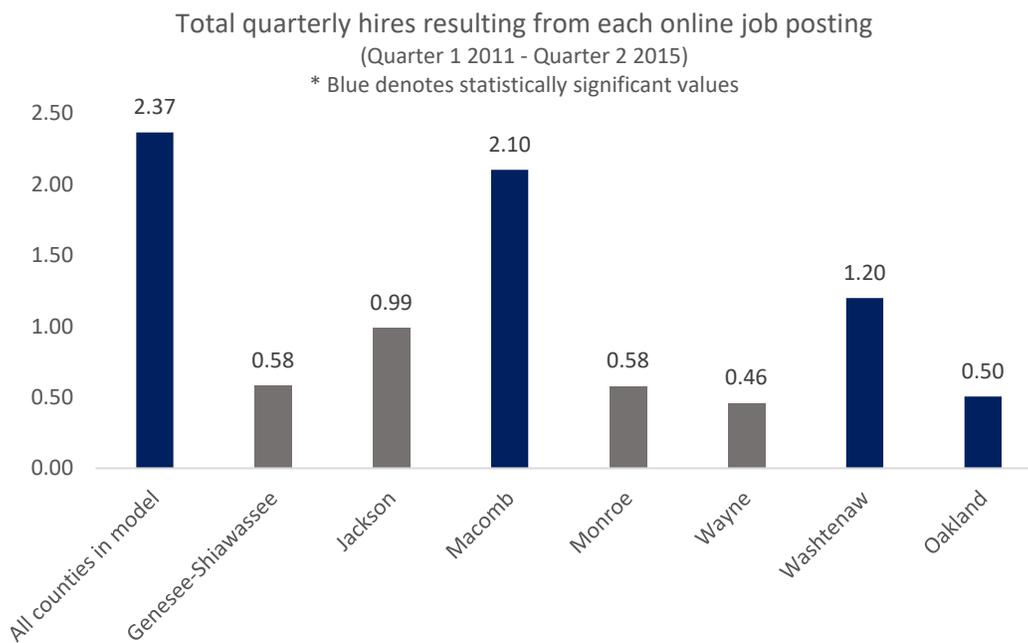
The results of the "All Hires" analysis can be found in Table 1 and Figure 1 following.

Table 1. Coefficients for and significance of relationship of postings on hiring, Q1 2011 – Q2 2015

Geography	MODEL	Each New Job Posting Results in "X" Hires	Statistically Significant at 95% level?	Percentage of Variation in Hiring Explained by Postings
<b>All counties in model</b>	All Hiring	2.365921	YES	66.27%
<b>Genesee-Shiawassee</b>	All Hiring	0.5830192	NO	4.10%
<b>Jackson</b>	All Hiring	0.9907776	NO	2.61%
<b>Macomb</b>	All Hiring	2.102093	YES	21.95%
<b>Monroe</b>	All Hiring	0.578502	NO	-0.95%
<b>Wayne</b>	All Hiring	0.4605918	NO	1.25%
<b>Washtenaw</b>	All Hiring	1.198762	YES	26.40%
<b>Oakland</b>	All Hiring	0.5049566	YES	24.91%

Data: Burning Glass Technologies, QWI  
 Analysis: Workforce Intelligence Network

Figure 1. Coefficients for relationship of postings and hiring, Q1 2011 – Q2 2015



Data: Burning Glass Technologies, QWI  
 Analysis: Workforce Intelligence Network

### New Hires

For the counties analyzed, each quarterly job posting results in 1.93 new hires in the subsequent quarter. Job postings explain 68.37 percent of the variation in new hires among employers in the analysis area. The geographies with statistically significant results from the “all hires” analysis, also had statistically significant results for the “new hires” analysis. One county, Jackson, had a coefficient for new hires (1.2 new hires per job posting in a quarter) that was significant at the 90% level, meaning that there is 90% confidence that the

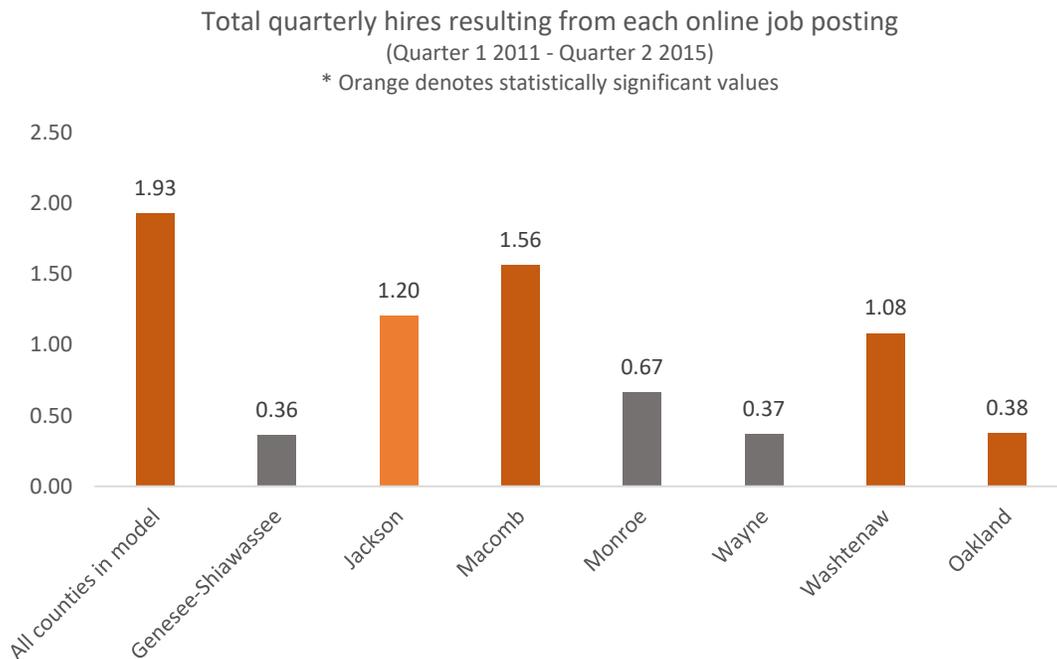
coefficient in accurate. While this does not align with the standard statistical acceptance of 95% confidence, it is still a strong enough relationship to warrant noting.

Table 2. Coefficients for and significance of relationship of postings on new hires, Q1 2011 – Q2 2015

Geography	MODEL	Each New Job Posting Results in "X" NEW Hires	Statistically Significant at 95% level?	Percentage of Variation in Hiring Explained by Postings
<b>All counties in model</b>	New Hires	1.9263660	YES	68.37%
<b>Genesee-Shiawassee</b>	New Hires	0.3621066	NO	10.40%
<b>Jackson</b>	New Hires	1.2049690	NO, 90%	16.21%
<b>Macomb</b>	New Hires	1.5612700	YES	48.66%
<b>Monroe</b>	New Hires	0.6664067	NO	7.98%
<b>Wayne</b>	New Hires	0.3670500	NO	4.42%
<b>Washtenaw</b>	New Hires	1.0819060	YES	36.92%
<b>Oakland</b>	New Hires	0.3780529	YES	28.40%

*Data: Burning Glass Technologies, QWI  
Analysis: Workforce Intelligence Network*

Figure 2. Coefficients for relationship of postings and new hires, Q1 2011 – Q2 2015



*Data: Burning Glass Technologies, QWI  
Analysis: Workforce Intelligence Network*

## Findings and Next Steps

1. In southeast Michigan, online job postings can explain two-thirds or more of hiring behavior one quarter after the posting occurs. Online job postings have predictive power for hiring.
  - a. Next steps include analyzing other factors that affect hiring to strengthen the predictive power of the model.
2. Between quarter one 2011 and quarter two 2015, each online job ad from the previous quarter resulted in 2.37 hires by southeast Michigan employers 1.93 of which were new hires. This is a ratio of 1 posting to 2.37 hires or 1 posting to 1.93 new hires.
  - a. Industry-by-industry analysis will follow this to see how the results shift depending on the type of employer.
3. While the region shows statistical significance in the connection between postings and hiring, smaller geographies vary in their level of significance. This may be due to the amount of data available to-date for each county, or the extreme variation in hiring behavior by employers in certain counties. The R-squared, or percentage of variation in hiring explained by the model, varies widely for each county. In some cases, postings explain very little hiring behavior.
  - a. Industry-by-industry analysis along with adding additional variable into the model will likely bring clarity to this issue.
4. Postings have predictive power but only for certain geographies and labor markets. The larger the geography/market, the more likelihood that online job ads can have predictive power for hiring behavior.