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Who Bears the Cost of Aggregate Fluctuations and Why?

Discussion by Jaroslav Borovička (NYU)
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Summary of the paper

- role of discount rate and cash flow shocks
- heterogeneity, segmentation

Questions

- cost of aggregate fluctuations?
- profit flows and valuation
- what are the discount rate and cash flow shocks?

Value of a worker to the firm

$$J_t = E_t \left[s_{t+1} \left(\pi_{t+1} + (1 - \delta_{t+1}) J_{t+1} \right) \right]$$

What moves J_t?

- π_{t+1} — firm's profit from the marginal worker
  - focus of the labor-macro literature
  - Shimer (2005, 2010), Hall (2005), Hagedorn and Manovskii (2008), Hall and Milgrom (2008)
- s_{t+1} — stochastic discount factor
  - focus on risk-premia: interaction of s_{t+1} with π_{t+1}
  - Mukoyama (2009), Hall (2017), Kilic and Wachter (2018), Kehoe, Midrigan, and Pastorino (2019), Kehoe et al. (2023)

Valuation of marginal worker

Value of a worker to the firm in a DMP framework

$$\frac{\kappa}{q_t} = E_t \left[s_{t+1} \left(\pi_{t+1} + (1 - \delta_{t+1}) \frac{\kappa}{q_{t+1}} \right) \right]$$

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Free entry $\implies$ Q-theory of hiring

- q_t — vacancy filling rate, observed in data
  - fluctuations in q_t have to be rationalized by fluctuations in J_t
  - unemployment volatility puzzle: hard to construct sufficiently volatile π_{t+1}

Euler equation for hiring

$$\frac{\kappa}{q_t} = E_t\left[s_{t+1}\pi_{t+1} + s_{t+1}\left(1-\delta_{t+1}\right)\frac{\kappa}{q_{t+1}}\right]$$

Suppose

- $q_{t+1} = \rho_q q_t + \varepsilon_{t+1}$, $\delta_{t+1} = \delta$, $s_{t+1} = \beta \approx 1$

Log-linear approximation

$$E_t\left[\widehat{\pi}_{t+1}\right] = -\frac{1-\left(1-\delta\right)\rho_q}{\delta}\widehat{q}_t = -1.9\widehat{q}_t$$

Quarterly data (detrended)

- $\rho_q = 0.9, \delta = 0.1$
- $\sigma\left[\widehat{q}_t\right] = 0.223$
- $\sigma\left[\widehat{y}_t\right] = 0.015$

$\Rightarrow$ without SDF contribution, we need $\sigma\left[E_t\left[\widehat{\pi}_{t+1}\right]\right] \approx 0.4$

Role of the risk premium

Return on hiring the worker

$$R^h_{t+1} = \frac{\pi_{t+1} + (1 - \delta_{t+1})\,\kappa/q_{t+1}}{\kappa/q_t}$$

Valuation equation

$$1 = E_t\left[s_{t+1}R^h_{t+1}\right] = E_t\left[s_{t+1}\right]E_t\left[R^h_{t+1}\right] + \underbrace{Cov_t\left[s_{t+1}, R^h_{t+1}\right]}_{-\Gamma_t}$$

- an increase in q_t makes workers cheaper $\implies$ increase in $E_t\left[R^h_{t+1}\right]$
- must be compensated by
  - decline in π_{t+1} (cash flow channel)
  - increase in $R^f_t \doteq (E_t[s_{t+1}])^{-1}$ (risk-free rate channel)
  - increase in Γ_t (risk-premium channel)

To what extent can fluctuations in Γ_t help explain labor market fluctuations?

This paper goes a long step further.

Introduction of rich heterogeneity.

- heterogeneous productivities $\Longrightarrow$ heterogeneous earnings
- richer transitions: Kudlyak and Lange (2018), Gregory, Menzio, and Wiczer (2021), Ahn, Hobijn, and Sahin (2022),
- allows to study distributional effects

Matching model and data using responses to identified shocks.

Exogenous stochastic discount factor

$$\begin{aligned} \log \Lambda_{t+1} &= -r_f - \frac{1}{2} x_t^2 - x_t \varepsilon_{A,t+1} \\ x_{t+1} &= \psi_x x_t + (1 - \psi_x) \bar{x} + \sigma_x \varepsilon_{x,t+1} \end{aligned}$$

- $\varepsilon_{x,t+1}$ are discount rate (risk-premium) shocks, $\varepsilon_{A,t+1}$ cash flow shocks

Large households pool idiosyncratic risk, except ...

- wage contract still uses reduced-form curvature as a stand-in for aversion to idiosyncratic risk

$$\hat{V}_t \left(h, z, \widehat{W}^M \right) = \max \, (1 - \chi) \, w^{1-\gamma} + \ldots$$

- if insurance of idiosyncratic risk is incomplete, it should likely be priced: Constantinides and Duffie (1996), Schmidt (2016), Ai and Bhandari (2018)

Model structure: Role of heterogeneity

Labor markets are segmented

- type (h, z) is observable, submarket conditioned on (h, z), workers cannot choose where to search

Technology is linear

$$y_{i,t} = A_t h_{i,t} z_{i,t} \qquad \kappa_t \left(h_{i,t}, z_{i,t}\right) = \bar{\kappa} A_t h_{i,t} z_{i,t}$$

- firm boundaries are not defined and workers' output independent of each other

Workers therefore do not interact in any way (even stronger than 'block recursivity')

- macro dynamics (exogenous SDF and aggregate productivity) affect the distribution
- but the distribution does not feed back

Adverse TFP shock (decline in A_t)

- no impact on employment because all costs are proportional to A_t
- wages slowly decline due to wage smoothing
- high income workers affected somewhat more because of the tighter upper limited commitment constraint where more high-income workers are bunched

Adverse discount rate shock (increase in x_t)

- benefits of employment for low-income workers are backloaded (z is mean reverting and h depends on on-the-job accumulation) $\implies$ their value decreases
- matches are harder to sustain
- workers also more willing to accept lower wages in exchange for smoothing

Who bears the cost of aggregate fluctuations and why?

'The cost' refers to a welfare calculation.

- but there is no welfare calculation in the paper
- model describes impact of adverse shocks but the Lucas (1987) calculation nets those out against the benefits of positive shocks

Such a welfare calculation is most likely not very informative in the model.

- exogenous SDF
- idiosyncratic risk is insured in large families (unlike in Krebs (2007)).
- wage smoothing is included in reduced form

'...and why?'

- the discount rate and cash flow shocks do not have a structural interpretation in the empirical part
- the model takes a stand on their form

The paper does not evaluate the cost of aggregate fluctuations but it is still higly informative.

- it provides a detailed fit to micro level data and sensible distributional fit for responses to two types of aggregate shocks
- this allows to study (the positive side of) distributional implications of other changes in the economy

The limitation is the lack of feedback from the heterogeneous labor market to aggregate economy.

- 'aggregate demand' effects, ...

Incentives of firms to hire depend on profit flows generated by the matches

$$\frac{\kappa}{q_t} = E_t \left[s_{t+1} \pi_{t+1} + s_{t+1} \left(1 - \delta_{t+1} \right) \frac{\kappa}{q_{t+1}} \right]$$

- models in macro-labor focus on getting wages right but often ignore the profit dynamics (Borovička and Borovičková (2019))
- are implied profit flows in line with data?

Asset pricing implications

- the model imposes a rather high and volatile price of risk
- this is needed to generate meaningful fluctuations in employment
- but that can easily lead to overshooting of the asset price volatility since dividends have much longer duration than labor market matches

Asymmetric impulse responses in a nonlinear model

- figures plot IRFs evaluated at the balance growth path, in one direction
- but these are state-dependent and asymmetric, are the plotted IRFs 'typical'?
- empirical approach ignores these nonlinearities

Identification of the cash flow and discount rate shocks from returns does not orthogonalize them.

- are they roughly orthogonal as the model assumes?

The shift-share design with market β's does not seem to be very illuminative.

- results more akin to attenuation bias from noisy regressors?

Impressive micro-level empirical work

- novel evidence that combines asset market data and labor flows

Model as an organizing device to understand the flows

- insightful incorporation of detailed contracting features that replicate the empirical facts
- some shortcuts (e.g., scaling of costs by productivity) to deliver the required results but some simplification is inevitable

I would change the title.

Appendix

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