How much did Bonus Unemployment Insurance Payments During the COVID Pandemic Depress Aggregate Employment?

Did supplemental unemployment compensation discourage a return to full-time work?

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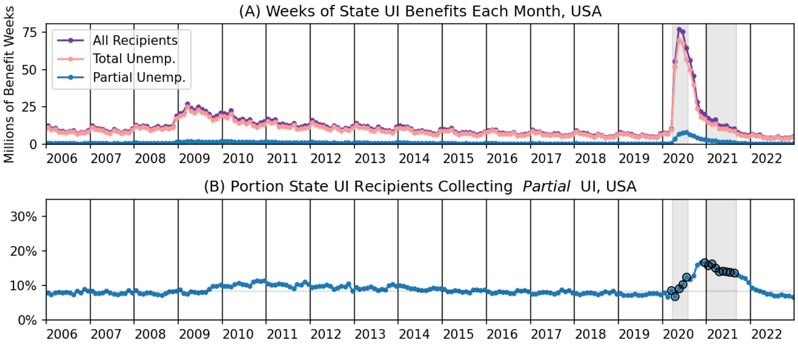
Outline

- During the Pandemic, large supplemental payments were given to anyone collecting even a dollar of Unemployment Insurance.
- These payments were made to the fully unemployed and to those with reduced hours.
- (Ganong et al 2022) found these programs only slightly reduced the job finding rate.
- But what about the effect on the intensive margin?

Regular State UI Recipients Over Time, All US



Partial Unemployment Insurance

- If a person is eligible for UI, a weekly benefit amount (WBA) is determined based on employment history.
    - Except for high earners, it's about half of their typical income.
    - Constant throughout entire UI spell.
- Benefits depend both on the current week's gross earnings, and on the individual's WBA.
    - Your WBA is the amount you collect when totally unemployed.
    - As earnings increase, benefits decrease
    - Details vary by state.
- During the pandemic, the Federal Pandemic Unemployment Compensation supplement was paid out in full to anyone collecting even a single dollar of state UI.
    - 600 dollars per week April to July, 2020
    - 300 dollars per week January to September, 2021

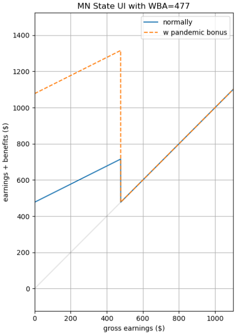
Example: State UI Benefits in Minnesota

In Minnesota, the rule is that the benefits for a given week are determined by:

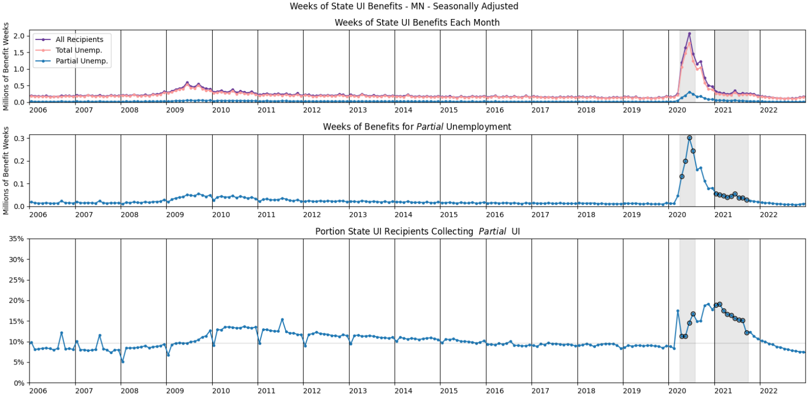
$$benefits = \begin{cases} WBA - \frac{earnings}{2} & \text{if } earnings < WBA \\ 0 & \text{if } earnings \geq WBA \end{cases}$$

where WBA is weekly benefit amount (person-specific, fixed for entire duration of benefits spell). Frame and the earnings refers to the current week's labor income before taxes and transfers.

Figure on right: earnings and benefits for a hypothetical Minnesota worker with a WBA of 477 USD



Regular State UI Recipients Over Time, MN



- Model of unemployment insurance with partial employment and moral hazard.
-

Outline

Consumer's Choices

The consumer's optimand is straightforward:

$$\mathbb{E}\sum_{j}\beta^{t}U(c_t, l_t) = \mathbb{E}\sum_{t}\beta^{t}\frac{(c_t^{1-\sigma} l_t^{\sigma})^{1-\rho} - 1}{1-\rho}$$

Two decisions the consumer faces:

1. How to split income between consumption and (non-interest-bearing) savings
   - budget is $a' + c = a + y_d$, where a is assets, and y_d is disposable income.
   - assets are subject to the constraint $a' \geq 0$
2. Whether and how much to work when give a job opportunity. (See next slide.)

Job Search

Employment opportunity $s \in \{E, P, U\}$ represents whether the person has a job opportunity ($s = E$), a partial job opportunity ($s = P$) or no job opportunity ($s = U$). (Employment, Partial employment, full Unemployment)

- s evolves according to a 3x3 transition matrix χ

$$\chi = \begin{bmatrix} \chi(E,E) & \chi(E,P) & \chi(E,U) \\ \chi(P,E) & \chi(P,P) & \chi(P,U) \\ \chi(U,E) & \chi(U,P) & \chi(U,U) \end{bmatrix}$$

employment status $\eta \in \{\mathrm{E}, \mathrm{P}, \mathrm{U}\}$ represents the level of work the consumer actually chooses to engage in.

- If $s = E$, consumer can choose from $\eta \in \{\mathrm{E}, \mathrm{P}, \mathrm{U}\}$
- If $s = P$, consumer can choose from $\eta \in \{\mathrm{E}, \mathrm{P}, \mathrm{U}\}$
- If $s = U$, consumer can choose from $\eta = \mathrm{U}$

Unemployment Benefits

- $\mu \in \{0, 1\}$ is a binary variable indicating whether the person collects unemployment benefits.
  - If $s = E$, then $\mu = 0$
  - If $(s, \eta) = (P, \mathrm{P})$ or (U, U), then $\mu = 1$
  - If $\eta = \mathrm{U}$, but $s \neq U$, then $\mu = 1$ with probability π_u, 0 otherwise
  - If $\eta = \mathrm{P}$, but $s \neq P$, then $\mu = 1$ with probability π_p, otherwise
- If Consumer collects benefits, the benefits adjust their disposable income to some fraction of employed disposable income, called the "replacement rate".
  - θ_p is replacement rate for partially employed (when $(\eta, \mu) = (\mathrm{P}, 1)$)
  - θ_u is replacement rate for unemployed (when $(\eta, \mu) = (\mathrm{U}, 1)$)

Utility Flows, Income, and Leisure

Utility flow is $U\Big(a - a' + y_d(\eta,\mu),\ l(\eta)\Big)$

where $y_d(\eta,\mu)$ is the disposable income and $l(\eta)$ is the leisure that results from the worker's decisions.

$$y_d(\eta,\mu) = \begin{cases} (1-\tau)w & \text{if } (\eta,\mu) = (\mathrm{E},0) \\ (1-\tau)w\frac{\hat{h}_p}{\hat{h}_e} & \text{if } (\eta,\mu) = (\mathrm{P},0) \\ 0 & \text{if } (\eta,\mu) = (\mathrm{U},0) \\ (1-\tau)\left(w\theta_p + b\right) & \text{if } (\eta,\mu) = (\mathrm{P},1) \\ (1-\tau)\left(w\theta_u + b\right) & \text{if } (\eta,\mu) = (\mathrm{U},1) \end{cases}$$

$$l(\eta) = \begin{cases} 1 - \hat{h}_e & \text{if } \eta = \mathrm{E} \\ 1 - \hat{h}_p & \text{if } \eta = \mathrm{P} \\ 1 & \text{if } \eta = \mathrm{U} \end{cases}$$

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Timeline Within Each Period

1. Consumer receives potential job offer $s \in \{E, P, U\}$
2. Consumer chooses employment status $\eta \in \{\mathrm{E}, \mathrm{P}, \mathrm{U}\}$
3. Draw $\mu \in \{0, 1\}$: does the Consumer get unemployment benefits?
4. Consumer chooses m' after seeing μ

Value Functions

$$
\begin{aligned}
V(a,s) \; &= \max_{\eta} \Bigg\{ \mathbb{E} \Bigg[\max_{m'} \Big\{ U\Big(y^d(\eta,\mu) + a - a', l(\eta) \Big) \\
&\qquad + \beta \sum_{s'} \chi(s,s') V(a',s') \Big\} \Bigg] \Bigg\}
\end{aligned}
$$

$$
\text{s.t.} \qquad \eta \in \begin{cases} \{E,P,U\} & \text{if } s = E \\ \{P,U\} & \text{if } s = P \\ \{U\} & \text{if } s = U \end{cases}
$$

$$
0 \leq a' \leq a + y^d(\eta,\mu)
$$

Market Clearing and Equilibrium

State of a person is $x = (a, s, \eta, \mu)$
Stationary equilibrium consists of

- decision rules $c(x)$, $a'(x)$, $\eta'(a, s)$
- time-invariant measure $\lambda(x)$ of people in state x
- tax rate τ

Such that

1. Given the tax rate, the decision rules solve the worker's maximization problem.
2. The goods market clears.
3. The government's budget constraint is balanced each period.
4. $\lambda(x') = \lambda(x)$

Adding heterogeneity to the model.

In *US unemployment insurance replacement rates during the pandemic* (Ganong, Noel, and Vavra, 2020), the authors use CPS data to estimate the income distribution of workers benefitting from the Pandemic Unemployment Compensation.

Quintile	**1**	**2**	**3**	**4**	**5**
Pre-pandemic Weekly Income	372	592	886	1280	2323

From Table 1 from (Ganong, Noel, and Vavra, 2020)

Adding this to model:

- 5 'types' of people corresponding to these income quintiles.
- Income scaled so that 886 corresponds to $y = 1$

Outline

Calibrating χ

- Each period is 1 month.
- Transition matrix calculated from Current Population Survey data to match pre-pandemic economy:

$$\chi = \begin{bmatrix} \chi(E,E) & \chi(E,P) & \chi(E,U) \\ \chi(P,E) & \chi(P,P) & \chi(P,U) \\ \chi(U,E) & \chi(U,P) & \chi(U,U) \end{bmatrix} = \begin{bmatrix} 0.965 & 0.017 & 0.018 \\ 0.598 & 0.343 & 0.059 \\ 0.339 & 0.057 & 0.604 \end{bmatrix}$$

- This matrix gives a stationary distribution for E, P, and U of approximately $92.6\%, 2.8\%, 4.6\%$, which is close to the actual distribution of $92.6\%, 2.9\%, 4.5\%$

Working Time

- $\hat{h}_e$ is set to 0.45, representing a full work week of 45 hours out of possible 100.
- And time spent for part-time work is set to $\hat{h}_p = 0.15$

Other Parameters

- $\beta = 0.9966$
- $\sigma = 0.5$
- $\rho = 2$
- $\theta_u = 0.5$
- $\theta_p = 0.\bar{6}$
- $\pi = 0.12$

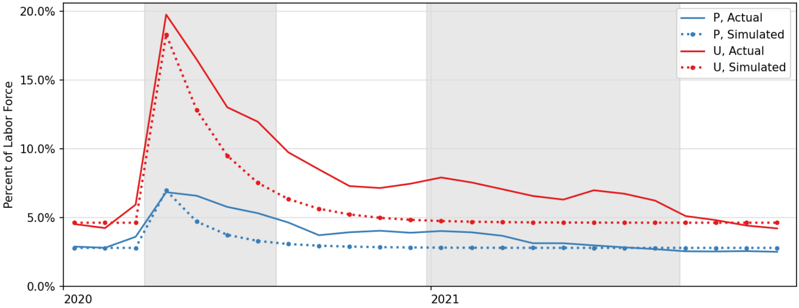
Simulation of Pandemic and FPUC

- Start in pre-pandemic stationary equilibrium.
- Iterate measure month by month. 24 periods representing 2020 and 2021.
- Represent the direct effect of the pandemic as one time shock, where transition between months 3 and 4 is:

$$\chi_{shock} = \begin{bmatrix} 0.783 & 0.065 & 0.152 \\ 0.360 & 0.252 & 0.388 \\ 0.268 & 0.053 & 0.679 \end{bmatrix}$$

- Then transition process reverts to normal.

Simulation without bonus UI payments



Simulation with bonus UI payments