“Temporary Unemployment and Labor Market Dynamics During the COVID-19 Recession”

Brookings Papers on Economic Activity
September 2020

Jessica Gallant
University of Toronto

Kory Kroft
University of Toronto
and NBER

Fabian Lange
McGill University
and NBER

Matt Notowidigdo
University of Chicago
Booth School of Business
and NBER
Motivation

The COVID-19 recession is a very unusual recession:

• Record-shattering UI claims, extremely rapid increase in the unemployment rate \((u)\)

• Increase in \(u\) much larger than corresponding drop in job vacancies – “breaking” the Beveridge curve

• Typically, recessions begin with large increase in separations followed by low job finding rates, but job finding rates have remained relatively high during the COVID-19 recession

This paper focuses on one specific way the COVID-19 recession stands out: the sharp increase in temporary unemployment
Beveridge Curve is drunk

The Beveridge Curve (job openings rate vs. unemployment rate), seasonally adjusted
Click and drag within the chart to zoom in on time periods

- Dec 2000 to Feb 2001
- Mar 2001 to Nov 2001*
- Dec 2001 to Nov 2007
- Dec 2007 to June 2009*
- July 2009 to Apr 2020

9:04 AM · Jun 9, 2020 · Twitter Web App
This paper

• Develops search-and-matching model that distinguishes between temporary (T) and permanent (P) unemployment
  
  • **Key idea:** If workers believe unemployment is temporary, they impose less “congestion” on search-and-matching process – they will be “waiting”, rather than “searching”

• Calibrates model using 2001-2019 Current Population Survey (CPS) data

• Adjusts the Beveridge curve based on the composition of the unemployed using our calibrated model

• Use model to project $u$ over next 18 months under different scenarios -- evolutions of job vacancies, job separations, and the recall rate of the temporary unemployed “waiting” to be recalled
Outline

- Related literature
- Data
- Motivating figures
- Search-and-matching model
- Calibration results
- Conclusion
Related literature

• BPEA papers on dynamics of recessions: Elsby et al. (2010) and Elsby et al. (2011)

• Search-and-matching model: Kroft et al. (2016), Krueger et al. (2014 BPEA), Kroft et al. (2019)


• COVID-19 labor market dynamics papers: Chodorow-Reich and Coglianese (2020), Gregory, Menzio, Wiczer (2020), Bick and Blandin (2020)

• Additional COVID-19 papers: Bartik et al. (2020a,b), Goolsbee and Syverson (2020), Barrero et al. (2020)
Outline

• Related literature
• Data
• Motivating figures
• Search-and-matching model
• Calibration results
• Conclusion
Data

- Monthly **CPS** data between January 2001 - August 2020, using both cross-sectional and matched panel
  - Labor market states: employed ($E$), temporary unemployment ($T$), permanent unemployed ($P$), and non-participation ($N$)
  - Temporary unemployed classified as either “waiting” ($T^W$) or “actively searching” ($T^A$)
  - Measure “stocks” each month as well as month-to-month transition rates each month
  - Measure stocks of unemployed by duration $d$, $P(d)$ and $T(d)$
- Job vacancies measured using **JOLTS**
Measurement

- Drawing on Forsythe et al. (2020a,b), our own analysis, and BLS guidance, we include employed workers who are “absent for other reasons” and unpaid in the stock of $T^W$

- We divide $T$ into $T^W$ and $T^A$ based on question about whether they are “actively searching” for a new job

- We address “rotation group bias” by estimating transition rates in a way that imposes consistency with measured stocks each month, following Kroft et al. (2016)
[Motivating figures] unemployment rate ($u$)

Panel A: Full Sample

Panel B: August 2019 to August 2020

Seasonally adjusted
Motivating figures: unemployment rate ($u$)

Panel A: Full Sample

Panel B: August 2019 to August 2020

Seasonally adjusted
Job vacancies ($V$)

Panel A: Full Sample

Panel B: July 2019 - July 2020

Seasonally adjusted
Job separation rates, $E$-to-$U$

Panel A: Full Sample

Panel B: July 2019 to July 2020

- Black circles: Probability unemployed this month if employed last month
- Blue squares: Probability permanent unemployed this month if employed last month
- Red diamonds: Probability temporary unemployed this month if employed last month
Temporary unemployed share, \( T/(P+T) \)

Panel A: Full Sample

Share of unemployed who are temporary unemployed

Panel B: August 2019 to August 2020

Seasonally adjusted
Job finding rates / re-employment rates

Panel A: Job finding rate of temporary unemployed

Panel B: Job finding rates of permanent unemployed and all unemployed

Legend:
- All unemployed
- Permanent unemployed
- Temporary unemployed
Negative duration dependence for T and P

Job finding rate

Unemployment duration (months)

- Permanent unemployed
- Searching temporary unemployed
Transitions between $T$ and $P$

Panel A: Full Sample

Panel B: July 2019 to July 2020

Legend:
- Blue line: Probability temporary unemployed this month if permanent unemployed last month (unconditional)
- Red line: Probability permanent unemployed this month if temporary unemployed last month (unconditional)
Transitions between $T$ and $P$

The big problem: The labor market has moved on from temporary furloughs to growing permanent job loss. That'll cause the recession to drag... for years, says @BetseyStevenson.

Hall and Kudlyak (2020): “[T]here has been no visible increase in the transition rate [from $T$ to $P$] ... this is encouraging news, [but] there are reasons to be cautious ... frequency of leakage from [$T$ to $P$] increases during economic downturns ... consequently, leakage will increase if the pandemic recession resumes and unemployment rises.”
Outline

• Related literature
• Data
• Motivating figures
• Search-and-matching model
• Calibration results
• Conclusion
Search-and-matching model

- Exogenous ("forcing") variables: job separation rates, transition rates between non-employment categories, recall rates for $T^W$
- Main endogenous objects: job finding rates for $P(d)$, $T(d)$, $N$
- Job finding rate (JFR) determined by matching model:
  \[
  \frac{M(S_t, V_t)}{S_t} = m_0 x_t^{1-\alpha}, \text{ where } x_t = \frac{V_t}{S_t}
  \]
  - For $P(d)$, JFR is:
    \[
    \lambda_{t}^{P(d)\rightarrow E} = \text{Prob}(E_t | P_{t-1}(d)) = A(d) m_0 x_t^{1-\alpha}
    \]
  - For $N$, JFR is:
    \[
    \lambda_{t}^{N\rightarrow E} = \text{Prob}(E_t | N_{t-1}) = s m_0 x_t^{1-\alpha}
    \]
Job finding rates for $T^W$ and $T^A$

- Job finding rate for $T^A(d)$ is:

$$\lambda_{t}^{T^A(d)\rightarrow E} = \pi \lambda_{t}^{T^W\rightarrow E} + (1 - \pi \lambda_{t}^{T^W\rightarrow E}) \lambda_{t}^{P(d)\rightarrow E}$$

- Total search effort given by:

$$S_t = \bar{P}_t + (1 - \pi \lambda_{t}^{T^W\rightarrow E}) \bar{T}_t^A + sN_t$$

$$\bar{P}_t = \sum_{d=1}^{D} A(d) P_t(d)$$

$$\bar{T}_t^A = \sum_{d=1}^{D} A(d) T_t^A(d)$$
Calibration

1. Estimate stocks and transition rates using CPS data

2. Estimate $A(d)$ using 2001-2019 data following Kroft et al. (2019); assumed to be the same for $T^A(d)$ and $P(d)$ and stable over time

3. Estimate remaining model parameters using minimum distance on 2001-2019 data

4. In both (2.) and (3.) find very similar estimates to Kroft et al. (2016) which used only pre-2008 data. Suggests that the matching model parameters and duration dependence parameters are fairly stable
Job finding rates in-sample and out-of-sample
Job finding rates in-sample and out-of-sample

Job Finding Rates for Unemployed: Baseline Model

- U-to-E observed
- U-to-E predicted
Comparing to model without temporary unemployment

Job Finding Rate of Unemployed
Beveridge curve
Beveridge curve
## Forcing variables

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Vacancies</td>
<td>7,108,250</td>
<td>5,857,000</td>
<td>5,305,000</td>
<td>5,222,000</td>
<td>5,843,000</td>
<td>6,949,000</td>
</tr>
<tr>
<td>E to N transition rate</td>
<td>0.023</td>
<td>0.017</td>
<td>0.053</td>
<td>0.041</td>
<td>0.024</td>
<td>0.023</td>
</tr>
<tr>
<td>E to T transition rate</td>
<td>0.005</td>
<td>0.021</td>
<td>0.140</td>
<td>0.037</td>
<td>0.018</td>
<td>0.019</td>
</tr>
<tr>
<td>E to P transition rate</td>
<td>0.006</td>
<td>0.006</td>
<td>0.010</td>
<td>0.006</td>
<td>0.007</td>
<td>0.006</td>
</tr>
<tr>
<td>T to P transition rate</td>
<td>0.112</td>
<td>0.372</td>
<td>0.148</td>
<td>0.034</td>
<td>0.050</td>
<td>0.039</td>
</tr>
<tr>
<td>T to N transition rate</td>
<td>0.181</td>
<td>0.535</td>
<td>0.571</td>
<td>0.144</td>
<td>0.129</td>
<td>0.128</td>
</tr>
<tr>
<td>P to N transition rate</td>
<td>0.403</td>
<td>0.371</td>
<td>0.636</td>
<td>0.419</td>
<td>0.321</td>
<td>0.229</td>
</tr>
<tr>
<td>P to T transition rate</td>
<td>0.017</td>
<td>0.029</td>
<td>0.088</td>
<td>0.051</td>
<td>0.121</td>
<td>0.131</td>
</tr>
<tr>
<td>N to P transition rate</td>
<td>0.055</td>
<td>0.048</td>
<td>0.046</td>
<td>0.047</td>
<td>0.074</td>
<td>0.051</td>
</tr>
<tr>
<td>N to T transition rate</td>
<td>0.004</td>
<td>0.009</td>
<td>0.032</td>
<td>0.059</td>
<td>0.047</td>
<td>0.039</td>
</tr>
<tr>
<td>Share of temporary unemployed searching</td>
<td>0.181</td>
<td>0.108</td>
<td>0.083</td>
<td>0.124</td>
<td>0.194</td>
<td>0.234</td>
</tr>
<tr>
<td>Job finding rate of waiting temporary unemployed</td>
<td>0.642</td>
<td>0.455</td>
<td>0.805</td>
<td>0.373</td>
<td>0.451</td>
<td>0.416</td>
</tr>
</tbody>
</table>
## Forcing variables

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Vacancies</td>
<td>7,108,250</td>
<td>5,857,000</td>
<td>5,305,000</td>
<td>5,222,000</td>
<td>5,843,000</td>
<td>6,949,000</td>
</tr>
<tr>
<td>E to N transition rate</td>
<td>0.023</td>
<td>0.017</td>
<td>0.053</td>
<td>0.041</td>
<td>0.024</td>
<td>0.023</td>
</tr>
<tr>
<td>E to T transition rate</td>
<td>0.005</td>
<td>0.021</td>
<td>0.140</td>
<td>0.037</td>
<td>0.018</td>
<td>0.019</td>
</tr>
<tr>
<td>E to P transition rate</td>
<td>0.006</td>
<td>0.006</td>
<td>0.010</td>
<td>0.006</td>
<td>0.007</td>
<td>0.006</td>
</tr>
<tr>
<td>T to P transition rate</td>
<td>0.112</td>
<td>0.372</td>
<td>0.148</td>
<td>0.034</td>
<td>0.050</td>
<td>0.039</td>
</tr>
<tr>
<td>T to N transition rate</td>
<td>0.181</td>
<td>0.535</td>
<td>0.571</td>
<td>0.144</td>
<td>0.129</td>
<td>0.128</td>
</tr>
<tr>
<td>P to N transition rate</td>
<td>0.403</td>
<td>0.371</td>
<td>0.636</td>
<td>0.419</td>
<td>0.321</td>
<td>0.229</td>
</tr>
<tr>
<td>P to T transition rate</td>
<td>0.017</td>
<td>0.029</td>
<td>0.088</td>
<td>0.051</td>
<td>0.121</td>
<td>0.131</td>
</tr>
<tr>
<td>N to P transition rate</td>
<td>0.055</td>
<td>0.048</td>
<td>0.046</td>
<td>0.047</td>
<td>0.074</td>
<td>0.051</td>
</tr>
<tr>
<td>N to T transition rate</td>
<td>0.004</td>
<td>0.009</td>
<td>0.032</td>
<td>0.059</td>
<td>0.047</td>
<td>0.039</td>
</tr>
<tr>
<td>Share of temporary unemployed searching</td>
<td>0.181</td>
<td>0.108</td>
<td>0.083</td>
<td>0.124</td>
<td>0.194</td>
<td>0.234</td>
</tr>
<tr>
<td>Job finding rate of waiting temporary unemployed</td>
<td>0.642</td>
<td>0.455</td>
<td>0.805</td>
<td>0.373</td>
<td>0.451</td>
<td>0.416</td>
</tr>
</tbody>
</table>
## Forcing variables

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Vacancies</td>
<td>7,108,250</td>
<td>5,857,000</td>
<td>5,305,000</td>
<td>5,222,000</td>
<td>5,843,000</td>
<td>6,949,000</td>
</tr>
<tr>
<td>E to N transition rate</td>
<td>0.023</td>
<td>0.017</td>
<td>0.053</td>
<td>0.041</td>
<td>0.024</td>
<td>0.023</td>
</tr>
<tr>
<td>E to T transition rate</td>
<td>0.005</td>
<td>0.021</td>
<td>0.140</td>
<td>0.037</td>
<td>0.018</td>
<td>0.019</td>
</tr>
<tr>
<td>E to P transition rate</td>
<td>0.006</td>
<td>0.006</td>
<td>0.010</td>
<td>0.006</td>
<td>0.007</td>
<td>0.006</td>
</tr>
<tr>
<td>T to P transition rate</td>
<td>0.112</td>
<td>0.372</td>
<td>0.148</td>
<td>0.034</td>
<td>0.050</td>
<td>0.039</td>
</tr>
<tr>
<td>T to N transition rate</td>
<td>0.181</td>
<td>0.535</td>
<td>0.571</td>
<td>0.144</td>
<td>0.129</td>
<td>0.128</td>
</tr>
<tr>
<td>P to N transition rate</td>
<td>0.403</td>
<td>0.371</td>
<td>0.636</td>
<td>0.419</td>
<td>0.321</td>
<td>0.229</td>
</tr>
<tr>
<td>P to T transition rate</td>
<td>0.017</td>
<td>0.029</td>
<td>0.088</td>
<td>0.051</td>
<td>0.121</td>
<td>0.131</td>
</tr>
<tr>
<td>N to P transition rate</td>
<td>0.055</td>
<td>0.048</td>
<td>0.046</td>
<td>0.047</td>
<td>0.074</td>
<td>0.051</td>
</tr>
<tr>
<td>N to T transition rate</td>
<td>0.004</td>
<td>0.009</td>
<td>0.032</td>
<td>0.059</td>
<td>0.047</td>
<td>0.039</td>
</tr>
<tr>
<td>Share of temporary unemployed searching</td>
<td>0.181</td>
<td>0.108</td>
<td>0.083</td>
<td>0.124</td>
<td>0.194</td>
<td>0.234</td>
</tr>
<tr>
<td>Job finding rate of waiting temporary unemployed</td>
<td>0.642</td>
<td>0.455</td>
<td>0.805</td>
<td>0.373</td>
<td>0.451</td>
<td>0.416</td>
</tr>
</tbody>
</table>
## Forcing variables

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Vacancies</td>
<td>7,108,250</td>
<td>5,857,000</td>
<td>5,305,000</td>
<td>5,222,000</td>
<td>5,843,000</td>
<td>6,949,000</td>
</tr>
<tr>
<td>E to N transition rate</td>
<td>0.023</td>
<td>0.017</td>
<td>0.053</td>
<td>0.041</td>
<td>0.024</td>
<td>0.023</td>
</tr>
<tr>
<td>E to T transition rate</td>
<td>0.005</td>
<td>0.021</td>
<td>0.140</td>
<td>0.037</td>
<td>0.018</td>
<td>0.019</td>
</tr>
<tr>
<td>E to P transition rate</td>
<td>0.006</td>
<td>0.006</td>
<td>0.010</td>
<td>0.006</td>
<td>0.007</td>
<td>0.006</td>
</tr>
<tr>
<td>T to P transition rate</td>
<td>0.112</td>
<td>0.372</td>
<td>0.148</td>
<td>0.034</td>
<td>0.050</td>
<td>0.039</td>
</tr>
<tr>
<td>T to N transition rate</td>
<td>0.181</td>
<td>0.535</td>
<td>0.571</td>
<td>0.144</td>
<td>0.129</td>
<td>0.128</td>
</tr>
<tr>
<td>P to N transition rate</td>
<td>0.403</td>
<td>0.371</td>
<td>0.636</td>
<td>0.419</td>
<td>0.321</td>
<td>0.229</td>
</tr>
<tr>
<td>P to T transition rate</td>
<td>0.017</td>
<td>0.029</td>
<td>0.088</td>
<td>0.051</td>
<td>0.121</td>
<td>0.131</td>
</tr>
<tr>
<td>N to P transition rate</td>
<td>0.055</td>
<td>0.048</td>
<td>0.046</td>
<td>0.047</td>
<td>0.074</td>
<td>0.051</td>
</tr>
<tr>
<td>N to T transition rate</td>
<td>0.004</td>
<td>0.009</td>
<td>0.032</td>
<td>0.059</td>
<td>0.047</td>
<td>0.039</td>
</tr>
<tr>
<td>Share of temporary unemployed searching</td>
<td>0.181</td>
<td>0.108</td>
<td>0.083</td>
<td>0.124</td>
<td>0.194</td>
<td>0.234</td>
</tr>
<tr>
<td>Job finding rate of waiting temporary unemployed</td>
<td>0.642</td>
<td>0.455</td>
<td>0.805</td>
<td>0.373</td>
<td>0.451</td>
<td>0.416</td>
</tr>
</tbody>
</table>
Baseline vs. model without temporary unemployment

Unemployment Rate

Counterfactual begins with observed forcing variables
Continues with simulated forcing variables

- Observed
- Baseline Model
- Single Unemployment State
Baseline vs. model without temporary unemployment

Unemployment Rate

Counterfactual begins with observed forcing variables
Continues with simulated forcing variables

Observed
Baseline Model
Single Unemployment State
Baseline vs. model without temporary unemployment

Unemployment Rate

- Counterfactual begins with observed forcing variables
- Continues with simulated forcing variables

Graph showing the comparison between observed data, baseline model, and single unemployment state model over time.
Baseline vs. “stalling out” scenario

Unemployment Rate

Counterfactual begins with observed forcing variables

Continues with simulated forcing variables

Forcing variables linearly approach Mar 2019-Feb 2020 averages over next 24 months
Stall indefinitely (forcing variables remain at Jul 2020 levels)
Baseline vs. “stalling out” scenario

Unemployment Rate

- Counterfactual begins with observed forcing variables
- Continues with simulated forcing variables

- CBO 2020Q4
- Fed SEP & Blue Chip 2020Q4
- Fed SEP Optimistic 2020Q4
- CBO 2021Q4
- Fed SEP 2021Q4

- Stall indefinitely (forcing variables remain at Jul 2020 levels)
- Forcing variables linearly approach Mar 2019-Feb 2020 averages over next 24 months

BLS Headline
Summary of calibration results

• We find that $u$ declines more rapidly compared to a model without $T/P$ distinction & compared to forecasts.

• To match professional forecasts, need a “U-turn” in job separations (or substantial reductions in vacancies and the recall rate for $T$).

• Results are consistent with small share of workers reporting that “jobs are hard to get” => jobs may not be “scarce” for the unemployed workers actively searching for a job.

• No meaningful increase in long-term unemployment (LTU) during recovery; we project LTU share approaching 25% (similar to 2019 levels), compared to 50% LTU share for several years following Great Recession.
Conclusions

• The COVID-19 recession is unusual: job finding rates usually fall during recessions following a rapid inflow into unemployment (Elsby et al. 2010)

• Assuming that the unemployment “outflow rate” follows the dynamics of past recessions may lead to overestimating the recovery time for the labor market

• Calibrated model provides rigorous support for focusing somewhat less on the “headline” unemployment rate as a measure of labor market slack; instead, need to look at composition of unemployed alongside vacancies and job separations