Optimal Short-Time Work Policy

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Motivation

- Great Recession, Covid-19 Pandemic: Steep increase in unemployment

- How should we stabilize the labor market?

- OECD countries responded by
  Introducing or extending Short-Time Work (STW) despite of having
  well established Unemployment Insurance (UI) systems

This Paper

- Focus: STW as a complement to the UI system
    - Alleviates UI system's moral hazard problems despite having its own.

- Questions:
    - How should we use STW?
    - How well can we stabilize the business cycle?
    - Can we reach the planner allocation?

Environment and STW Policy

- Environment:
  SaM Model with flexible intensive margin and exogenous UI

- STW Policy:
    - *Eligibility:* Hours worked fall below a certain threshold.
    - *Generosity:* Compensation for every hour they work less than normally.
    - *Mechanism:* Pays subsidy to the least productive firm/worker matches.

- Interpretation:
  STW as state-contingent wage-subsidy

Results

- How should we use STW?
    1. General rules:
        1.1 Eligibility: Only firm-worker matches that would otherwise dissolve
        1.2 Generosity: Offset moral hazard problems of UI
    2. Rules in recessions:
        2.1 Eligibility: Get stricter
        2.2 Generosity: Get more generous

- How well can we stabilize the business cycle?
    3. Stabilizes employment and consumption but not output.

- Can we reach planner allocation?
    4. No, because STW has little influence on vacancy posting
        $\rightarrow$ solvable with vacancy subsidy if STW had no moral hazard problems.
    5. No, because using STW comes at output loss (moral hazard problem).
        $\rightarrow$ not solvable

Literature

Literature

- Braun and Brügemann (2017)
    - Find that STW might reduce the moral hazard problems of an UI system in a static implicit contract model
    - <u>This paper:</u> Generalizes the idea to a SaM model, looks at optimal business cycle response and proposes an optimal policy mix.
- Balleer et al. (2016), Cooper, Meyer, and Schott (2017)
    - Both analyze STW in a SaM model over the business cycle with inflexible hours adjustment
    - <u>This paper:</u> Analyzes optimal STW policy with flexible hours worked over the business cycle.
- Cahuc, Kramarz, and Nevoux (2021)
    - Analyzes windfall profits of STW in a partial equilibrium model.
    - <u>This paper:</u> Connects to the modeling of STW in the sense that key to the effect of STW is the influence of the STW subsidy on the surplus of the marginal matches.

Model

Assumptions

- Canonical Search and Matching Model augmented with
  1. Flexible hours choice
  2. Endogenous separations (caused by idiosyncratic productivity shocks)
  3. Lay-off costs
  4. Aggregate productivity shocks (causes the recession)

- Two possible inefficiencies:
  1. Moral hazard problems of the exogenous UI system
  2. Rigid-salaries (counter-cyclical bargaining power of workers)

- Policy Measures
  1. Short time work
  2. Production tax
     (finances UI and STW system, balances budget every period)

Firm Side

- Value of firm producing regularly:

$$J_t(\epsilon) = y_t(\epsilon, h_t(\epsilon)) - w_t - \tau_{J,t} + \beta \cdot E_t\left[J_{t+1}\right]$$

- Eligibility: $h_t(\epsilon) \leq D_t$ (Hours fall below threshold)
  Value of firm on STW:

$$J_{stw,t}(\epsilon) = y_t(\epsilon, h_{stw,t}(\epsilon)) - \underbrace{\frac{w_t}{\bar{h}} \cdot h_{stw,t}(\epsilon)}_{\substack{\text{on STW:} \\ \text{pay for hours worked only}}} - \tau_{J,t} + \beta \cdot E_t\left[J_{t+1}\right]$$

- Separations: $\epsilon < \epsilon_{s,t}$, pay lay-off costs F, severance payment $w_{eu,t}$.

Worker Side

- Value of an employed worker when producing regularly:

$$V_t(\epsilon) = w_t + \Pi_t - v(h_t(\epsilon)) + \beta \cdot E_t[V_{t+1}]$$

- Value of an employed worker on STW:

$$V_{stw,t}(\epsilon) = \underbrace{\frac{w_t}{\bar{h}} \cdot h_{stw,t}(\epsilon)}_{\text{Reduced Income from Firm}} + \underbrace{(\bar{h} - h_{stw,t}(\epsilon)) \cdot \tau_{stw,t}}_{\text{STW Subsidy}} + \Pi_t$$
$$- v(h_{stw,t}(\epsilon)) + \beta \cdot E_t[V_{t+1}]$$

- Workers, that are unemployed at the beginning of the period, receive unemployment benefits b_t and get reemployed with probability f_t:

$$U_t = b_t + \Pi_t + \beta \cdot E_t[f_t \cdot V_{t+1} + (1 - f_t) \cdot U_{t+1}]$$

Nash-Bargaining

- Generalized Nash-Bargaining
  Takes place before the temporary productivity ϵ has been revealed:

$$\max_{w_t, w_{eu,t}, h_t(\epsilon), h_{stw,t}(\epsilon), \epsilon_{s,t}} (J_t)^{1-\eta_{t-1}} \cdot (V_t - U_t)^{\eta_{t-1}}$$

  η_t : Bargaining power of the worker

- Hours worked on STW:
  Are distorted downwards by STW compensation:

$$\underbrace{\alpha \cdot a_t \cdot \epsilon \cdot h_{stw,t}(\epsilon)^{\alpha-1}}_{\text{Marginal Product of Labor}} = \underbrace{v'(h_{stw,t}(\epsilon))}_{\text{Marginal Disutility of Labor}} + \underbrace{\tau_{stw,t}}_{\text{STW Benefits}}$$
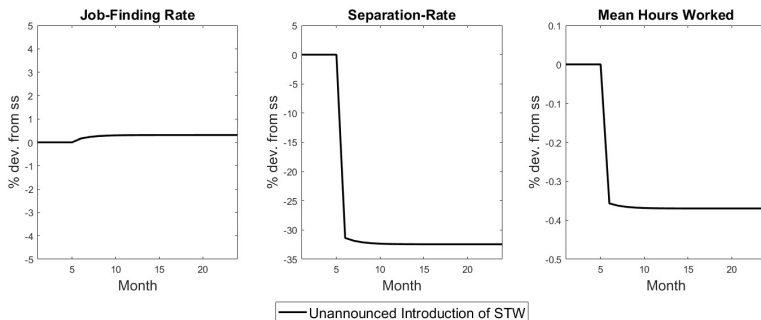
How does STW work?

Figure 1: Unannounced Introduction of STW

- Saves separations at the cost of working hours:
    - → leads to output loss
- Little influence on job-finding rate

Results: Optimal STW Policy

Result 1.1: Eligibility - Minimize Output Loss

- STW threshold D_t (Eligibility):

  - <u>Target:</u> Minimize output loss from STW

  - <u>Solution:</u> Set eligibility condition so that only firm-worker matches, that would have been destroyed without STW, can go on STW:

  $$y_t(\epsilon_{stw,t}) - v\left(h_t(\epsilon_{stw,t})\right) - \tau_{J,t} + F + \frac{1 - \eta_t \cdot f_t}{1 - \eta_t} \cdot \frac{k_v}{q_t} = 0$$

- STW benefits $\tau_{stw,t}$ (Generosity): Focus on in next section

Result 1.2: Generosity - offset Moral Hazard Problems UI

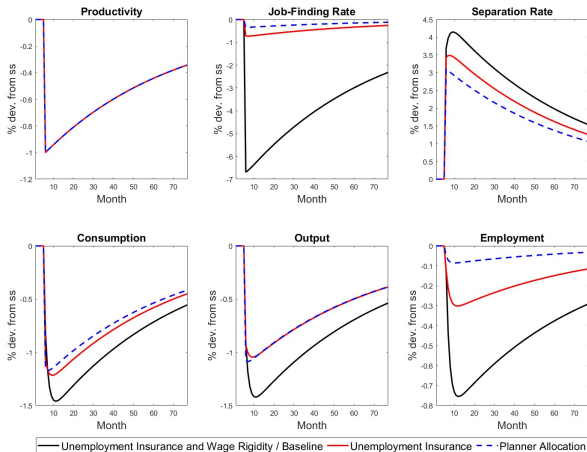- Optimal Net-Transfer via STW (without hours distortions):

$$\tau_{stw}^{total} = \frac{1}{1 - \beta \cdot (1 - G(\epsilon_s)) \cdot (1 - f)} \cdot \left(\underbrace{\tau^b}_{\text{Fiscal Externality}} + \underbrace{\beta \cdot (1 - f) \cdot b}_{\text{Moral Hazard UI}} \right) + \tilde{\lambda}_\theta$$

$\tilde{\lambda}_\theta$ influence of STW subsidy on Job-Creation: Close to zero.

- Implications:
    - Net-Transfer via STW to the least productive matches equals
        1. the expected discounted value of UI benefits a worker forgoes when staying employed
        2. the expected fiscal externality of the UI system paid by the firm.
    - The value of the Net-Transfers grows if the job-finding rates fall.

# Note: Moral Hazard Problems of UI grow in Recessions.

Unemployment Insurance and Wage Rigidity / Baseline — Unemployment Insurance — - -Planner Allocation

- Negative productivity shock $+$ wage rigidity
  $\rightarrow$ large fall in job-finding rate $\rightarrow$ moral hazard problems of UI grow
  $\rightarrow$ amplification of separations

Result 2: STW Subsidy more generous, Eligibility stricter
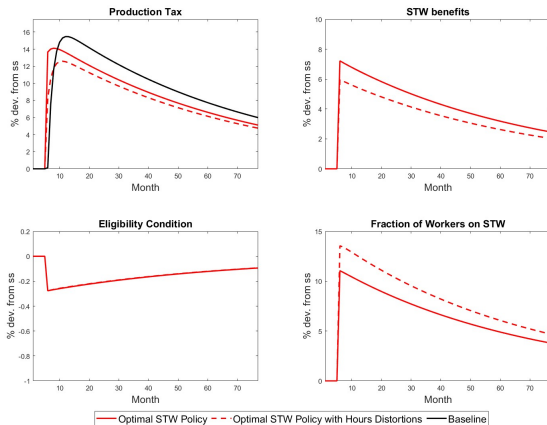
- STW benefits react to the growing moral hazard problems of the UI system
- Firms and workers choose lower working hours: thus, more eligible for STW

Result 3: STW stabilizes Consumption/ Employment, not Output.
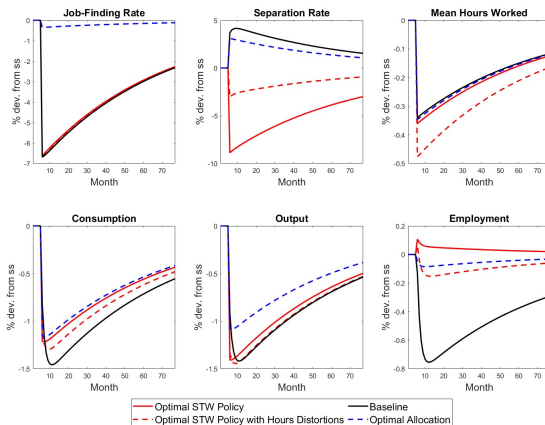
- The optimal allocation cannot be achieved:
  1. Job-finding rate not stabilized   2. Moral Hazard STW

Results: Optimal Policy Mix

Combine STW with a Vacancy Subsidy

Job-Creation Condition:

$$\frac{(1 - \tau_{V,t}) \cdot k_v}{q_t} = \beta \cdot E_t \left[J_{t+1} \right]$$

Decentralized Separation Condition:

$$y_t(\epsilon_{s,t}) - v(h_t(\epsilon_{s,t})) + \tau_{stw,t}^{total} - \tau_t^{v,b} + \frac{1 - \eta_t \cdot f_t}{1 - \eta_t} \cdot \frac{(1 - \tau_{V,t}) \cdot k_v}{q_t} + F = 0$$
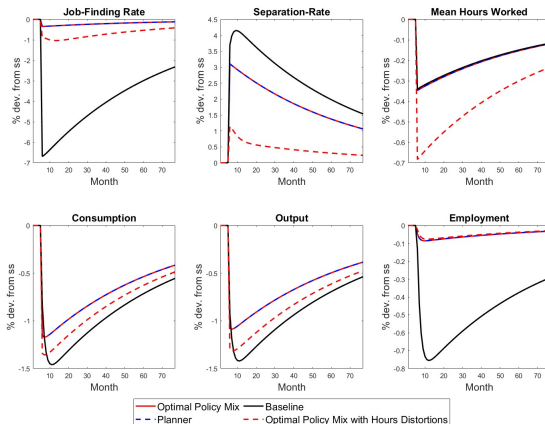
<u>Idea:</u>

- STW stabilizes separations
- Vacancy subsidy stabilizes vacancies

<u>Problem of the vacancy subsidy:</u>

- Also increases separations

Result 4/5: Can we reach the Planner Allocation?

- Without moral hazard STW: Implementation Planner Allocation
- With moral hazard STW: 1. Planner Allocation unattainable
  2. Reduces effectiveness of vacancy subsidy

Conclusion

Conclusion

- Environment with flexible intensive margin:
    - STW can be welfare improving, especially when combined with a vacancy subsidy but not optimal due to its moral hazard problems.
    - Conjecture: US-style experience rating system might work better.

- Environment with inflexible intensive margin:
    - STW as subsidy and flexibilization tool
    - Not clear, whether STW or experience rating system works better?

Appendix

Sources I

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