

# FRBSF ECONOMIC LETTER

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## Assessing Employment Growth in 2007

In 2007, Federal Reserve policymakers and others who pay close attention to the health of the nation's labor markets were seeing conflicting signals from two important data series on employment that often move largely in tandem. As expected, following fairly robust growth rates in 2006, both series showed reduced growth rates in 2007 as economic activity was slowing. But the deceleration was much steeper for the household series than for the payroll series, thus giving different impressions of the severity of the economic slowdown.

These two series are produced monthly by the U.S. Bureau of Labor Statistics (BLS). It is not entirely surprising that discrepancies between them should arise from time to time, because they are based on different surveys and are designed to capture different definitions of employment. This *Economic Letter* discusses the sources of the recent discrepancy between them and decomposes the gap in 2007 into its different components. The analysis shows that only one-fourth of the growth discrepancy (through December 2007) can be attributed to definitional differences, and that the yearly benchmark revisions to the payroll series account for a slightly smaller portion. Possible causes for the remaining gap in growth rates are discussed.

### **The payroll and household employment series**

The payroll and household employment series are based on different employment concepts and survey sources. Most notably, the payroll series is based on a survey of a large number of business establishments and measures the number of (non-farm) jobs, while the household series is based on a survey of a smaller number of households and measures the number of employed workers.

The payroll series is constructed from the Current Employment Statistics (CES) survey, which is a monthly sample of 160,000 businesses and government agencies, covering approximately 400,000 worksites. Because it estimates the number of jobs, in cases where an individual holds more than one job, it counts each job separately. Each year,

the CES sample is updated (“benchmarked”) to employment counts based on Unemployment Insurance (UI) tax records filed by nearly all employers. It is designed to provide a reliable measure of monthly employment change with detailed industrial and geographic information.

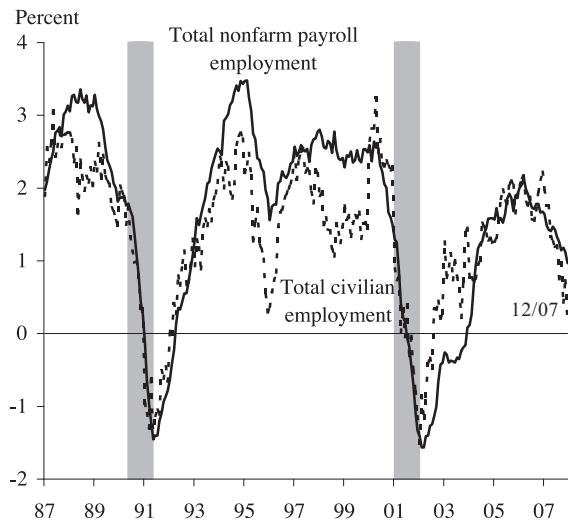
The household series (also called “civilian employment”) is constructed from the Current Population Survey (CPS), which is a monthly survey of approximately 60,000 U.S. households. This series estimates the number of employed persons aged 16 and over, counting individuals who hold multiple jobs only once. The following workers are included in the household series but excluded from the payroll series: the unincorporated self-employed, unpaid family workers, agricultural and related workers, private household workers, and workers absent without pay from their jobs. The CPS is designed to provide accurate information on the size and composition of the labor force; its monthly estimates are most reliable for key ratios, such as the rates of unemployment and labor force participation. However, because of its smaller survey size, the CPS employment estimates are subject to a large sampling error, which produces high monthly variability. The survey is adjusted annually to reflect population controls based on updated estimates from the U.S. Census Bureau.

### **Comparing employment growth**

As Figure 1 illustrates, over the long run, the payroll and household series typically track each other closely. The divergences that do occur have often exhibited a cyclical pattern, with payroll employment growing faster than household employment during economic expansions (Bowler and Morisi 2006). This pattern was evident during most of the 1990s expansion. The most important explanatory factor appears to be the understatement of underlying population growth in the household survey between census years.

A different pattern emerged during the expansion that followed the 2001 recession: from 2002 to

**Figure 1**  
**U.S. employment growth**  
 (% change from 12 months earlier, seasonally adjusted)



Source: U.S. BLS, CES and CPS surveys (data releases prior to February 1, 2008).

2004, payroll employment continued to decline, but household employment grew significantly. Since payroll employment growth had been higher before the recession, this actually brought the two employment series closer together. After thorough analyses of the divergence in growth, no consensus was reached about the primary contributory factors, although analysts speculated that inter-censal population adjustments in the household series had overstated population growth and, hence, employment growth.

This history provides useful context for the most recent episode. During 2007, a noticeable discrepancy emerged between the two series, with the payroll series showing more employment growth than the household series. Over the 12 months ending in December 2007 payroll employment grew by 1,328,000 (1.0% growth), while household employment grew by 262,000 (0.2% growth). Although the size of this discrepancy is smaller than it was in the late 1990s and in the 2002–2004 period, it is still large enough to create a very different view of the strength of the labor market in 2007 depending on which series is used.

### Reconciling employment trends

The first step in reconciling the two series is to address the definitional differences, namely, which workers are counted and which jobs are counted. This involves subtracting the following workers from the household employment count: all agri-

cultural workers, the self-employed, unpaid family workers, private household workers, and workers on unpaid absences from their jobs (see Figure 2). Self-employment turns out to be a major contributor to the discrepancy between the series: due to a decline in self-employment in 2007, household employment growth rises substantially when these workers are eliminated from the employment count, with two-thirds of the gap in growth rates disappearing. However, adjusting for multiple job-holding (which fell in 2007) reduces estimated growth in household employment. Overall, adjusting the household series with the employment definitions in the payroll survey explains 25% of the discrepancy between the series for the 12 months ending in December.

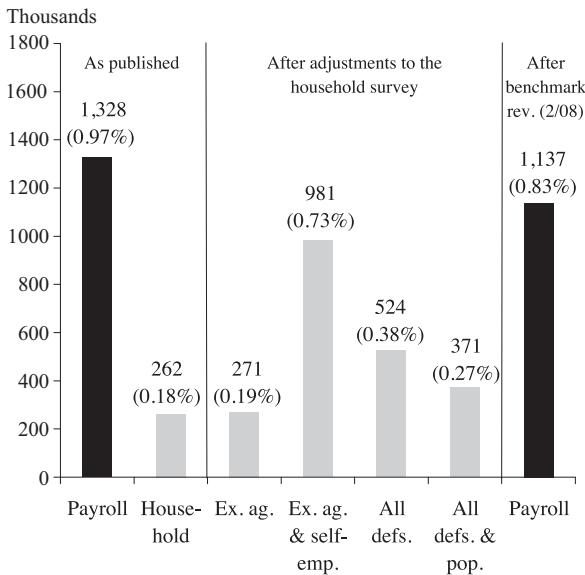
Another adjustment is even more technical. Each January the household survey is benchmarked to reflect inter-censal population estimates, creating a discrete jump between December and January in the official household employment numbers. Smoothing the adjustment of higher employment to pre-2007 dates reduces the household series employment growth and *increases* the discrepancy between the two series (U.S. BLS 2007). The remaining discrepancy is 957,000 more new jobs in the payroll series than in the adjusted household series. The implied growth rates for the 12 months ending in December 2007 are about 0.3% for the smoothed and adjusted household series and 1.0% for the payroll series. The overall adjustments explain only about one-tenth of the gap in growth rates, with a remaining growth gap of 0.7 percentage points.

### Other explanations for the remaining gap

Various potential explanations exist for the remaining discrepancy, although they are not definitive and do not clearly indicate which series provides a more accurate depiction of recent labor market conditions.

Each February the BLS publishes a revision to its previous year employment estimates, replacing the sample-based numbers with UI-based benchmark levels. The 2008 benchmark revision brought the payroll employment estimates for March 2007 down by 0.2 percentage points (293,000 jobs). Seasonally adjusting and wedging these lower employment numbers into the previous 11 months of data slightly reduces the discrepancy between the series' 12-month growth rates through December.

**Figure 2**  
**Employment change (12/06 to 12/07)**



Note: Annual growth rates in parentheses.  
Source: BLS.

As noted above, population adjustments for the household survey in between census years have contributed to past episodes where household employment growth was lower than payroll employment growth. These population adjustments are difficult to estimate in between census years, primarily due to the difficulties associated with estimating net immigration. Historically, the population controls contributed significantly to the discrepancy between payroll and household survey employment in the 1980s and 1990s, when the household survey showed less growth than the payroll survey. However, restrictions imposed after September 11, 2001, may reduce the business cycle volatility of immigration, implying a smaller role for the error from population estimates.

More general reporting errors remain a source for discrepancy that cannot be reconciled. When workers are misclassified—for example, when self-employed workers are classified as wage and salary workers—definitional adjustments will not account for the resulting discrepancy. Similarly, workers who are paid “off the books” are not reported in the payroll series but may report themselves as employed in the household survey; job loss by such workers might account for a portion of the lower growth in the household series in 2007. The contribution of each of these discrepancies is difficult to assess but likely to be small during 2007.

Sampling errors due to firm births and deaths that are not accounted for in the payroll series are of particular concern around cyclical turning points. Since 2003, the payroll survey uses model-based estimates to account for new firms that are missing from the sample and exiting firms that simply stop reporting. However, the drawback to this model-based approach is that it assumes a predictable continuation of historical patterns and, therefore, produces unreliable estimates at economic turning points. Some observers have expressed exactly this concern, that the payroll series overstated employment growth during much of 2007 due to an inadequate adjustment for firm births and deaths.

### Conclusion

This *Economic Letter* discusses the sources of the discrepancy between the growth in the household and payroll employment series that occurred during 2007. The analysis shows that smoothing and adjusting the household employment series for definitions and incorporating the benchmark revisions to the payroll employment series eliminate only a tenth of the December 2007 gap in annual growth rates between the two series. Both series showed slower employment growth in 2007 than in 2006, although the decline in self-employment in the unadjusted household series may suggest some weakness that is not reflected in the payroll series. Because the two employment series are based on different surveys and employment measures, periodic divergences are to be expected. Real-time assessment of the implications of such discrepancies are hindered by analysts’ inability to pin down the contribution of the model-based estimation of firm births and deaths in the payroll series (particularly around cyclical turning points), along with underlying changes in the population base used for the household series, worker misclassification, and “off the books” employment.

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## Index to Recent Issues of *FRBSF Economic Letter*

DATE	NUMBER	TITLE	AUTHOR
8/10	07-24	Are Global Prices Converging or Diverging?	Glick
8/31	07-25	Changing Productivity Trends	Trehan
9/14	07-26-27	Recent Financial Developments and the U.S. Economic Outlook	Yellen
9/21	07-28	Changes in Income Inequality across the U.S.	Regev/Wilson
9/28	07-29	Internal Risk Models and the Estimation of Default Probabilities	Christensen
10/5	07-30	Relative Comparisons and Economics: Empirical Evidence	Daly/Wilson
10/19	07-31	Corporate Access to External Financing	Lopez
10/26	07-32	Asset Price Bubbles	Lansing
11/2	07-33	Labor Force Participation and the Prospects for U.S. Growth	Daly/Regev
11/23	07-34	Financial Globalization and Monetary Policy	Spiegel
11/30	07-35	Fixing the New Keynesian Phillips Curve	Dennis
12/7	07-36-37	The U.S. Economy and Monetary Policy	Yellen
12/14	07-38	Sovereign Wealth Funds: Stumbling Blocks or Stepping Stones...?	Aizenman/Glick
1/18	08-01	Publishing FOMC Economic Forecasts	Rudebusch
1/25	08-02	Publishing Central Bank Interest Rate Forecasts	Rudebusch
2/1	08-03	2007 Annual Pacific Basin Conference: Summary	Glick
2/8	08-04-05	Prospects for the Economy in 2008	Yellen
2/15	08-06	Recent Trends in Economic Volatility: Conference Summary	Notzon/Wilson
2/22	08-07	Economic Conditions in Singapore and Vietnam: A Monetary...	Yellen
2/29	08-08	The Economics of Private Equity Investments: Symposium Summary	Lopez

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