

Note: As of June 6, 2018, updates of the DHI Hiring Indicators report have been discontinued. There may be future reports on an annual or less regular frequency, however the data, information and report in this monthly form will discontinue.

The Average Duration of Job Vacancies Rose to Another All-Time High in April

This edition of *DHI Hiring Indicators* considers millions of job openings on Dice.com to quantify labor market conditions in 54 skill categories. The job openings we consider are concentrated in technology sectors, software development, other computer-related occupations, engineering, financial services, and certain other professional occupations. We also report statistics on vacancy durations, recruiting intensity and other labor market outcomes.

Section I summarizes our key findings and conclusions. Section II draws on the **DHI Vacancy and Application Flow Database** to present summary statistics on applicant numbers for vacancy postings. Section III draws on the **Job Openings and Labor Turnover Survey (JOLTS)** to present statistics on vacancy durations and recruiting intensity per vacancy. Section IV provides additional information about the *DHI Hiring Indicators* and DHI Group, Inc. A separate Excel file contains monthly time-series data for the statistics discussed in this report and a large set of additional statistics.

I. Highlights

1. The median number of applications per completed vacancy posting spell is 3, and the mean is 11.8. These statistics pertain to postings on Dice.com that specify commonly required skills.
2. Looking across skill categories and over time, employers extend vacancy posting durations when applicant numbers are small.
3. Turning to JOLTS data for the entire U.S. economy, the **DHI-DFH Mean Vacancy Duration Measure** rose to 31.1 working days in April, the highest value on record for the second month in a row.

“Vacancy durations continue to lengthen as U.S. labor markets tighten further,” said Dr. Steven Davis, Chicago Booth professor and Senior Fellow at the Hoover Institution. Davis is a co-developer of the DHI Database and co-creator of the DHI-DFH Mean Vacancy Duration Measure, the Recruiting Intensity Index and the DHI skill-level measures of labor market tightness.

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 Dice.com and other specialized online platforms for posting job vacancies and attracting applications.¹ Employer-side clients comprise

¹ Other DHI platforms include eFinancialCareers, Rigzone, and ClearanceJobs. Analysis of the DHI Database in this report draws on “Application Flows” by Steven J. Davis and Brenda Samaniego de la Parra.

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 10 million unique vacancies posted to the Dice.com platform from more than sixty thousand employer-side clients. These postings have attracted over 130 million applications since January 2012.²

About 80 percent of postings in the DHI Database fit a “standard” pattern: (a) The client posts a vacancy, (b) most applications arrive within the first week or two after posting, and (c) the client permanently removes the posting within one month. Other postings do not conform to this pattern; instead, they remain online for many weeks or months, and applications flow in over time. The vast majority of these “long-duration” postings reflect employers with recurring hiring needs for certain positions and recruiting firms that more or less continuously seek applicants for certain types of jobs.³ In other words, each long-duration posting typically involves multiple job openings rather than a single position. This report considers standard postings, each of which typically pertains to a single job position.

Table II.1 reports summary statistics on application numbers for more than 3 million standard postings on the Dice.com platform from January 2012 to December 2017. The table focuses on postings that require at least one of the 54 listed software and programming skills. Columns (2) and (4) summarize application numbers from the employer perspective. Columns (3) and (5) summarize the situation from the jobseeker perspective.

As seen in Column (4), the equal-weighted median number of applicants per completed posting spell is 3. This statistic underscores the challenge that many employers and recruiters face in finding qualified applicants. Column (2) says that the equal-weighted mean number of applicants is 11.8. The mean is greater than the median, because a small share of postings attracts a large share of applications.

The hiring landscape looks very different from the perspective of jobseekers, as revealed by the applications-weighted statistics in Columns (3) and (5). The weighted mean number of applications per posting is 102, and the weighted median is 45. These two statistics tell us that the average jobseeker applies to job openings that attract many other applicants.

These results help reconcile contradictory impressions of labor market conditions: Many employers feel hampered by a scarcity of skilled applicants for open job positions, while many workers face intense competition for the jobs they seek. In truth, there is no real contradiction between these impressions. One characterization holds for employers, and one holds for workers. Both are true at the same time when application flows are distributed across vacancy postings in a highly uneven manner. That’s the situation for postings on the Dice.com platform.

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.

³ A small number of long-duration postings arise from single-position job vacancies that take many weeks or months to fill. This situation is rare in the DHI Database. See “Application Flows” by Davis and Samaniego de la Parra for more information about the distinction between standard and long-duration postings.

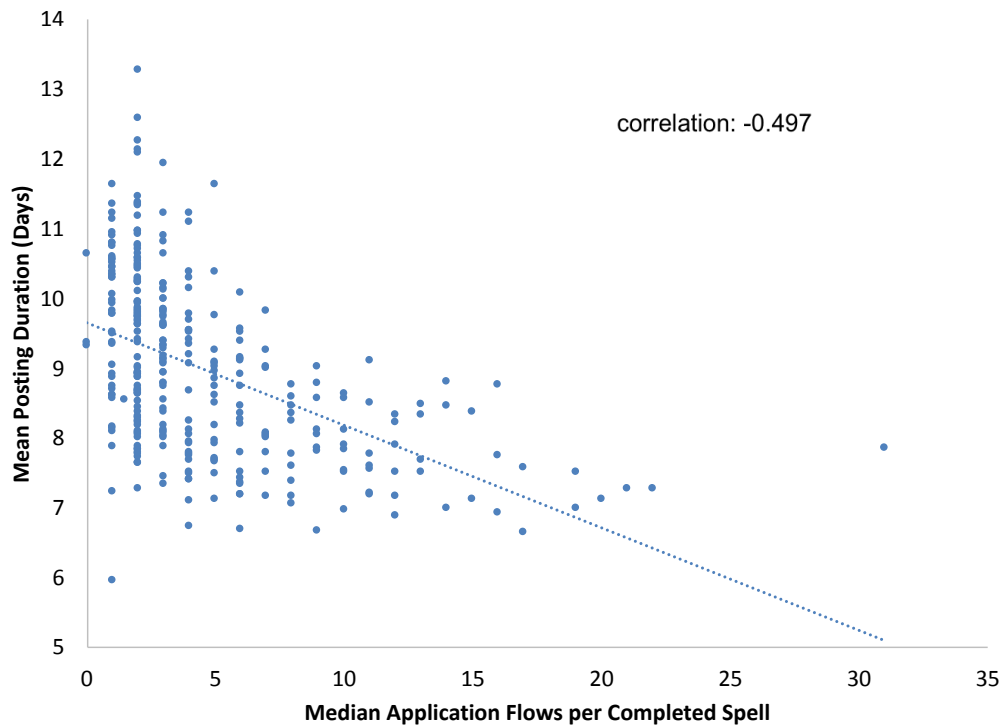
Figure II.1 shows the relationship of the mean posting duration in a given skill category and year to the median number of applications per completed spell in the same category and year. As seen in the figure, posting durations are longer when applicants are fewer. This pattern suggests that employers respond to a scarcity of applicants by lengthening posting durations, so as to enlarge the pool of candidates for the open job.

Table II.1. Applications Per Completed Posting Spell by Skill Requirements, 2012-2017

	Mean Applications per Completed Spell			Median Applications per Completed Spell	
	(1) No. of Postings	(2) Equal Weights	(3) Application Weighted	(4) Equal Weights	(5) Application Weighted
Standard Postings with Frequently Required Skills	3,097,722	11.8	102.3	3	45
Selected Skills					
COBOL	10,248	18.1	46.2	11	31
HADOOP	19,022	28.8	111.1	10	78
SSIS	6,341	26.7	120.0	9	79
INFORMATICA	30,106	20.7	91.4	9	51
ABAP	2,222	17.0	52.7	9	35
ETL	42,649	20.6	90.2	8	53
COGNOS	17,749	13.4	45.9	7	29
SQL	98,961	18.9	100.8	6	60
SAP	200,146	11.3	38.1	6	24
SALESFORCE	58,242	20.3	105.0	5	73
BIGDATA	16,364	15.0	61.4	5	42
ORACLE	190,389	12.0	60.2	5	33
JAVA	318,005	21.0	196.9	4	114
DOTNET	195,973	18.3	165.8	4	96
IOS	22,535	16.9	74.9	4	60
SHAREPOINT	56,903	11.5	55.3	4	36
DATA	149,481	10.9	53.3	4	32
SAS	16,528	9.7	34.6	4	23
WINDOWS	44,251	8.60	37.87	4	22
HYPERION	12,342	8.49	27.68	4	19
LOTUS	2,797	5.55	13.54	4	10
USER INTERFACE	49,310	26.4	199.5	3	149
LINUX	41,383	10.6	72.4	3	48
MOBILE	38,349	10.4	63.7	3	39
C	67,934	9.37	81.87	3	30
UNIX	23,898	8.00	52.75	3	28
TIBCO	12,598	7.46	28.87	3	18
WEBSHERE	19,996	7.30	35.58	3	21
SYSTEMS	263,608	7.18	41.24	3	21

SOA	9,560	6.91	34.92	3	17
DATABASE	65,311	6.64	38.56	3	18
PEOPLESOFT	59,869	6.21	25.00	3	14
ABINITIO	6,070	5.63	24.83	3	13
PYTHON	16,702	10.3	50.8	2	37
JEE	10,886	10.3	101.6	2	56
CLOUD	27,347	9.8	86.9	2	41
NET	5,782	9.6	62.9	2	40
NETWORK	170,200	9.47	76.71	2	43
FINANCE	8,760	8.63	63.88	2	32
WEB	107,092	7.96	82.23	2	42
CISCO	20,067	6.52	66.72	2	27
PHP	23,850	6.48	34.10	2	23
SOFTWARE	205,712	6.45	45.97	2	21
DRUPAL	7,142	6.30	29.77	2	22
VISUALBASIC	11,497	6.22	43.99	2	17
USER EXPERIENCE	20,221	5.81	49.19	2	18
IBM	21,383	5.64	29.86	2	16
APPLICATIONS	109,415	5.24	29.81	2	15
SECURITY	100,852	4.56	25.25	2	12
PERL	4,361	4.49	31.37	2	12
SOLUTION	44,042	4.48	22.78	2	11
DELPHI	861	3.95	15.04	2	8
MATLAB	502	3.60	15.53	2	8
RUBY	11,908	5.58	40.11	1	24

Figure II.1 Median Application Flows and Mean Posting Duration, 2012-2017



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

The **DHI-DFH Mean Vacancy Duration Measure** rose to 31.1 working days in April, 0.8 days above its revised value for March. 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. 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.

The **DHI-DFH Recruiting Intensity Index**, plotted in Figure III.3, was 1.05 in April, slightly above its revised value for March. Tables III.1 and III.2 below report industry-level statistics for mean vacancy duration and recruiting intensity per vacancy.

Figure III.1. DHI-DFH Measure of National Mean Vacancy Duration, January 2001 to April 2018

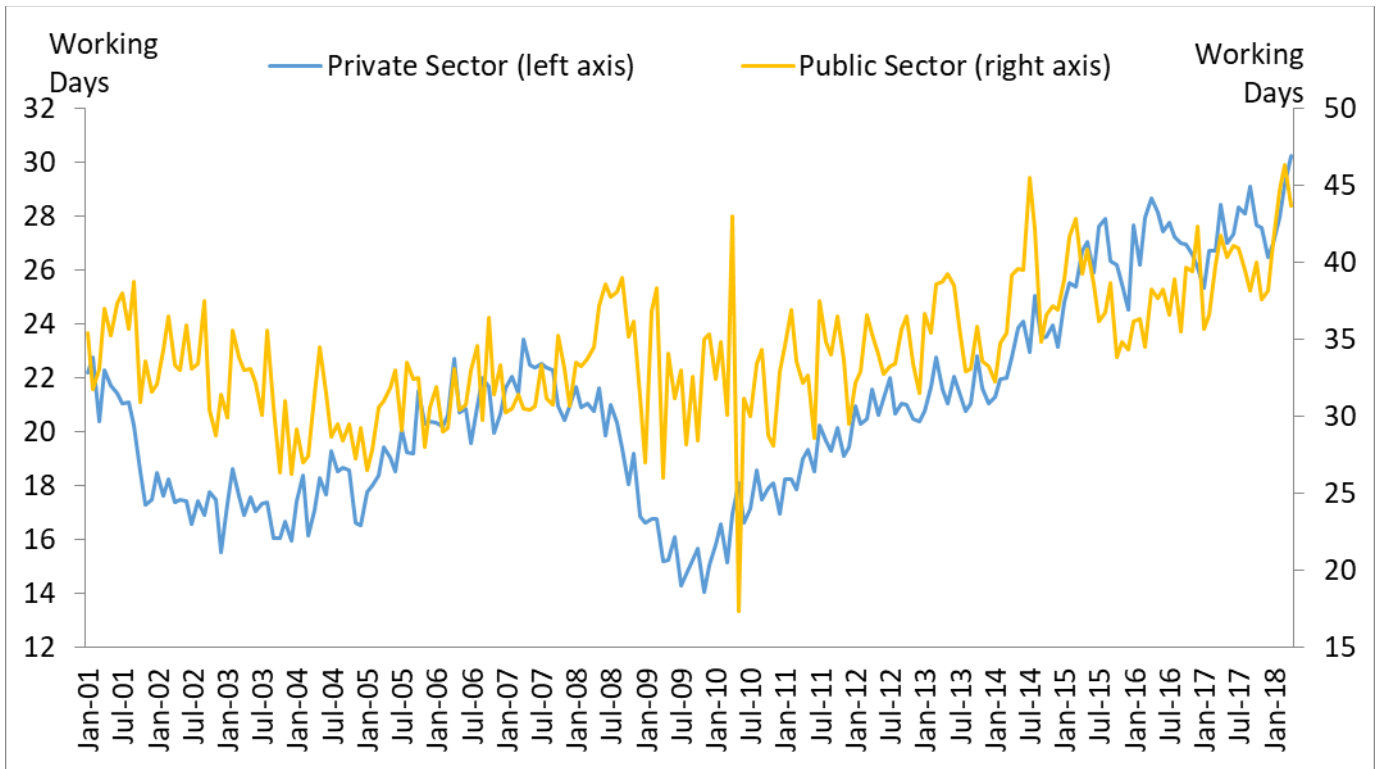
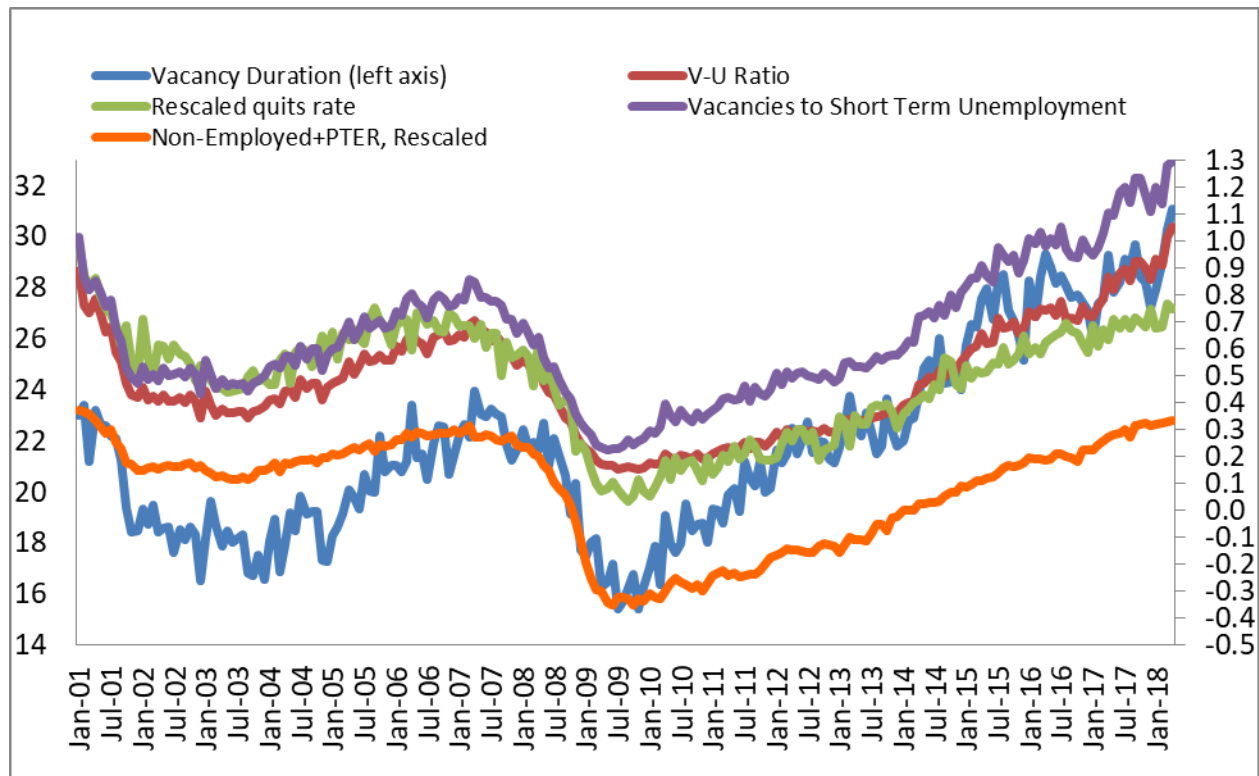


Figure III.2. National Labor Market Slackness Measures, January 2001 to April 2018



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 same 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 April 2018

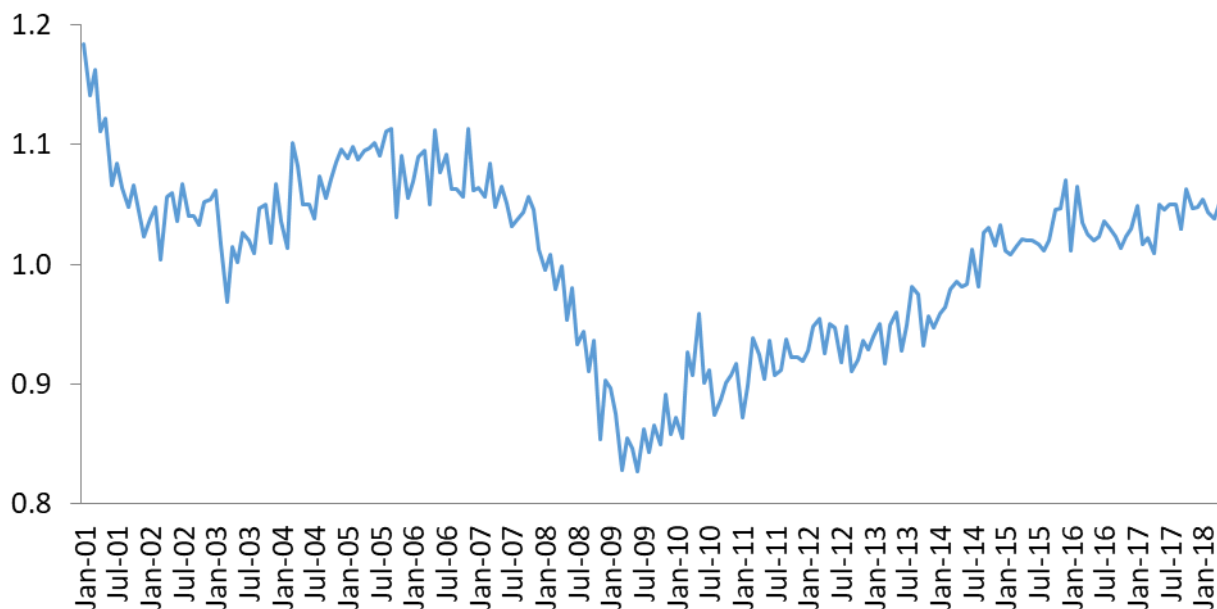


Table III.1. DHI-DFH Measure of Mean Vacancy Duration by Industry and Time Period, No. of Working Days, January 2001 to April 2018

	2001 to 2003	2004 to 2006	2008	2009	2010 to 2012	2013 to 2014	2015 to 2016	2017	Jan-Apr 2018
Resources	12.0	14.0	18.1	13.5	18.7	20.0	15.7	19.9	20.7
Construction	7.9	8.8	7.3	4.3	6.1	10.2	13.1	14.0	16.1
Manufacturing	17.4	20.9	21.6	13.8	23.4	28.8	31.1	30.5	30.3
Wholesale and Retail Trade	14.2	15.8	15.5	13.1	15.9	19.2	22.6	25.9	27.1
Warehouse, Trans. & Utilities	18.6	17.0	20.6	11.3	18.2	23.2	28.5	25.9	32.9
Information	25.8	36.0	34.5	23.4	40.9	36.7	32.4	33.0	41.3
Financial Services	28.0	32.1	27.6	25.7	33.4	36.6	43.8	46.1	47.2
Professional and Business Services	18.3	19.9	21.3	16.6	18.8	20.8	26.7	23.5	23.9
Education	21.3	25.0	22.0	18.5	21.1	25.2	29.7	28.4	27.5
Health Services	39.1	35.8	36.4	29.8	33.5	36.5	46.1	47.7	49.4
Leisure and Hospitality	13.7	14.8	14.9	10.4	13.3	18.0	19.6	20.9	22.3
Other Services	22.5	18.6	25.2	16.9	18.9	20.5	26.0	32.2	27.5
Government	33.2	30.7	35.7	32.2	33.0	36.9	38.0	39.1	44.0
Non-Farm	19.3	20.0	21.1	16.6	20.0	23.3	27.5	28.2	29.6

Table III.2. DHI-DFH Recruiting Intensity Index by Industry and Time Period, January 2001 to April 2018

	2001 to 2003	2004 to 2006	2008	2009	2010 to 2012	2013 to 2014	2015 to 2016	2017	Jan-Apr 2018
Resources	0.99	1.06	1.05	0.70	1.00	1.01	0.95	1.24	1.27
Construction	1.07	1.04	0.89	0.90	1.01	0.91	0.88	0.91	0.86
Manufacturing	1.02	1.09	0.95	0.85	0.94	0.90	0.95	1.09	1.16
Wholesale and Retail Trade	1.05	1.10	0.96	0.84	0.89	0.99	1.02	0.98	1.00
Warehouse, Trans. & Utilities	0.96	1.13	0.94	0.92	0.96	1.06	1.12	1.12	1.19
Information	1.10	1.08	0.87	0.83	0.91	1.08	1.16	1.14	1.21
Financial Services	1.06	1.09	0.99	0.84	0.87	0.97	0.94	0.95	0.93
Professional and Business Services	1.08	1.07	0.90	0.83	0.94	0.98	1.02	1.04	1.06
Education	1.00	0.99	1.04	0.96	0.99	0.97	1.08	1.06	1.10
Health Services	1.08	1.04	1.01	0.93	0.89	0.94	1.01	1.03	1.03
Leisure and Hospitality	1.08	1.08	0.97	0.84	0.88	0.94	1.02	1.00	1.00
Other Services	1.02	1.07	0.94	0.96	0.95	0.97	1.00	1.08	0.99
Government	1.05	1.05	0.94	0.87	0.93	0.96	1.11	1.08	1.07
Non-Farm	1.05	1.08	0.95	0.86	0.92	0.97	1.03	1.04	1.05

Table III.3. DHI-DFH Measure of Mean Vacancy Duration by Establishment Size, Number of Working Days, December 2000 to February 2018

Class Size	2001 to 2003	2004 to 2006	2008	2009	2010 to 2012	2013 to 2014	2015 to 2016	2017	Jan.-Feb. 2018
1-9	19.4	17.9	19.9	13.3	16.8	21.2	26.6	26.7	28.0
10-49	15.2	15.8	16.5	12.9	15.7	19.8	24.3	25.0	23.9
50-249	15.7	17.8	18.2	15.1	17.9	21.1	24.2	25.8	26.6
250-999	21.0	22.8	24.8	17.7	24.4	25.3	30.2	31.5	30.6
1000-4999	36.3	37.9	35.8	30.8	34.5	37.0	39.6	35.9	37.8
5000+	48.8	42.7	39.9	40.8	55.8	57.1	58.4	58.9	63.3

Table III.4. DHI-DFH Measure of Recruiting Intensity by Establishment Size, Number of Working Days, December 2000 to February 2018

Class Size	2001 to 2003	2004 to 2006	2008	2009	2010 to 2012	2013 to 2014	2015 to 2016	2017	Jan.-Feb. 2018
1-9	0.98	1.09	0.98	0.96	0.95	0.91	0.98	1.05	1.01
10-49	1.05	1.09	0.95	0.89	0.90	0.95	1.00	0.99	1.00
50-249	1.09	1.08	0.94	0.81	0.90	0.97	1.00	1.01	1.00
250-999	1.06	1.07	0.91	0.84	0.94	1.02	1.04	1.04	1.12
1000-4999	1.05	1.04	1.04	0.84	0.94	1.03	1.16	1.27	1.27
5000+	0.97	1.19	1.12	0.78	0.79	0.86	1.02	1.03	0.97

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 quantify 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.

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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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