

Payroll Employment at the Weekly Frequency

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Overview

- ▶ Review Data
- ▶ Benchmark Revisions
- ▶ Seasonal Adjustment
- ▶ Payroll Types
- ▶ Weekly Indexes
- ▶ Recent Developments

Our data are based on weekly records from the payroll processor ADP

- ▶ ADP processes paychecks for 20 percent of U.S. private employment
- ▶ Every pay period: clients send ADP data on the number of workers to pay
- ▶ Data is recorded weekly
- ▶ Information on industry, client size, geography

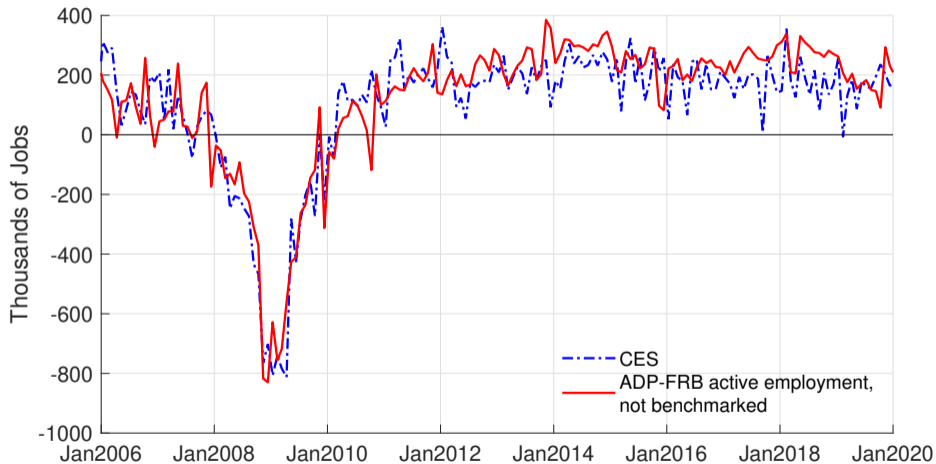
Two types of payroll included in data files

- ▶ “Active” employment: Number of workers in the payroll system.
- ▶ “Paid” employment: Number of paychecks issued.

Papers that this work builds on

- ▶ Cajner, Crane, Decker, Hamins-Puertolas, Kurz, and Radler (2018).
- ▶ Cajner, Crane, Decker, Grigsby, Hamins-Puertolas, Hurst, Kurz, and Yildirmaz (2020)

Monthly ADP-FRB tracked the business cycle very well



FRB-ADP Employment Series Construction

- ▶ We define employment to be employment for the pay period covering each Saturday.
- ▶ “Continuers” concept as in CES (the Bureau of Labor Statistics monthly survey)
- ▶ Snapshot employment for pay periods including each Saturday
- ▶ For each business we calculate weekly growth rates and remove outliers.
- ▶ Apply sampling weights by business size and industry from QCEW
- ▶ Adjust for missing biweekly payers

We end up with weekly non-seasonally adjusted indexes for both paid and active employment

Benchmarking

Corrects for whether the underlying sample-based data are representative and accounts for changes in economic activity due to business entry and exit

The BLS CES

- ▶ BLS benchmarks CES March employment level to the March QCEW and other data and wedges back to the preceding March.
- ▶ the BLS introduces a birth-death model to adjust for entry and exit
- ▶ The benchmarked monthly CES data do not reflect population data

The weekly ADP-FRB data follows a similar methodology

- ▶ ADP-FRB benchmarked to March QCEW and wedged back
- ▶ Adjust forward using a forward benchmark, based on recent benchmark misses.

Benchmarking: continued

Results of Benchmarking

- ▶ The forward benchmark reduces the root mean squared benchmark miss by about 30 percent.
- ▶ ADP-FRB had a smaller benchmark revision relative to the CES data 9 out of the last 18 years

Constant-Scope Benchmark Revisions, all series seasonally adjusted

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	RMSE
CES	-135	747	-230	-81	-947	-427	48	473	-98	121	-232	-143	141	-103	-516	-296	57	571	391.1
ADP-FRB	-74	-744	107	156	3	-627	-436	384	646	26	126	-205	665	573	193	-552	-914	366	464.5

Seasonal Adjustment

Seasonal adjustment is particularly challenging with nontraditional data

We previously focused on monthly data and we employed Census's X-13 seasonal adjustment program.

- ▶ Weekly seasonal procedures for weekly data
- ▶ locally weighted regressions on trigonometric functions
- ▶ stop using data after February 2020 for the estimation of our seasonal factors

Seasonally adjusted weekly series are differenced to estimate the change in employment each week, with a particular focus on BLS reference-week comparisons and four-week moving averages.

Seasonal Adjustment: continued

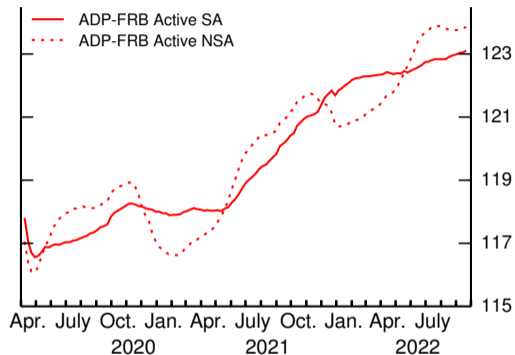


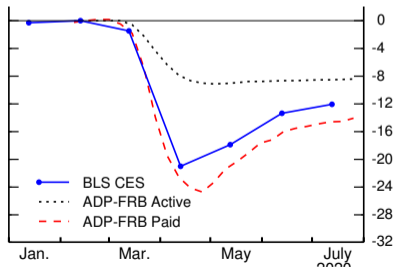
Figure: Seasonally adjusted Active employment from trough

Active, Paid, and Spliced

We focused on active employment before the pandemic

- ▶ paid employment is volatile (bonuses, payroll corrections, etc)
- ▶ active and paid series exhibit different seasonal and trend behavior
- ▶ active employment performed better in forecasting

Temporary layoffs 80 percent of job losses over the first two months of the pandemic.
The gap between “paid” and “active” employment represents unpaid furloughs.



Spliced series combines active and paid employment

The Value of Weekly Employment Indexes

More timely measures of turning points

- ▶ Employment estimates available about nine days after the fact
- ▶ Peak and trough
- ▶ Waves of COVID infections

Do not need to extrapolate from weekly to monthly estimates

- ▶ Monthly read in hand once have the week containing the 12th
- ▶ Tenor of labor market just weekly average of the growth rates

Weekly Indexes: continued

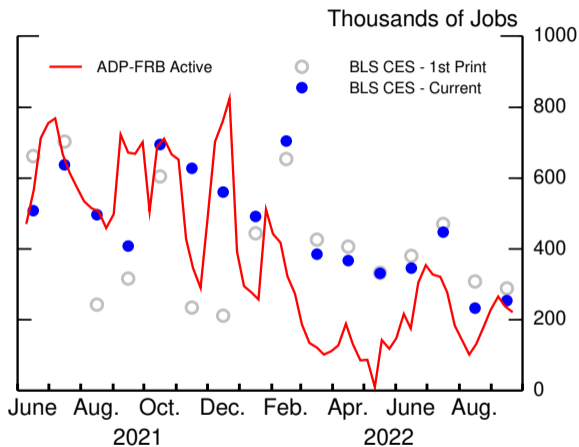


Figure: Recent ADP-FRB Data and CES Revisions

Recent Developments

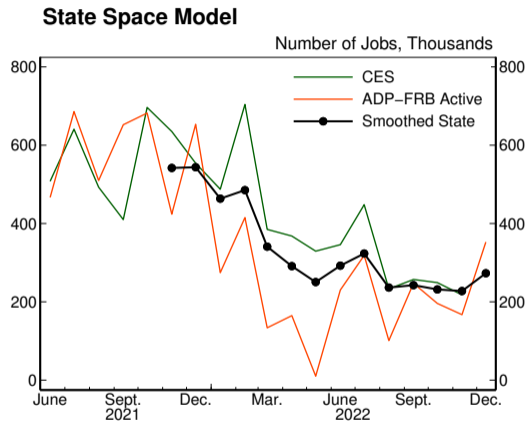
Notable upward revisions to the first CES prints during subsequent releases of the BLS CES data in the second half of 2021.

- ▶ August-December 2021, the first print releases were revised up by cumulative 1.2 million jobs

Another divergence between ADP-FRB and CES data in the first part of 2022.

- ▶ ADP-FRB average monthly growth of 200,000 January-November 2022
- ▶ 370,000 jobs per month in CES
- ▶ Gains in construction employment?
- ▶ Q2 QCEW data

Recent Developments: Return to Kalman filter approach



- ▶ Underlying job growth of about 300,000 so far in 2022