

## Help Wanted OnLine® Technical Note

### Background

The Conference Board *Help Wanted OnLine® (HWOL)* program measures the demand for labor in the United States using advertised online job vacancies. HWOL utilizes millions of individual job ads collected in real-time from thousands of online job boards to deliver a comprehensive and robust measure of labor demand. It is one of the earliest published monthly indicators of economic activity in the previous month, with data publication centered around the first of each month.

The HWOL program first published the *Help Wanted OnLine® (HWOL) Data Series* in July 2005, providing users with a data series of total and new online job ads. The program revised the HWOL Data Series and launched the *Experimental Help Wanted OnLine® (HWOL) Index* in December 2018.

### Description

The *Experimental Help Wanted OnLine® Index* measures changes over time in advertised online job vacancies. It reflects monthly trends in employment opportunities across the US. Ads are collected in real-time from different online job boards and are deduplicated across all in-scope job boards to create the HWOL universe of online job ads. The number of total unique job ads from the HWOL universe are aggregated every month to create the HWOL Data Series.

The Experimental HWOL index is designed for the specific purpose of providing a robust time series for measuring changes in labor demand over time. It improves upon the HWOL Data Series' ability to assess local labor markets trends by reducing volatility and non-economic noise and improving correlation with local labor market conditions.

A complete time series of the Experimental HWOL Index is published at the national level, complemented by comparable measures of labor supply (unemployment rate) and employment from the Bureau of Labor Statistics (BLS). Index levels and percent changes are also published by Census Division, state, Metropolitan Statistical Area (MSA), 2-digit SOC occupation, and 2-digit NAICS industry. Indexes do not measure differences in the number of ads among geographies. The current month's level of total ads from the HWOL Data Series is published for each geographic area as a measure of relative size.

### Methodology

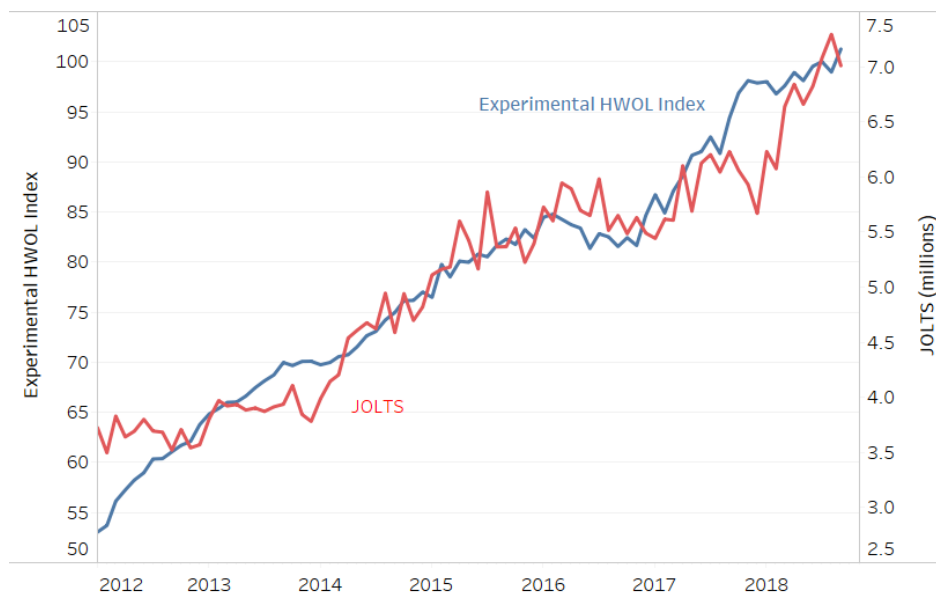
The HWOL program uses data collected in real-time (by CEB, Inc.) from over 28,000 online job sources including traditional job boards, corporate boards, and social media sites to create the HWOL universe of online job ads. Job boards that are aggregators (i.e. only scrape ads from other sources, including corporate boards, and provide no unique ads) are identified and removed from active collection to eliminate a major source of duplicate ads. Ads from staffing firms have proven to be exceptionally problematic due to their volatility and ineffectiveness in signaling actual hiring trends, and therefore are

excluded from the HWOL universe of job ads. Every month, the number of unique job ads from the universe are aggregated to create the HWOL Data Series total ads and new ads level.

The Experimental HWOL Index aggregates month-to-month changes in the number of ads posted within each ad source from the HWOL universe, and excludes the ads contributed by new boards in each period. The Experimental HWOL Index is based on a dynamic panel of sources which is redefined each month. Ads specifically from job boards that experience unusually large movements in the previous month may be excluded to reduce the impact of non-economic noise. Anonymous ads with an unknown employer are excluded to ensure reliability of trends. The result is an index that is highly correlated with local labor market trends. The Experimental HWOL Index is published in preliminary form and subject to monthly revisions and an annual revision.

### Reliability of Estimates

At the national level, The Experimental HWOL Index tracks well with the leading measure of job openings from the BLS Job Openings and Labor Turnover Survey (JOLTS). The Experimental HWOL Index is smoother than JOLTS, with less volatility in measuring employment opportunities across the country.



Source: The Conference Board, Bureau of Labor Statistics

The HWOL program includes most online job ads and aims to capture a universe count and is not subject to the typical sampling error and non-response error components associated with most statistical surveys. The non-sampling error sources for the HWOL program would include population under-coverage due to missing a portion of the targeted population (e.g. a large Internet job source) and over-coverage due to the inability to fully eliminate duplicate ads from survey estimates. Additional potential

sources of non-sampling error would include occupational and/or geographic coding errors which could affect the proper classification of individual ads.

## Data Coverage

**Collection.** All online advertised vacancies posted directly on internet job boards are targeted to create the HWOL universe. The HWOL program uses data collected from online job sources including traditional job boards, corporate boards, and social media sites to create a universe of online job ads. Direct collection from corporate boards (i.e. employer-specific career sites) are an important, reliable, and stable source of online job postings and are now included since the December 2018 revision. New job board sources are added during the annual revision after a vetting process while some existing sources may be dropped if deemed unreliable.

Internet job sources that are aggregators (i.e. only scrape ads from other sources, including corporate boards, and provide no unique ads) are identified and removed from active collection to eliminate a major source of duplication in counting online ads. New job sources are identified using independent research and recommendations from industry sources across the US. This process results in updates to the HWOL program during the annual revision. Job sources that cover smaller niche markets are also included in the HWOL program; however, smaller local job sources in an area with a limited number of ads may not be targeted for collection. Ads from staffing firms have proven to be exceptionally problematic due to their volatility and ineffectiveness in signaling actual hiring trends, and therefore are excluded from the HWOL program.

**Reference Period.** The HWOL program uses a mid-month survey reference period. Data is aggregated from the 14<sup>th</sup> of the previous month to the 13<sup>th</sup> of the current month. This reference period is aligned to the BLS unemployment “job search” time period to provide a more accurate comparison of labor supply and labor demand in the US economy.

**Deduplication.** Data in the HWOL program series reflect deduplicated ads. A major issue in producing estimates of the actual level of advertised vacancies for a geographic area is the elimination of duplicate ads. There is a significant amount of ad-scraping across job sources, and there are large nationwide job boards that contain only scraped ads. The HWOL program first identifies job boards that are only aggregators of ads from other job sources and eliminates these from active collection. Any remaining duplicate ads across all in-scope HWOL job boards are eliminated from published estimates. This process significantly limits the level of potential duplicates in the final estimates, reducing the count of overall ads collected from over 10 million ads to over 5.3 million ads after deduplication.

**Occupational coding.** The HWOL program uses the Office of Management and Budget (OMB) Standard Occupational Classification (SOC) Manual to assign an occupational code to each ad. Occupational coding is done at the 6-digit SOC level and the 8-digit O\*Net level using autocoder software selected by The Conference Board for its accuracy. The Conference Board periodically updates the O\*Net classification of HWOL data and reclassifies the entire HWOL database of ads with each new OMB revision to the SOC manual.

**Industry coding.** The HWOL program uses the Office of Management and Budget (OMB) North American Industry Classification System (NAICS) to classify ads by industry.

**Area coding.** The area coding for an ad is determined first by the location cited in the text of the ad itself; approximately 93% of all ads are coded to a county/city level. Of the remaining ads, approximately 5% are coded as “Statewide” with 2% coded as “nationwide” ads; nationwide ads would appear in the national total but not in any regional, state, or metropolitan area totals.

**Estimation.** All HWOL level counts are produced as a direct sum of the city counts (i.e. a county total is a sum of the cities contained within the county). There are two exceptions: the State counts, which also include “Statewide ads” (i.e. ads which are only posted at the State level —approximately 2% of total ads), and the US counts, which include both Statewide ads along with “Nationwide ads” (i.e. ads which are only posted at the US level—approximately 5% of total ads).

## Definitions

**Job boards.** The HWOL program includes traditional job boards (employment websites), corporate boards (i.e. employer-specific career sites), and social media sites that collect online job ads. Job boards that are aggregators (i.e. only scrape ads from other sources, including corporate boards, and provide no unique ads) are removed from the HWOL universe of online job ads.

**New ads.** New ads are all unduplicated ads which did not appear in the previous reference period. An ad is counted as “new” only in the month it first appears.

**Total ads.** Total ads are unduplicated ads appearing in the reference period. This figure includes both new ads and ads reposted from the previous month.

**Supply/Demand Rate.** The supply/demand (S/D) rate is the number of unemployed divided by the number of advertised vacancies (i.e. the number of unemployed per advertised vacancy).

**Regional data.** Regions are as defined by the U.S. Census Bureau.

**Metropolitan area data.** The Conference Board uses the 2015 Office of Management and Budget (OMB) county-based MSA definitions for the HWOL data; however, the BLS unemployment program uses the OMB alternative NECTA (New England Cities and Town Area) MSA definition.

**Occupational data.** Occupational data use the 2010 OMB Standard Occupational Classification (SOC) system. All ads are coded to the 6-digit SOC level and 8-digit O\*Net level. National data in the monthly release are at the 2-digit major occupational group level.

**Industry data.** Industrial data use the 2015 North American Industry Classification System (NAICS) system. All ads are coded to the 6-digit NAICS level. National data in the monthly release are at the 2-digit major industrial group level.

**Unemployment data.** The unemployment and labor force data used in this release come from the BLS Current Population Survey (CPS) and the Local Area Unemployment Statistics (LAUS) program. Taken together, both programs provide a timely and accurate profile of labor force information for the nation and all major levels of geographic detail.

**BLS Job Openings Data.** The BLS publishes monthly job openings data from its Job Openings and Labor Turnover Survey (JOLTS). This program provides a broad national picture of hiring activity, which includes openings, hires and separations.

**Seasonal Adjustment.** The HWOL program uses the Census Bureau's X-12 seasonal adjustment software to annually update the seasonal adjustment factors for each of the publication time series. The new seasonally adjusted series are released with the publication of each year's January data.

**HWOL Annual Revision.** With the December 2018 press release, the HWOL program has incorporated its annual revision, which helps ensure the accuracy and consistency of the HWOL time series. This year's annual revision includes updates to the job board coverage, a revision of the historical data from January 2012 forward, and an update of the seasonal adjustment factors.

The underlying data for The Conference Board HWOL Program is collected by CEB, Inc.