Assessing the Relationship Between Online Job Postings and Total Hires and Education Levels in Arizona

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Help Wanted Online (HWOL)

- HWOL data series from the Conference Board primarily consists of online job postings by occupation
- These job postings are compiled from internet job boards, company websites, and newspapers using spidering technology. Examples of websites:
  - Monster
  - CareerBuilder
  - Employer Job Boards
  - Government Job Boards
- Postings collected at regular frequency and de-duplication logic applied. Continuously updated
- Data are parsed to produce information on hiring requirements including education, experience, skills, and certifications
- A useful resource to assess current online job posting trends, new and emerging occupations, and their skill requirements
- Geographically comprehensive (State, MSA, County)

Longitudinal Employment Dynamics

- Provides labor market information (LMI) statistics by industry
- LMI data collected from establishment universe quarterly
- Unemployment insurance covered employment and wages by industry
- Worker demographics collected includes age, sex, race, ethnicity, educational attainment, and place of residence
- Variety of data sources used for worker demographics such as, administrative records, Social Security data, Federal tax records, and other census and survey data
- Six month lag in the data
Employment and Population Statistics

Hiring activity in Arizona gradually picking up post-recession

Total Hires by Quarter and Year

Source: U.S. Census Bureau; Local Employment-Household Dynamics program

*Total hires measures total accessions, i.e., new hires plus recalls
Online Ad postings picking up at a faster pace than total hires post-recession

Source: Conference Board; Help Wanted Online Data Series
Over-the-year growth in online ads outpaced total hires

Over-The-Year Percent Change in Total Hires

Over-The-Year Percent Change in Online Ads
Arizona Hiring activity greater in 4th quarter and lowest in the 1st quarter

Percent Total Hires by Quarter and Year

Source: U.S. Census Bureau; Local Employment-Household Dynamics program
Fewer Ads in the 1st quarter compared to the rest of the year.

Source: U.S. Census Bureau; Local Employment-Household Dynamics program.
From 2009 to 2013Q3 Online Ads accounted for roughly half the hires.

2009 to 2013Q3 average
Total Hires: 427,709
Online Ads: 216,680

Source: U.S. Census Bureau; Local Employment-Household Dynamics program
Conference Board; Help Wanted Online Data Series
Total Hires Greater Than Online Ads

Source: U.S. Census Bureau; Local Employment-Household Dynamics program Conference Board; Help Wanted Online Data Series
Greater internet access, fluency, and familiarity, possible improvement in deduplication logic, reduced cost, etc. may be contributing to the declining ratio.

Source: U.S. Census Bureau; Local Employment-Household Dynamics program; Conference Board; Help Wanted Online Data Series
Largest gap between hires and online ads in the 4th quarter most likely due to a higher concentration of seasonal hires not necessarily requiring an online ad.
Scatter plot of total hires Vs online Ads

Total_Hires versus Online_Ads (with least squares fit)

Y = 1.14e+005 + 1.81X

Employment and Population Statistics
Do Online Job Ads Predict Hiring?

Cochrane-Orcutt, using observations 2005:4-2013:3 (T = 32)
Dependent variable: Total_Hires
\[ \rho = 0.80576 \]

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<thead>
<tr>
<th></th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-ratio</th>
<th>p-value</th>
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Statistics based on the rho-differenced data:

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<th>Value</th>
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Total Hires = 96,948.2 + 1.65327 Online Ads + e
Education Categories

Local Employment Household Dynamics

Five educational sub-categories:
• Less than high school
• High school or equivalent, no college
• Some college or Associate degree
• Bachelor's degree or advanced degree
• Educational attainment not available (workers aged 24 or younger)

Help Wanted Online

Eight educational sub-categories:
• Less than high school
• High school diploma or equivalent
• Some college, no degree
• Postsecondary non-degree award
• Associate's degree
• Bachelor's degree
• Master's degree
• Doctoral or professional degree
Employment and Population Statistics

Proportion of All Hires by Education Category

- Less than high school
- Some college or Associate degree
- High school or equivalent, no college
- Bachelor's degree or advanced degree
- Educational attainment not available (24 or younger)

Source: U.S. Census Bureau; Local Employment-Household Dynamics program
Educational Attainment by Age
2012 ACS 3-year estimates

- Population 18 to 24 years
- Population 25 years and over

<table>
<thead>
<tr>
<th>Educational Level</th>
<th>Population 18-24</th>
<th>Population 25+</th>
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</thead>
<tbody>
<tr>
<td>Less than high school graduate</td>
<td>18.7%</td>
<td>14.3%</td>
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<tr>
<td>High school graduate or equivalent</td>
<td>30.3%</td>
<td>24.6%</td>
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<tr>
<td>Some college or associate's degree</td>
<td>44.6%</td>
<td>34.4%</td>
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<tr>
<td>Bachelor's degree or higher</td>
<td>6.5%</td>
<td>26.7%</td>
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Source: U.S. Census Bureau, American Community Survey
All Hires by Education Category
Aged 25 and Older

- Less than high school
- High school or equivalent, no college
- Some college or Associate degree
- Bachelor’s degree or advanced degree

Source: U.S. Census Bureau; Local Employment-Household Dynamics program
Total Ads by Education Category

- Less than high school
- High school or equivalent, no college
- Some college or Associate degree
- Bachelor's degree or advanced degree

Source: Conference Board, Help Wanted Online Data Series
Employment and Population Statistics

Over the Year Change by Education Category

All Hires (LEHD)

Total Ads (HWOL)

Sources: U.S. Census Bureau, Local Employment-Household Dynamics program & Conference Board, Help Wanted Online Data Series
Over the Year Percent Change, All Education Categories

Hires are Aged 25 and Older

- Total Ads (HWOL)
- All Hires (LEHD)
All Hires by Education Category
Aged 25 and Older

- Less than high school
- High school or equivalent, no college
- Some college or Associate degree
- Bachelor’s degree or advanced degree

Source: U.S. Census Bureau; Local Employment-Household Dynamics program
Employment and Population Statistics

All Hires (LEHD) vs. Total Ads (HOWL)
Hires are Aged 25 and Older

Average 2012:Q4 through 2013:Q3

- Less than high school: 32.5%
- High school or equivalent, no college: 27.7%
- Some college or Associate degree: 18.3%
- Bachelor's degree or advanced degree: 36.5%

Sources: U.S. Census Bureau, Local Employment-Household Dynamics program & Conference Board, Help Wanted Online Data Series
Employment and Population Statistics

Sources: U.S. Census Bureau, Local Employment-Household Dynamics program & Conference Board, Help Wanted Online Data Series
# All Hires Aged 25 and Older

Cochrane-Orcutt, using observations 2005:4-2013:3 (T = 32)

Dependent variable: All Hires  
rho = 0.711248

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Statistics based on the rho-differenced data:

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<td>rho</td>
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<td>Durbin-Watson</td>
<td>2.222030</td>
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## Employment and Population Statistics

### All Hires Aged 25 and Older

#### Less than high school

**Yule-Walker Estimates**

| Parameter | Estimate  | Error  | t Value | Pr > |t| |
|-----------|-----------|--------|---------|------|---|
| Intercept | 57169     | 21945  | 2.61    | 0.0142 |
| E1_ads    | 0.8455    | 0.8791 | 0.96    | 0.3439 |

#### High school or equivalent, no college

**Yule-Walker Estimates**

| Parameter | Estimate  | Error  | t Value | Pr > |t| |
|-----------|-----------|--------|---------|------|---|
| Intercept | 42687     | 22629  | 1.89    | 0.0690 |
| E2_ads    | 0.6603    | 0.2466 | 2.68    | 0.0119 |

#### Some college or Associate degree

**Yule-Walker Estimates**

| Parameter | Estimate  | Error  | t Value | Pr > |t| |
|-----------|-----------|--------|---------|------|---|
| Intercept | 37317     | 28035  | 1.33    | 0.1932 |
| E3_ads    | 1.7040    | 0.5915 | 2.88    | 0.0073 |

#### Bachelor's degree or advanced degree

**Yule-Walker Estimates**

| Parameter | Estimate  | Error  | t Value | Pr > |t| |
|-----------|-----------|--------|---------|------|---|
| Intercept | 51402     | 27161  | 1.89    | 0.0681 |
| E4_ads    | 0.3022    | 0.3286 | 0.92    | 0.3651 |
Office of Employment and Population Statistics
Arizona Department of Administration

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