

The Cyclicity of Income Risk: Empirical Estimates from Monetary Policy Shocks

Tobias Broer, John Kramer, Kurt Mitman

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Introduction: Micro ↔ Macro

Broad Motivation

- What are the distributional consequences of aggregate shocks?
- How does heterogeneity affect aggregate outcomes?
- What's the interplay between the two?

What we do:

- Use identified monetary policy shocks to measure response of:
 - Separation rates
 - Job-finding rates
 - Wagesacross the earnings distribution.
- HANK model to quantify the importance of heterogeneity for the response to aggregate shocks (Not today)

Heterogeneity and Monetary Policy

- Theory suggests that heterogeneity has the potential to impact the transmission of MP
- Crucially depends on cyclicality of idiosyncratic income risk
- Scant empirical evidence (so far)

(Quantitative) Theory:

- Gornemann et al (2012), McKay et al (2016), Auclert (2019), Kaplan et al (2018), Werning (2015), Broer et al (2019), Hagedorn et al (2019a,b)

Empirical evidence

- Coibion et al (2017): MP affects inequality of labor earnings, income, consumption and expenditure

Two percent sample of German Labor Market Histories 1974-2014

- 1.7 million individual histories
- Labor market spells split into Episodes (~ 12 months)
- ~ 300 million month-person observations
- Labor market status, compensation, benefits

Peculiarities

- Focus on Euro-sample (2000-2014)
- “Daily Wage” is average earnings during an episode
- Focus on individuals “*without special characteristics*”

Descriptive Statistics

Cutting the data

- Employed vs Non-employed
- Deciles: Current wage or 5-year moving average of historical wages

Table 1: Descriptive Statistics by Decile – January 2000

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	mean	mean	mean	mean	mean	mean	mean	mean	mean	mean
Female	0.77	0.73	0.59	0.50	0.43	0.36	0.32	0.30	0.24	0.13
Age	39.32	39.91	38.52	38.26	38.69	39.69	40.81	41.43	42.30	44.02
Education	1.10	1.07	1.09	1.10	1.10	1.11	1.15	1.22	1.44	1.74
Skill level	1.97	2.03	2.09	2.10	2.11	2.13	2.19	2.32	2.59	2.99
Part time	0.47	0.41	0.26	0.16	0.09	0.05	0.04	0.03	0.02	0.01
Daily wage	19.60	38.79	50.09	60.12	69.04	77.45	86.26	97.98	116.01	141.60
Empl next period	0.97	0.98	0.99	0.99	0.99	0.99	1.00	1.00	1.00	1.00
Observations	48409	48752	51788	44532	51884	46602	49641	47108	46905	48001

For each decile, estimate a linear probability model:

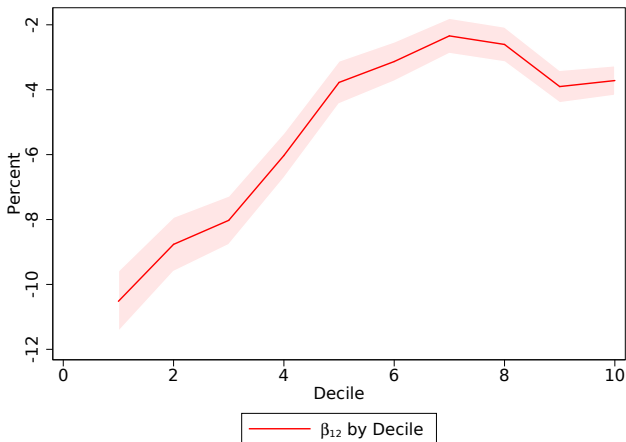
$$emp_{j,t+h}^d = \alpha + \beta_h^d \Delta i_t + \varepsilon_{j,h} \quad | emp_{j,t-1}^d = 1$$

- Probability of unchanging labor market status
- Impulse response by decile at $t - 1$
- Includes dummies for calendar months
- Instrument using high frequency movements in OIS rates [Details](#)

Effect of 100BP monetary contraction – Employed

Change in probability of remaining employed vs **non-employed**

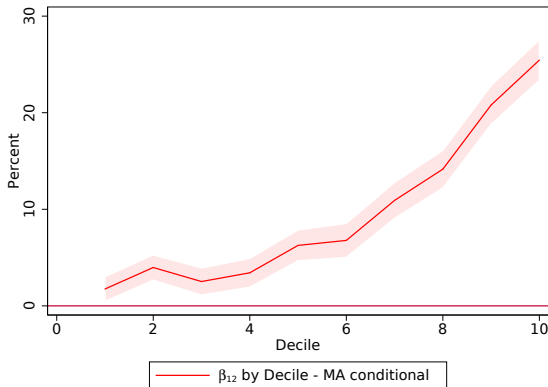
- $emp_{j,t}^d = 1$ if employed
- $emp_{j,t}^d = 0$ if non-employed



Effect of 100BP monetary contraction – Non-Employed

Change in probability of remaining non-employed vs employed

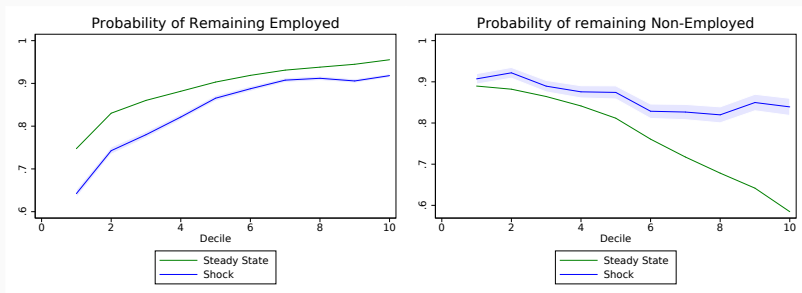
- $emp_{j,t}^d = 1$ if non-employed
- $emp_{j,t}^d = 0$ if employed
- Deciles based on conditional moving average wage



Relatives and Absolutes

Shocks in relation to baseline probabilities

- Lower incomes less likely to stay employed
- Higher incomes **more** likely to stay unemployed
- Effects are large



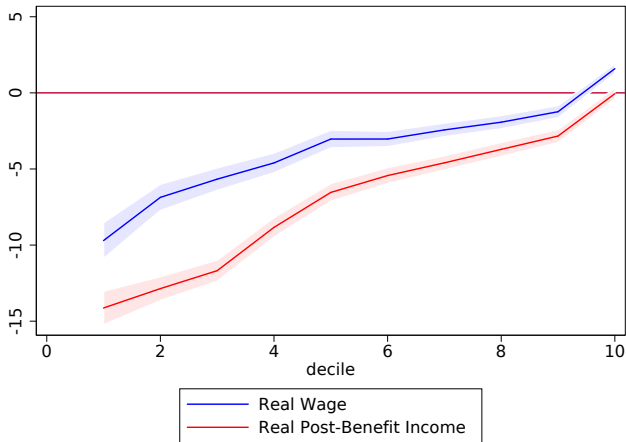
Log-change in wage:

$$w_{j,t+h}^d - w_{j,t-1}^d = \alpha + \beta_h^d \Delta i_t + \varepsilon_{j,h}$$

- Real wage
- Conditional on staying employed
- Possible to include benefits (unconditional)

12-Month impact – Real wage

Percentage change in real wage over employment episode



New-Keynesian Model with labor market that can account for the observations above

Ideas

- Hardwire
- Directed search
- Job-ladder

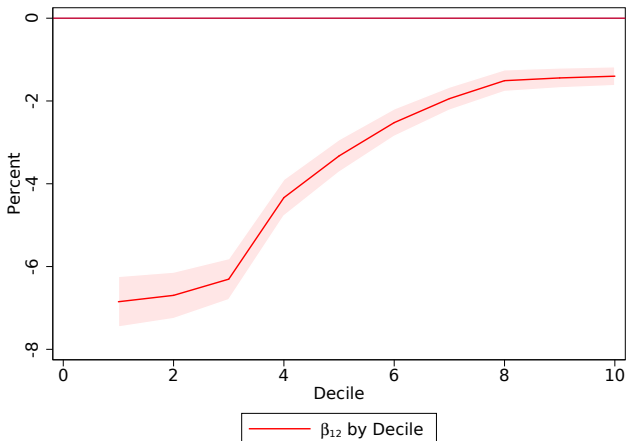
Feedback much appreciated

Appendix

Effect of 100BP monetary contraction – Employed

Change in probability of remaining employed vs unemployment

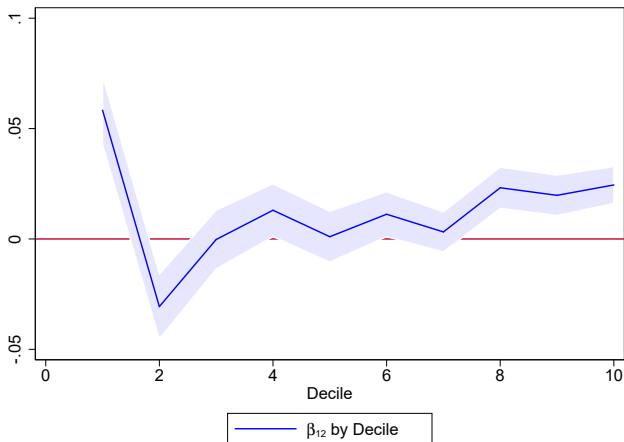
- $emp_{j,t}^d = 1$ if employed
- $emp_{j,t}^d = 0$ if unemployed



Effect of 100BP monetary contraction – United States

Change in probability of remaining employed vs non-employment

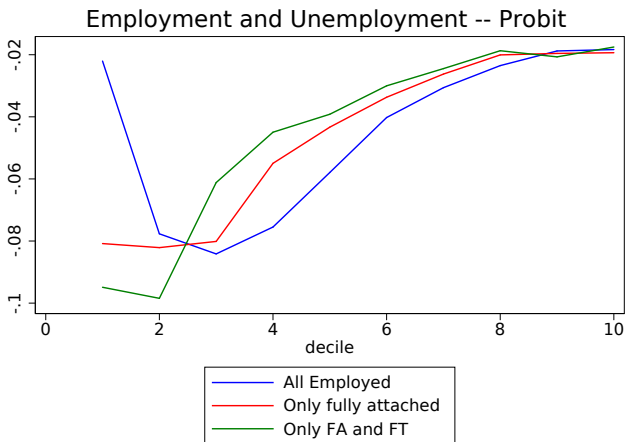
- $emp_{j,t}^d = 1$ if employed
- $emp_{j,t}^d = 0$ if non-employed



Probit Regression

Change in probability of remaining employed vs unemployment

- $emp_{j,t}^d = 1$ if employed
- $emp_{j,t}^d = 0$ if non-employed



Instrument for monetary policy **surprise**:

- EONIA Overnight Indexed Swap rates during
- short window around ECB announcements

Eonia OIS:

- 3M-3Y contracts swapping EONIA floating rate for fixed rate
- Highly collateralized
- Cash settled
- Rates include expectations