Developing Annual Estimates of Hires and Separations[1]

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1. Introduction

The Job Openings and Labor Turnover Survey (JOLTS) has seen a growing demand, especially from the business community, for annual statistics. Requests for annual turnover rates[1] make up more than a quarter of all JOLTS data requests. The following discussion will provide a short background of the program, a presentation of how to calculate an annual rate using JOLTS estimates, the practical uses and users of this data, and a brief presentation of some annual rates.

2. Background

The Bureau of Labor Statistics (BLS) began publishing monthly estimates of job openings, hires, quits, layoffs and discharges, other separations, and total separations[2] in July 2002. As a relatively new survey, estimates are available from December 2000 to the present for the nation as a whole, by ownership (private vs. public), and by supersector and select sector based on the North American Industry Classification System (NAICS).

Vacancy, hires, and separations data are collected from a sample of approximately 16,000 business establishments every month. The sampling frame consists of approximately 8.5 million establishments compiled as part of the operations of the BLS Quarterly Census of Employment and Wages, or QCEW, program. This frame includes all employers subject to State Unemployment Insurance (UI) laws and all Federal agencies subject to the Unemployment Compensation for Federal Employees (UCFE) program. The scope covers all nonagricultural industries for the private and public sector, but excludes self-employed, unpaid family workers, and private household employees. The JOLTS sampling frame is stratified by ownership, region, major industry division, and size class.

JOLTS employment estimates are ratio-adjusted to the current month Current Employment Statistics[3] (CES) employment estimates, and this ratio is used to adjust the levels for all other JOLTS data elements. Rates are then computed from the levels. Hires are any additions to the payroll and separations are any subtractions from the payroll lasting more than seven days. Hires and separations are collected for the entire month.

Table 1. Annual total separations rates[1] by industry, not seasonally adjusted

(Percent)

Industry and region	2001	2002	2003	2004
Total	41.4	38.1	37.1	38.7
INDUSTRY				
Total private	46.4	42.7	41.6	43.4
Natural resources and mining	38.4	39.3	38.1	35.9
Construction	70.2	67.5	67.6	66.1
Manufacturing	37.6	33.6	30.0	29.5
Durable goods	36.8	33.2	30.2	29.6
Nondurable goods	38.9	34.1	29.6	29.3
Trade, transportation, and utilities	47.4	43.6	42.2	45.0
Wholesale trade	31.5	31.4	29.4	30.0
Retail trade	57.3	51.6	49.5	53.1
Transportation, warehousing, and utilities	35.8	32.9	34.8	37.4
Information	32.5	28.3	25.0	27.2
Financial activities	27.5	26.7	23.8	26.8
Finance and insurance	23.7	22.9	19.6	22.4
Real estate and rental and leasing	38.1	38.0	35.9	39.4
Professional and business services	47.7	44.3	46.0	50.9
Education and health services	30.5	28.2	27.1	27.3
Educational services	19.5	21.4	23.3	21.8
Health care and social assistance	32.7	29.5	27.9	28.3
Leisure and hospitality	82.6	72.9	70.6	71.4
Arts, entertainment, and recreation	75.1	76.9	73.6	76.3
Accommodations and food services	83.9	72.2	70.0	70.6
Other services	37.6	37.7	40.5	41.3
Government	14.9	14.6	14.6	14.9
Federal	14.6	14.8	17.0	15.0
State and local	15.0	14.6	14.3	14.9

[1] The annual total separations rate is the number of total separations during the entire year as a percent of annual average employment.

JOLTS began publishing official seasonally adjusted estimates for select series and data elements in April 2004. Seasonally adjusted estimates allow for over-the-month analysis. Some series and data elements are not seasonally

[1] Rates are as a percent of employment, unless otherwise noted.

[2] JOLTS considers total separations to be turnover. The terms are interchangeable for JOLTS purposes.

[3] CES is the BLS monthly payroll survey that estimates total nonfarm U.S. employment.

adjusted because of the short time series, and because these series do not show enough of a seasonal pattern to date.

The primary purpose of JOLTS is to provide a timely and accurate picture of labor demand for the U.S. economy. In order to be consistent with measures of labor supply available, the Current Population Survey[4] (CPS) unemployment rate, the survey was designed and built as a monthly survey. JOLTS job openings rates[5] provide the needed measure of labor demand to compare with the CPS unemployment rate. The Beveridge Curve[6] is an economic model that examines this relationship of labor demand and labor supply over time. Job openings data provide a picture of labor demand at a particular point in time. As a stock measure, JOLTS monthly job openings estimates are not additive and cannot be used to calculate annual statistics. Fortunately, there have been very few requests for annual job openings statistics. There have been some requests for annual hires statistics, but the majority of requests have been for annual turnover statistics.

Table 2. Annual hires rates[1] by industry, not seasonally adjusted

(Percent)

Industry and region	2001	2002	2003	2004
Total	41.4	38.1	37.9	41.1
INDUSTRY				
Total private	45.5	42.0	42.1	45.6
Natural resources and mining	36.5	37.6	37.8	39.1
Construction	65.9	65.8	68.0	65.6
Manufacturing	25.1	26.6	26.6	29.9
Durable goods	21.7	24.8	26.7	30.2
Nondurable goods	30.9	29.5	26.5	29.4
Trade, transportation, and utilities	46.1	41.2	41.1	46.4
Wholesale trade	29.6	27.5	26.4	30.4
Retail trade	56.6	50.3	49.8	54.7
Transportation, warehousing, and utilities	33.2	29.2	31.3	39.3
Information	26.6	23.5	23.5	26.0
Financial activities	28.3	25.5	25.5	27.9
Finance and insurance	25.0	21.5	20.4	22.3
Real estate and rental and leasing	37.5	36.9	39.9	43.6
Professional and business services	51.7	48.6	49.1	55.4
Education and health services	35.1	31.7	31.1	30.9
Educational services	27.3	22.2	26.9	25.4
Health care and social assistance	36.5	33.5	32.0	31.9
Leisure and hospitality	86.4	74.0	70.9	76.4
Arts, entertainment, and recreation	84.6	77.6	74.4	77.3
Accommodations and food services	86.7	73.3	70.3	76.3
Other services	37.9	35.3	40.0	41.1
Government	19.8	18.8	17.0	18.0
Federal	18.6	22.3	17.2	17.2
State and local	20.0	18.3	17.0	18.2

[1] The annual hires rate is the number of hires during the entire year as a percent of annual average employment.

3. Calculating JOLTS Annual Rates

Among the many annual statistics published by the BLS are: employment, unemployment, earnings, hours, absences, and mass layoffs. Some of these statistics are annual averages for a given time period, others publish annual totals, and some publish both. Whether and what annual statistics are published is based on added value to users and guided by established economic conceptual theory.

Figure 1. Annual Rate Formula

$$\frac{\sum_{i=1}^{12} x_i}{\frac{1}{12}\sum_{i=1}^{12} y_i}$$

Where x is the JOLTS data element value in month i and y is CES employment in month i

For those requesting annual turnover rates, JOLTS provides a formula to calculate an annual rate from JOLTS total separations statistics. The formula is the total number of separations for the year (summation of the 12 monthly total

[4] CPS is the BLS monthly household survey that estimates U.S. unemployment.

[5] Job openings rates are as a percent of employment and job openings.

[6] For additional information on the Beveridge Curve and JOLTS, see Clark, Kelly. "What an Indicator of Labor Demand Means For U.S. Labor Market Analysis" *Joint Statistical Meetings of the American Statistical Association,* 2003

separation levels) divided by annual average monthly employment for the year, times 100. (See Figure 1.) Annual average employment is provided by CES. An approximation can be calculated by adding the 12 monthly total separations rates. The slight difference between the two calculations is due to rounding. This same formula can also be used to calculate an annual rate of hires, voluntary separations (quits), involuntary separations (layoffs and discharges), and other separations. JOLTS hires and separations are collected for the entire month, and are therefore flow measures. On the other hand, JOLTS job openings are a stock measure because they are collected as of the last business day of the month. For this reason, economic conceptual theory does not allow for an annual job openings rate.

Although JOLTS estimates are at the aggregate level, the following is an illustrative example of how to compute an annual turnover rate at the establishment level. Suppose a company reports monthly separations for 2004 of 4, 4, 5, 3, 5, 4, 6, 4, 4, 3, 2, 4 and monthly employment levels of 12, 13, 10, 12, 13, 12, 13, 11, 14, 10, 12, 12. The company's turnover rate for month 1 is (4/12)100, or 33 percent. The company's annual turnover rate is [(sum of separations)/(sum of employment/12)]100, or (48/12)100, which is 400 percent.

4. Practical Uses and Users

The most common use of annual JOLTS statistics is as a benchmarking tool. Most of those individuals requesting annual turnover rates are human resources specialists trying to compare their company's turnover rate to a national average for similar companies. JOLTS estimates allow companies to measure the effectiveness of their hiring and retention policies against national averages. Federal, State, and local officials also use these measures as a benchmarking tool. Annual hires and separations estimates provide a partial picture of the efficiency of job matching models. JOLTS statistics are used by Federal, State, and local policy-makers; investment companies; and academia to analyze and monitor the health of the U.S. economy. JOLTS annual hires and separations statistics allow for international comparisons to other industrialized nations.

Table 3. Annual quits rates[1] by industry, not seasonally adjusted

(Percent)

Industry and region	2001	2002	2003	2004
Total	23.4	20.6	19.1	21.0
INDUSTRY				
Total private	26.3	23.2	21.6	23.8
Natural resources and mining	17.0	14.9	14.5	16.4
Construction	27.4	24.7	23.2	25.2
Manufacturing	15.0	14.0	12.9	14.9
Durable goods	13.8	13.4	13.0	14.8
Nondurable goods	17.1	15.1	12.8	15.0
Trade, transportation, and utilities	28.9	25.1	22.7	25.2
Wholesale trade	17.0	16.2	15.1	15.7
Retail trade	36.7	31.5	28.3	32.0
Transportation, warehousing, and utilities	18.7	15.7	13.9	15.5
Information	18.8	14.6	13.8	15.8
Financial activities	16.1	15.0	13.8	16.1
Finance and insurance	14.4	13.2	11.2	13.4
Real estate and rental and leasing	21.0	20.2	21.2	24.1
Professional and business services	26.1	23.0	21.6	24.8
Education and health services	20.4	17.5	16.4	17.0
Educational services	11.2	11.8	10.9	10.9
Health care and social assistance	22.1	18.6	17.5	18.2
Leisure and hospitality	55.2	46.8	43.6	44.6
Arts, entertainment, and recreation	33.4	34.7	29.6	26.8
Accommodations and food services	59.1	48.9	46.1	47.6
Other services	21.5	22.3	21.8	26.0
Government	8.0	7.2	6.6	6.9
Federal	9.2	7.6	7.0	6.0
State and local	7.8	7.2	6.6	7.0

[1] The annual quits rate is the number of quits during the entire year as a percent of annual average employment.

Most requests for annual JOLTS statistics have been from companies for turnover rates shortly after the end of the calendar year. Annual hires and turnover statistics help companies budget for hiring, training, firing, quits, and retirements.

Table 4. Annual layoffs and discharges rates[1] by industry, not seasonally adjusted

(Percent)

Industry and region	2001	2002	2003	2004
Total	15.1	14.6	15.2	14.9
INDUSTRY				
Total private	17.2	16.6	17.2	16.8
Natural resources and mining	17.7	17.7	16.6	12.0
Construction	39.5	40.3	42.0	37.9
Manufacturing	19.4	16.7	14.3	12.4
Durable goods	19.3	16.9	14.3	12.4
Nondurable goods	19.6	16.6	14.2	12.4
Trade, transportation, and utilities	16.0	15.5	16.4	16.6
Wholesale trade	12.6	13.0	11.9	12.2
Retail trade	17.8	16.9	18.0	17.8
Transportation, warehousing, and utilities	14.2	14.0	16.6	18.0
Information	11.4	11.6	9.6	9.2
Financial activities	8.3	9.2	7.2	7.7
Finance and insurance	6.0	7.0	5.6	5.7
Real estate and rental and leasing	14.6	15.4	12.0	13.4
Professional and business services	18.3	17.3	21.1	22.8
Education and health services	7.8	8.5	8.6	8.3
Educational services	6.0	7.9	10.6	9.6
Health care and social assistance	8.2	8.6	8.2	8.1
Leisure and hospitality	24.3	23.4	24.2	24.1
Arts, entertainment, and recreation	39.9	40.7	42.5	47.5
Accommodations and food services	21.5	20.4	21.0	20.1
Other services	13.0	12.8	15.9	12.5
Government	4.3	4.5	5.2	5.0
Federal	2.2	4.2	5.9	3.7
State and local	4.6	4.5	5.1	5.3

[1] The annual layoffs and discharges rate is the number of layoffs and discharges during the entire year as a percent of annual average employment.

5. JOLTS Annual Rates Data

The annual turnover, or total separations, rate increased 1.6 percentage points to 38.7 percent in 2004. (See Table 1 for all available annual turnover rates.) The 2004 turnover rate was still below the 2001 high of 41.4 percent. The industry supersectors[7] with the highest annual rates, on average between 2001 and 2004, were arts, entertainment, and recreation; accommodations and food services; construction; and retail trade. The industries with the lowest rates were State and local government; Federal government; educational services[8]; and finance and insurance. The supersectors with the largest volatility in annual turnover rates for the past four years were accommodations and food services; nondurable goods manufacturing; retail trade; information; and durable goods manufacturing.

The annual hires rate increased 3.2 percentage points to 41.1 percent in 2004. (See Table 2 for all available annual hires rates.) The annual hires rate has exceeded the annual turnover rate for the past two years. The supersectors with the highest annual hires rates, on average, were arts, entertainment, and recreation; accommodations and food services; construction; retail trade; and professional and business services. The supersectors with the lowest rates, on average, were State and local government; Federal government; finance and insurance; information; and educational services.

The annual quits rate decreased in 2002 and 2003, but increased in 2004 to 21.0 percent. (See Table 3 for all available annual quits rates.) The annual layoffs and discharges rate has remained relatively constant between 2001 and 2004, measuring 14.9 percent for 2004. (See Table 4 for all available annual layoffs and discharges rates.) The annual other separations rate (which includes transfers to other locations, retirements, and disabilities) was essentially unchanged between 2001 and 2004, measuring 2.8 percent for 2004. (See Table 5 for all available annual other separations rates.) Over the four year period from 2001 to 2004, quits accounted for the majority of annual turnover, averaging 54.1 percent of the turnover. Layoffs and discharges accounted for a large part of the remaining turnover during this period, averaging 38.6 percent of annual turnover. Other separations accounted for an average of only 7.3 percent of annual turnover over the same time period.

Table 5. Annual other separations rates[1] by industry, not seasonally adjusted
(Percent)

Industry and region	2001	2002	2003	2004
Total	2.9	2.9	2.8	2.8
INDUSTRY				
Total private	2.9	2.9	2.8	2.8
Natural resources and mining	4.0	6.7	7.5	7.3
Construction	3.3	2.5	2.4	2.9
Manufacturing	3.2	2.8	2.8	2.2
Durable goods	3.7	2.9	2.9	2.4
Nondurable goods	2.3	2.5	2.6	1.8
Trade, transportation, and utilities	2.6	3.0	3.1	3.2
Wholesale trade	2.0	2.2	2.4	2.1
Retail trade	2.8	3.2	3.1	3.3
Transportation, warehousing, and utilities	2.8	3.2	4.3	3.9
Information	2.3	2.0	1.6	2.1
Financial activities	3.1	2.6	2.8	3.0
Finance and insurance	3.3	2.6	2.8	3.3
Real estate and rental and leasing	2.5	2.4	2.7	2.1
Professional and business services	3.3	3.9	3.4	3.3
Education and health services	2.3	2.2	2.1	1.9
Educational services	2.3	1.9	1.8	1.3
Health care and social assistance	2.4	2.3	2.2	2.0
Leisure and hospitality	3.1	2.7	2.8	2.7
Arts, entertainment, and recreation	1.9	1.6	1.7	1.9
Accommodations and food services	3.2	2.9	3.0	2.9
Other services	3.2	2.5	2.7	2.9
Government	2.6	2.9	2.8	2.9
Federal	3.2	3.1	3.9	5.4
State and local	2.5	2.9	2.7	2.6

[1] The annual other separations rate is the number of other separations during the entire year as a percent of annual average employment.

6. Conclusion

As users become more acquainted with JOLTS data, and the time series become longer, demand will continue to grow. To meet this growing demand for annual statistics, JOLTS plans to begin publishing annual hires and turnover statistics in the future. In the meantime, users can use the formula included in this paper. The annual rates will be published for the calendar year, but any 12-month period can be used to calculate an annual rate.

[7] JOLTS industry estimates are classified according to the North American Industry Classification System (NAICS).

[8] Educational services consists of only private establishments. Public education is included in government estimates.

[1] *Any opinions expressed in this paper are those of the authors and do not necessarily reflect the official policy or position of the Bureau of Labor Statistics.*