

# Discussion of “Worker heterogeneity and employment recoveries in the face of aggregate demand and pandemic shocks” by Ravenna and Walsh

Oleksiy Kryvtsov  
Bank of Canada

NBU Annual Research Conference, 28 May 2020

*The views expressed here are ours, and they do not necessarily reflect the views of the Bank of Canada*

# Selection in the labor market

- In recessions, less-capable workers are more likely to leave workforce and less likely to find new job
  - ▶ Large empirical literature: younger, less-educated, low-skilled
  - ▶ Can account for slow recovery, and decoupling of wages from employment during Great Recession
- Paper: implications of selection during the COVID pandemic
  - ▶ NK business cycle model with search and matching in labor markets
  - ▶ Productivity differences among workers who compete for same jobs
    - ★ Different from skills across occupations/sectors
  - ▶ Based on [Ravenna and Walsh \(2012\)](#) but different application
  - ▶ New: stylized COVID simulation (U.S. data), monetary policy

# Selection in the labor market

- In recessions, less-capable workers are more likely to leave workforce and less likely to find new job
  - ▶ Large empirical literature: younger, less-educated, low-skilled
  - ▶ Can account for slow recovery, and decoupling of wages from employment during Great Recession
- Paper: implications of selection during the COVID pandemic
  - ▶ NK business cycle model with search and matching in labor markets
  - ▶ Productivity differences among workers who compete for same jobs
    - ★ Different from skills across occupations/sectors
  - ▶ Based on **Ravenna and Walsh (2012)** but different application
  - ▶ New: stylized COVID simulation (U.S. data), monetary policy

# Model: key features

- Households with 2 types of workers: H and L
  - ▶ **Productivity:**  $\phi^H$  and  $\phi^L \cdot a_{i,t}^L$ , where  $a_{i,t}^L \in (0, 1]$  are i.i.d.
  - ▶ **Tractable:** four worker states EH, EL, UH, UL
- Firms:
  - ▶ Matched with workers randomly,  $I_t = \psi V_t^{1-\alpha} S_t^\alpha$
  - ▶ Match is an “interview”: observe worker’s productivity
  - ▶ **Screening:** hire all H, but only some L ( $a_{i,t}^L > \bar{a}_t$ )
  - ▶ Nash wage bargaining,  $\eta$
  - ▶ **Separations:** exog (both H, L) + endog (only L with  $a_{i,t}^L > \bar{a}_t$ )
  - ▶ Worker information destroyed after separation

# Model: key features

- Households with 2 types of workers: H and L
  - ▶ **Productivity:**  $\phi^H$  and  $\phi^L \cdot a_{i,t}^L$ , where  $a_{i,t}^L \in (0, 1]$  are i.i.d.
  - ▶ Tractable: four worker states EH, EL, UH, UL
- Firms:
  - ▶ Matched with workers randomly,  $I_t = \psi V_t^{1-\alpha} S_t^\alpha$
  - ▶ Match is an “interview”: observe worker’s productivity
  - ▶ **Screening:** hire all H, but only some L ( $a_{i,t}^L > \bar{a}_t$ )
  - ▶ Nash wage bargaining,  $\eta$
  - ▶ **Separations:** exog (both H, L) + endog (only L with  $a_{i,t}^L > \bar{a}_t$ )
  - ▶ Worker information destroyed after separation

# Selection mechanism in recession

- Homogeneous case ( $\phi^H = \phi^L$ )
  - ▶ No composition effect
- Heterogeneity ( $\phi^H > \phi^L$ ), no screening
  - ▶ Share of L in unemployed  $\gamma_t$  goes up
  - ▶ Firms post less V (“composition effect”)
  - ▶ Both UH and UL less likely to find a job
  - ▶ Real wages go down
- Screening
  - ▶ UL less likely to find a job than UH
  - ▶ Even less incentive to post V (“incentive effect”)
  - ▶ Real wages go up
- Amplification and GE effects via  $\bar{a}_t$  and  $\gamma_t$ 
  - ▶ Higher  $\bar{a}_t$  — more L are let go (higher  $\gamma_t$ )
  - ▶ Higher  $\gamma_t$  — lower value of a match (higher  $\bar{a}_t$ )
  - ▶ Disturbances to the value of the match are amplified

# Selection mechanism in recession

- Homogeneous case ( $\phi^H = \phi^L$ )
  - ▶ No composition effect
- Heterogeneity ( $\phi^H > \phi^L$ ), no screening
  - ▶ Share of L in unemployed  $\gamma_t$  goes up
  - ▶ Firms post less V (“composition effect”)
  - ▶ Both UH and UL less likely to find a job
  - ▶ Real wages go down
- Screening
  - ▶ UL less likely to find a job than UH
  - ▶ Even less incentive to post V (“incentive effect”)
  - ▶ Real wages go up
- Amplification and GE effects via  $\bar{a}_t$  and  $\gamma_t$ 
  - ▶ Higher  $\bar{a}_t$  — more L are let go (higher  $\gamma_t$ )
  - ▶ Higher  $\gamma_t$  — lower value of a match (higher  $\bar{a}_t$ )
  - ▶ Disturbances to the value of the match are amplified

# Selection mechanism in recession

- Homogeneous case ( $\phi^H = \phi^L$ )
  - ▶ No composition effect
- Heterogeneity ( $\phi^H > \phi^L$ ), no screening
  - ▶ Share of L in unemployed  $\gamma_t$  goes up
  - ▶ Firms post less V (“composition effect”)
  - ▶ Both UH and UL less likely to find a job
  - ▶ Real wages go down
- Screening
  - ▶ UL less likely to find a job than UH
  - ▶ Even less incentive to post V (“incentive effect”)
  - ▶ Real wages go up
- Amplification and GE effects via  $\bar{a}_t$  and  $\gamma_t$ 
  - ▶ Higher  $\bar{a}_t$  — more L are let go (higher  $\gamma_t$ )
  - ▶ Higher  $\gamma_t$  — lower value of a match (higher  $\bar{a}_t$ )
  - ▶ Disturbances to the value of the match are amplified



## Selection mechanism in recession

- Homogeneous case ( $\phi^H = \phi^L$ )
  - ▶ No composition effect
- Heterogeneity ( $\phi^H > \phi^L$ ), no screening
  - ▶ Share of L in unemployed  $\gamma_t$  goes up
  - ▶ Firms post less V (“composition effect”)
  - ▶ Both UH and UL less likely to find a job
  - ▶ Real wages go down
- Screening
  - ▶ UL less likely to find a job than UH
  - ▶ Even less incentive to post V (“incentive effect”)
  - ▶ Real wages go up
- Amplification and GE effects via  $\bar{a}_t$  and  $\gamma_t$ 
  - ▶ Higher  $\bar{a}_t$  — more L are let go (higher  $\gamma_t$ )
  - ▶ Higher  $\gamma_t$  — lower value of a match (higher  $\bar{a}_t$ )
  - ▶ Disturbances to the value of the match are amplified

# COVID shock scenario in the model

- Rise in exog separation rate and fall in consumption demand
- This is a useful exercise for thinking about
  - ▶ L-shaped recovery: large and persistent rise in U, fall in U exit rates
  - ▶ Asymmetric outcomes for H and L workers, when the shock is symmetric
  - ▶ The importance of EU and UE flows for the rise in U

# 1. V- or L-shaped recovery?

- Model:
  - ▶ L-shaped recovery: large and persistent rise in U, fall in U exit rates
- V- vs L-shaped recovery is still TBD, large variation across countries
- Kudlyak and Wolcott (2020): most layoffs during pandemic are temporary
  - ▶ Federal Worker Adjustment and Retraining Notification Act
  - ▶  $\Delta \text{Unemp}$  in Feb-Apr 2020: 10.7 ppt (total) = 10.8 (temp) + 0.4 (perm) - 0.5
  - ▶ Allow a mix of temporary and permanent separations in the model
- Economic crisis seems to be tightly related to health crisis
  - ▶ Model currently does not model the health crisis
  - ▶ Would predict that recession lasts beyond the health crisis

# 1. V- or L-shaped recovery?

- Model:
  - ▶ L-shaped recovery: large and persistent rise in U, fall in U exit rates
- V- vs L-shaped recovery is still TBD, large variation across countries
- Kudlyak and Wolcott (2020): most layoffs during pandemic are temporary
  - ▶ Federal Worker Adjustment and Retraining Notification Act
  - ▶  $\Delta \text{Unemp}$  in Feb-Apr 2020: 10.7 ppt (total) = 10.8 (temp) + 0.4 (perm) - 0.5
  - ▶ Allow a mix of temporary and permanent separations in the model
- Economic crisis seems to be tightly related to health crisis
  - ▶ Model currently does not model the health crisis
  - ▶ Would predict that recession lasts beyond the health crisis

# 1. V- or L-shaped recovery?

- Model:
  - ▶ L-shaped recovery: large and persistent rise in U, fall in U exit rates
- V- vs L-shaped recovery is still TBD, large variation across countries
- Kudlyak and Wolcott (2020): most layoffs during pandemic are temporary
  - ▶ Federal Worker Adjustment and Retraining Notification Act
  - ▶  $\Delta \text{Unemp}$  in Feb-Apr 2020: 10.7 ppt (total) = 10.8 (temp) + 0.4 (perm) - 0.5
  - ▶ Allow a mix of temporary and permanent separations in the model
- Economic crisis seems to be tightly related to health crisis
  - ▶ Model currently does not model the health crisis
  - ▶ Would predict that recession lasts beyond the health crisis

## 2. Asymmetry across industries/countries?

- Model:
  - ▶ Outcomes for H and L workers **asymmetric**, shock is **symmetric**
- COVID – asymmetric impact across occupations/industries
  - ▶ **Bartik et al. (2020)**:
    - ★ **Employment fell >50%**: retail, arts and entertainment, personal services, food services, and hospitality businesses
    - ★ **Not disrupted**: finance, professional services, and real estate
  - ▶ **Dingel and Neiman (2020)**: share of jobs that can be done at home
    - ★ **occupations**: lawyers (97%), managers (87%), barbers (26%), construction, food workers (0%)
    - ★ **industries**: educational/professional services >80%, agriculture, accommodation and food <10%
    - ★ **countries**: U.S. 37%, U.K. and Sweden (>40%), Mexico and Turkey (<25%)

## 2. Asymmetry across industries/countries?

- Model:
  - ▶ Outcomes for H and L workers **asymmetric**, shock is **symmetric**
- COVID – amplification in multi-sector setting
  - ▶ Negative supply shocks can trigger large demand contractions in multi-sector economies (**Guerreri et al., 2020**)
  - ▶ Skill mismatch (**Grigsby, 2020**)
- **Consider adding heterogeneous jobs (2 sectors)**
  - ▶ **Use rich data during pandemic to quantify composition effects**

### 3. Flows in/out of labor force?

- Model
  - ▶ The importance of EU and UE flows for the rise in U
  - ▶ No flows in/out of the labor force
    - ★ Procyclical separations will lead to change in composition in U
- Coibion et al. (2020): out of 20 million workers who lost jobs by April 6, most did not seek a job
  - ▶ Small  $\Delta$  in unemployment (+2 ppt), large  $\Delta$  in participation (-7 ppt)
- Allow endogenous LF participation in the model



## 4. Are compositional shifts quantitatively large?

- Compositional changes quantitatively important if variation in inflows in U ( $\rho_t^n$ ) is large relative to share of UL in U ( $\gamma_t$ )
  - ▶ **Ravenna-Walsh (2012)**: the effect of TFP fall on U is twice smaller in U.S. (higher flows, lower U) than in EuroU (lower flows, higher U)
  - ▶ **Use cross-country variation to quantify contribution of selection mechanism during the pandemic**
- Does the shape of the distribution matter for the mechanism?
  - ▶ fraction of endogenous separations:  $\rho_t^n = F(\bar{a}_t)$
  - ▶ expected elasticity of the average surplus from the match with L:  
$$\int_{\bar{a}_t}^1 s_{i,t}^L f(a_i) da_i$$

## 4. Are compositional shifts quantitatively large?

- Compositional changes quantitatively important if variation in inflows in U ( $\rho_t^n$ ) is large relative to share of UL in U ( $\gamma_t$ )
  - ▶ **Ravenna-Walsh (2012)**: the effect of TFP fall on U is twice smaller in U.S. (higher flows, lower U) than in EuroU (lower flows, higher U)
  - ▶ **Use cross-country variation to quantify contribution of selection mechanism during the pandemic**
- Does the shape of the distribution matter for the mechanism?
  - ▶ fraction of endogenous separations:  $\rho_t^n = F(\bar{a}_t)$
  - ▶ expected elasticity of the average surplus from the match with L:  
$$\int_{\bar{a}_t}^1 s_{i,t}^L f(a_i) da_i$$

## 5. What can/should monetary policy do?

- Useful contribution of this paper is application to monetary policy
- Are there inflationary or deflationary risks?
  - ▶ **Unfavorable inflation-unemployment trade-off:** large and protracted rise in U leads to a substantial monetary easing and inflationary pressures
  - ▶ Rise in unemployment more severe if ZLB binding and countercyclical markups — deflationary pressures
- Is dual mandate for monetary policy more desirable? (Berger et al. 2020)
- How much can monetary policy do to mitigate the recession?
  - ▶ Monetary policy in a monetary union (U.S., EuroU)
  - ▶ Should central banks buy regional bonds?

## 5. What can/should monetary policy do?

- Useful contribution of this paper is application to monetary policy
- Are there inflationary or deflationary risks?
  - ▶ Unfavorable inflation-unemployment trade-off: large and protracted rise in U leads to a substantial monetary easing and inflationary pressures
  - ▶ Rise in unemployment more severe if ZLB binding and countercyclical markups — deflationary pressures
- Is dual mandate for monetary policy more desirable? (Berger et al. 2020)
- How much can monetary policy do to mitigate the recession?
  - ▶ Monetary policy in a monetary union (U.S., EuroU)
  - ▶ Should central banks buy regional bonds?

## 5. What can/should monetary policy do?

- Useful contribution of this paper is application to monetary policy
- Are there inflationary or deflationary risks?
  - ▶ **Unfavorable inflation-unemployment trade-off**: large and protracted rise in U leads to a substantial monetary easing and inflationary pressures
  - ▶ Rise in unemployment more severe if ZLB binding and countercyclical markups — deflationary pressures
- Is dual mandate for monetary policy more desirable? (**Berger et al. 2020**)
- How much can monetary policy do to mitigate the recession?
  - ▶ Monetary policy in a monetary union (U.S., EuroU)
  - ▶ Should central banks buy regional bonds?

# Summary

- Elegant model, detailed and clear explanations
- Useful contribution to COVID literature
  - ▶ understand uneven impact of the crisis on workers
  - ▶ analyze implications for monetary policy
- Suggestions for future work:
  - ▶ Study composition effects in multi-sector setting
  - ▶ Further quantitative focus on composition shifts during pandemic
  - ▶ Use rich data during pandemic to quantify composition effects