Earnings Loss upon Job Loss and Monetary Policy

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Introduction

- Models of monetary policy (such as the New-Keynesian model) are used to capture the trade-off between inflation and unemployment.
  - HANK model allows us to better capture the costs of unemployment.
- Persistent earnings loss upon job displacement has been well documented.
  - Jacobson et al. (1993), von Wachter et al. (2009), Davis and von Wachter (2011).
- If monetary accommodation can reduce job destruction (and job displacement), monetary policy could have larger impact.
- I add the persistent earnings loss upon job displacement into the HANK model, and study implications for monetary policy.
  - Next addition: endogenous job destruction, wealthy hand-to-mouth.

Earnings Loss upon Job Loss

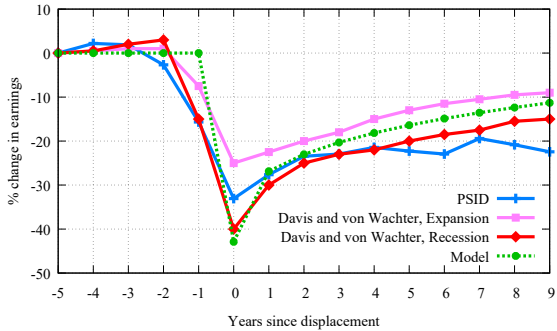

Figure: Earnings Loss upon Job Loss, Data and Model

- In the model, upon job loss, worker's productivity drops by $\delta_p = 0.34$.
- When employed, productivity follows AR(1) with a positive drift.
- The model matches the profile of earnings loss upon job loss well.

Theories of Long-Run Earnings Loss

- Ljungqvist and Sargent (1998): Skill depreciation during unemployment spells.
  - Earnings loss in the model is closest to this hypothesis.
- Krolikowski (2017): Those who lost their job have to start from the bottom of the job ladder.
- Huckfeldt (2022): Those who lose their job might have to switch occupations or industries.

Overview of the Model

- Standard HANK (Heterogeneous-Agent New-Keynesian) model.
  - Heterogeneous workers: (p, e, h, a).
  - Mortensen-Pissarides frictional labor market with random search.
  - A match could be destroyed by exogenous or endogenous separation.
  - Standard New-Keynesian set-up (quadratic nominal price adjustment cost).
  - Monetary authority following the standard Taylor rule.

- Effects of accommodative monetary policy.
  - Standard intertemporal substitution channel.
  - Standard wage channel.
  - Inflate the value of (matched) labor firms:
    - $\rightarrow$ Higher job-finding rate.
    - $\rightarrow$ Lower job-separation rate ($\rightarrow$ Prevent skill depreciation).
      $\rightarrow$ Increase workers' earnings, and thus consumption

Worker's Problem

$$V(X, p, e, h, a) = \max_{a', c} \left[u(c) + \beta \mathbb{E} V(X', p', e', h', a') \right] \tag{1}$$

subject to:

$$c + p^a a' = (p^a + d^a)a + \begin{cases} (1-\tau)wp & \text{if } e = 1 \\ \min(\phi_0 wp, \phi_1 \overline{wp}) & \text{if } e = 2 \end{cases} \tag{2}$$

$$a' \geq \begin{cases} 0 & \text{if } h = 1 \\ a & \text{if } h = 2 \end{cases} \tag{3}$$

- (2) is the budget constraint. Non-financial income depends on the current employment status e.
- (3) is associated with the i.i.d. wealthy hand-to-mouth shock.

Dynamics of Individual Productivity (p)

- If a worker loses its job, p drops at δ_p.
  - $\delta_p = 0.34$, following Greenstone and Looney (2011).
- While employed, p goes up on average.
  - Mean reversion + positive drift of the AR(1) process.
- "super-productive" state is added to match income and wealth inequality.
  - Castañeda et al. (2003).

Labor Market Dynamics (e)

- An unemployed worker finds a job with job-finding rate $f(p)$.
  - Labor market is segmented by p.
  - Standard search and matching with aggregate matching function.
  - $f(p)$ is determined by how many firms post a vacancy, at cost $\kappa(p)$.

- A match produces xp each period.
  - x is the marginal product per efficiency unit.
  - Bargaining outcome w follows: $w = \omega_0 \overline{x} + \omega_1 (\log x - \log \overline{x})$
  - Profits of the firm: $xp - wp$.

- A match can be destroyed exogenously and endogenously (den Haan et al. (2000), Fujita and Ramey (2012))
  - Exogenous match destruction shock λ^x
  - Endogenous match destruction shock $\lambda^n(p) \leftarrow$ i.i.d. operating cost shock

Labor Firm's Problem

$$J(X,p) = (x - w)p + \mathbb{E}\frac{1}{1+r}(1-\lambda^x)\int \max\left[\sum_{p'}\pi_{p'|p,1,1}J(X',p') - \epsilon^n, 0\right] d\mu(\epsilon^n(p)) \quad (4)$$

- Exogenous separation: λ^x
- Endogenous separation: $\lambda^n = Prob\left[\sum_{p'}\pi_{p'|p,1,1}J(X',p') - \epsilon^n < 0\right]$
- Some (but not many) inefficient separations due to the ad-hoc wage rule.

Quadruple Whammy of Job Loss

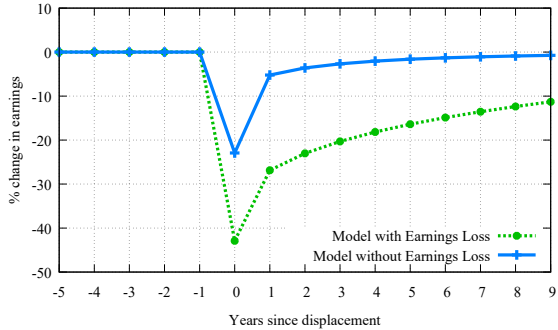

Figure: Earnings Loss, with and without Skill Depreciation

- Receive UI benefits instead of earnings.
- Skill depreciation (drop in p).
- Higher job-destruction rate $\lambda^n(p)$ with lower $p \leftarrow$ MP.
- Lower job-finding rate $f(p)$ with lower $p \leftarrow$ MP.

Consumption Dynamics upon Job Loss

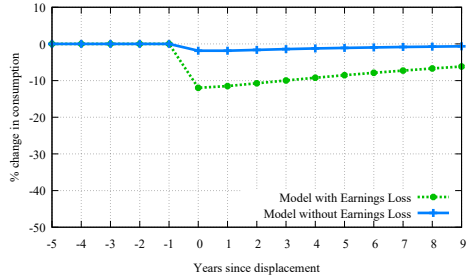

Figure: Consumption Decline, with and without Skill Depreciation

- Data: Consumption declines after a job loss by 5-13%, depending on country, sample selection, and expenditure categories.
- Standard HA model: small decline (2%).
- Model with skill depreciation: larger decline (12%).

Experiments

- Start from the economy with UR=5%
  - Unemployment as of the end of 2007.
- Large negative aggregate productivity shock hits the economy.
  - Size of the shock is calibrated such that the peak UR is 10%.
  - Peak unemployment rate during the Great Recession (GR).
- Quantify the long-term costs of the GR within the model.
  - Taking into account long-term earnings loss upon job loss.
  - Compare with the case without long-term earnings loss.
  - Compare with an alternative experiment under a more accommodative MP.
- Current version does not have endogenous match destruction!

Macro Aggregates during the Great Recession

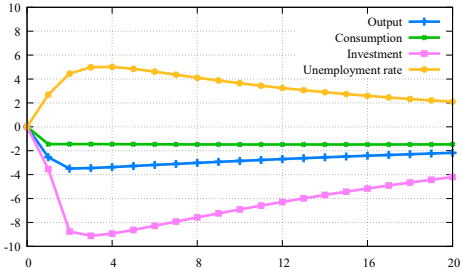

Figure: Macro Aggregates during the Great Recession Scenario

- Standard impulse response to a negative TFP shock.

Long-Term Costs of Job Loss during the Great Recession

Line	Name	Value
	Long-Term Costs of Job Loss per Worker ($)	
1	With earnings loss, Steady state	74,393
2	With earnings loss, Great Recession	80,491
3	Without earnings loss, Great Recession	21,231
	Change in UR during the GR	
4	In percentage points	5.00
5	In thousands (Based on LF in 2019)	8,232
	Total Long-Term Costs of Job Loss (% of GDP)	
6	With earnings loss (2×5)	3.10
7	Without earnings loss (3×5)	0.82

- Long-term cost of job loss is about 4 times larger with earnings loss upon job loss.

Impact of Accommodative Monetary Policy

Line	Name	(% of GDP)
	Total Long-Term Costs with Earnings Loss	
1	Baseline MP	3.10
2	Accommodative MP	2.84
3	Difference	0.26
	Total Long-Term Costs without Earnings Loss	
4	Baseline MP	0.82
5	Accommodative MP	0.74
6	Difference	0.07

- Costs of earnings loss are smaller under the accommodative MP, because UR goes up less (to 9.6% instead of 10%).
- The long-term costs of job loss that can be mitigated by accommodative MP are larger, if earnings loss upon job loss are taken into account.
- Even larger if endogenous job destruction can be mitigated by the MP.

Concluding Remarks

- With earnings loss upon job loss, the empirically observed large decline in consumption expenditures upon job loss can be replicated.
- When long-term earnings loss is taken into account, the cost of job loss is larger, so is the potential impact of monetary policy that mitigate it.
- Monetary policy could be even more impactful with the followings:
  - Endogenous job destruction.
  - Endogenous δ_p and larger earnings loss in recessions.
  - Hand-to-mouth.

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