Did COVID-19 Induce a Reallocation Wave?

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¹The views presented here are those of the author alone and may not necessarily represent those of the Bank of Greece, the European Central Bank, or the European System of Central Banks.
Motivation

Preview of results

Some stylised facts
   Business Expectations: Reallocation or Uncertainty?
   Job Switches and Churning

Mismatch Unemployment

A Structural BVAR approach

Concluding remarks
Motivation

Sources: Federal Reserve Bank, St Louis, FRED

Sources: Botelho, Consolo and Dias da Silva, Hours worked in the euro area, ECB Economic Bulletin, issue 6/2021
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This Paper

- Examine whether a job reallocation occurred in the US. No unique way of tackling the issue: holistic approach. Rely on a variety of data sources and methods.

- **First, consider evidence from CPS and JOLTS.**
  - Workers switching occupation, sector, employer.
  - Hires, layoffs and quits, aggregate and by firm size.

- **Second, examine mismatch (indirect).**
  - A reallocation shock should be accompanied by mismatch.
  - Take well known off-shelf search and matching model with heterogeneous sectors (Sahin et al. 2014) and test in pandemic sample.

- **Third, gauge different drivers of labor market fluctuations during the pandemic.**
  - Bayesian Structural Vector Autoregression (SVAR): identification strategy based on sign restrictions
  - Separate reallocation shock from neutral technology, wage bargaining, matching efficiency shocks.
Preview of results

- Little evidence of an especially large reallocation wave occurring.

- Occupation-sector-employer switches reasonably close to trend. Employer switches higher in 2021 ("Great Resignation").

- Mismatch unemployment increased in the pandemic, but accounts for a relatively small part of total unemployment.
  - Similar to Great Recession: mismatch did increase briefly but then came down quickly. Mismatch unemployment < 20% of total.

- Aggregate demand and neutral technology shocks main driver of output and inflation (Guerrieri et al, 2020).
  - Reallocation shocks are not found to have a large and persistent labour market or output effects.
  - Reallocation matters and it is an integral mechanism of a market economy, but no outsize role during the pandemic.

- Focus on sample until 2021Q3; energy, supply chain, inflation muddy the picture substantially.
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Business Expectations

(a) Expected excess reallocation

(b) Uncertainty

<table>
<thead>
<tr>
<th>Company</th>
<th>Current value of 10'000$ invested</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peloton</td>
<td>871 USD</td>
<td>-91%</td>
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<tr>
<td>Robinhood</td>
<td>1'118 USD</td>
<td>-89%</td>
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<tr>
<td>Affirm</td>
<td>1'166 USD</td>
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<td>Lemonade</td>
<td>1'597 USD</td>
<td>-84%</td>
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<td>Draft Kings</td>
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<td>Teladoc</td>
<td>1'751 USD</td>
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<td>Roku</td>
<td>1'788 USD</td>
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<td>Beyond Meat</td>
<td>1'944 USD</td>
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<td>DocuSign</td>
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<td>Coinbase</td>
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<tr>
<td>Zoom</td>
<td>2'272 USD</td>
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</tr>
<tr>
<td>Netflix</td>
<td>2'469 USD</td>
<td>-75%</td>
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</table>

The world’s 10 richest people have all lost billions since 2022 started — except for Warren Buffett

Published Fri, Jan 28 2022, 2:21 PM EST
Updated Sun, Jan 30 2022, 7:34 PM EST

May 2022 (relative to peak)

Sources: Federal Reserve Bank, St Louis, FRED
Hires and Separations

(c) Hire and separation rates

(d) Layoff and quit rates

Source: JOLTS.
Job Switches and Churning

(e) Occupation/Industry switchers

(f) Employer Switchers

Source: CPS and Fujita et al. (2021).
Hires and Separations across firm size

(g) Hire rate
(h) Separation rate

Source: JOLTS.
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Mismatch unemployment

- Indirect approach: examine extent to which unemployment is frictional.
  - A large reallocation shock implies workers need to be shifted across sectors and occupations: matching frictions can slow down this reallocation, creating mismatch unemployment over the short-run.

- Use heterogeneous sector extension of canonical S&M model by Sahin et al. (2014).

- Estimate a planner-designed allocation of hires across sectors (given unemployment, vacancies, matching efficiency, productivity and job destruction rates), and compare with actual hires.

- Framework casts mismatch (and mismatch $u$) as deviations from an optimal allocation.
Mismatch Indexes

- The social planner chooses $u^*_i$ such that the optimal hiring across sectors $h^*_i$ maximises employment.
- How? by equating marginal contribution of job searchers across sectors - more searchers in sectors with higher vacancies and matching efficiencies.
- Mismatch, $M_{\phi,t}$: fraction of hires lost compared to the amount of optimal hiring, $h^*_{i,t}$

$$M_{\phi,t} = 1 - \frac{h_t}{h^*_t} = 1 - \sum_{i=1}^{I} \left( \frac{\phi_{it}}{\bar{\phi}_t} \right) \left( \frac{\nu_{it}}{\nu_t} \right) ^{\alpha} \left( \frac{u_{it}}{u_t} \right) ^{1-\alpha} \quad (1)$$

We consider three measures:

- $M_{\phi,t}$ cross-sectional heterogeneity of matching efficiencies, $\bar{\phi}_t$.
- $M_{z,t}$ cross-sectional heterogeneity in productivity, $\bar{\phi}_{z,t}$.
- $M_t$ no heterogeneity (except unemployment and vacancies).
Measuring Misallocation (Sahin et al, 2014)

Notes: Mismatch index (LHS); implied mismatch unemployment (RHS).
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A Structural Bayesian VAR with sign restrictions

- Verify the importance of a reallocation shock in a Bayesian SVAR with sign restrictions.

- 6 variables and 6 shocks:
  - Shocks: Aggregate Demand (AggDem), Neutral Technology (ASTech), Job Reallocation (ASJRe), Matching Efficiency (MatEff), Wage Bargaining (WagBag), Labor Supply (LabSup).

- ASJRe also a technology shock, but induces churn; raises both layoffs and hires.
  - ASTech instead reduces layoffs (marginal job more productive).

- ASJRe differs from MatEff for the different effects on unemployment.
  - Both raise layoffs, but as MatEff improves matching it reduces unemployment.
### Sign Restrictions

<table>
<thead>
<tr>
<th>Variable</th>
<th>AggDem</th>
<th>ASTech</th>
<th>ASJRe</th>
<th>WagBag</th>
<th>MatEff</th>
<th>LabSup</th>
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<td>-</td>
<td>+</td>
<td>-</td>
<td></td>
<td>+</td>
</tr>
</tbody>
</table>

**Table:** Matrix of Sign Restrictions

**Notes:** See also Canova et al (2010) and Foroni et al (2018)
Unemployment and Layoffs - Historical Decomposition

Figure: Layoffs
Note: historical decomposition of layoffs across the six different shocks.

Figure: Unemployment
Note: historical decomposition of unemployment across the six different shocks.
Hires and Output

Figure: Hires

Note: historical decomposition of the hiring rate across the six different shocks.

Figure: Output

Note: historical decomposition of industrial production - proxy for output - across the six different shocks.
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- Reallocation has not played a major role in the adjustment of the US labour market during the pandemic.

- Evidence from direct measures of job switches and indirect measures of mismatch unemployment.

- Reallocation shocks do not appear to be the main drivers of the business cycle fluctuations during the pandemic period; no outsize role relative to other episodes.
Thank you for your attention.

Data description

  - Use series of Fujita et al. (2021) which corrects for under-reporting of job-to-job transitions.

- Job Openings and Labor Turnover Survey (JOLTS) to capture labor market flows, also by firm size.

- For mismatch exercise, also use sectoral value added data from BEA, and destruction rates from BLS.

Figure: Sector stayers

Note: Share of workers employed in the same sector where they were employed a year earlier. Source: CPS.
Inflation and Wages - Historical Decomposition

**Figure: Inflation**

**Figure: Wages**

Note: historical decomposition across the six different shocks.
Variance decomposition and IRFs

Figure: FEVD

Note: forecast error variance decomposition across the six different shocks.

Figure: IRFs

Note: impulse response functions.
Layoffs and Hires - Historical Decomposition (long)

Figure: Layoffs

Note: historical decomposition across the six different shocks.

Figure: Hires

Note: historical decomposition across the six different shocks.
Unemployment and Wages - Historical Decomposition (long)

**Figure: Unemployment**

**Figure: Wages**

Note: historical decomposition across the six different shocks.
Inflation and IP - Historical Decomposition (long)

Figure: Inflation

Note: historical decomposition across the six different shocks.

Figure: IP

Note: historical decomposition across the six different shocks.