

# New Measures for Accessions, Separations, and Turnover in the Quarterly Workforce Indicators

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March 19, 2013

For the first time since the initial release of the Quarterly Workforce Indicators (QWI) in 2002, we are modifying the set of 30 indicators (adding and removing several indicators). These changes are planned for the spring release of data in 2013. The changes largely concern additions and modifications to worker separations, hires, and turnover. The purpose of this memo is to inform users of the upcoming changes planned and allow a period of comment from the user community.

## Additional Hires and Separations Variables

The current set of Quarterly Workforce Indicators contain a number of measures of quarterly hires and separations. These include all hires, new hires, recalls, and separations, and stable (meaning the job lasted at least a full-quarter) versions of these measures. We plan to release additional indicators for hires and separations that correspond to the point in time employment measures (beginning of quarter employment, end of quarter employment) in the QWI. These measures are:

**End-of-Quarter Hires (HirAEnd):** Employees working at the firm on the last day of the quarter who were hired by the firm during that quarter.

**Beginning-of-Quarter Separations (SepBeg):** Employees working at the firm on the first day of the quarter who separated from the firm during that quarter.

We are also adding an additional variable 'Replacement Hires' – the count of hires that take place in excess of net increases in employment.

**Replacement Hires (HirAEndRepl) = End-of-Quarter Hires – Job Creation**

where job creation is the difference between end-of-quarter employment and beginning-of-quarter employment calculated at the establishment level (zero if the difference is negative). Thus replacement hires is the count of new employees at the end of the quarter who do not contribute to net employment growth over the quarter.

The corresponding hires and separation rates (also provided as variables on the files) are:

**Hiring Rate (HirAEndR):** End-of-quarter hires divided by the average of beginning and end of quarter employment.

**Separation Rate (SepBegR):** Beginning-of-quarter separations divided by the average of beginning and end of quarter employment.

**Replacement Hiring Rate** ( $HirAEndReplR$ ) = Replacement Hires divided by the average of beginning and end of quarter employment.

and the corresponding new identities:

End-of-quarter hires = Replacement Hires + Job Creation  
Hiring Rate = Replacement Hiring Rate + Job Creation Rate

### Modification to Turnover Measure

We also will be modifying the calculation of the existing turnover measure, which captures the average rate of hires and separations within a firm. Some users have noticed unusually high turnover rates in certain data cells. These may result from a timing issue in the specification of the measure. The current calculation is as follows:

$$\frac{HirAS(t) + SepS(t)}{2 \times EmpS(t)}$$

In the QWI system, accessions into full quarter employment are counted in the first quarter of full quarter employment; however, separations from full quarter employment are counted in the last quarter of employment. So while full quarter accessions are a strict subset of full quarter employment in the same quarter, full quarter separations are a strict subset of full quarter employment in the previous quarter. This can result in very high turnover estimates (much greater than 100%) in cells where a large fraction of stable employment separates. There is no corresponding phenomenon when a large fraction of stable employment are hires. We propose utilizing the count of full quarter separations in the next quarter, which would result in imposing an upper bound of 100% on the turnover calculation. The new turnover calculation will then be:

$$\text{Turnover} = \frac{HirAS(t) + SepS(t+1)}{2 \times EmpS(t)}$$

### Other Additional Variables

The following variables are also to be added to the QWI. These additions are to better synchronize measures between QWI and LODES, or to provide denominators to additional ratio variables. These variables are necessary for particular analyses but may not be of interest to the majority of data users.

- Earnings for Beginning-of-Quarter Employees ( $EarnBeg$ ): This measure is currently available in LODES but not QWI.
- Full-Quarter Employment in the Previous Quarter ( $EmpSpv$ ): Needed to complete full-quarter job flow identities.
- Full-Quarter Separations in the Subsequent Quarter ( $SepSnx$ ): This variable corresponds to the number of workers in the cell for Earnings of Full-Quarter Separations.

## Measures to be dropped

Due to the enormous size of the files, adding variables to the QWI is not costless. To minimize the storage burden for users who download complete files, we propose removing some variables from the set of QWI indicators. Most of these variables we believe to be lightly used, but we appreciate any feedback from users who do use these measures during this comment period.

- Earnings for End-of-Quarter Employees (EarnEnd): This measure will be replaced by the Earnings for Beginning-of-Quarter to better sync with LODES.

The following variables are biased in the state-based QWI, which uses within-state job histories only to calculate nonemployment spells and previous earnings. Similar but much less biased measures of these following variables will appear in the job-to-job flows data product to be released next year. Meanwhile we would like to remove these variables from the QWI:

- Average change in monthly earnings for hires and separations (EarnSepC, EarnSepS).
- Average quarters of nonemployment for hires, new hires, recalls, and separations (NEmpHirA, NEmpHirN, NEmpHirR, NEmpSep)

## Comments/Questions

We are planning to begin release of the new set of indicators for the QWI in spring of 2013 and welcome comments while we are working to implement the new version. Please send any comments and/or questions on these changes to [ces.local.employment.dynamics@census.gov](mailto:ces.local.employment.dynamics@census.gov)

## Formal definitions of new variables

QWI measures are constructed by looking at work histories for individual jobs, and aggregating counts to the desired levels for data release. Measures of job creation and job destruction are initially calculated at the establishment level, which we then aggregate again aggregated to the level for data release. For ease of calculation, many of the new set of variables we are adding are all derived using combinations of other predefined public release measures, rather than being calculated from microdata directly. In the following table we provide the equivalent calculation that would be made on either job-level or establishment-level data, as appropriate.

Measure	Field name	Calculation	Technical Definition
End-of-quarter hires	HirAEnd	EmpEnd-EmpS	Job level calculation: A worker <i>i</i> is an end-of-quarter hire with employer <i>j</i> in <i>t</i> if worker has positive earning in <i>t</i> and <i>t+1</i> , but no earnings from <i>j</i> in <i>t-1</i> .
Beginning-of-quarter separations	SepBeg	Emp-EmpS	Job level calculation: A worker <i>i</i> is a beginning-of-quarter separation from employer <i>j</i> in <i>t</i> if worker has positive earning in <i>t</i> and <i>t-1</i> , but no earnings from <i>j</i> in <i>t+1</i> .
End-of-quarter hiring rate	HirAEndR	HirAEnd/.5*(Emp+EmpEnd)	End-of-quarter hires divided by average of beginning and end-of-quarter employment.
Beginning-of-quarter separation rate	SepBegR	SepBeg/.5*(Emp +EmpEnd)	Beginning-of-quarter separations divided by average of beginning and beginning-of-quarter employment.
Turnover	TurnOvrS	(HirAS + SepSnx) / (2 x EmpS)	One half times the sum of full-quarter “Hires – All” in the current quarter and full-quarter separations in the next quarter, divided by the number of full quarter employees in the current quarter.
Replacement hires	HirAEndRepl	HirAEnd-FrmJbGn	Establishment level calculation: End-of-quarter hires in <i>t</i> minus job creation in <i>t</i> . Job creation is the difference between end-of-quarter employment in <i>t</i> and beginning-of-quarter employment in <i>t</i> , or zero if that difference is negative.

Replacement hiring rate	HirAEndReplR	$HirAEndRepl // .5 * (Emp + EmpEnd)$	Replacement hires divided by average of beginning and end-of-quarter employment
Average monthly earnings for beginning-of-quarter employees	EarnBeg	N/A	Add all quarterly earnings at $j$ in $t$ for all $i$ who are beginning-of-quarter employees. Divide this by the number of beginning-of-quarter employees at $j$ . Then divide that by three.
Full quarter employment in the previous quarter	EmpSpv	N/A	Job level calculation: A worker $i$ is full-quarter employed in the previous quarter in time $t$ if worker has positive earnings at firm $j$ in $t-2$ , $t-1$ , and $t$ .
Full quarter separation in the next quarter	SepSnx	N/A	Job level calculation: A worker $i$ is a full-quarter separation in the next quarter with employer $j$ in $t$ if the worker has positive earnings at $j$ in $t-1$ , $t$ , and $t+1$ , but no earnings from $j$ in $t+2$ .

## Comparison of Set of Quarterly Workforce Indicators

Variable name	2002-2012 releases	Spring 2013	Description
Emp	x	x	Employment: Counts
EmpEnd	x	x	Employment end-of-quarter: Counts
EmpS	x	x	Employment stable jobs: Counts
EmpSpv		x	Full quarter employment in the previous quarter
EmpTotal	x	x	Employment reference quarter: Counts
HirA	x	x	Hires All: Counts
HirN	x	x	Hires New: Counts
HirR	x	x	Hires Recalls: Counts
Sep	x	x	Separations: Counts
HirAEnd		x	All Hires, End-of-quarter employed
SepBeg		x	Separations, Beginning-of-quarter employed
HirAEndR		x	End-of-quarter hiring rate
SepBegR		x	Beginning-of-quarter separation rate
HirAEndRepl		x	End-of-quarter hires that are replacement hires
HirAEndReplR		x	End-of-quarter replacement hire rate
HirAS	x	x	Hires All stable jobs: Counts
HirNS	x	x	Hires New stable jobs: Counts
SepS	x	x	Separations stable jobs: Counts
SepSnx		x	Full quarter separations in the next quarter
TurnOvrS	x	x (mod)	Turnover stable jobs: Ratio
FrmJbGn	x	x	Firm Job Gains: Counts
FrmJbLs	x	x	Firm Job Loss: Counts
FrmJbC	x	x	Firm jobs change: Net Change
FrmJbGnS	x	x	Firm Gain stable jobs: Counts
FrmJbLsS	x	x	Firm Loss stable jobs: Counts
FrmJbCS	x	x	Firm stable jobs change: Net Change
EarnS	x	x	Employees stable jobs: Average monthly earnings
EarnBeg		x	Average monthly earnings for beginning-of-quarter employees
EarnEnd	x		Employees end-of-quarter : Average monthly earnings
EarnHirAS	x	x	Hires All stable jobs: Average monthly earnings
EarnHirNS	x	x	Hires New stable jobs: Average monthly earnings
EarnSepS	x	x	Separations stable jobs: Average monthly earnings
EarnHirAC	x		Hires All: Average change in monthly earnings
EarnSepC	x		Separations: Average change in monthly earnings
Payroll	x	x	Total quarterly payroll: Sum
NEmpHirA	x		Hires All: Average quarters of non-employment
NEmpHirN	x		Hires New: Average quarters of non-employment
NEmpHirR	x		Hire Recalls: Average quarters of non-employment
NEmpSep	x		Separations: Average periods of non-employment