

Smaller Firms Outpace Larger Ones in Applications to Technology-Oriented Jobs

This edition of *DHI Hiring Indicators* reports new statistics on vacancy posting durations and applications per posting by firm size for technology-oriented jobs covered by the **DHI Vacancy and Application Flow Database**. It also draws on the **Job Openings and Labor Turnover Survey (JOLTS)** to present updated statistics on mean vacancy duration and recruiting intensity per vacancy for the U.S. economy, with breakdowns by industry, region, establishment size and firm size.

Section I contains highlights. Section II draws on the **DHI Database** to compare application flows and posting durations across smaller and larger firms. Section III draws on the **JOLTS** to present statistics on vacancy durations and recruiting intensity per vacancy, as well as other indicators of labor market tightness. Section IV provides additional information about the *DHI Hiring Indicators* and DHI Group, Inc. A separate Excel file contains monthly time-series data for statistics discussed in this report and a large set of additional statistics.

I. Highlights

1. The **DHI-DFH Mean Vacancy Duration Measure** for the U.S. economy fell to 28.4 working days in October 2017.
2. Turning to the technology-oriented jobs covered by the **DHI Database**, smaller firms outpace larger ones in attracting applications for job openings. In 2017, firms with 1-19 employees attracted about 15 applicants per vacancy posting on average, as compared to 12 applicants for firms with 500-999 employees and 6 applicants for those with 10,000 or more employees.
3. Smaller firms began attracting more applicants after DHI enhanced the applicant-side search functionality of its Dice.com platform in December 2014. At the same time, DHI also made it possible for employer-side clients to signal registered jobseekers, encouraging an application. These improvements in platform functionality appear to be especially valuable for smaller employers.
4. Jobs in the DHI Database typically require hard skills, e.g., computer-programming skills. They are concentrated in technology sectors, software development, other computer-related occupations, engineering, financial services, and certain other professional occupations. Thus, patterns pertaining to firm size in the **DHI Database** may not hold for other types of jobs.

“Contrary to the longstanding view that larger firms offer the most desirable jobs, smaller firms outpace larger ones in attracting applicants for technology-oriented jobs,” said Dr. Steven Davis, Distinguished Service Professor of Economics at the Chicago Booth School of Business and Senior Fellow at the Hoover Institution. “Recent advances in the search functionality of job boards make it easier for smaller firms to attract applicants.” Davis is a co-developer of the DHI Database and co-creator of the DHI-DFH Mean Vacancy Duration Measure.

“While not as strong as prior years, tech hiring was among the star players of the job creation game in 2017, which I anticipate will continue into 2018,” said Michael Durney, President and CEO of DHI Group, Inc. “As

companies build out their tech infrastructure next year and source candidates to create innovative products, those employers who keep a pulse on salary and skill trends will be best equipped to offer ideal roles to skilled professionals and ultimately beat out the competition in landing top tech talent.”

II. Results Based on the DHI Vacancy and Application Flow Database

The **DHI Vacancy and Application Flow Database** links daily application flows to millions of online vacancy postings. The raw data come from DHI Group, Inc., which owns and operates several specialized online platforms for posting job vacancies and attracting applications. Employer-side clients comprise organizations that directly hire their own employees, recruitment firms that solicit applicants for third parties, and staffing firms that hire workers to lease to other firms. Vacancy postings are concentrated in technology sectors, software development, other computer-related occupations, engineering, financial services, and certain other professional occupations. The DHI Database contains over 9.5 million unique vacancy postings from more than fifty thousand employer-side clients.¹ These postings have attracted more than 79 million applications since January 2012.²

Table II.1 reports statistics on vacancy posting durations and applications per posting for Direct Hire Employers in the DHI Database. Perhaps surprisingly, smaller firms attract more applications per posting than larger firms. Postings by firms with 10 to 19 employees attracted an average of 2.26 applications per day in 2017 and 15.1 applications per completed posting spell, both greater than any other employer size category. In contrast, postings by firms with 10,000 or more employees attracted only 0.43 applications per day and 5.8 applications per completed spell. Larger employers also tend to have longer posting durations. It’s worth stressing that these patterns pertain to postings for jobs in technology-oriented sectors that typically require hard skills. Different patterns may prevail for other types of jobs.

As seen in Figure II.1, smaller firms began to attract applications at a markedly faster clip in 2015. Not coincidentally, DHI introduced important improvements to the functionality of its Dice.com platform in December 2014. These improvements included a new, more powerful search engine that enabled job seekers to better tailor their search queries and more easily identify vacancies of interest. Another improvement let registered visitors who complete an online profile make their information accessible to prospective employers. Employers can then signal interest to the registered job seeker, alerting him or her to a particular posting and encouraging an application. In addition, for job seekers who register and complete a profile, DHI streamlined the process of submitting an application via the Dice.com platform. Based on the evidence in Figure II.1, it appears that these improvements to the Dice.com platform are especially valuable in helping smaller firms attract a larger applicant pool.

¹ The DHI Database captures data generated from DHI’s Dice.com platform. Other DHI platforms include [eFinancialCareers](#), [Biospace](#), [Rigzone](#), [ClearanceJobs](#), and [Hcareers](#). Analysis of the DHI Database in this report draws on “Application Flows” by Steven J. Davis and Brenda Samaniego de la Parra.

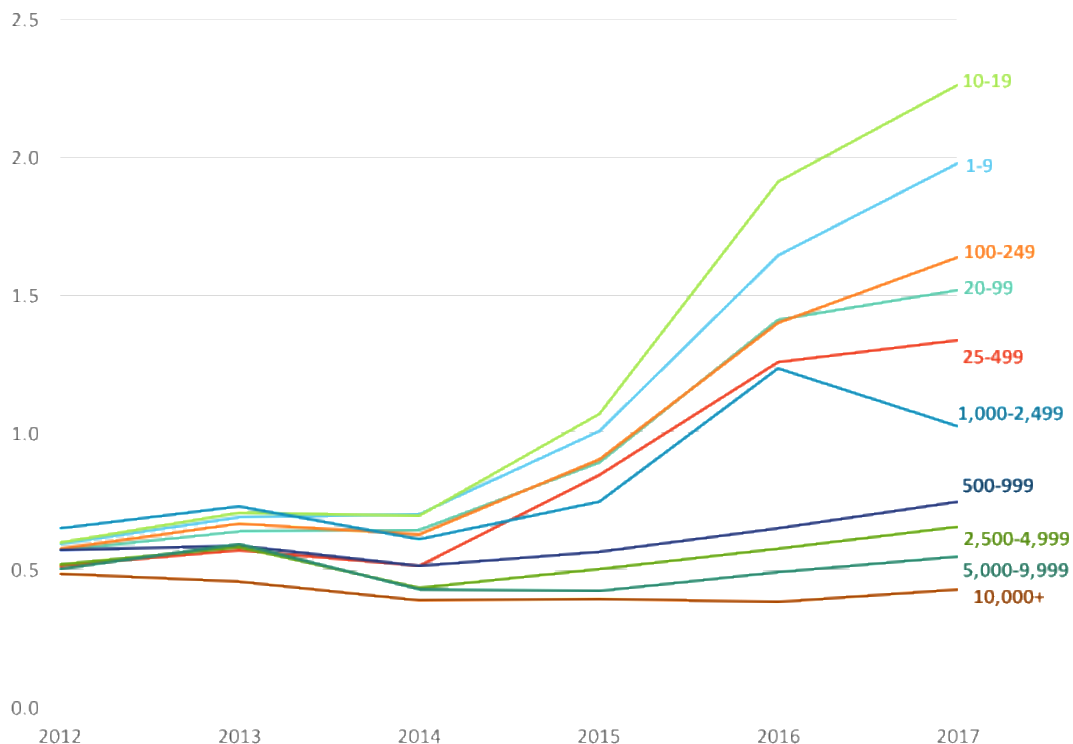
² When posting a vacancy, the DHI client decides whether job seekers must file an application via email through the DHI platform or through an external URL operated by the client or a third party. In the first case, the DHI database records the number of completed email applications. In the second case, the database records how often job seekers click through to the external URL. We pool these two classes of vacancies and applications in this report.

Table II.1. Statistics on Vacancy Postings and Applications by Firm Size, Using Data for 2017 on Standard Postings by Direct-Hire Employers

Number of Employees	Sample Share	Applications Per Vacancy-Day	Mean Posting Duration, In Days	Mean Applications Per Spell	Percent of Spells with No Application
1-9	19%	1.98	7.3	14.9	18%
10-19	5%	2.26	6.4	15.1	22%
20-99	19%	1.52	8.1	12.5	24%
100-249	7%	1.64	8.3	14.0	19%
250-499	7%	1.33	8.8	12.3	19%
500-999	2%	0.75	16.2	12.0	16%
1,000-2,499	3%	1.02	12.9	13.3	19%
2,500-4,999	2%	0.66	17.2	11.3	17%
5,000-9,999	5%	0.55	13.1	7.4	29%
10,000 or more	7%	0.43	13.4	5.8	31%
Unknown	6%	1.35	9.1	12.4	38%

Source: “Application Flows” by Steven J. Davis and Brenda Samaniego de la Parra, 2017, University of Chicago, using standard postings by Direct Hire Employers in the DHI Database from January to July 2017. “Standard postings” typically correspond to a single job position. See the working paper or the [October 2016 edition](#) of the DHI Hiring Indicators for a fuller discussion of standard postings. “Sample share” computed as a percent of active vacancy days for jobs that first posted in 2017. “Spell duration” is the total time from first to last active date and time, inclusive of any intermittent offline spells. All spell-based statistics refer to completed spells. This table excludes Direct Hire Employers that report no employees.

Figure II.1. Applications per Vacancy-Day by Firm Size, Annual Averages, Standard Postings by Direct-Hire Employers

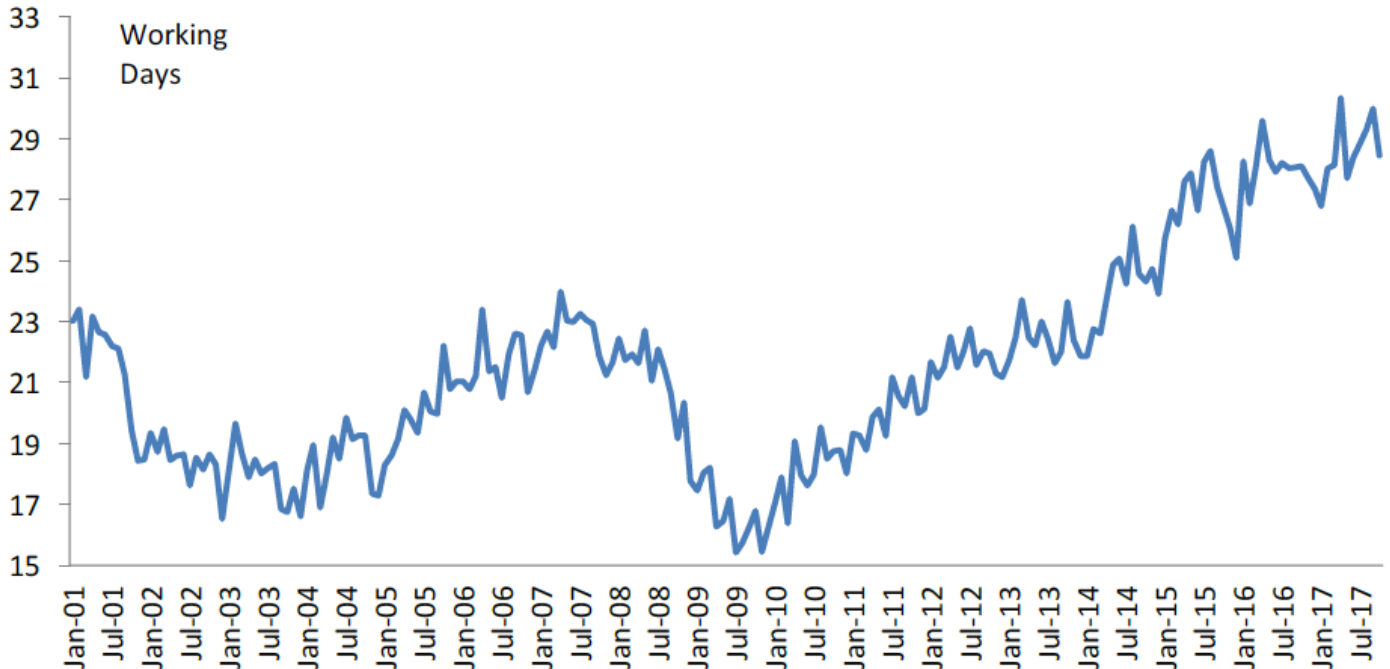


III. Results Based on the Job Openings and Labor Turnover Survey

The **DHI-DFH Mean Vacancy Duration Measure** fell to 28.4 working days in October, down from 30.0 days in September. Figure III.1 shows the evolution of the mean vacancy duration in the United States since 2001. This duration measure reflects the vacancy concept in the Job Openings and Labor Turnover Survey (JOLTS). Specifically, a job opening gets “filled” according to JOLTS when a job offer for the open position is accepted. Thus, the duration statistic refers to the average length of time required to fill open positions. Typically, there is also a lag between the fill date and the new hire’s start date on the new job.

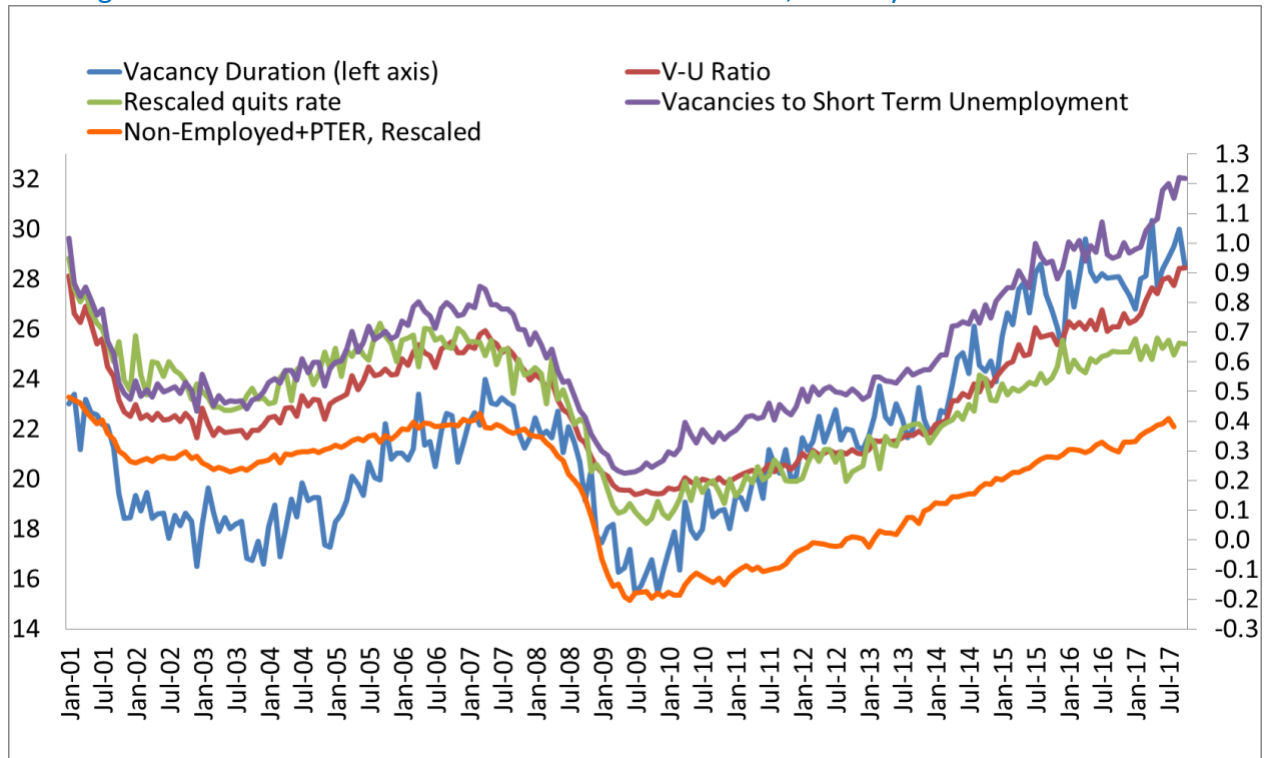
Figure III.2 displays four other indicators of labor market slack alongside the mean vacancy duration. All five measures show a pronounced tightening of U.S. labor markets since 2009 and a modest rise from June to July 2017. Three of the measures – mean vacancy duration, the vacancy-unemployment ratio, and the ratio of vacancies to the number of persons unemployed for 26 weeks or less – exceed their peak values prior to the recession of 2008-2009. The post-recession rise in the mean vacancy duration is especially pronounced.

Figure III.1. DHI-DFH Measure of National Mean Vacancy Duration, January 2001 to October 2017



The **DHI-DFH Recruiting Intensity Index**, plotted in Figure III.3, rose to 1.06 in October, up from 1.02 in September. Tables III.1 and III.2 below report industry-level statistics for mean vacancy duration and recruiting intensity per vacancy.

Figure III.2. National Labor Market Slackness Measures, January 2001 to October 2017



Notes: Short Term Unemployment is the number of persons unemployed 26 weeks or less. The Quit Rate is rescaled to have the same mean and variance as the Vacancy-Unemployment Ratio from January 2001 to date. Non-Employment + PTER, an index developed by Hornstein, Kudlyak and Lange, reflects all persons who are not employed (weighted by labor force attachment) plus persons working part time for economic reasons who would prefer full-time work full. Here, their index is multiplied by minus one and then rescaled to have the standard deviation as the Vacancy-Unemployment Ratio from January 2001 to date.

Figure III.3. DHI-DFH Index of Recruiting Intensity per Vacancy, January 2001 to October 2017

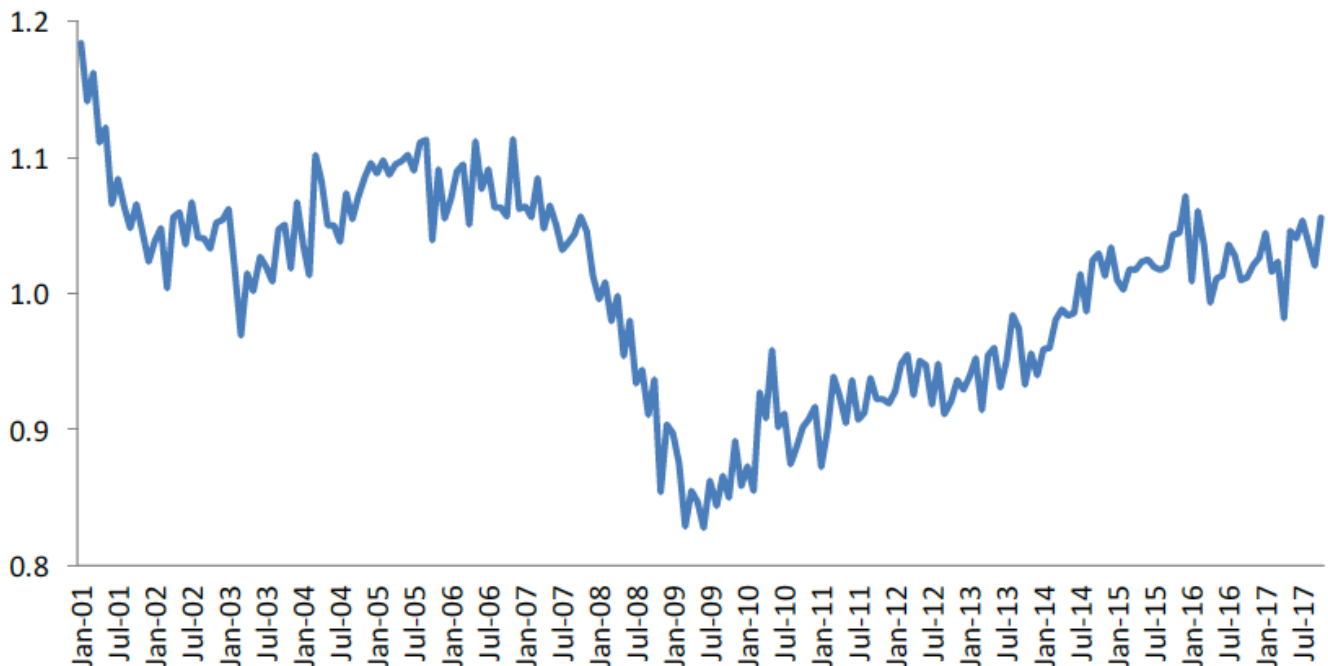


Table III.1. DHI-DFH Measure of Mean Vacancy Duration by Industry and Time Period, No. of Working Days,

January 2001 to October 2017

	2001 to 2003	2004 to 2006	2008	2009	2010 to 2012	2013	2014	2015	2016	Jan.-Oct. 2017
Resources	12.0	14.0	18.1	13.5	18.7	17.5	22.5	17.5	13.0	17.5
Construction	7.9	8.8	7.3	4.3	6.1	9.5	10.9	11.4	14.9	13.4
Manufacturing	17.4	20.9	21.6	13.8	23.4	28.4	29.2	30.4	32.1	31.1
Wholesale and Retail Trade	14.2	15.8	15.5	13.1	15.9	19.8	18.6	21.0	24.1	25.3
Warehouse, Trans. & Utilities	18.6	17.0	20.6	11.3	18.2	22.5	23.9	29.1	27.3	26.1
Information	25.8	36.0	34.5	23.4	40.9	36.4	36.8	35.6	29.1	33.0
Financial Services	28.0	32.1	27.6	25.7	33.4	36.1	37.1	43.2	44.7	44.7
Professional and Business Services	18.3	19.9	21.3	16.6	18.8	19.6	22.0	27.0	26.3	25.1
Education	21.3	25.0	22.0	18.5	21.1	23.7	26.6	29.9	28.9	29.7
Health Services	39.1	35.8	36.4	29.8	33.5	34.6	38.4	44.6	47.7	48.8
Leisure and Hospitality	13.7	14.8	14.9	10.4	13.3	16.6	19.3	19.6	19.7	20.9
Other Services	22.5	18.6	25.2	16.9	18.9	20.1	21.0	22.2	30.1	31.8
Government	33.2	30.7	35.7	32.2	33.0	35.9	37.7	37.8	37.8	40.5
Non-Farm	19.3	20.0	21.1	16.6	20.0	22.5	24.1	26.9	28.0	28.6

Table III.2. DHI-DFH Recruiting Intensity Index by Industry and Time Period,
January 2001 to October 2017

	2001 to 2003	2004 to 2006	2008	2009	2010 to 2012	2013	2014	2015	2016	Jan.-Oct. 2017
Resources	0.99	1.06	1.05	0.70	1.00	0.98	1.04	0.89	1.03	1.25
Construction	1.07	1.04	0.89	0.90	1.01	0.94	0.89	0.88	0.87	0.92
Manufacturing	1.02	1.09	0.95	0.85	0.94	0.88	0.92	0.93	0.96	1.09
Wholesale and Retail Trade	1.05	1.10	0.96	0.84	0.89	0.94	1.04	1.04	1.00	0.98
Warehouse, Trans. & Utilities	0.96	1.13	0.94	0.92	0.96	1.01	1.11	1.12	1.09	1.09
Information	1.10	1.08	0.87	0.83	0.91	1.06	1.11	1.16	1.12	1.10
Financial Services	1.06	1.09	0.99	0.84	0.87	0.99	0.95	0.95	0.92	0.97
Professional and Business Services	1.08	1.07	0.90	0.83	0.94	0.96	1.00	1.01	1.03	1.03
Education	1.00	0.99	1.04	0.96	0.99	0.95	1.00	1.07	1.07	1.04
Health Services	1.08	1.04	1.01	0.93	0.89	0.92	0.97	1.01	1.00	1.02
Leisure and Hospitality	1.08	1.08	0.97	0.84	0.88	0.92	0.96	1.01	1.01	0.99
Other Services	1.02	1.07	0.94	0.96	0.95	0.98	0.96	1.04	0.93	1.08
Government	1.05	1.05	0.94	0.87	0.93	0.93	0.99	1.10	1.13	1.06
Non-Farm	1.05	1.08	0.95	0.86	0.92	0.95	1.00	1.03	1.02	1.03

IV. About the DHI Hiring Indicators

The **DHI-DFH Recruiting Intensity Index** quantifies the effective intensity of recruiting efforts per vacancy by employers with vacant job positions. The index is normalized to an average value of 1.0 for the period from January 2001 to December 2012. It complements the monthly [Job Openings Rate](#) produced by the U.S. Bureau of Labor Statistics (BLS) from the [Job Openings and Labor Turnover Survey](#).

The pace of new hires in the economy depends on the number and types of job seekers, the number and types of job vacancies, and employer actions that affect how quickly vacant jobs are filled. These actions include the choice of recruiting methods, expenditures on help-wanted ads, how rapidly employers screen job applicants, hiring standards, and the attractiveness of compensation packages offered to prospective new hires. The BLS Job Openings Rate captures the availability of job vacancies in the economy, while the **DHI-DFH Recruiting Intensity Index** captures the intensity of employer efforts to fill those vacancies. The index is available at the national, regional and industry levels and by establishment size class (number of employees).

The index construction follows the method developed by Steven J. Davis, R. Jason Faberman and John Haltiwanger (DFH) in "[The Establishment-Level Behavior of Vacancies and Hiring](#)," published in the May 2013 issue of the *Quarterly Journal of Economics*, and extended to industry and regional indices in "[Recruiting Intensity during and after the Great Recession: National and Industry Evidence](#)," published in the May 2012 issue of the *American Economic Review*.

The **DHI-DFH Vacancy Duration Measure** quantifies the average number of working days taken to fill vacant job positions. It supplements other measures often used to assess the tightness of labor market conditions such as the ratio of vacant jobs to unemployed workers.

Vacancy durations depend on the relative numbers of job seekers and job vacancies, the recruiting and search methods available to employers and job seekers, employer recruiting intensity per vacancy, the search intensity of job seekers, and the degree to which the requirements of jobs on offer match the skills, locations and preferences of job seekers. Other things equal, a larger ratio of job vacancies to job seekers yields longer vacancy durations.

The **DHI-DFH Vacancy Duration Measure** follows the method developed by Steven J. Davis, R. Jason Faberman and John Haltiwanger (DFH) in "[The Establishment-Level Behavior of Vacancies and Hiring](#)," published in the May 2013 issue of the *Quarterly Journal of Economics*. That method combines a simple model of hiring dynamics with data on hires and vacancies from the [Job Openings and Labor Turnover Survey](#) (JOLTS) conducted by the U.S. Bureau of Labor Statistics. Using their model and the JOLTS data, DFH estimate an average daily job-filling rate for vacant job positions in each month. Taking the reciprocal of the daily job-filling rate yields the **DHI-DFH Vacancy Duration Measure**, which is available at the national, regional and industry levels and by establishment size class.

The average daily job-filling rate is closely related to the "vacancy yield," the ratio of hires during the month to the stock of vacancies on the last business day of the previous month. Unlike the vacancy yield, however, the daily job-filling rate (and the **DHI-DFH Vacancy Duration Measure**) adjusts for job vacancies that are posted and filled within the month. Working days are defined as Mondays through Saturdays, excluding major national holidays.

The **Skill-Level Slackness Measures** use the daily flow of applications per posting to analyze relative labor market tightness. These measures recognize that job characteristics, such as skill requirements, affect the applications received by each posting, and control for this by grouping vacancies based on the first skill mentioned in the job description. Rising (falling) values for this measure for a particular skill indicate that average daily application flows have increased (decreased), and hence, that labor market tightness fell (rose) for postings that require the skill. For more information about the DHI Vacancy and Application Flow Database and the skill-level tightness measures, see “Application Flows” by Steven J. Davis and Brenda Samaniego de la Parra.

About DHI Group, Inc.

DHI Group, Inc. (NYSE: DHX) is a leading provider of data, insights and employment connections through our specialized services for technology professionals and other select online communities. Our mission is to empower tech professionals and organizations to compete and win through expert insights and relevant employment connections. Employers and recruiters use our websites and services to source, hire and connect with the most qualified and highly-skilled tech professionals, while professionals use our websites and services to find ideal employment opportunities, relevant job advice and tailored career-related data. For over 25 years, we have built our Company on providing employers and professionals with career connections, news, tools and information. Today, we serve multiple markets located throughout North America, Europe, the Middle East and the Asia Pacific region.

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