New Data on Business Employment Dynamics

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Introduction

In September 2003, The Bureau of Labor Statistics published the quarterly business employment dynamics data series for the first time. Since then, the business employment dynamics statistics have generated a great deal of interest among economists, policy makers, business community, researchers and all other employment data users. By decomposing the net change in employment into gross job gains and gross job losses, and further by dividing gross job gains into business openings and expansions and gross job losses into business closings and contractions, the business employment dynamics (BED) statistics reveal the underlying dynamics of the job market.

The development of the BLS business employment dynamics data was motivated in large part by research in the academic community. The creation of longitudinal establishment datasets at the U.S. Census Bureau during the past several decades led to influential publications by Dunne, Roberts and Samuelson (1988, 1989a, 1989b), Davis and Haltiwanger (1990, 1992), and Davis, Haltiwanger, and Schuh (1996). From this literature, we have learned that there is a large amount of establishment level employment volatility not evident at the aggregate level, and the gross job flow statistics have fascinating business cycle properties. Yet despite all that we have learned about the labor market from this literature, the empirical analysis in these papers was restricted to data from the manufacturing sector, and the call for more comprehensive data always resonates. The second generation of analysis using longitudinal microdata from the States' unemployment insurance systems illustrates how gross job flows in manufacturing are not representative of the entire U.S. economy – see Anderson and Meyer (1994), Foote (1998), Burgess, Lane, and Stevens (2000), and Spletzer (2000). The research resulting from the creation of these longitudinal establishment datasets has not only stimulated the review and updating of existing labor market theories, but has also stimulated the U.S. statistical agencies to develop their administrative datasets in such a way so as to produce longitudinal job flow statistics such as the business employment dynamics data series.

In this paper, we describe the new gross job gains and gross job loss statistics from the BLS business employment dynamics program. It begins with definitions of *gross job gains* and *gross job losses* followed by description of the source data used by the Bureau to generate estimates of quarterly gross job gains and gross job losses, and an explanation of the methodology employed for longitudinally linking establishment records. The heart of the article is the presentation of the new BLS business employment dynamics data series, together with an analysis of the levels and movements of gross job gains and gross job losses during the past 12 years. The article concludes with a summary of ongoing work and planned future enhancements to the gross job gains and gross job loss statistics at the Bureau.

Concepts and Definitions

The cross-sectional or "snap-shot" employment statistics that are published by the Bureau of Labor Statistics are invaluable for policy-makers, researchers, and the business community. The BLS report on monthly changes in employment affects stock market movements and interest rate decisions considerably. Yet this single macroeconomic statistic is the net result of the millions of decisions by millions of business establishments in the U.S. economy changing their employment levels. Each decision reflects the business-specific economic conditions of supply, demand, labor availability, market share goals, investments in research and development, etc; that face managers every day. While the aggregate net employment change statistic identifies the overall growth or decline of the labor market, it does not summarize the underlying heterogeneity of the many establishments opening and expanding, or the many establishments contracting or closing.

The definitions of gross job gains and gross job losses are easily derived from the definition of net employment growth. Notationally, let $E_{e,t}$ denote the employment of establishment e in quarter t. Net employment growth in quarter t is defined as the change in aggregate employment from one quarter to the next:

(1) Net Employment Growth (t) = $\sum$ Ee,t - $\sum$ Ee,t-1

Noting that establishments can be classified based upon their employment dynamics from one quarter to the next, this equation for net employment growth can be manipulated as:

(2) Net Employment Growth (t) = $\sum$ Ee,t - $\sum$ Ee,t-1
= $\sum$ (Ee,t - Ee,t-1)
= $\sum$ (E_i,t - E_i,t-1) + $\sum$ (E_d,t – E_{di},t-1) +$\sum$ (E_n,t - E_n,t-1)
= $\sum$ (E_o,t - 0) + $\sum$ (E_x,t - E_x,t-1) +$\sum$ (E_c,t - E_c,t-1) + $\sum$ (0 - E_l,t-1).

Where
E*i*,t= employment at establishments increasing employment
E_d,t= employment at establishments decreasing employment
E_n,t=employment at establishments with no change in employment
E_o,t=employment at opening establishments
E_x,t=employment at expanding establishments
E_c,t=employment at contracting establishments
E_l,t=employment at closing establishments.

Note that the quarterly employment change for the set of establishments that do not change their level of employment from one quarter to the next is zero, and this term drops out of the final version of equation (2). In the Business Employment Dynamics data, there are 3.2 million establishments with positive employment that do not change their employment between the first and second quarters of 2004.

The definitions for gross job gains and gross job losses fall immediately out of the above equation. *Gross job gains* are the sum of all employment increases at opening and expanding establishments:

(3) Gross Job Gains (t) = $\sum$ (Eo,t - 0) + $\sum$ (Ex,t - Ex,t-1).

Gross job losses are the sum of all employment losses at contracting and closing establishments:

(4) Gross Job Losses (t) = $\sum$ (Ec,t - Ec,t-1) + $\sum$ (0 - E_l,t-1).

An *expanding* establishment is defined as a continuous unit that increases its employment from a positive level in the previous quarter to a higher level in the current quarter, and a *contracting* establishment is a continuous unit that decreases its employment from the previous quarter to a lower positive level in the current quarter. An *opening* establishment is one that has positive employment in the current quarter, and either had zero employment or was not in the database the previous quarter. A *closing* establishment is one that had positive employment in the previous quarter, and has either zero employment or is not in the database the current quarter.

Because it is not possible to define business deaths on a contemporaneous basis, the definitions of establishment openings and closings used in the BLS BED program are conceptually different than the more familiar definitions of establishment births and deaths. In the State UI systems, businesses are allowed to and often do report zero employment for several quarters after they have effectively closed. This undoubtedly occurs when a business owner temporarily shuts down but anticipates starting up the business again when economic conditions improve. By reporting zero employment and wages on the quarterly contributions form, the business owner can keep their UI account active. This results in many observed business closings, but which of these closings will start up again and which will die is not observed for several more quarters. Although deaths cannot be defined contemporaneously in the BLS BED press releases, it is possible to define births and deaths in the historical microdata.

It is important to note that gross job gains and gross job loss statistics measure the sum of establishment-level net employment changes, and do not measure the flow of workers into and out of the establishment. For example, if an establishment increases employment from 50 workers to 60 workers, these 10 additional jobs are classified as gross job gains. This addition of 10 jobs during the quarter might have occurred with the addition of 10 new hires, or by the net of 20 new hires and 10 separations. Counts of hires and separations are published monthly by the Job Openings and Labor Turnover Survey (JOLTS) program at the BLS.

Source Data and Linkage Methodology

The quarterly business employment dynamics statistics are derived from a longitudinal database compiled from the Quarterly Census of Employment and Wages (QCEW) program. The QCEW is based on quarterly reports on employment and wages by all employers subject to unemployment insurance laws. The quarterly reports are reviewed and edited by the states and are sent to BLS as part of a federal-state cooperative program. These reports are used to generate QCEW data on employment and wages, which covers 98 percent of all non-farm payrolls. The QCEW micro-records are also linked across quarters to create a longitudinal history for each establishment. The longitudinal QCEW is used to tabulate data on business employment dynamics gross job gains and gross job losses. The QCEW data go through multiple layers of editing at the states and the BLS to ensure a high quality linked product.

The theoretical foundation for the BLS record linkage methodology is based on the work of Ivan P. Felligi and Alan B. Sunter, and is more fully explained in Robertson, Huff, Mikkelson, Pivetz, and Winkler (1997). The linkage methodology is a complex multi-stage process in which records are linked across two consecutive quarters. In the first stage, the continuous records are linked by their unique establishment identifiers. More than 95 percent of the records are linked at this stage. In the next step, information on predecessors and successors are used to match records. A predecessor is the previous owner and a successor is the new owner of a business establishment. The UI identifier of predecessors and successors are used to link establishments that changed ownership during the quarter. In addition, multi-establishments that changed the reporting configuration in the quarter are linked at this stage. The objective is to avoid generating spurious births and deaths by maintaining the continuity of the records in all these events. The remaining records are checked against a probability-based weighted match algorithm using information such as name, address, phone numbers and so on. In the final stage, the remaining large unmatched records are reviewed by analysts for possible manual linkage. The longitudinal QCEW database of establishments and the link file created by the linkage methodology are used to construct business employment dynamics data elements such as employment and counts of establishments at opening, expanding, closing and contracting businesses.

Gross job gains and gross job losses

Cross-sectional results. The seasonally adjusted time series of gross job gains and gross job losses are presented in table 1. During the third quarter of 2004, the economy gained a (seasonally adjusted) total of 191,000 jobs. This employment decline is the net result of two factors: the jobs gained by opening and expanding establishments and the jobs lost by closing and contracting establishments. Opening and expanding establishments gained 7.8 million jobs in the third

Table 1. 3-Month private sector gross job gains and losses, seasonally adjusted

Category	3 months ended				
	Sept. 2003	Dec. 2003	Mar. 2004	June 2004	Sept. 2004
	Levels (in thousands)				
Gross job gains…….....	7,396	7,646	7,745	7,857	7,789
At expanding establishments….....	5,897	6,063	6,231	6,292	6,123
At opening establishments.….....	1,499	1,583	1,514	1,565	1,666
Gross job losses…….....	7,324	7,302	7,310	7,263	7,598
At contracting establishments.....	5,893	5,816	5,871	5,726	5,953
At closing establishments….....	1,431	1,486	1,439	1,537	1,645
Net employment change[1]..….....	72	344	435	594	191
	Rates (percent)				
Gross job gains…….....	6.9	7.2	7.2	7.2	7.2
At expanding establishments…….	5.5	5.7	5.8	5.8	5.7
At opening establishments.….....	1.4	1.5	1.4	1.4	1.5
Gross job losses…….....	6.8	6.8	6.8	6.7	7.0
At contracting establishments.....	5.5	5.4	5.5	5.3	5.5
At closing establishments….....	1.3	1.4	1.3	1.4	1.5

Net employment change[1].....….....	0.1	0.4	0.4	0.5	0.2

[1] The net employment change is the difference between total gross job gains and total gross job losses. See the Technical Note for further information.

quarter of 2004, while closing and contracting establishments lost 7.6 million jobs. Each of these figures is substantially larger than the net employment change statistic, which illustrates the sizable amount of job "churning" that occurs in the U.S. economy every quarter.

Gross job gains result from expanding and opening establishments. How large are these two components relative to each other? In the third quarter of 2004, employment in expanding establishments grew by 6.1 million jobs and employment in opening establishments grew by 1.7 million. These statistics indicate that expanding establishments account for 79 percent, and opening establishments for 21 percent, of quarterly gross job gains. With regard to gross job losses, employment in contracting establishments declined by 6.0 million jobs, employment in closing establishments by 1.6 million jobs. Thus, contracting establishments accounted for 78 percent and closing establishments for 22 percent of quarterly gross job losses. Expanding and contracting establishments accounted for most jobs gained and lost when measured quarterly.

Measured in percentages rather than levels, the gross job gain rate in the U.S. private-sector economy was 7.2 percent between June 2004 and September 2004, and the gross job loss rate for the quarter was 7.0 percent. The interpretation of these statistics is that the jobs gained in opening and expanding establishments during the quarter made up 7.2 percent of the total number of jobs and the jobs lost from closing and contracting establishments during the quarter constituted 7.0 percent of the total number of jobs. The difference of 0.2 percent between the gross job gain rate and the gross job loss rate is the net employment growth rate, seasonally adjusted, between June 2004 and September 2004.

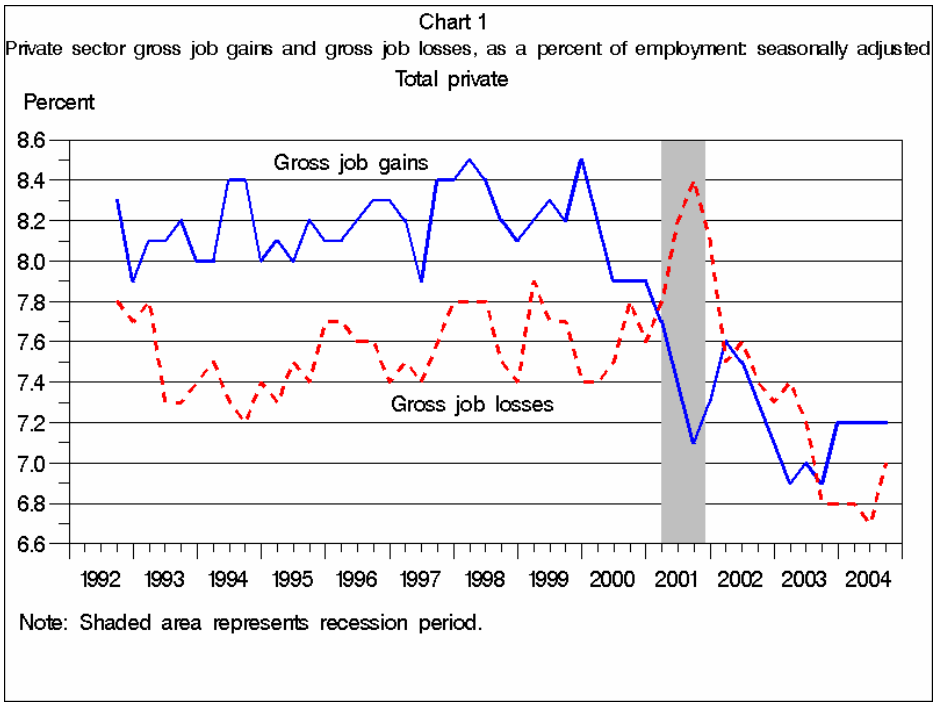
An important component of the business employment dynamics data series is the establishment counts underlying the gross job gains and gross job losses. In the third quarter of 2004 there were about 1.5 million expanding establishments (22.7 percent of all active establishments) and 1.5 million contracting establishments (22.5 percent). Approximately 354,000 establishments (5.4 percent) opened during the quarter, and 345,000 establishments (5.3 percent) closed during the quarter. The difference of the number of opening establishments and the number of closing establishments (9,000) is the net change in the number of active establishments during the quarter. The statistics of gross job gains and gross job losses and the establishment counts indicate that the average expanding establishment added 4.1 jobs during the quarter and the average contracting establishment lost 4.1 jobs during the quarter. A similar calculation shows that the average opening establishment starts with 4.7 employees in its first quarter of positive employment and the average closing establishment is responsible for the loss of 4.8 employees in the final quarter in which it still has employees.

These business employment dynamics data reveal the large gross job flows that underlie the substantially smaller net employment change statistic. The business employment dynamics statistics also expand our understanding of the U.S. economy. Primarily, the gross job flow and establishment flow statistics reveal the tremendous amount of churning underlying the net growth rates. Each quarter in the U.S. economy, millions of establishments remaining in operation are adding or subtracting from their workforces, creating a turnover of millions of jobs. At the same time, hundreds of thousands of establishments open and close, causing the simultaneous gain and loss of millions of jobs. These business employment dynamics statistics demonstrate that a sizable number of jobs and establishments appear and disappear in the short time frame of 3 months.

Time-series results. The business employment dynamics data for any given quarter highlight the large amount of churning that underlies net employment growth. One of the principal uses of these data is to gain an understanding of this continuous churning over the course of the business cycle, which, to a large degree, is defined by the growth (or shrinkage) of employment. The new BLS gross job gain and gross job loss statistics will enable researchers to analyze the extent to which economic recessions and expansions are characterized by changes in business expansions and openings, by changes in business contractions and closings, or by a combination of the two.

The seasonally adjusted gross job gain and gross job loss rates are plotted in chart 1. As explained earlier, the difference between the gross job gain rate and the gross job loss rate is the familiar net employment growth rate. When gross job gains are above gross job losses, there are net employment gains; when gross job losses exceed gross job gains, there are net employment losses. The most recent business cycle, which was dated by the National Bureau of Economic Research

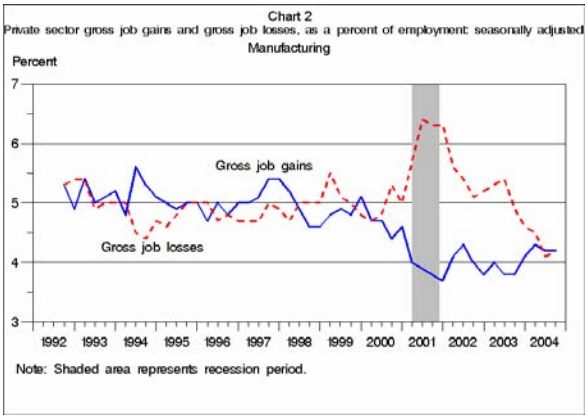
(NBER) as occurring between March 2001 and November 2001 is evident in chart 1. Between the third quarter of 1992 and the first quarter of 2000, the gross job gain rate was relatively constant, averaging 8.2 percent per quarter, and the gross job loss rate also was relatively constant, averaging 7.5 percent per quarter. The gross job gain rate started to decline in 2000 and dropped substantially in 2001 (to 7.2 percent in the third quarter of the latter year). The gross job loss rate increased considerably in 2001, rising to a high of 8.3 percent in the third quarter. Thus, the declining net employment growth rate during the first three quarters of 2001 is characterized by both a falling gross job gain rate and a rising gross job loss rate.

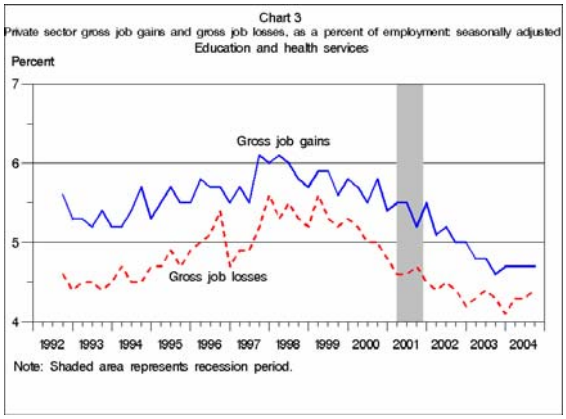


With the official ending of the NBER-dated recession in late 2001, the gross job loss rate decreased considerably and, by early to mid-2002, returned to a rate comparable to its pre-recession rates. The same cannot be said for the gross job gain rate following the recession: in calendar year 2002, the gross job gain rates remained in the range from 7.2 percent to 7.5 percent, substantially lower than the measure's pre-recession rates.

Gross job gains and gross job losses by major industries: The BED data by major industries reveal the heterogeneity of job creation and job destruction across industries. Focusing on percentages, so we can compare statistics across industries, in the third quarter of 2004, the national gross job gains rate is 7.2 percent and the gross job loss rate is 7.0 percent. The gross job gains rate ranges from a low of 2.5 percent in utilities and 4.2 percent in manufacturing to a high of 11.6 percent in construction and 16.3 percent in natural resources and mining. Observing manufacturing to have one of the lowest rates and construction to have one of the highest rates is consistent with the findings in the gross job flows literature (see Anderson and Meyer 1995, Foote 1998, and Spletzer 2000).

The BED statistics also reveal the sectoral differences in pattern of gross job gains and gross job losses over the course of business cycle. Chart 2 shows gross job gains and gross job losses in manufacturing. Gross job losses in manufacturing peaked in the midst of 2001 recession, while gross job gains dipped to the lowest level by the end of the recession. During the recovery, gross job losses dropped sharply, reaching to an all time low, while gross job gains rose slightly and remained well below the pre-recession level In contrast, gross job gains and gross job losses in education and health services show the absence of the recession in that sector. It also reveals that the rates of gross job gains and gross job losses are both declining and are hovering around the lowest point since the beginning of the time series in 1992. . (See chart3)





Future Development

These new gross job gain and gross job loss statistics will help economists, policymakers, and business leaders better understand the labor market and the U.S. economy. The data described represent just the start of a number of new data series flowing from the BLS Business Employment Dynamics program. In addition to publishing the national-level data by major industry sector described herein, the Bureau is preparing further data series at more detailed levels. Plans are in the works to release gross job gain and gross job loss statistics for geographical regions, such as States and counties, although confidentiality restrictions will determine just how much detail will be published. The Bureau also is working on gross job gain and gross job loss data by size class, which will allow the commonly asked question "Who creates the most jobs?" to be answered. The statistics presented in this article are all at the establishment level; the Bureau is working on gross job gain and gross job loss statistics at the firm level as well. Finally, BLS recent research on annual gross job gain and gross job loss statistics, and related issues such as business survival rates will extend the domain of business employment dynamics data series.

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