The Cyclicality of the Wage Offer Distribution

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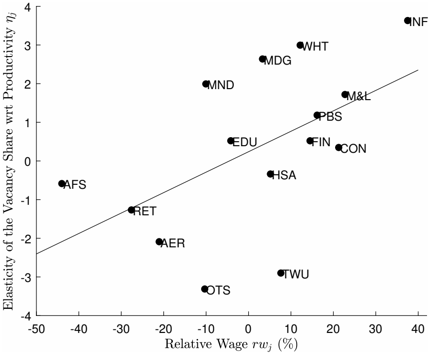
Introduction

- Well documented that the number of vacancies v is pro-cyclical, e.g. Shimer (2005)
- Much less is known about the cyclicality of the wage offer distribution F: CDF of wages across vacancies
  - Is the creation of high-wage vacancies more or less cyclical than the creation of low-wage vacancies?
- This paper
  - provides new evidence suggesting that the creation of high-wage vacancies is more cyclical
  - quantifies a new theory that accounts for the evidence by allowing unemployed workers to receive multiple offers simultaneously

Evidence 1

- An increase in productivity y_t is associated with an increase in the share of vacancies posted by high-wage industries $\frac{v_{j,t}}{v_t}$

$$\Delta \log \left(\frac{v_{j,t}}{v_t} \right) = \eta_j \Delta \log y_t + \varphi_j + Q_t \beta_j + \zeta_{j,t}$$

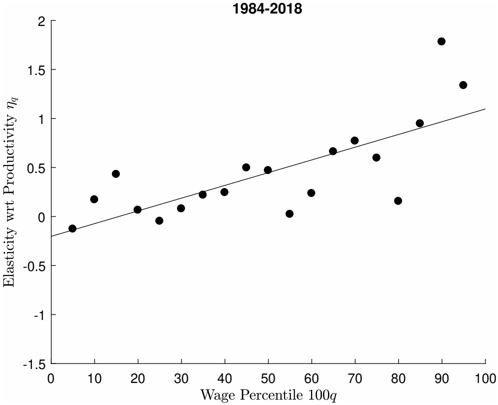


- *The slope of the fitted line is 0.053 with a standard error of 0.023*

Evidence 2

- An increase in productivity y_t has a larger impact on the upper end of the wage distribution of new hires from unemployment $w_{q,t}$

$$\Delta \log w_{q,t} = \eta_q \Delta \log y_t + \varphi_q + Q_t \beta_q + \varepsilon_{q,t}$$



The slope of the fitted line is 0.013 with a standard error of 0.003.

Model: Overview

- DMP meet Burdett and Judd (1983)
- DMP: Discrete time; homogeneous workers and homogeneous firms; random meetings between unemployed workers and vacancies; no on-the-job search; exogenous job destruction
- Deviation: Each period, a worker can meet *multiple* vacancies, and vice versa.
  - Vacancies are created at the beginning of a period with a *posted* wage
  - The total number of meetings across all workers and vacancies is deterministic $m(u, v)$
  - The number of meetings at the individual level is random; Poisson with mean $\lambda_j = \frac{m(u,v)}{j}, j \in \{u, v\}$
  - At the end of a period, a vacancy makes an offer to *one* of the workers it meets, if any
  - A worker with one or more offers accept the one with the highest wage if it's better than unemployment
- BJ: Multiple offers imply wage dispersion even with homogeneous agents on both sides
  - F is endogenous and non-degenerate

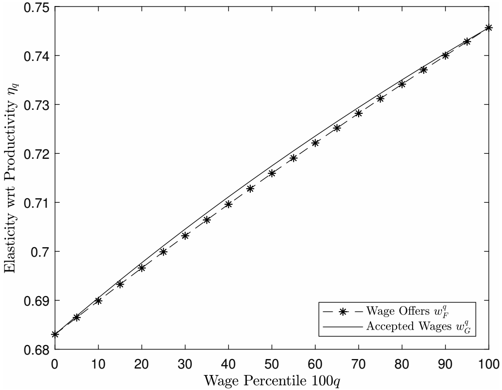
Comparative Statics

- $\frac{\partial P_M}{\partial y} > 0$ and $\frac{\partial P_M}{\partial u} < 0$ with P_M being the fraction of workers with multiple offers among those with at least one offer
  - Consistent with Guo (2020)
- Let w_F^q be qth percentile of the wage offer distribution F. We have, for any $0 \leq q_1 < q_2 \leq 100$
$$\frac{\partial w_F^{q_2}}{\partial y} > \frac{\partial w_F^{q_1}}{\partial y} > 0$$
- Intuition: an increase in productivity y raises the market tightness θ and the offer arrival rate
  - Unemployed workers are more likely to receive multiple offers
  - Low-wage offers are more likely to be rejected
  - In response, firms post a larger share of high-wage vacancies
- Same for G, the wage distribution of new hires from unemployment.

Calibration: Steady State

- Calibrated in the spirit of Hagedorn and Manovskii (2008)

$$\frac{\partial \log w_j^q}{\partial \log y} \text{ for } j \in \{F, G\}$$



Simulation: Dynamics

- Same qualitative predictions for the cyclicality of F and G
- Fit for other non-wage labor market moments (volatility, auto and cross correlations for u, v and y): no worse than standard DMP

		u	v	θ	y	u	v	θ	y
		Panel A: Data				Panel B: Standard DMP Model			
Standard deviation		0.127	0.133	0.233	0.013	0.257	0.174	0.267	0.013
Autocorrelation		0.882	0.920	0.905	0.774	0.823	0.586	0.759	0.760
Correlation matrix	u		-0.899	-0.897	-0.316		-0.567	-0.662	-0.699
	v			0.937	0.456			0.890	0.909
	θ				0.362				0.996
		Panel C: Model in This Paper							
Standard deviation		0.106	0.147	0.186	0.013				
Autocorrelation		0.795	0.695	0.761	0.761				
Correlation matrix	u		-0.702	-0.748	-0.732				
	v			0.981	0.978				
	θ				0.999				