

The Labor Demand and Labor Supply Channels of Monetary Policy

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- ▶ Study response of labor market flows to identified monetary policy shocks
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- ▶ Apply standard accounting framework: Response of employment **twice as large** holding **supply-driven flows** fixed

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- ▶ **Estimate key parameters** to match response of **labor market flows** to “monetary policy shock”
 - ▶ Study by feeding in responses for layoff rate, job-finding rate, interest rate and wages
- ▶ Model achieves **close fit** for aggregate **labor market flows**
 - ▶ Also **consistent** with micro evidence on **MPCs and MPEs**
- ▶ Model implies quantitatively important **labor supply response**:
Fix labor supply policy functions at steady-state, **employment falls $\approx 70\%$ more**
- ▶ Mechanism: **Relative value of non-employment falls** with **job finding rate**

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- ▶ **This paper:** New evidence that **decline in employment** from a **contractionary** monetary policy shock significantly attenuated by **increase in labor supply**
- ▶ Potentially relevant for understanding **post-Covid period**: large fiscal transfers to households, quits \uparrow , labor force participation \downarrow , inflation \uparrow

▶ Related Literature

Data & Methodology

Labor Market Flows

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- ▶ Particular focus on response of supply-driven flows to monetary policy
 - ▶ Decision to search from non-employment, e.g. U-to-N and N-to-U
 - ▶ Quits to unemployment and nonparticipation (new!)

Decomposition of Flows From Employment to Non-Employment

- ▶ Previous work: **E-to-U flows** dominated by **layoffs** (Elsby et al. 2009, Ahn, 2023)

	Total	Quits	Layoffs	Other
mean(x)	0.014	0.002	0.008	0.004
std(x)/std(Y)	5.41	8.12	7.94	5.44
corr(x, Y)	-0.81	0.60	-0.84	-0.54

Note: x denotes the variable in each column, Y denotes HP-filtered log real GDP. Standard deviations and correlations are computed for HP-filtered quarterly averages.

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- ▶ This paper: E-to-N flows show much larger role for quits

	Total	Quits	Layoffs	Other
mean(x)	0.030	0.012	0.003	0.015
std(x)/std(Y)	2.40	5.84	14.39	4.78
corr(x , Y)	0.50	0.53	-0.44	0.25

Estimating the Effects of Monetary Policy

- ▶ Begin with reduced-form VAR:

$$Y_t = \alpha + B(L)Y_{t-1} + u_t \quad (1)$$

- ▶ Seven monthly variables for baseline specification:
 - ▶ two-year Treasury yield, log CPI, log IP, corporate bond spreads
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- ▶ Assume **structural shocks**:

$$u_t = S\varepsilon_t \quad (2)$$

where the first structural shock is a “**monetary policy shock**”, ε_t^{mp}

- ▶ First column of S , denoted s_1 , describes the impact effect of the structural monetary policy shock ε_t^{mp} on u_t and Y_t
- ▶ Use an external instrument z_t to identify s_1

External Instrument

- ▶ External instrument z_t needs to satisfy:

$$\mathbb{E} \{ z_t \varepsilon_t^{mp} \} \neq 0 \quad (\text{Relevance})$$

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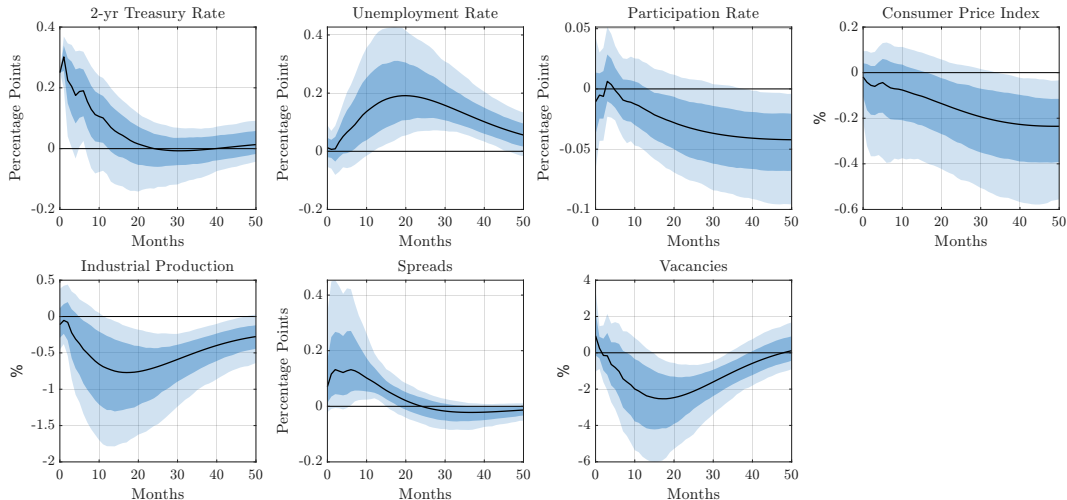
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- ▶ Labor market flows added one-by-one to the main VAR
 - ▶ Similar results using large Bayesian VAR (or local projections)

Estimates

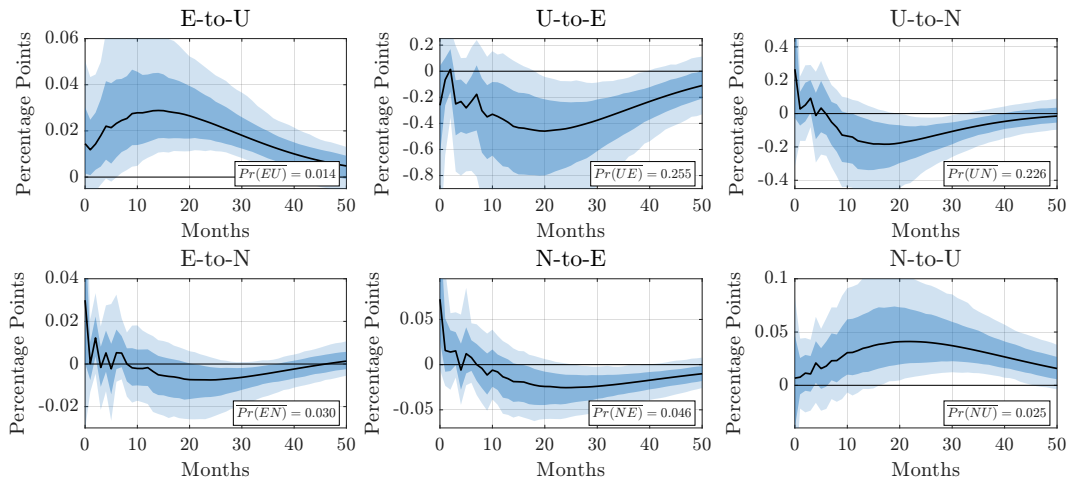
Baseline VAR



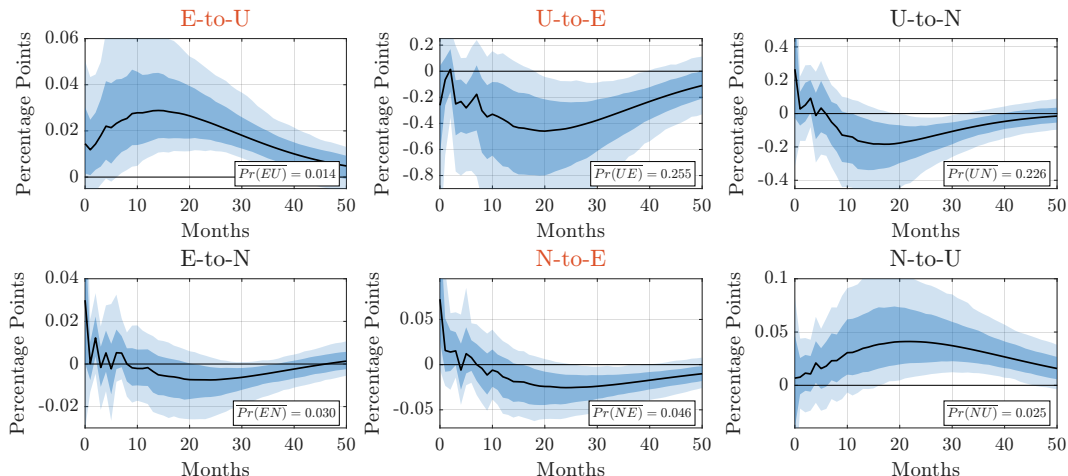
Robust F -statistic: 16.80

- ▶ Monthly data, 1978:M1–2019:M12
- ▶ Dark and light shaded regions report **68%** and **90%** confidence intervals

Response of Labor Market Flows

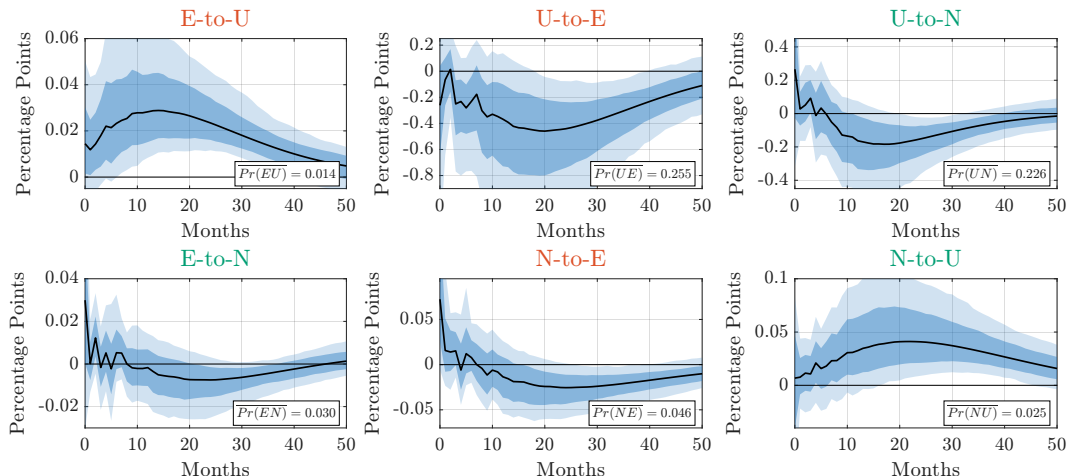


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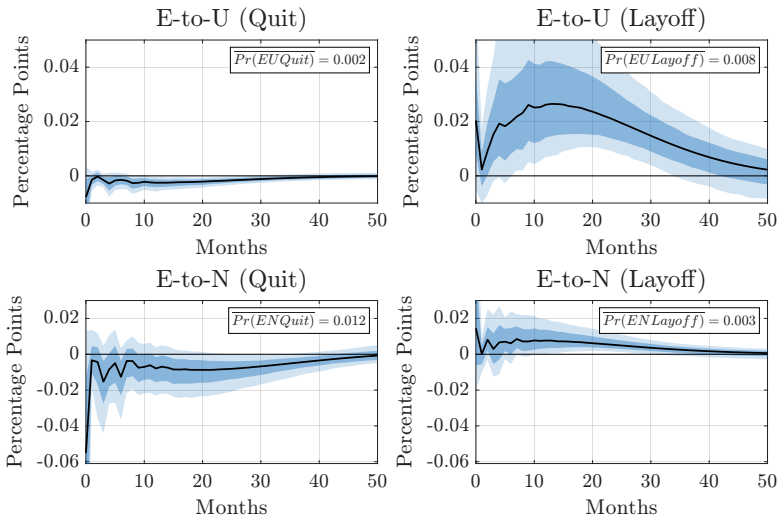
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- ▶ $p_{EU} \uparrow$, $p_{UE} \downarrow$, & $p_{NE} \downarrow \Rightarrow$ Consistent with narrative of **decline in labor demand**
- ▶ $p_{NU} \uparrow$, $p_{UN} \downarrow$, & $p_{EN} \downarrow$ (via quits) \Rightarrow Consistent with **increase in labor supply**

Response of E-to-U & E-to-N Flows: Quits vs Layoffs



- ▶ Increase in layoffs explains rise in E-to-U rate
- ▶ Decline in quits explains fall in E-to-N rate



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5. No response of **job-to-job transitions** ▶
6. Nominal **wages decline** slowly ▶



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 - ▶ **Large-scale Bayesian SVAR** 
 - ▶ **Local projections** 
3. Estimate qualitatively similar IRFs from “**Main Business Cycle Shock**” à la Angeletos et al (2020) 

Using Flows to Account for Dynamics of Labor Market Stocks

Flow-Based Accounting for Dynamics of Stocks

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- ▶ Difference of **hypothetical** and **actual** response of **employment** reflects role of p_{NU}

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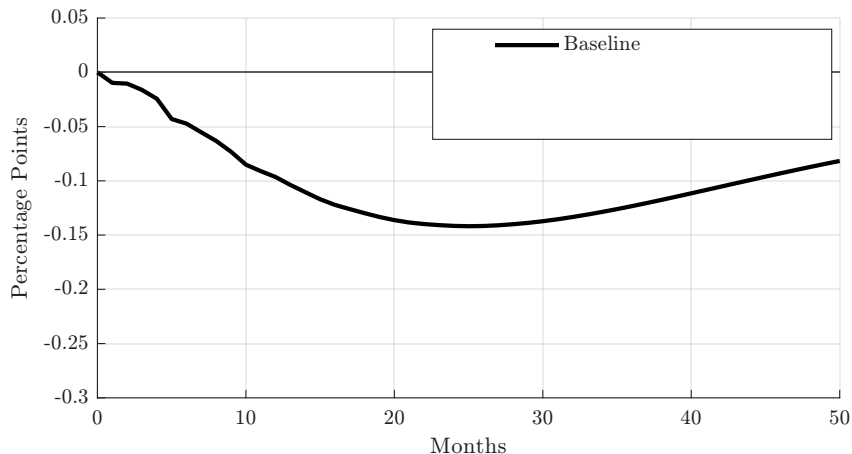
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- ▶ Repeat for all supply-driven flows, in various combinations

▶ Ins and Outs of Employment

▶ Ins and Outs of Unemployment

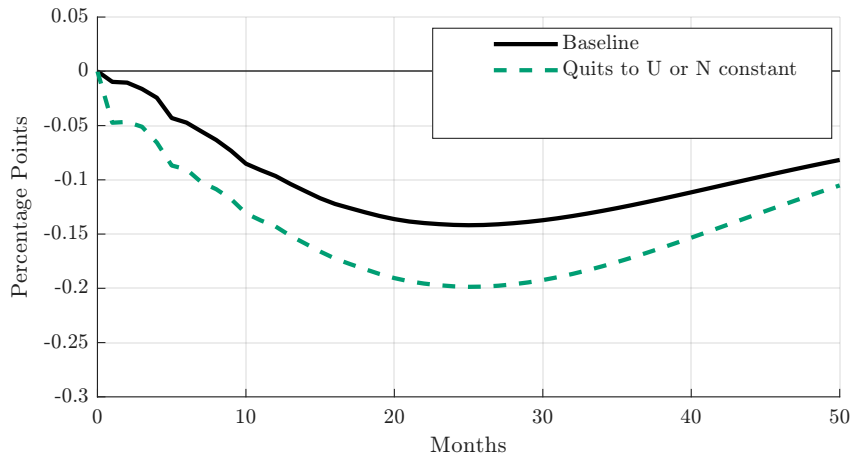
▶ Ins and Outs of Participation

Decomposing Employment Response to a Monetary Policy Shock



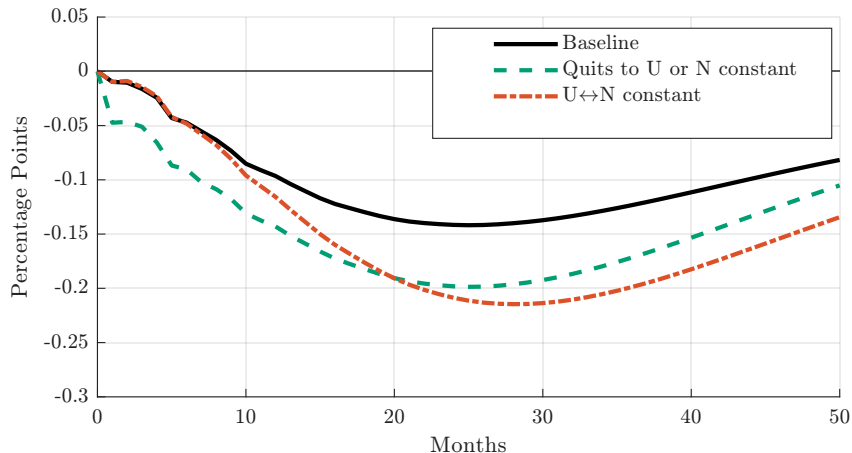
- ▶ Employment falls almost 0.15 percentage points when all flows respond

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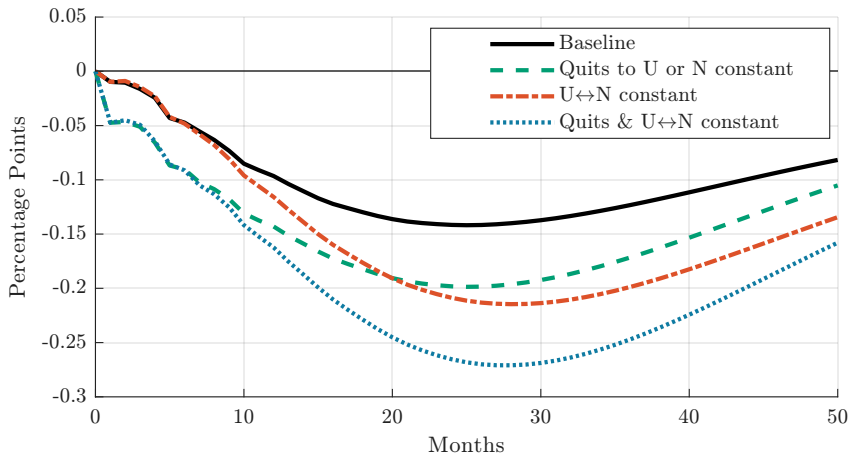
- ▶ Holding quit rate to U and N constant → employment falls 40% more

Decomposing Employment Response to a Monetary Policy Shock



- ▶ Holding U-to-N and N-to-U rates constant → employment falls 60% more

Decomposing Employment Response to a Monetary Policy Shock



▶ Holding all **supply-driven** flows fixed \Rightarrow Employment falls **twice as much**

▶ Controls for composition

▶ Participation

▶ Unemployment

▶ Using Local Projections

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 - ▶ Choose **consumption/savings** and **labor supply** (quit, search, accept)
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 - ▶ Labor supply response primarily driven by fall in **job-finding rate**
 - ▶ **Mechanism:** Value of non-employment **falls** with **job-finding rate**
 - ▶ **Consumption** of non-employed **falls** with worsening job-finding prospects through **precautionary** motive + **income** effect
 - ▶ **Fewer** employed **quit** to non-employment, **more** non-employed **search/accept**

Value Functions

Let $V_E(a, z)$, $V_{UI}(a, z, \kappa)$, and $V_{NoUI}(a, z, \kappa)$ represent the values of being employed, UI-eligible non-employed, and UI-ineligible non-employed:

Defined over

- ▶ a = assets
- ▶ z = idiosyncratic productivity: $\log z' = \rho_z \log z + \varepsilon_z$, $\varepsilon_z \sim N(0, \sigma_z^2)$
- ▶ κ = cost of job search, iid from logistic distribution: mean = μ_κ , scale = σ_κ

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$$V_E(a, z) = \max_{c, a'} \left\{ u(c) + \beta \max \left\{ \underbrace{\mathbb{E} V_{NoUI}(a', z', \kappa')}_{\text{Quit}}, \underbrace{\mathbb{E} [\delta_L V_{UI}(a', z', \kappa') + (1 - \delta_L) V_E(a', z')]}_{\text{Do Not Quit}} \right\} \right\}$$

subject to

$$c + a' = Ra + (1 - \tau)wz + T, \quad a' \geq 0$$

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$$V_{UI}(a, z, \kappa) = \max_{c, a'} \left\{ u(c) + \max \left\{ \underbrace{(1 - \kappa)\psi + \beta \mathcal{V}_{UI}^s(a', z)}_{\text{Search}}, \underbrace{\psi + \beta \mathcal{V}_{UI}^{ns}(a', z)}_{\text{Do Not Search}} \right\} \right\}$$

subject to

$$c + a' = Ra + (1 - \tau) \min\{\phi w z, \bar{\phi}\} + T, \quad a' \geq 0$$

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where

$$\mathcal{V}_{UI}^s(a', z) = f_s \cdot \max \left\{ \mathbb{E} V_E(a', z'), \mathbb{E} \overbrace{\tilde{V}_{UI}(a', z', \kappa')}^{\text{Accept or Reject Job Offer}} \right\} + (1 - f_s) \mathbb{E} \tilde{V}_{UI}(a', z', \kappa')$$

$$\mathcal{V}_{UI}^{ns}(a', z) = f_{ns} \cdot \max\{\mathbb{E} V_E(a', z'), \mathbb{E} V_{NoUI}(a', z', \kappa')\} + (1 - f_{ns}) \mathbb{E} V_{NoUI}(a', z', \kappa')$$

$$\tilde{V}_{UI}(a, z, \kappa) = \delta_{UI} V_{NoUI}(a, z, \kappa) + (1 - \delta_{UI}) V_{UI}(a, z, \kappa).$$

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subject to

$$c + a' = Ra + T, \quad a' \geq 0$$

where

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Estimation: A Monetary Policy Shock in the Model

- ▶ Feed in response of **job-finding rate**, **layoff rate**, **real interest rates** and **wages** from the data
- ▶ Overall **response of labor market flows** also determined by endogenous changes in **policy functions** + **distribution** of households across labor market states

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- ▶ Calibrate a number of parameters, $\theta_{EXT} \equiv \{\beta, \gamma, \bar{R}, \delta_{UI}, w, \alpha, \phi, \bar{\phi}, \tau, T\}$
 - ▶ Assume $u(c) = \frac{c^{1-\gamma}-1}{1-\gamma}$, $f_{ns} = \alpha f_s$

Estimation: A Monetary Policy Shock in the Model

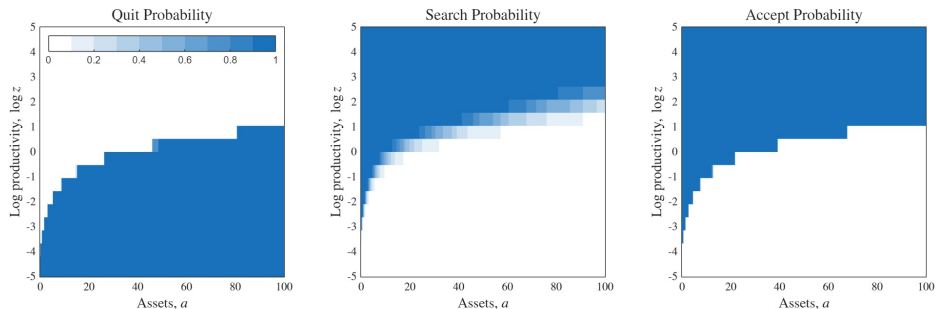
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 - ▶ Assume $u(c) = \frac{c^{1-\gamma}-1}{1-\gamma}$, $f_{ns} = \alpha f_s$
- ▶ Estimate remaining parameters to **match IRFs** of labor market flows
 - ▶ À la Christiano, Eichenbaum, Evans (2005) or Auclert, Rognlie, Straub (2020)


$$\theta_{EST} \equiv \{\rho_z, \sigma_z, \mu_\kappa, \sigma_\kappa, \psi, \delta_L, f_s\}$$

$$\hat{J} = \{EU_t, EN_t, UE_t, UN_t, NE_t, NU_t\}_{t=0}^{50}$$

$$\hat{\theta}_{EST} = \arg \min_{\theta_{EST}} (J(\theta_{EST}) - \hat{J})' \Sigma^{-1} (J(\theta_{EST}) - \hat{J})$$

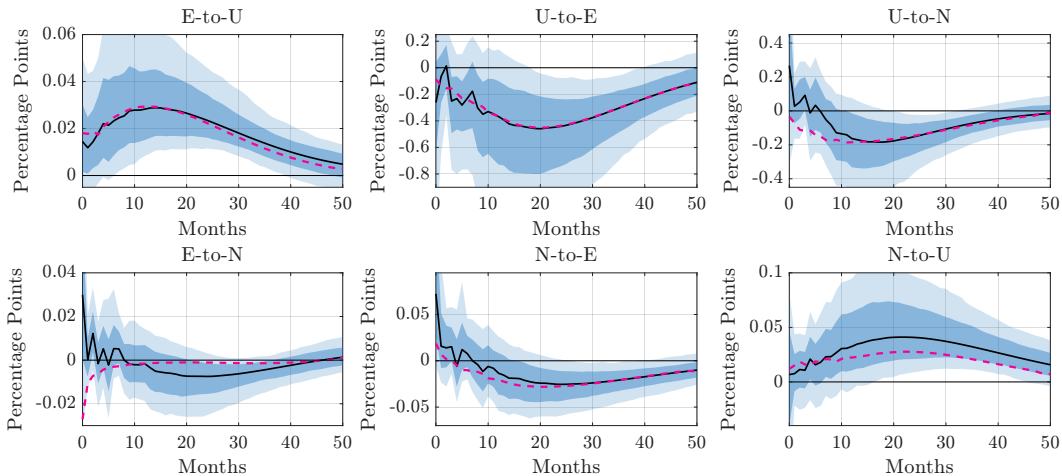
Results: Steady State



1. Model almost exactly fits steady-state transition rates between E, U and N 
2. Model is consistent with recent evidence on MPCs and MPEs (Orchard et al. (2023), Boehm et al. (2024), Golosov et al. (2023))

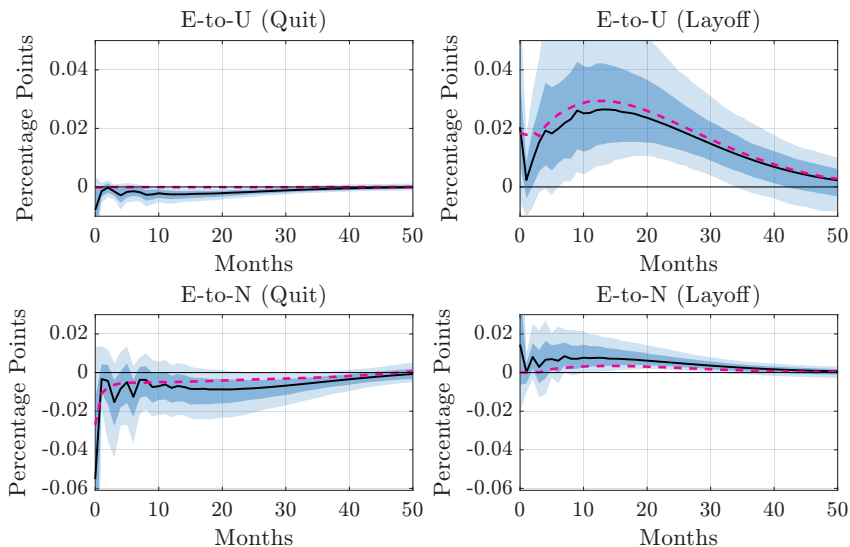
▶ MPC/MPE Details

Response of Labor Market Flows: Model vs Data



- ▶ Labor market flows from model (magenta lines) largely fall within 68% CI's

Response of Quits and Layoffs: Model vs Data



► Model also closely matches response of quits and layoffs

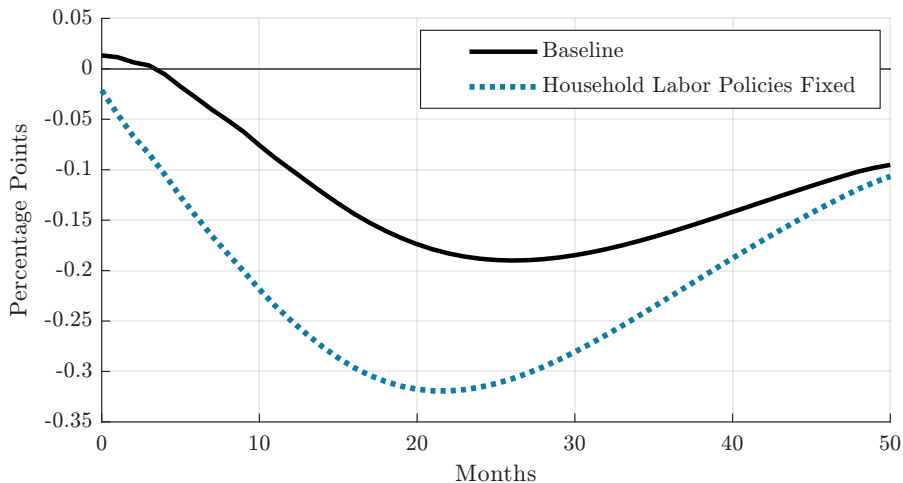
Evaluating the Role of Labor Supply

- ▶ Ability of model to match response of labor market flows could reflect endogenous changes in **composition** or household **labor supply**
- ▶ For example, **decrease in U-to-N** flows could reflect
 - ▶ **Greater mass of “likely searchers”** in non-employment, or
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Evaluating the Role of Labor Supply

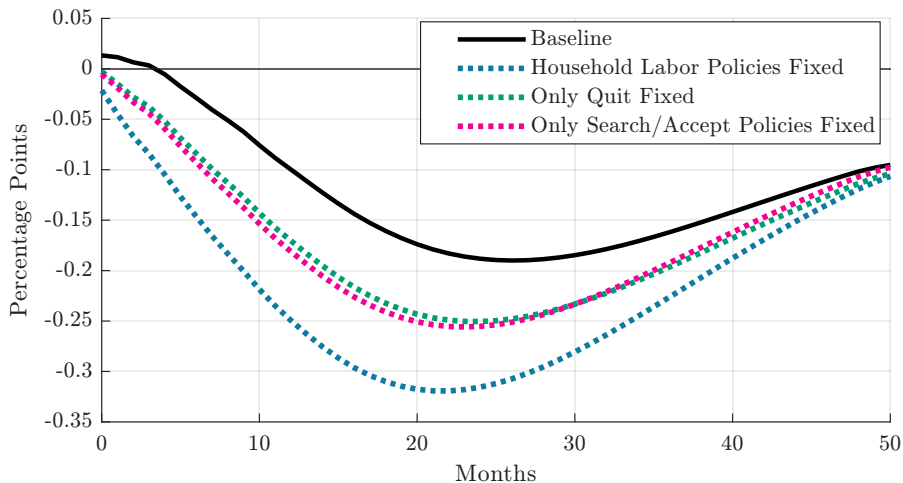
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 - ▶ **Greater mass of “likely searchers”** in non-employment, or
 - ▶ **Higher propensity to search** for employment of all workers
- ▶ To assess relative importance of two channels, simulate model holding labor supply policy functions at steady state
 - ▶ If changes in **labor supply** do not matter, **employment** should be **unaffected**

Evaluating the Role of Labor Supply: Employment Response



- ▶ **Finding:** Employment drops by additional $\approx 70\%$
 - ▶ Indicates **broad-based increase** in **labor supply** to contractionary monetary shock

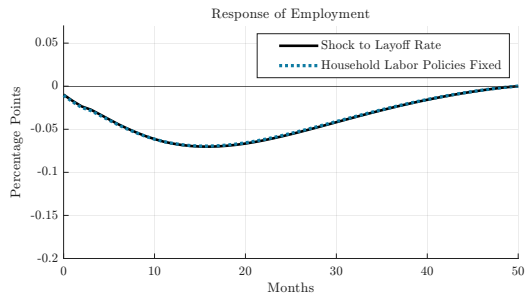
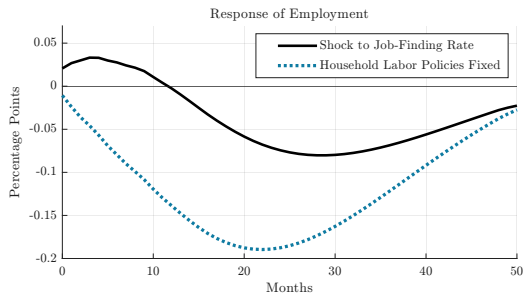
Evaluating the Role of Labor Supply: Employment Response



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 - ▶ **Shift in labor supply** of employed and non-employed is **equally important**

Mechanism: What is labor supply responding to?

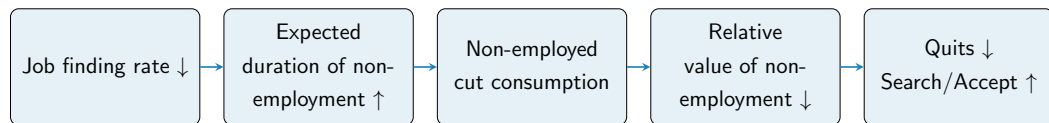
- ▶ Our “monetary policy shock” consists of paths for **job-finding rate**, **layoff rate**, **real interest rates** and **wages**
- ▶ Feed in paths of **job-finding rate** and **layoff rate** one by one:



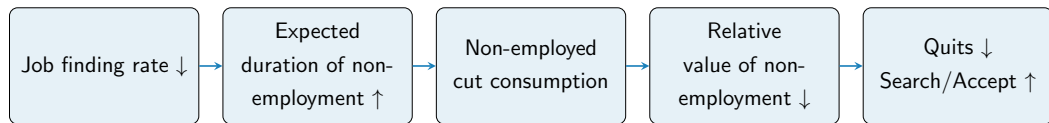
- ▶ **Labor supply increase** is due to **fall in job-finding rate**

▶ Decomposed response of flows

Mechanism: Why does labor supply respond to the job finding rate?



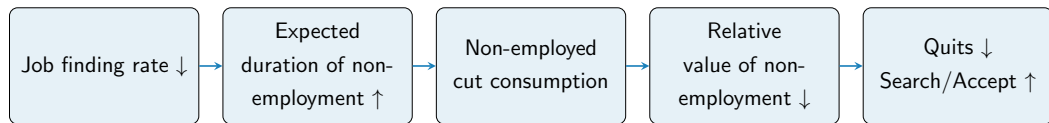
Mechanism: Why does labor supply respond to the job finding rate?



► From the estimated model:

	Wealth	Cons. Drop (%, SS)	Cons. Drop (%, Shock)
Marginal Quitters (SS)	59.61	1.82	1.91
Marginal Quitters (Shock)	59.81	1.71	1.81
% Change	0.71		

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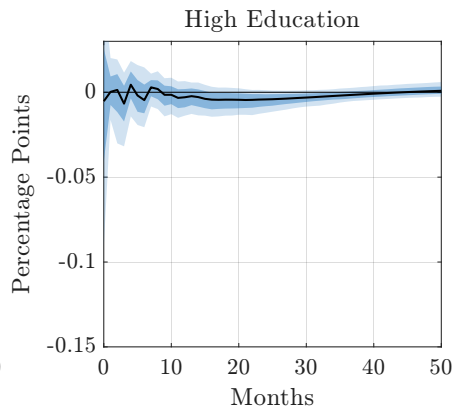
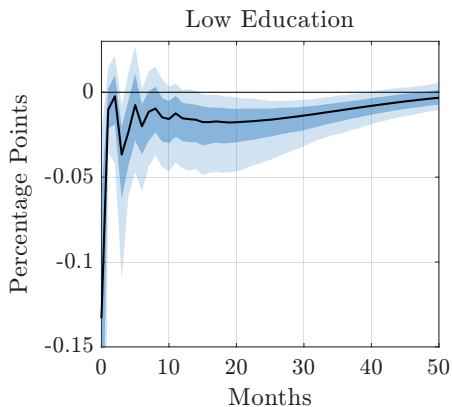
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- ▶ Required \uparrow in wealth to quit after shock is **larger for low productivity** (0.9%) than high productivity (0.4%)

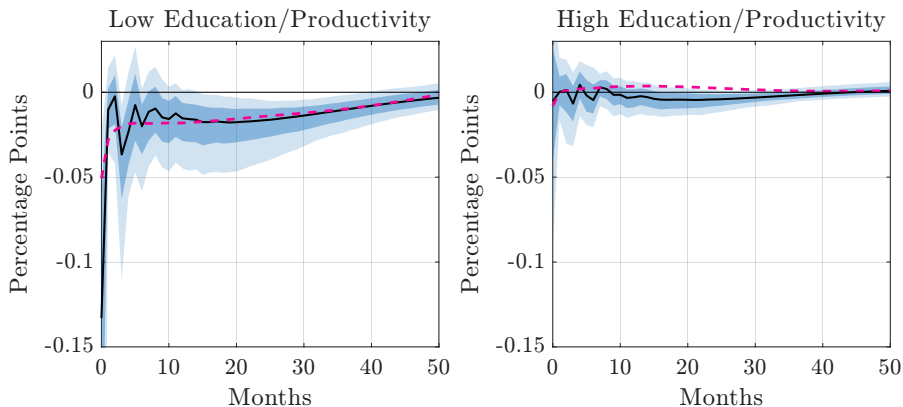
Mechanism: Whose labor supply is responding?

- ▶ Data: Decline in quits to N is concentrated among **less educated**



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 - ▶ Why? **Relative value of non-employment falls** with **job finding rate**
- ▶ **Empirical evidence** + **model findings** consistent with important role of **labor supply** in **monetary transmission mechanism**
- ▶ **Future work**: study labor supply response to Covid-era transfers. Evaluate role in “**Great Resignation**” and subsequent inflation

Appendix

Cyclical Properties of Labor Market Stocks and Flows

Cyclicity of Labor Market Stocks

	Employment- Population Ratio	Unemployment Rate	Participation Rate
$\text{mean}(x)$	61.14	6.19	65.16
$\text{std}(x)/\text{std}(Y)$	0.72	8.25	0.23
$\text{corr}(x, Y)$	0.83	-0.85	0.35

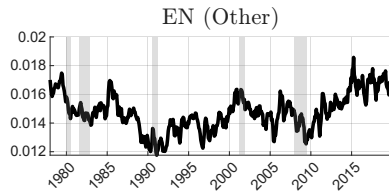
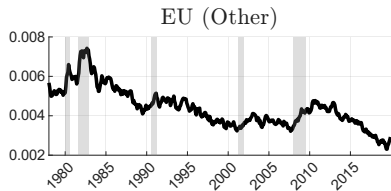
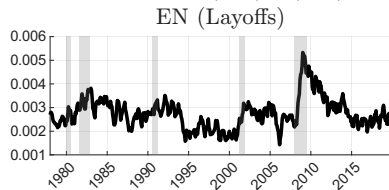
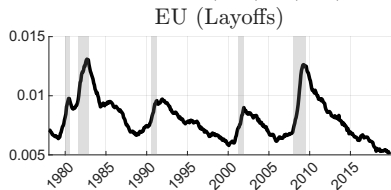
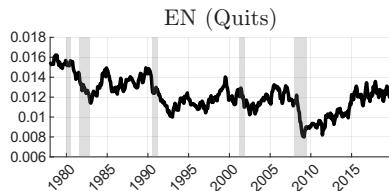
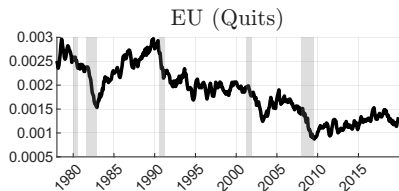
Note: x denotes the variable in each column, Y denotes HP-filtered log real GDP. Standard deviations and correlations are computed for HP-filtered quarterly averages. The sample is 1978-2019.

Cyclicity of Labor Market Flows

	EU	EN	UE	UN	NE	NU
$\text{mean}(x)$	0.014	0.030	0.255	0.226	0.046	0.025
$\text{std}(x)/\text{std}(Y)$	5.41	2.40	5.69	4.13	2.87	5.22
$\text{corr}(x, Y)$	-0.81	0.50	0.77	0.71	0.67	-0.67

Note: x denotes the variable in each column, Y denotes HP-filtered log real GDP. Standard deviations and correlations are computed for HP-filtered quarterly averages. The sample is 1978-2019.

Decomposition of EU Flows



Relevance of Distinction Between Quits and Layoffs

Post-EU Transition Rates: Quits vs Layoffs

<i>From</i>	<i>To</i>		
	E	U	N
E – U(Quit)	0.448	0.399	0.153
E – U(Layoff)	0.426	0.468	0.106

Note: Transition rates are shown for individuals that are in their first month of unemployment following an employment spell, split by reason for unemployment.

Relevance of Distinction Between Quits and Layoffs

Post-EN Report: Quits vs Layoffs

	Average Probability
Want Job E-N(Quit)	0.210
Want Job E-N(Layoff)	0.515
NE Want Job	0.145
NE Do Not Want Job	0.037
NU Want Job	0.172
NU Do Not Want Job	0.012

Note: The top section shows the probability that individuals want a job, split by the reason for leaving to nonparticipation. The bottom section shows the probabilities of moving to employment, split by whether or not nonparticipants report wanting a job.

Robustness of Quit/Layoff Distinction

Sequences of Reasons for U among E-U-U Individuals

<i>Sample period</i>	P(Quit Layoff)	P(Layoff Quit)
pre-Redesign	0.039	0.208
post-Redesign	0.007	0.026

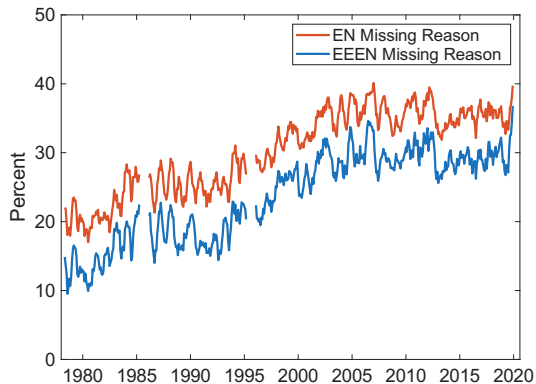
Note: The first row shows the probability of individuals switching their reason for unemployment from layoff to quit (in the first column), or from quit to layoff (in the second column), prior to the 1994 CPS redesign. The second row shows the same, but for the period following the redesign.

Transition Rates Across E-U-U Individuals

	<i>From</i>	<i>To</i>		
		E	U	N
(a)	E – U(Quit) – U(Layoff)	0.339	0.553	0.108
(b)	E – U(Quit) – U(Quit)	0.343	0.536	0.121
(c)	E – U(Layoff) – U(Quit)	0.352	0.557	0.091
(d)	E – U(Layoff) – U(Layoff)	0.264	0.667	0.068

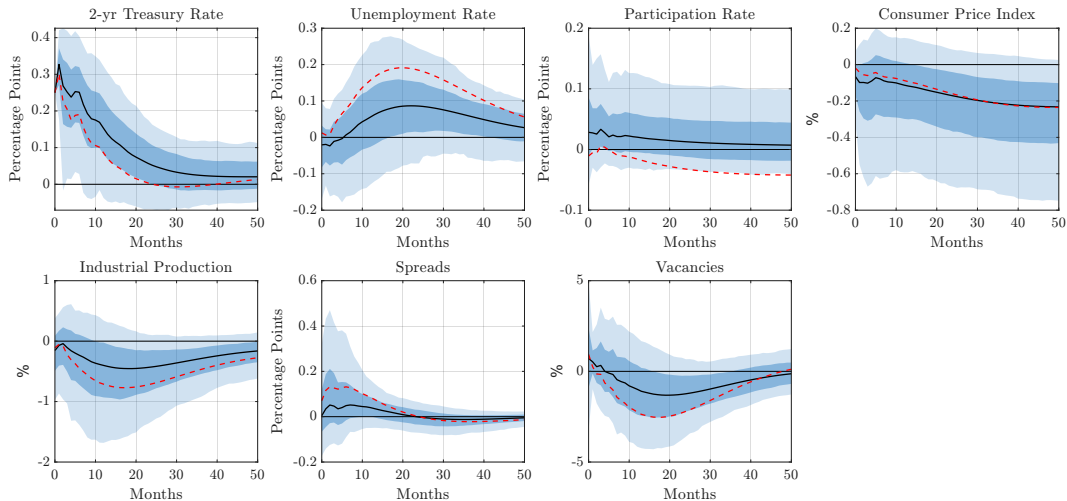
Note: Transition rates are shown for individuals that are in their second month of unemployment following an employment spell, split by reason for unemployment. The rates are computed for the period prior to the 1994 CPS redesign.

Fraction of EN Transitions with Missing Reason



Note: The red line shows the proportion of individuals making an EN transition for which there is missing data on the reason for leaving the last job. The blue line shows the same calculation for individuals that were employed in each of the first three months before moving to nonparticipation. Series are smoothed using a centered 5-month moving average.

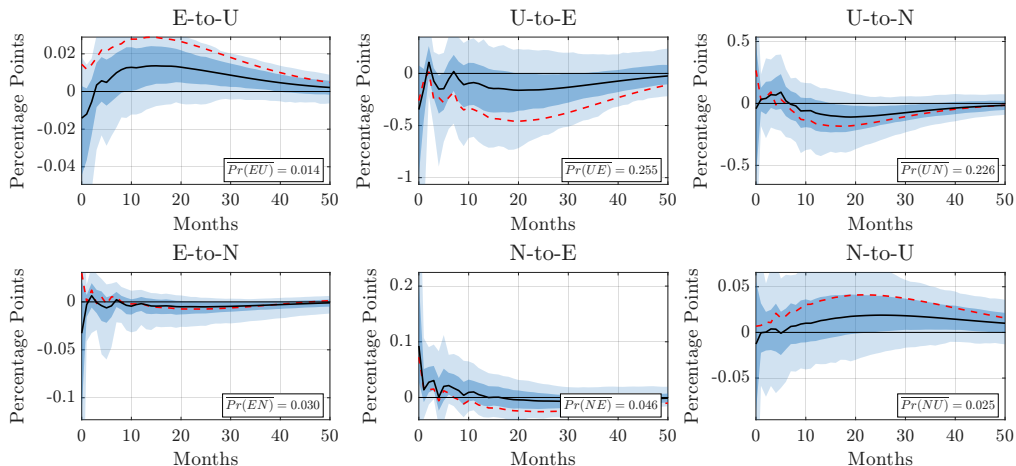
Baseline VAR: FOMC Announcement Shocks (Not Orthogonalized)



Robust F -statistic: 7.80

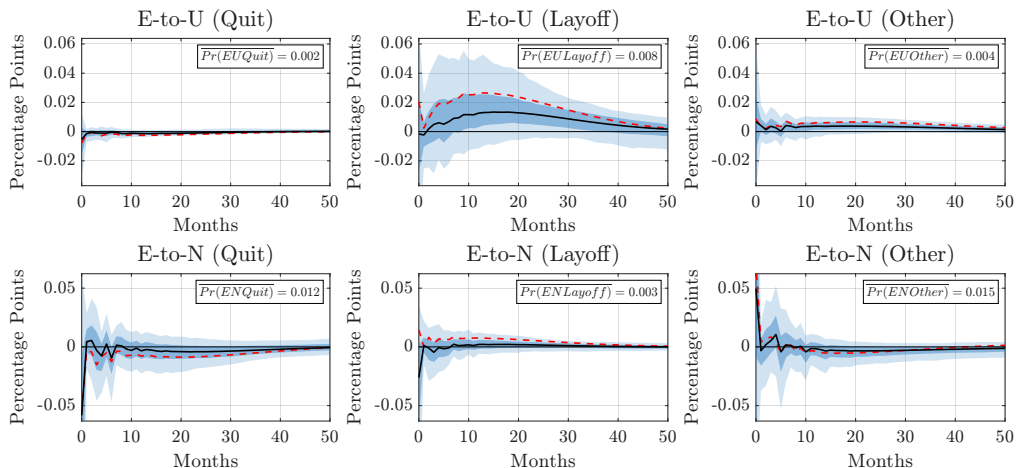
- ▶ **Black/Blue:** FOMC Announcement shocks, no orthogonalization
- ▶ **Dashed Red:** Our baseline estimates

Labor Market Flows: FOMC Announcement Shocks (Not Orthogonalized)



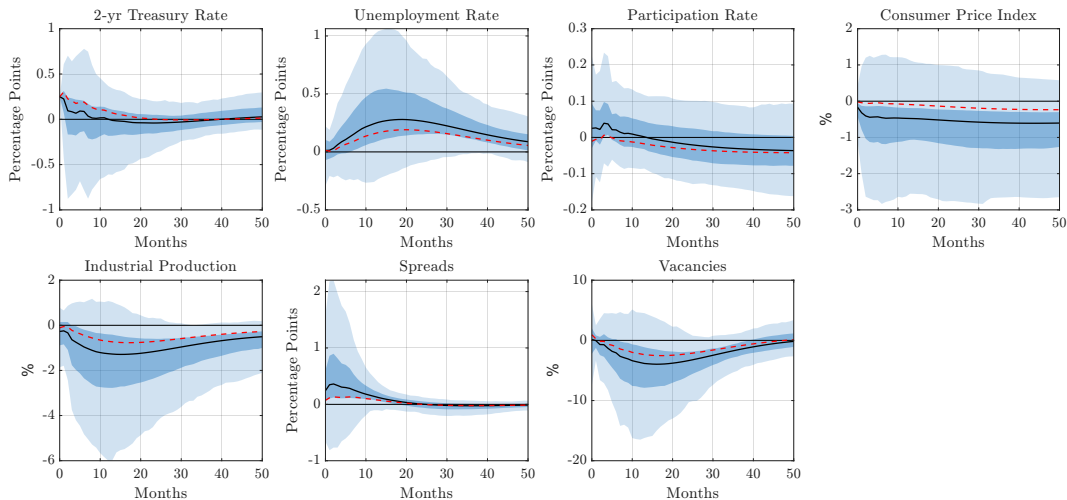
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Quit/Layoff Responses: FOMC Announcement Shocks (Not Orthog.)



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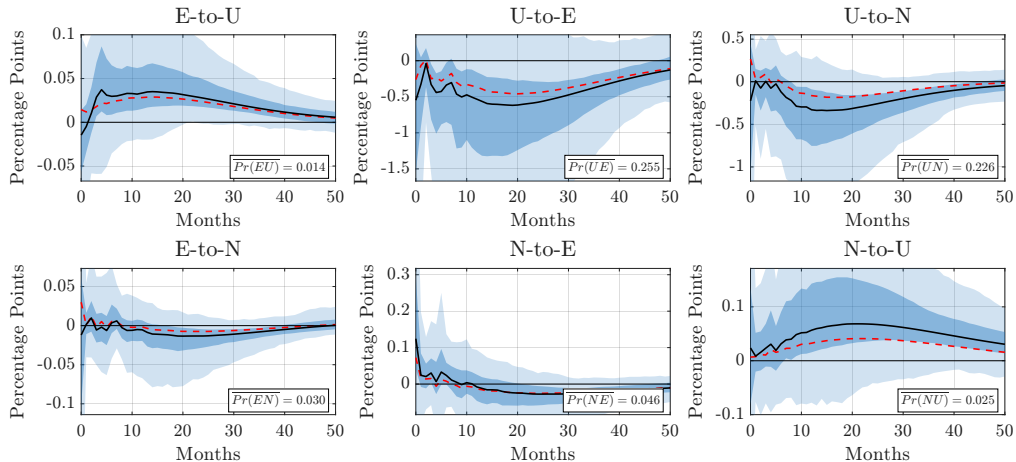
Baseline VAR: FOMC Announcement Shocks (Orthogonalized)



Robust F -statistic: 2.64

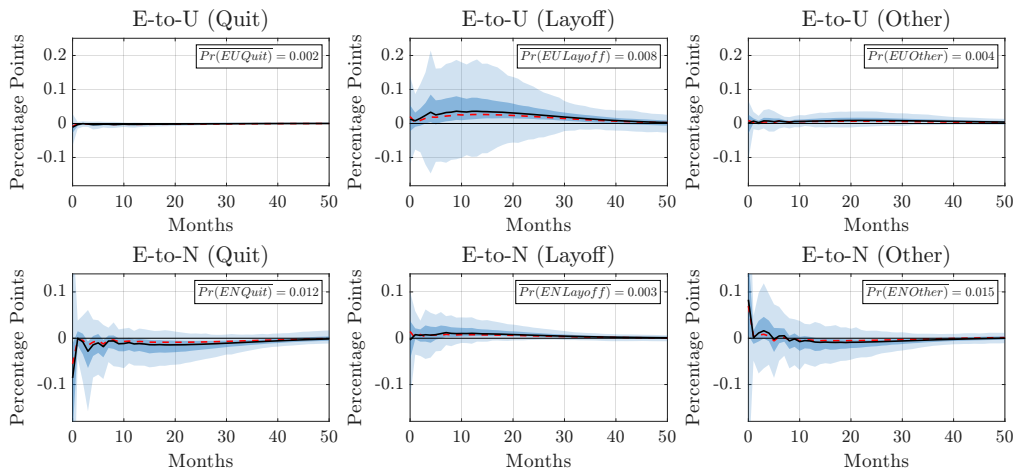
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Labor Market Flows: FOMC Announcement Shocks (Orthogonalized)



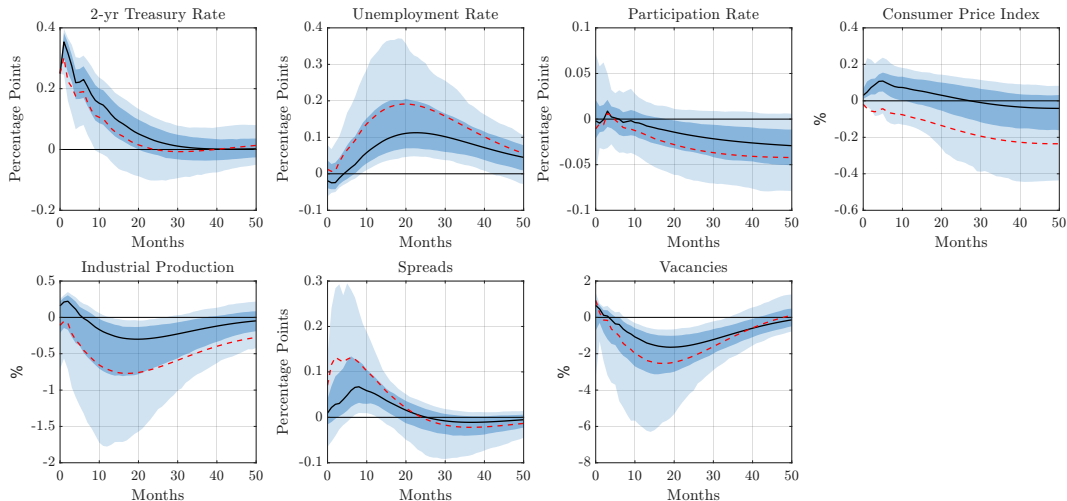
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Quit/Layoff Responses: FOMC Announcement Shocks (Orthogonalized)



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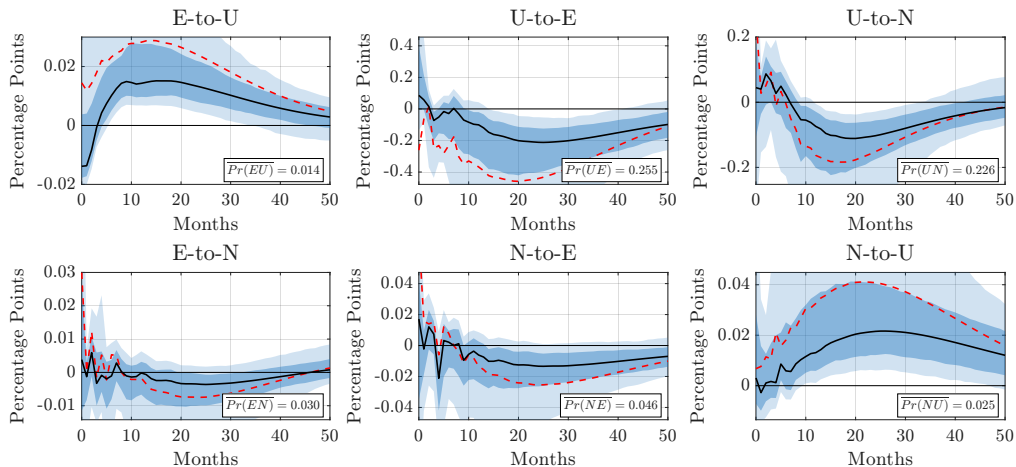
Baseline VAR: Romer & Romer Shocks



Robust F -statistic: 26.44

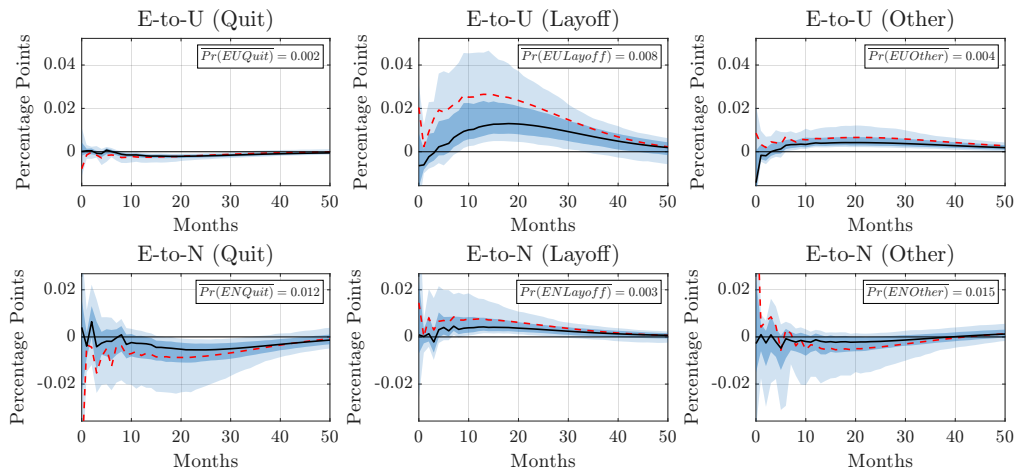
- ▶ **Black/Blue:** Updated Romer & Romer (2004) shocks, 1982:M10-2007:M12
- ▶ **Dashed Red:** Our baseline estimates

Labor Market Flows: Romer & Romer Shocks



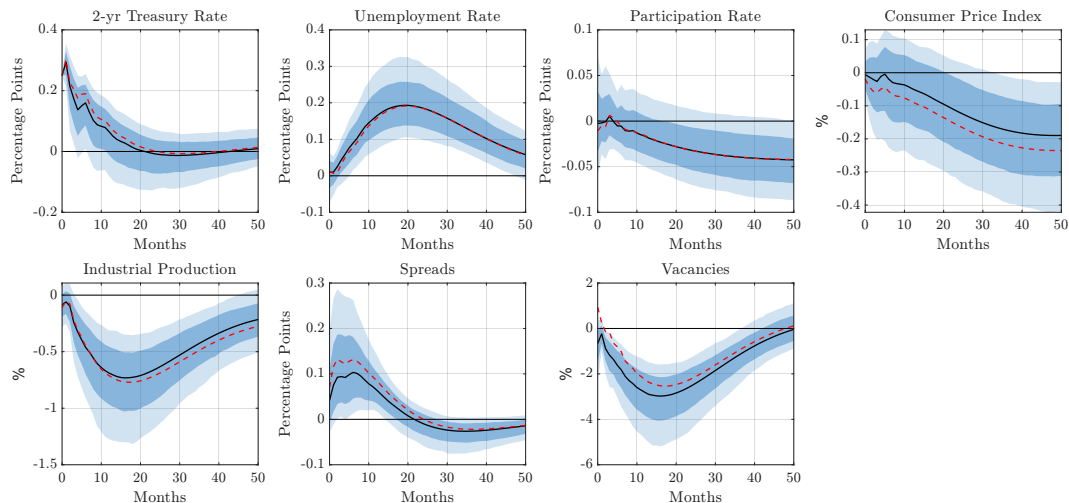
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Quit/Layoff Responses: Romer & Romer Shocks



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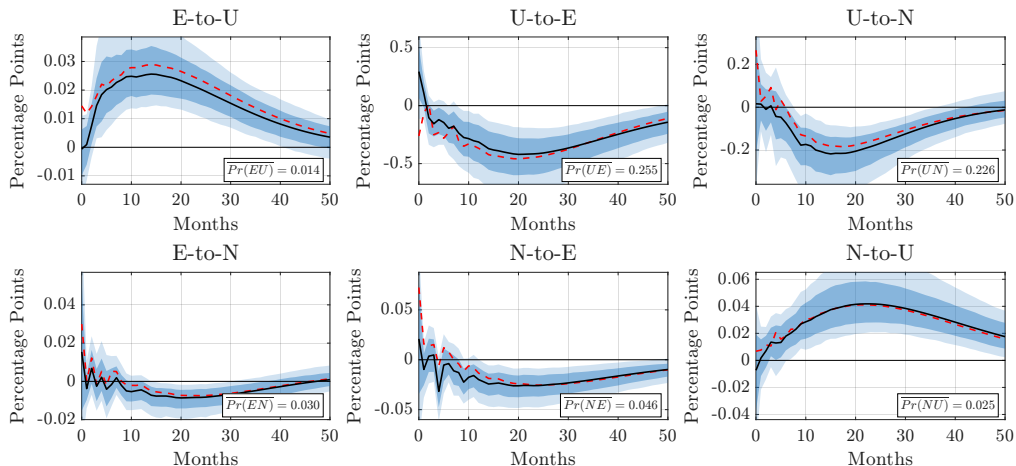
Baseline VAR: Aruoba & Drechsel (2024) Shocks



Robust F -statistic: 26.66

- ▶ **Black/Blue:** Aruoba & Drechsel (2024) shocks, 1982:M10-2008:M10
- ▶ **Dashed Red:** Our baseline estimates

Labor Market Flows: Aruoba & Drechsel (2024) Shocks



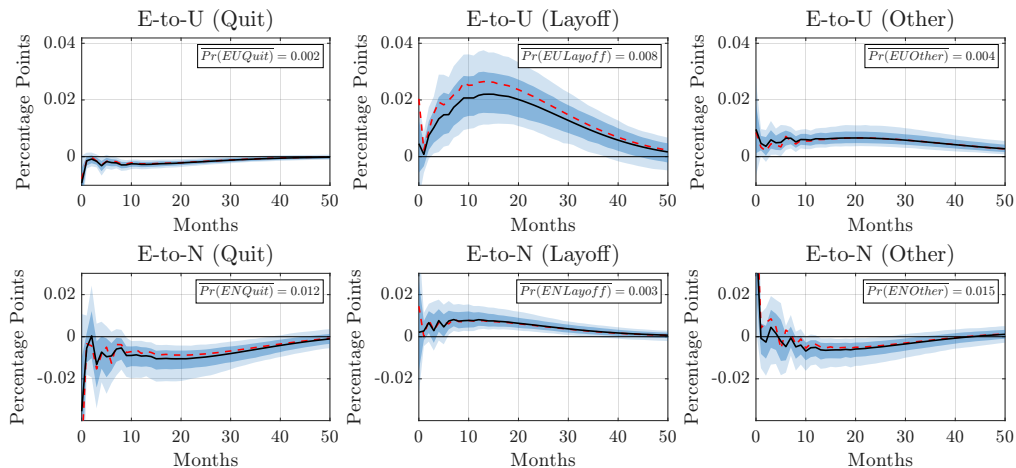
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◀ Back (Flows)

◀ Back (Robustness)

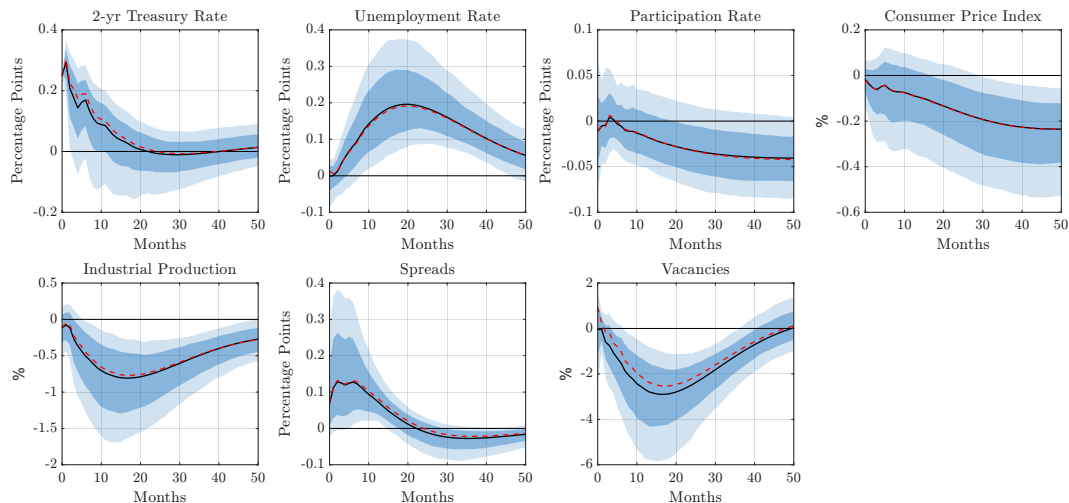
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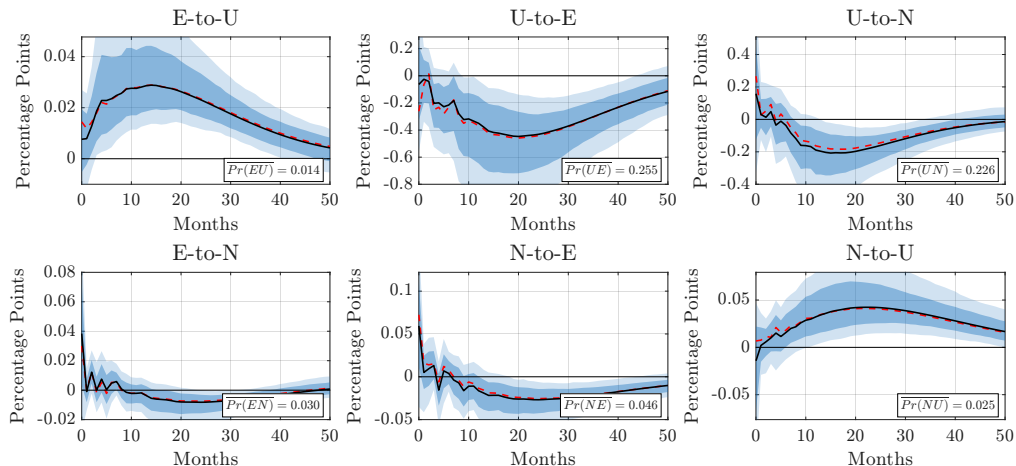
Baseline VAR: AD (2024) and SJ (2025) Shocks



Robust F -statistic: 18.25

- ▶ Two instruments: AD (2024) and SJ (2025) shocks, 1988:M10-2008:M10
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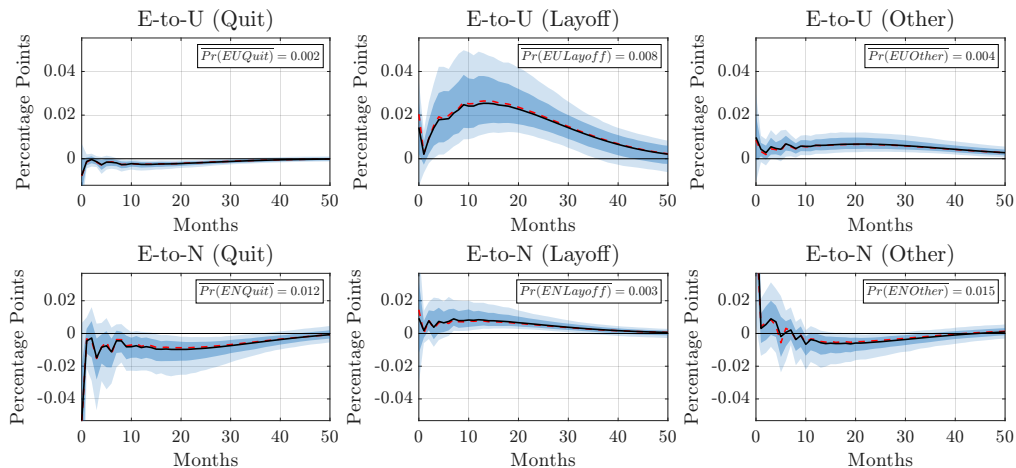
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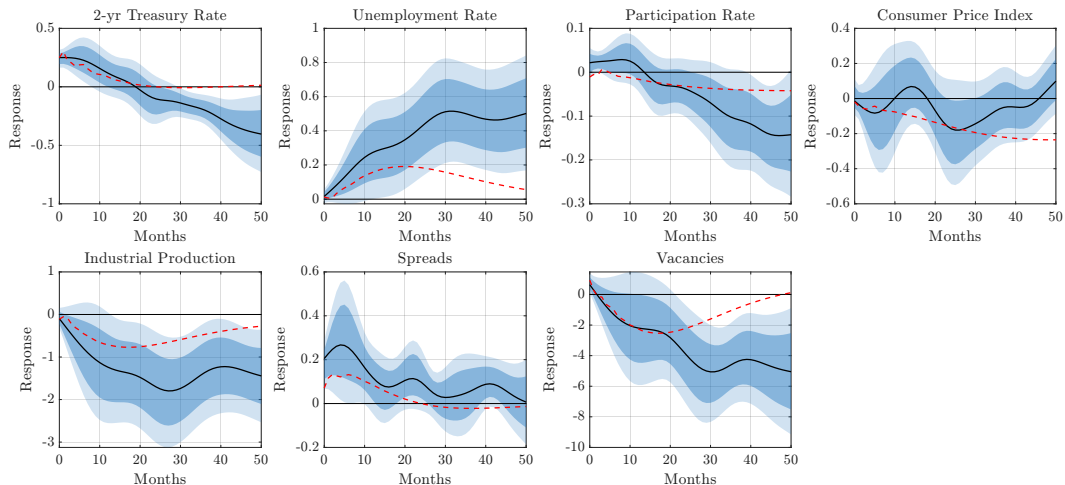
Quit/Layoff Responses: AD (2024) and SJ (2025) Shocks



Robust F -statistic: 18.25

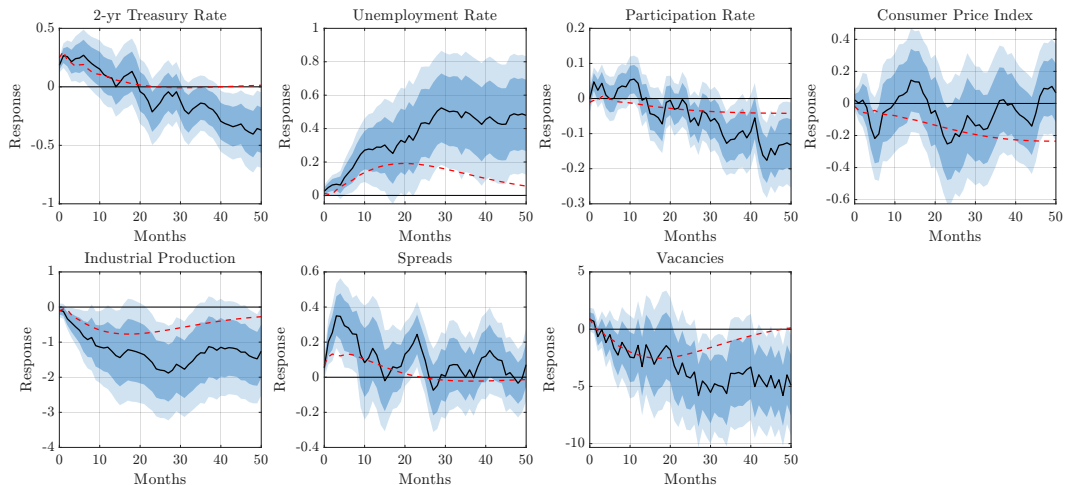
- ▶ Two instruments: AD (2024) and SJ (2025) shocks, 1988:M10-2008:M10
- ▶ **Dashed Red:** Our baseline estimates

Baseline Variables: Local Projection Estimates



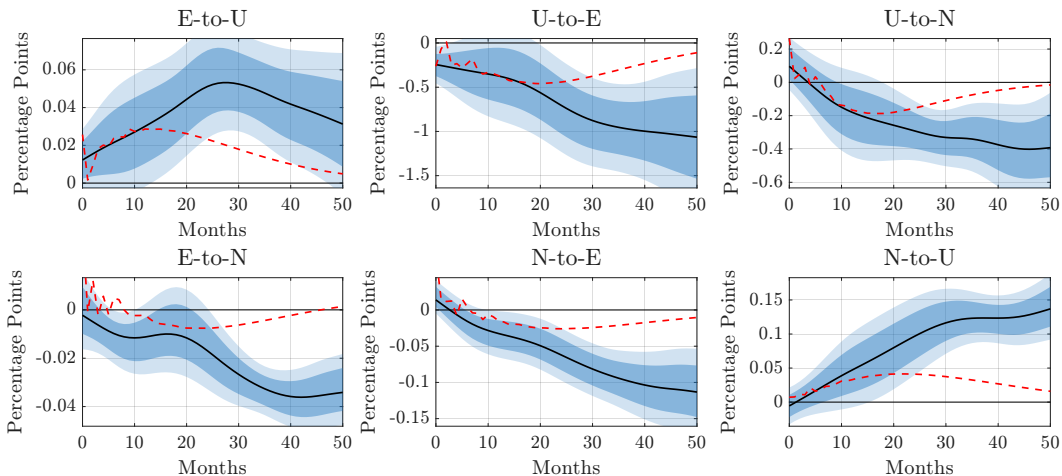
- ▶ **Black/Blue:** Smooth Local Projections (Barnichon & Brownlees (2019))
- ▶ **Dashed Red:** Our baseline estimates

Baseline Variables: Local Projection Estimates



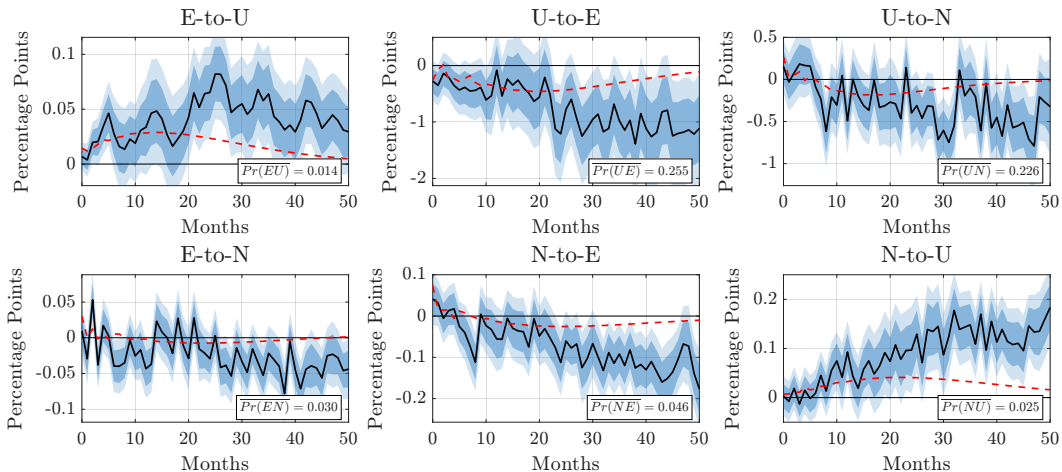
- ▶ **Black/Blue:** Standard Local Projections
- ▶ **Dashed Red:** Our baseline estimates

Labor Market Flows: Local Projection Estimates



- ▶ Black/Blue: Smooth Local Projections (Barnichon & Brownlees (2019))
- ▶ Dashed Red: Our baseline estimates

Labor Market Flows: Local Projection Estimates



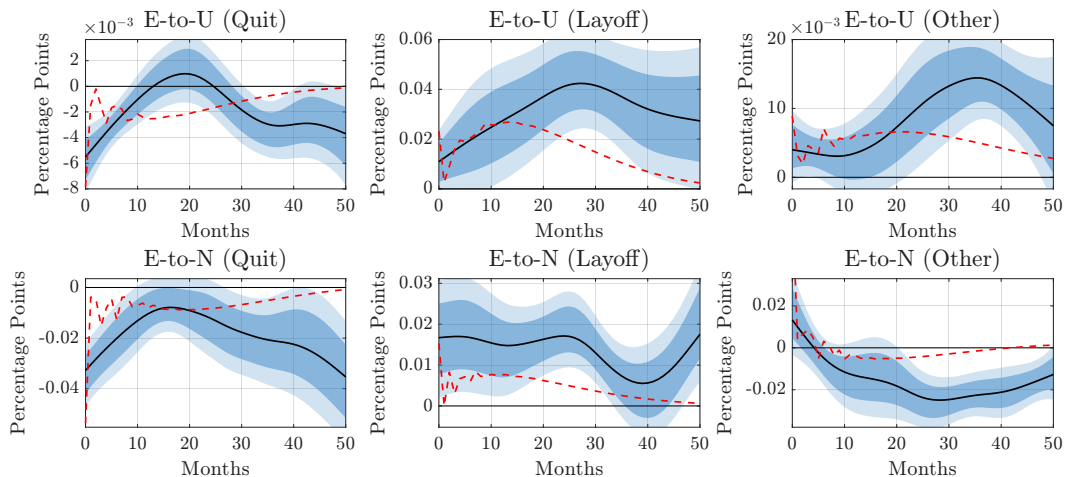
▶ Black/Blue: Standard Local Projections

▶ Dashed Red: Our baseline estimates

◀ Back (Flows)

◀ Back (Robustness)

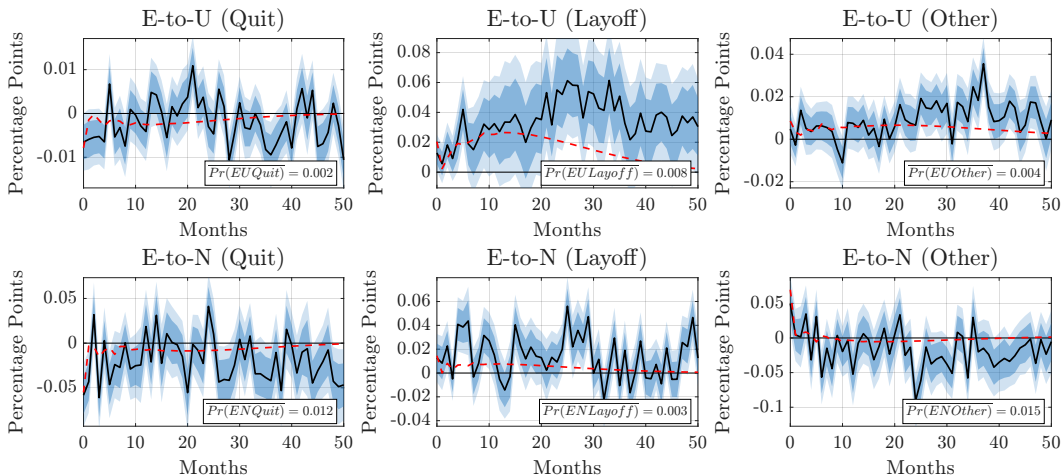
Quit/Layoff Responses: Local Projection Estimates



▶ Black/Blue: Smooth Local Projections (Barnichon & Brownles (2019))

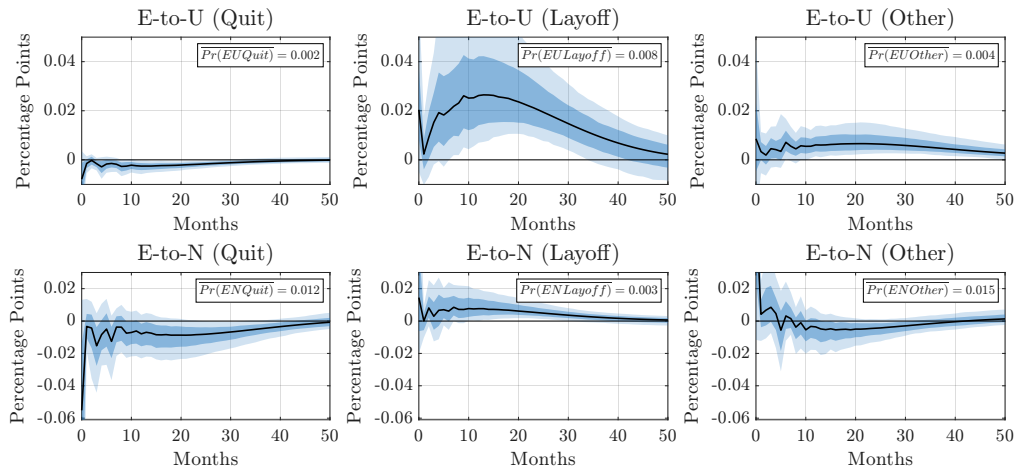
▶ Dashed Red: Our baseline estimates

Quit/Layoff Responses: Local Projection Estimates



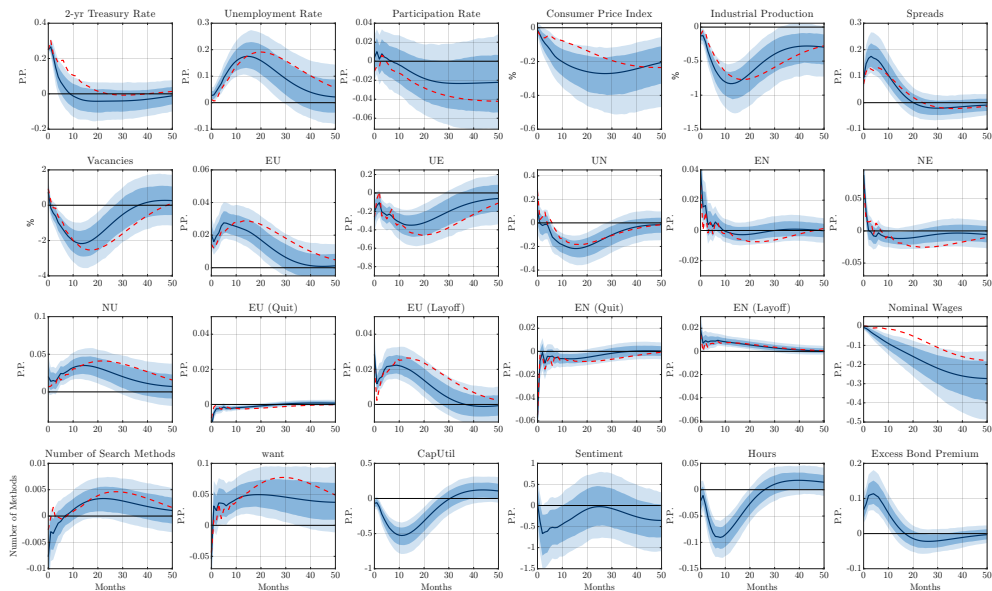
- ▶ Black/Blue: Standard Local Projections
- ▶ Dashed Red: Our baseline estimates

Quit/Layoff Responses: Including Other Separations



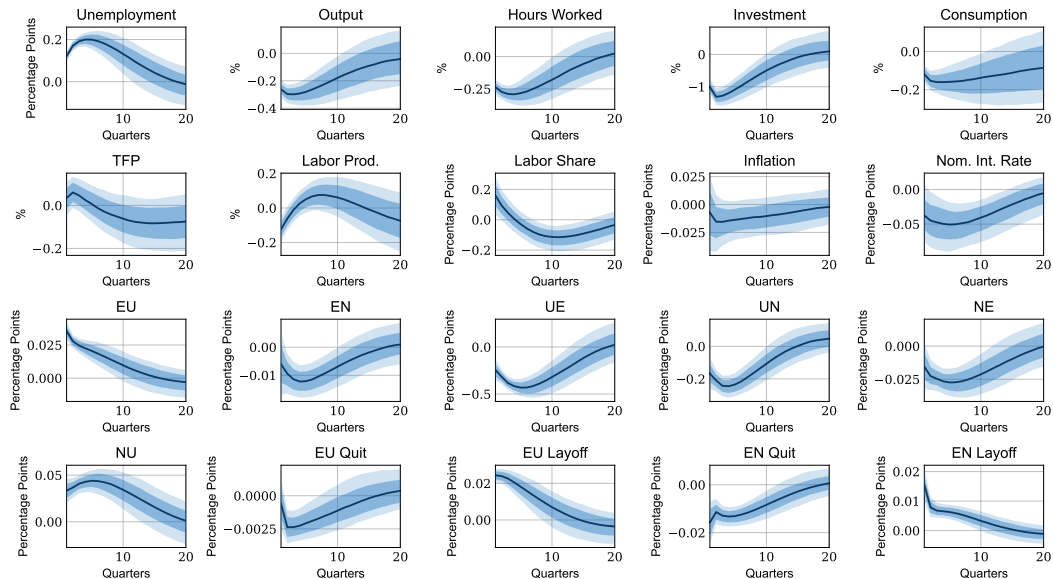
- ▶ "Other separations" not a key driver of EU or EN responses

Large Scale Bayesian VAR

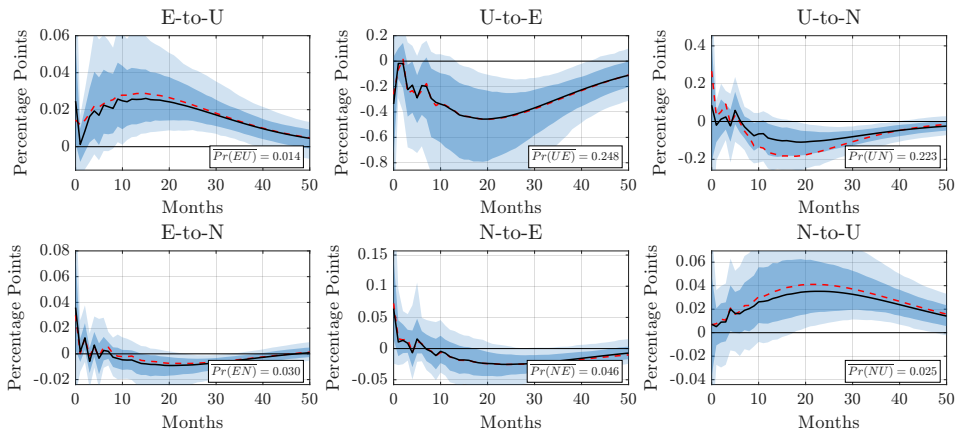


► **Dashed Red:** Our baseline estimates where available

Main Business Cycle Shock + Flows (Angeletos et al. (2020))

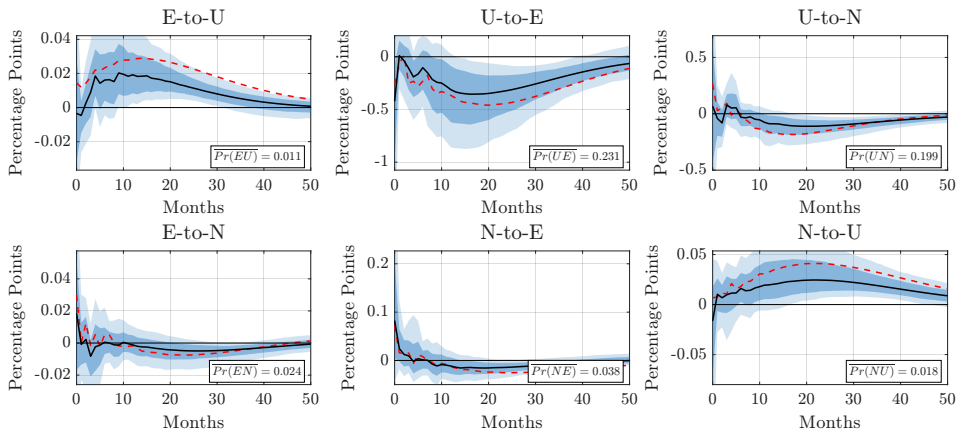


Labor Market Flows: Holding Composition Fixed



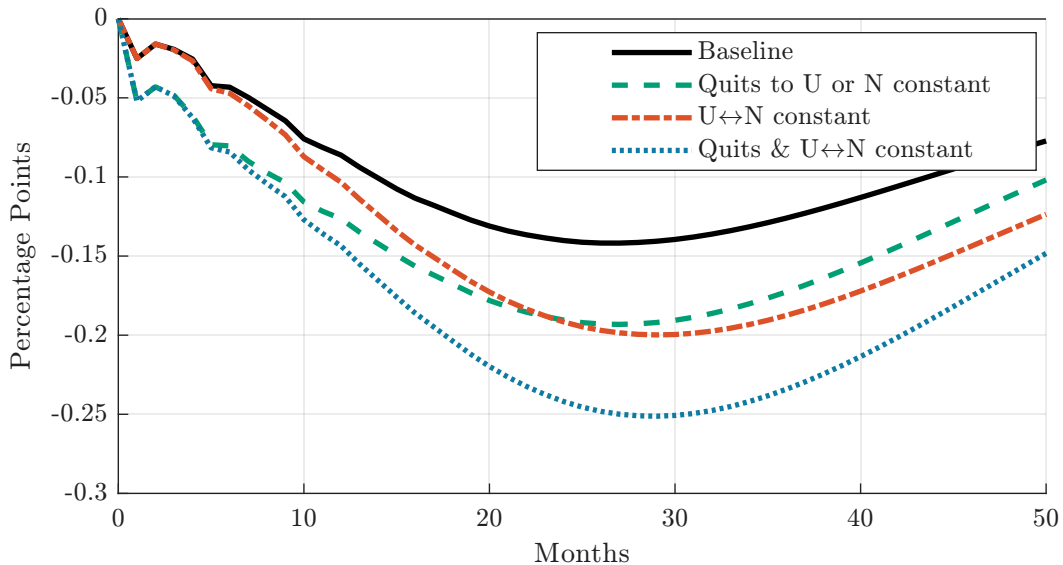
- ▶ Composition-adjusted flows by ex-ante characteristics, à la Elsby et al. (2015)
- ▶ Fix shares using bins for age \times gender \times education \times reason for unemployment
- ▶ Dashed red lines report our baseline estimates

Labor Market Flows: Holding Composition Fixed (Full Controls)

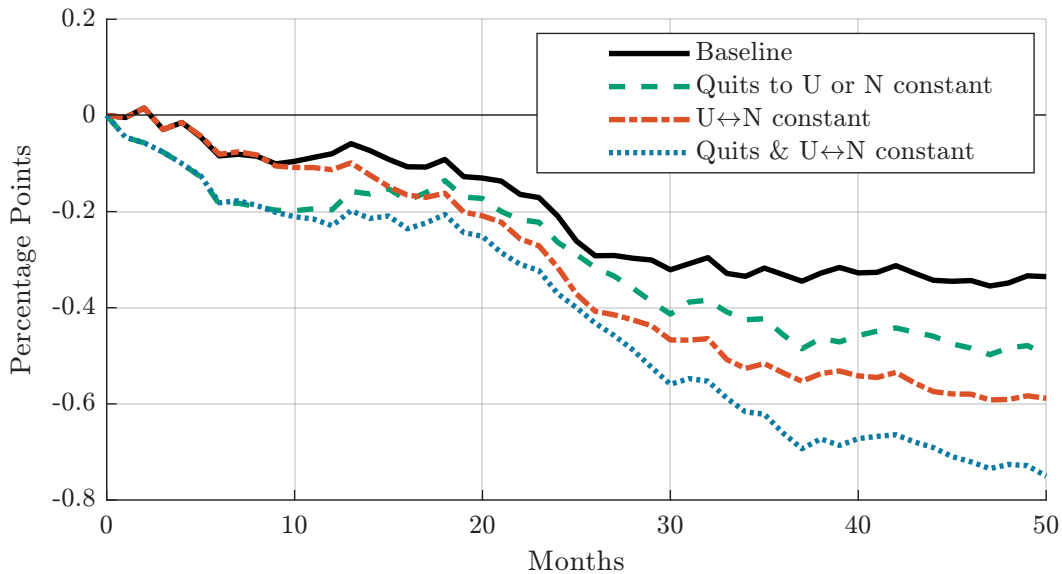


- ▶ Fix shares using bins for age × gender × education × reason for unemployment × labor market status one year ago
- ▶ Dashed red lines are baseline estimates (different sample...)

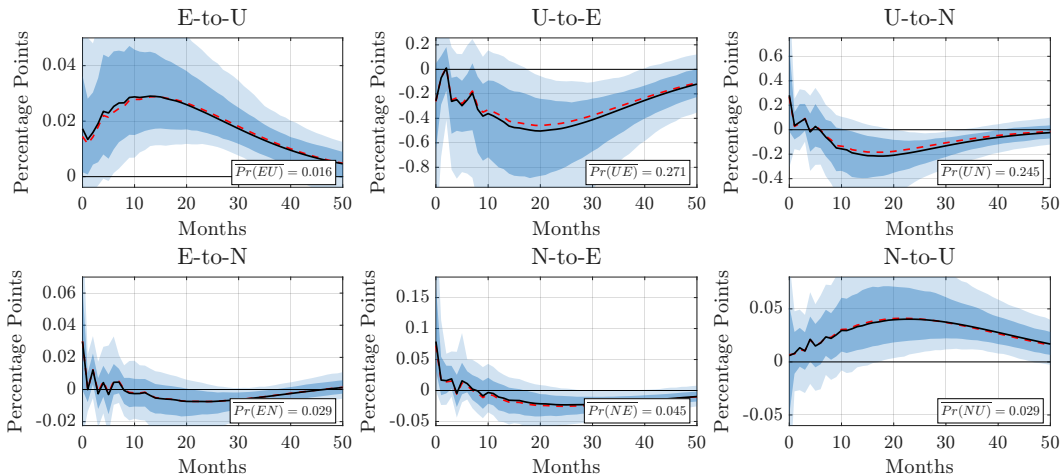
Decomposing Employment Response: Holding Composition Fixed



Decomposing Employment Response: Using Local Projections



Labor Market Flows: Corrected for Time-Aggregation

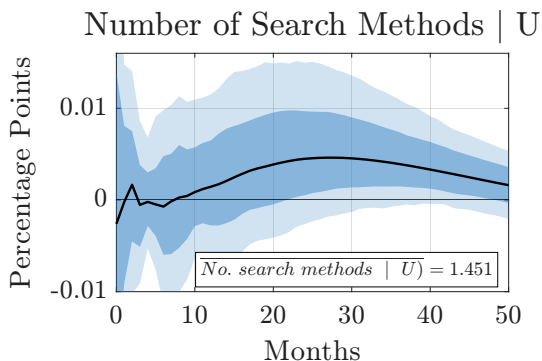
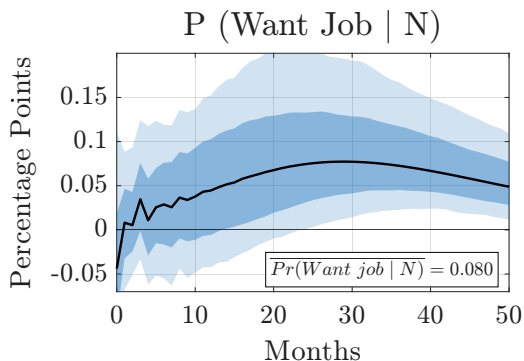


► **Dashed Red:** Our baseline estimates

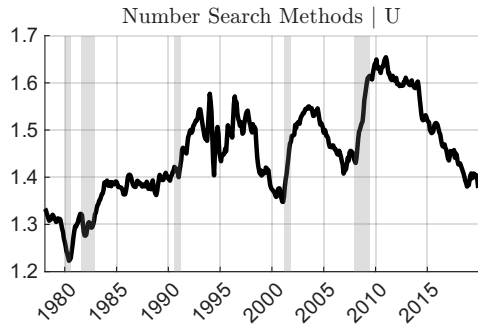
Intensive Margins of Labor Supply

Intensive margins of job search consistent with behavior of NU/UN flows:

- ▶ For N: share that want a job
- ▶ For U: number of search methods

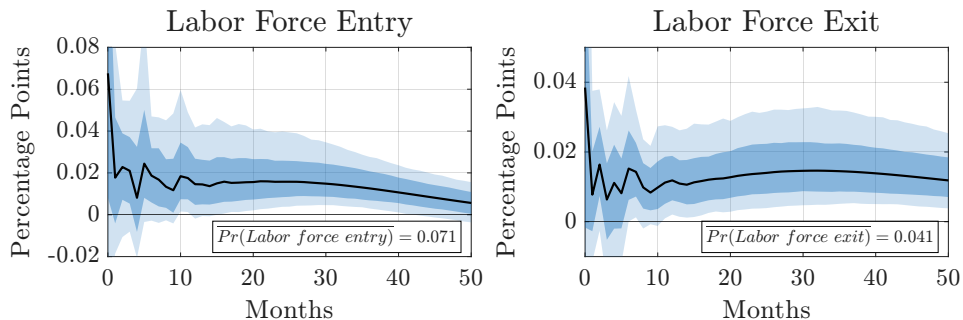


Intensive Margins: Time-Series



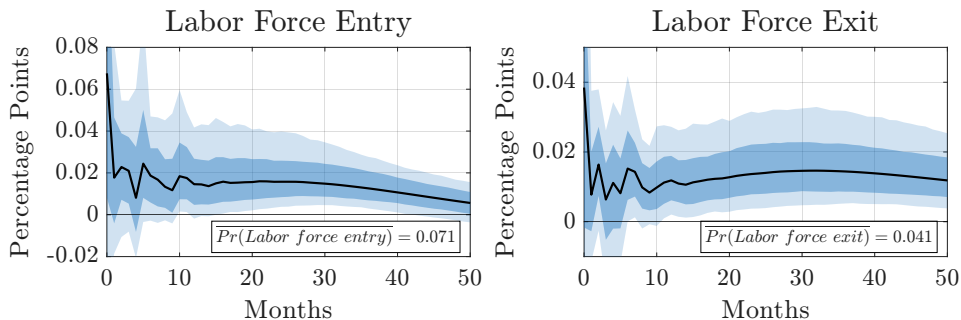
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Participation: Response of Labor Force Entry and Exit



- ▶ Participation falls due to **higher exit rate**, offset by **rise in entry**

Participation: Response of Labor Force Entry and Exit



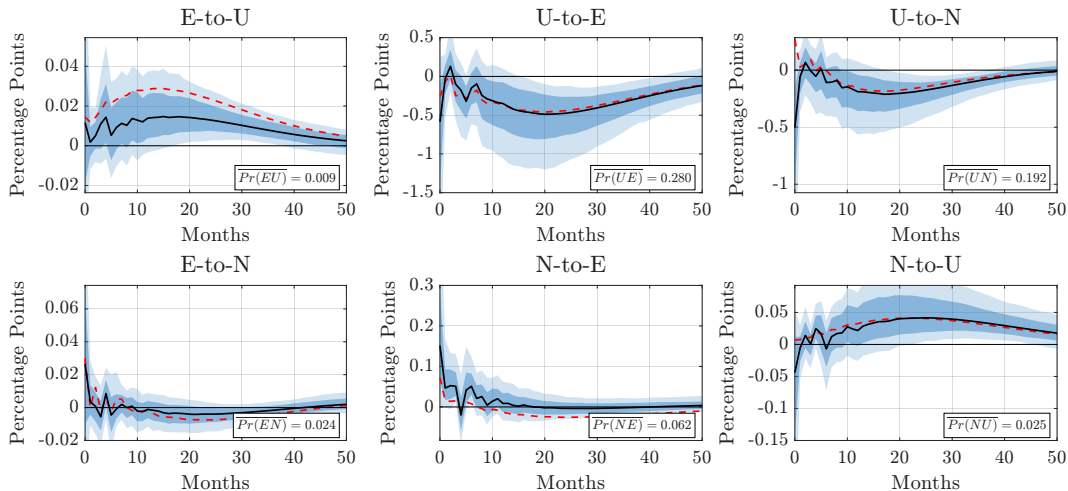
- ▶ Participation falls due to **higher exit rate**, offset by **rise in entry**
- ▶ Increase in exits driven by u_{t-1} , attenuated by UN_t and EN_t

$$(\text{Labor Force Entry Rate})_t = NU_t + NE_t,$$

$$(\text{Labor Force Exit Rate})_t = u_{t-1} \cdot UN_t + (1 - u_{t-1}) \cdot EN_t,$$

where u_{t-1} denotes the unemployment rate (and $\overline{UN} \gg \overline{EN}$)

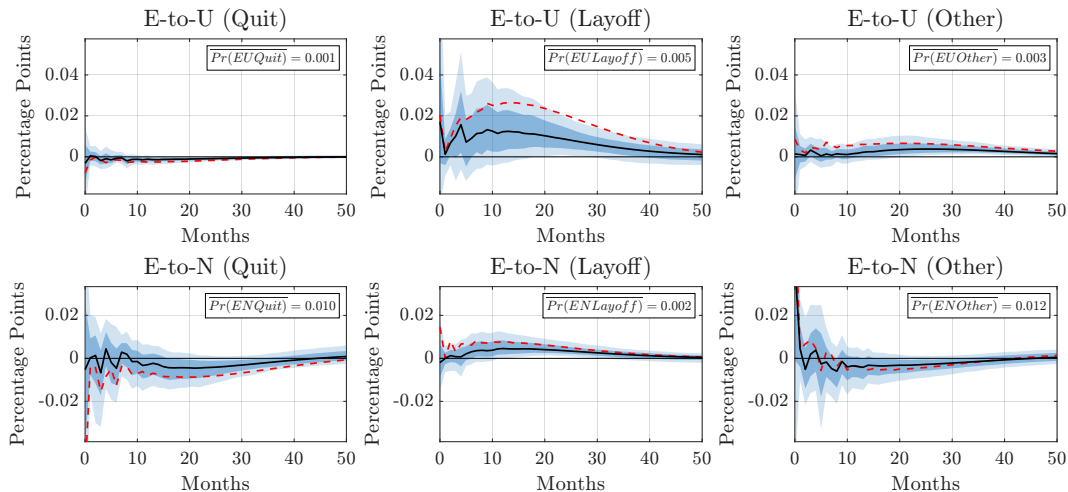
Labor Market Flows: Higher-Educated



► **Dashed Red:** Our baseline estimates

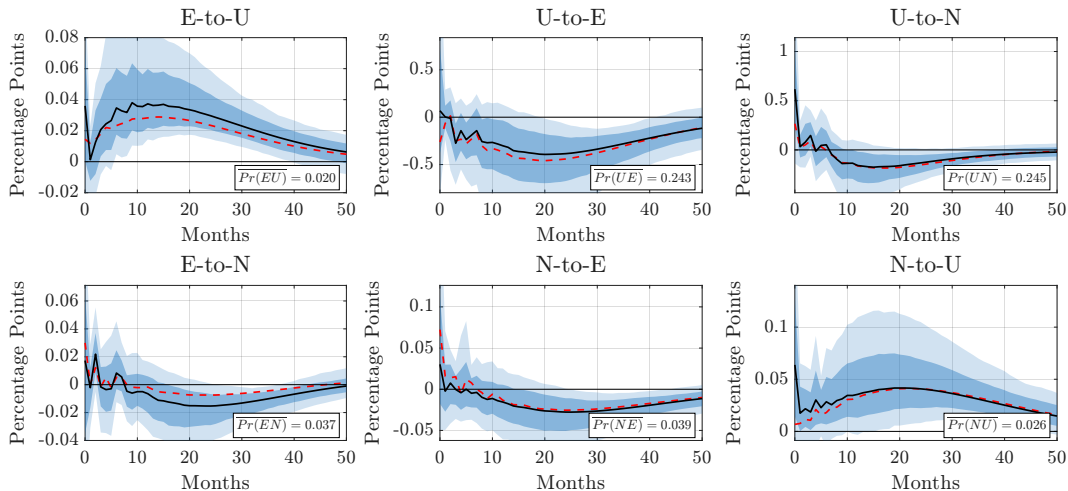
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Quit/Layoff Responses: Higher-Educated



► **Dashed Red:** Our baseline estimates

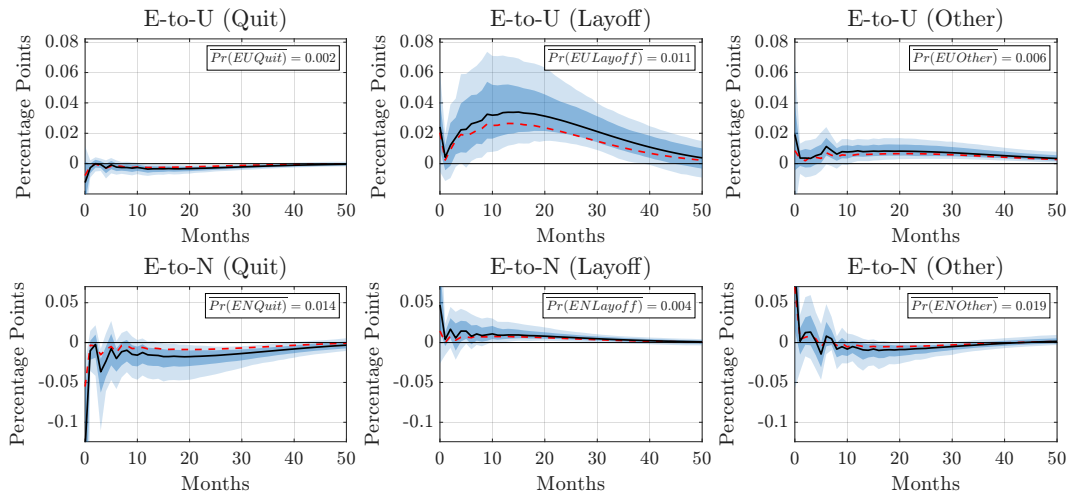
Labor Market Flows: Lower-Educated



► Dashed Red: Our baseline estimates

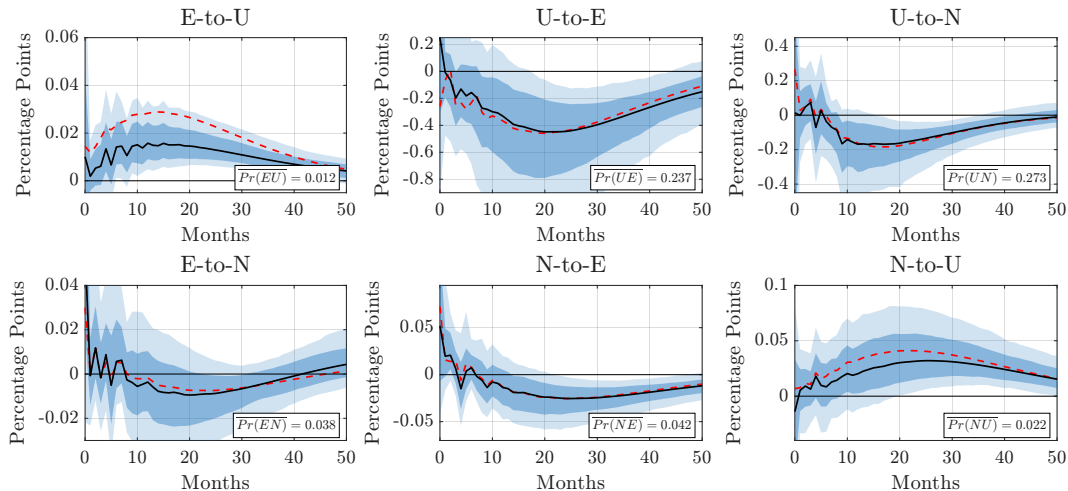
◀ Back

Quit/Layoff Responses: Lower-Educated



► **Dashed Red:** Our baseline estimates

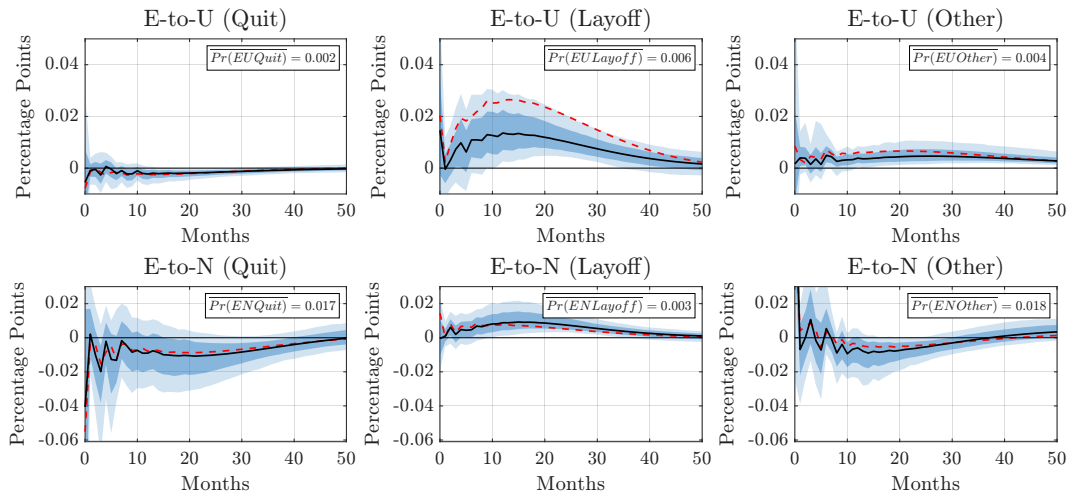
Labor Market Flows: Female



► **Dashed Red:** Our baseline estimates

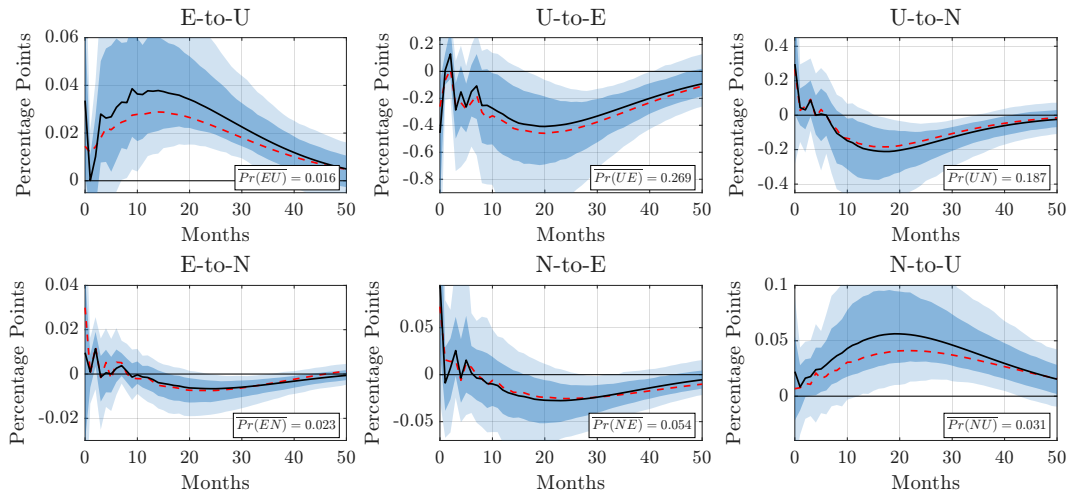
◀ Back

Quit/Layoff Responses: Female



► **Dashed Red:** Our baseline estimates

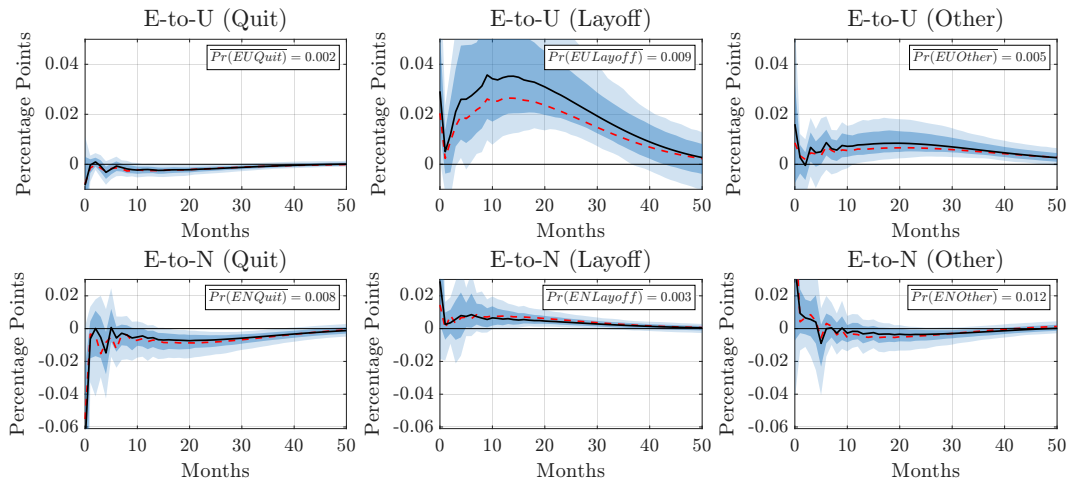
Labor Market Flows: Male



► **Dashed Red:** Our baseline estimates

◀ Back

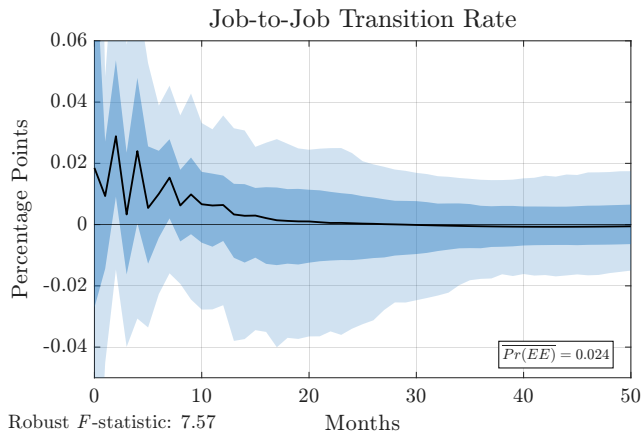
Quit/Layoff Responses: Male



► **Dashed Red:** Our baseline estimates

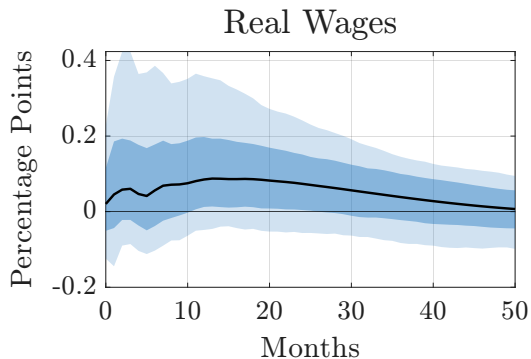
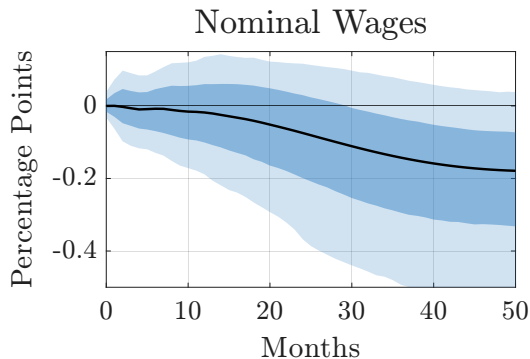
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Response of Job-to-Job Flows (1994-2019)



- ▶ Recent literature posits important role of **job-to-job transitions** for **inflation**
 - ▶ e.g. Faccini & Melosi (2023), Moscarini & Postel-Vinay (2025), Birinci et al (2025)
- ▶ Our estimates show no response of **EE** rate to **contractionary MPS**

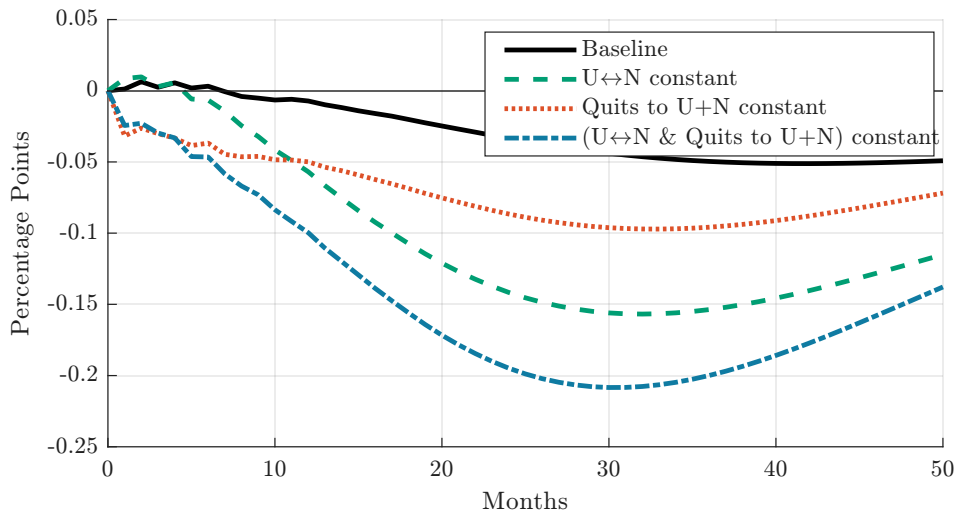
Response of Wages



- ▶ Nominal wages **decline more slowly** than CPI
⇒ **real wages rise very slightly** in the short-run

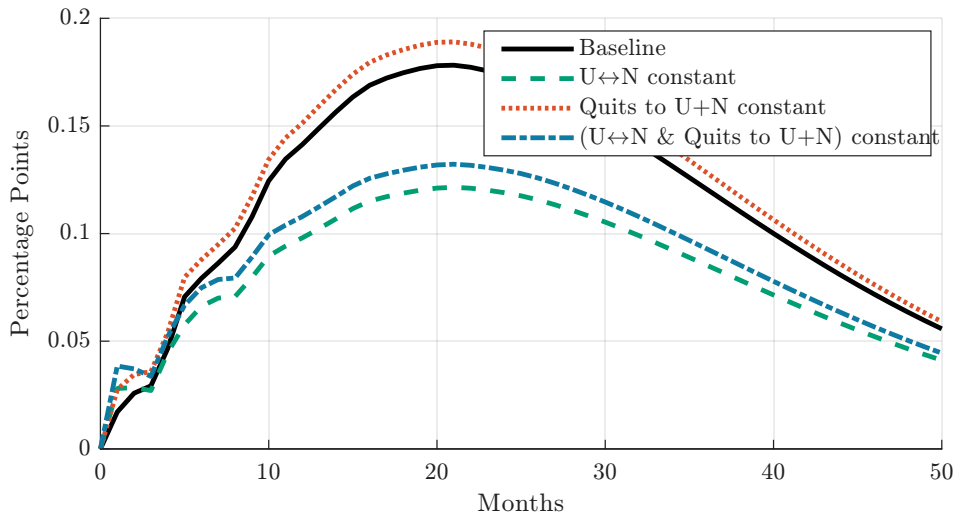
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Participation Response to a Monetary Policy Shock



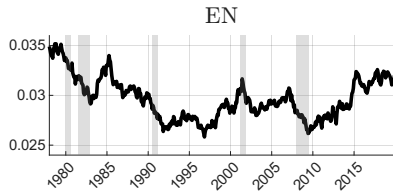
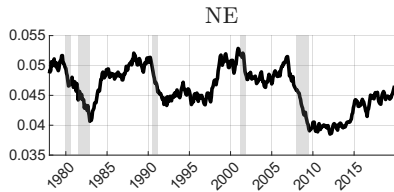
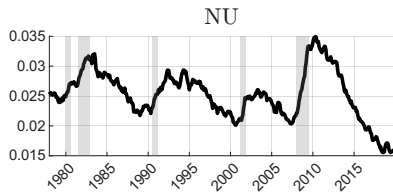
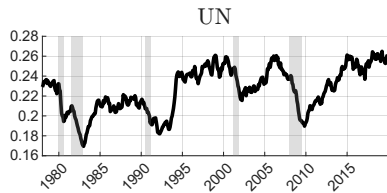
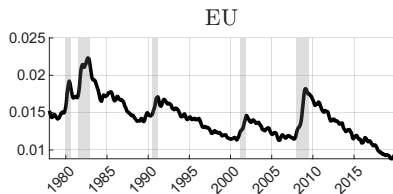
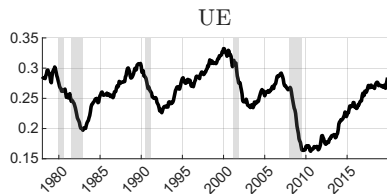
- ▶ With response of **supply-driven flows** fixed \Rightarrow Participation far **more procyclical**

Unemployment Response to a Monetary Policy Shock



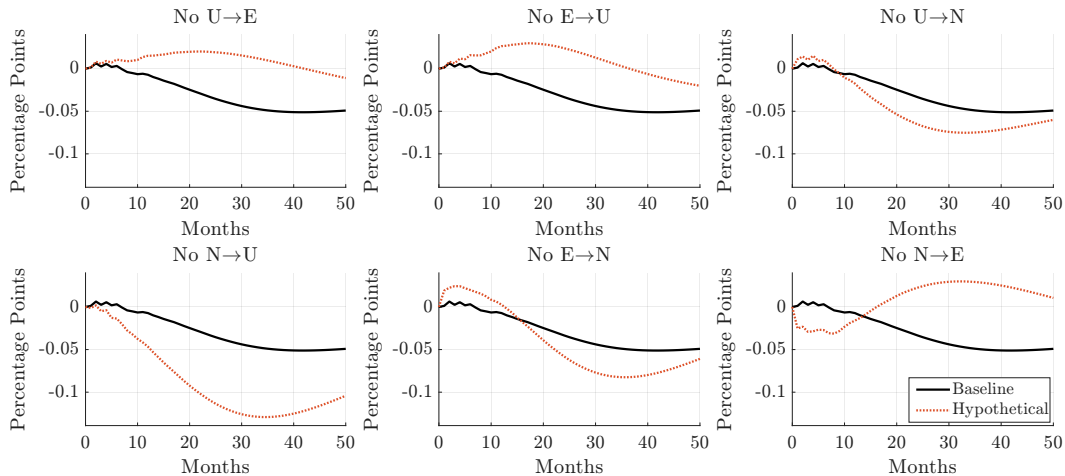
- ▶ Response of **quits** not important for unemployment dynamics

Time Series of Labor Market Flows



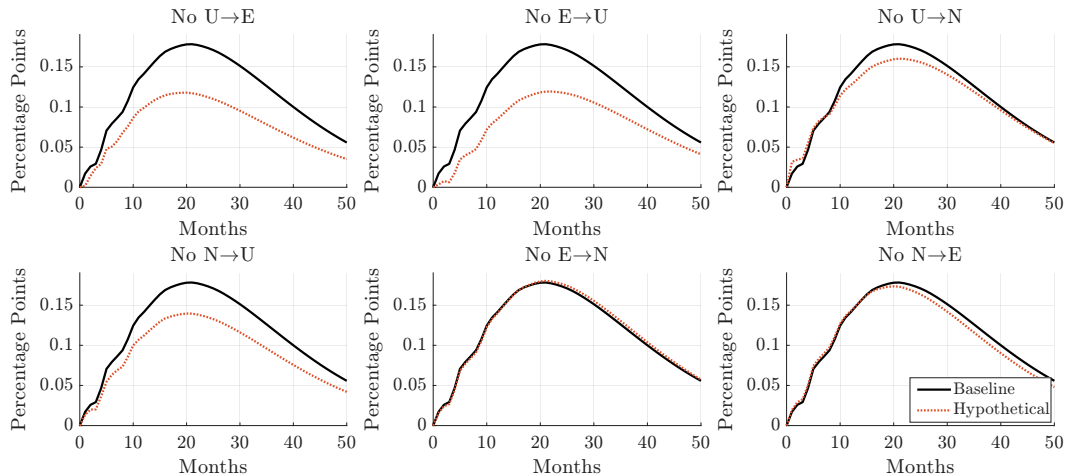
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The Ins and Outs of Participation



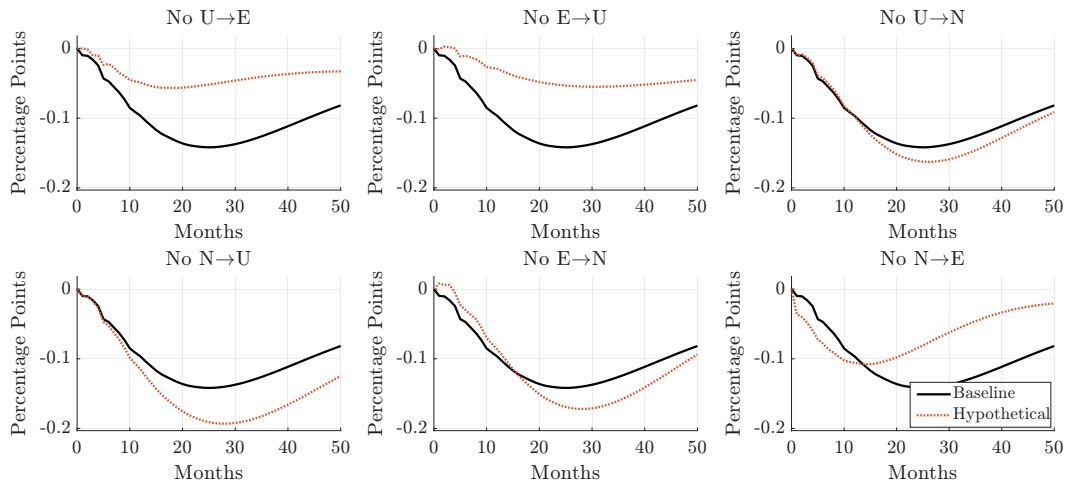
- ▶ $E \rightarrow U$ and $U \rightarrow E$ are important for participation cycle

The Ins and Outs of Unemployment



- ▶ $E \rightarrow U$ and $U \rightarrow E$ roughly equally responsible for rise in unemployment

The Ins and Outs of Employment



- ▶ $N \rightarrow U$ more important than $U \rightarrow N$ for supporting employment

Timing within a Model Period

1. All individuals draw a new value of **productivity**, z . Non-employed individuals draw an **i.i.d. search cost**, κ .
2. Employed individuals make **consumption/saving** decisions and choose whether or not to **quit their job**. Non-employed individuals make **consumption/saving** decisions and choose whether or not to **search for a job**.
3. Employed individuals who do not quit are exogenously **laid off** with probability δ . Non-employed individuals receive **job offers** with probabilities f_s of f_{ns} , depending on whether or not they actively search.
4. Non-employed individuals who receive job offers **decide whether or not to accept** such offers.
5. UI-eligible non-employed individuals who search and either do not receive a job offer or do not accept an offer are subject to **UI expiry** with probability δ_{UI} .

Estimation: A Monetary Policy Shock in the Model

- ▶ Feed in response of job-finding rate, layoff rate, real interest rates and wages from the data
- ▶ Overall response of labor market flows also determined by endogenous changes in policy functions + distribution of households across labor market states

Estimation: A Monetary Policy Shock in the Model

- ▶ Feed in response of job-finding rate, layoff rate, real interest rates and wages from the data
- ▶ Overall response of labor market flows also determined by endogenous changes in policy functions + distribution of households across labor market states
- ▶ Calibrate a number of parameters, $\theta_{EXT} \equiv \{\beta, \gamma, \bar{R}, \delta_{UI}, w, \alpha, \phi, \bar{\phi}, \tau, T\}$
 - ▶ Assume $u(c) = \frac{c^{1-\gamma}-1}{1-\gamma}$, $f_{ns} = \alpha f_s$

Estimation: A Monetary Policy Shock in the Model

- ▶ Feed in response of **job-finding rate**, **layoff rate**, **real interest rates** and **wages** from the data
- ▶ Overall **response of labor market flows** also determined by endogenous changes in **policy functions** + **distribution** of households across labor market states
- ▶ Calibrate a number of parameters, $\theta_{EXT} \equiv \{\beta, \gamma, \bar{R}, \delta_{UI}, w, \alpha, \phi, \bar{\phi}, \tau, T\}$
- ▶ Estimate remaining parameters to **match IRFs** of labor market flows
 - ▶ À la Christiano, Eichenbaum, Evans (2005) or Auclert, Rognlie, Straub (2020)

$$\begin{aligned}\theta_{EST} &\equiv \{\rho_z, \sigma_z, \mu_\kappa, \sigma_\kappa, \psi, \delta_L, f_s\} \\ \hat{J} &= \{EU_t, EN_t, UE_t, UN_t, NE_t, NU_t\}_{t=0}^{50} \\ \hat{\theta}_{EST} &= \arg \min_{\theta_{EST}} (J(\theta_{EST}) - \hat{J})' \Sigma^{-1} (J(\theta_{EST}) - \hat{J})\end{aligned}$$

Model Parameters

Calibrated			
Parameter	Description	Value	Source/Target
β	Discount factor	0.988	Quarterly MPC of 7-8%
R	Steady state real interest rate	1.001	1% Annual
γ	Risk Aversion Coefficient	2	Standard value
δ^{UI}	Benefit Exhaustion Probability	0.167	Expected duration of UI
w	Wage	1	Normalization
α	Efficiency of Active Search	0.6	Job-finding rate from N
ϕ	UI Replacement Rate	0.50	Graves (2023)
$\bar{\phi}$	Maximum UI payments	1.80	Graves (2023)
τ	Labor income tax rate	0.33	Auclert et al. (2021)
T	Lump-sum Transfer	0.23	Auclert et al. (2021)

Estimated			
Parameter	Description	Value	Standard Error
ρ_z	Persistence of Labor Productivity	0.961	(0.018)
σ_z	Standard Deviation of Labor Productivity	0.355	(0.021)
μ_κ	Mean value of Search Cost	0.762	(0.100)
σ_κ	Dispersion of Search cost	0.163	(0.021)
ψ	Value of Leisure	0.443	(0.171)
δ	Steady-state Layoff Rate	0.019	(0.002)
f_s	Steady-state Job-Finding Rate	0.273	(0.029)

Steady-State Labor Market Flows

Flow	Model	Data
EU	0.0143	0.0142
EN	0.0296	0.0296
UE	0.2548	0.2547
UN	0.2263	0.2262
NE	0.0461	0.0461
NU	0.0253	0.0252

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MPC Evidence

- ▶ Model produces *quarterly* MPC of 7-8%
- ▶ In line with “notional MPC” estimates from Orchard et al. (2023), Boehm et al. (2024)

TABLE 3—FIRST-QUARTER MPX AND MPC ESTIMATES FOR CALIBRATION OF MACROECONOMIC MODELS

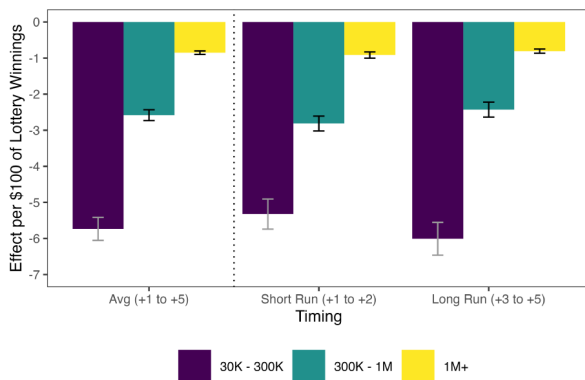
	Parker et al. (2013) (1)	Broda and Parker (2014) (2)	Borusyak, Jaravel, and Spiess (2023) (3)	Orchard, Ramey, and Wieland (2023b) (4)	This paper, treatment group 1 (5)
Total MPX (%)	52.3 to 91.1	50.8 to 74.8	24.8 to 36.6	28	23
Nondurable MPX (%)	12.8 to 30.8	14.1 to 20.8	6.9 to 10.2	0	6.6
Notional MPC (%)	16.3 to 28.5	15.9 to 23.4	7.8 to 11.4	8.8	7.2

Notes: This table reports the first-quarter MPX and MPC in studies of the 2008 tax rebates in the United States (columns 1–4) and for treatment card 1 participants in our experiment (column 5). The first row reports the MPX on all goods and services, while the second row focuses on nondurables alone. The third row follows the methodology of Laibson, Maxted, and Moll (2022) and reports the model-consistent (“notional”) MPC that can be used as a target for macroeconomic models, equal to the total MPX divided by 3.2. The range of estimates in column 1 corresponds to different household samples (see Tables 2 and 3 of Parker et al. (2013)). The range of estimates in columns 2 and 3 corresponds to the lowest and highest values among the three rescaling methods used by Broda and Parker (2014) and Borusyak, Jaravel, and Spiess (2023) to extrapolate the spending response they observe for consumer-packaged goods to broader samples. The estimates in the first two rows of column 4 are taken from Tables 3 and 5 of Orchard, Ramey, and Wieland (2023b). We compare our estimates to a larger set of papers in online Appendix Figure D13.

MPE Evidence

- ▶ Model produces *annual* MPE of 5-6%
- ▶ In line with Golosov et al. (2023), when considering “small” lotteries: \$30K-300K

Figure B.6: Wealth effects by prize size over time

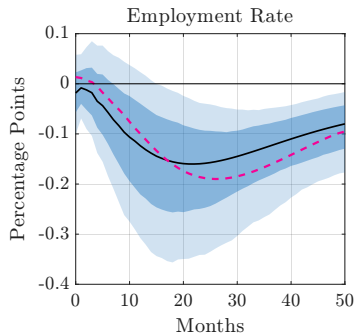
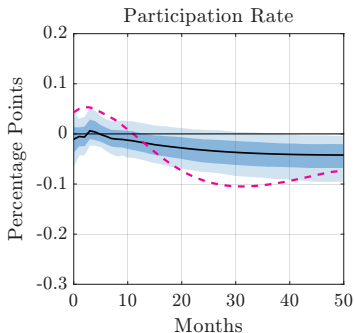


Steady-State Labor Market Flows: Heterogeneity

Flow	Data	Model	Data (Low Educ)	Data (High Educ)	Model (Low Prod)	Model (High Prod)
EU	0.014	0.014	0.020	0.009	0.015	0.014
EN	0.030	0.030	0.037	0.024	0.042	0.021
UE	0.255	0.255	0.243	0.280	0.237	0.267
UN	0.226	0.229	0.245	0.192	0.246	0.216
NE	0.046	0.046	0.039	0.062	0.027	0.084
NU	0.025	0.025	0.026	0.025	0.018	0.042

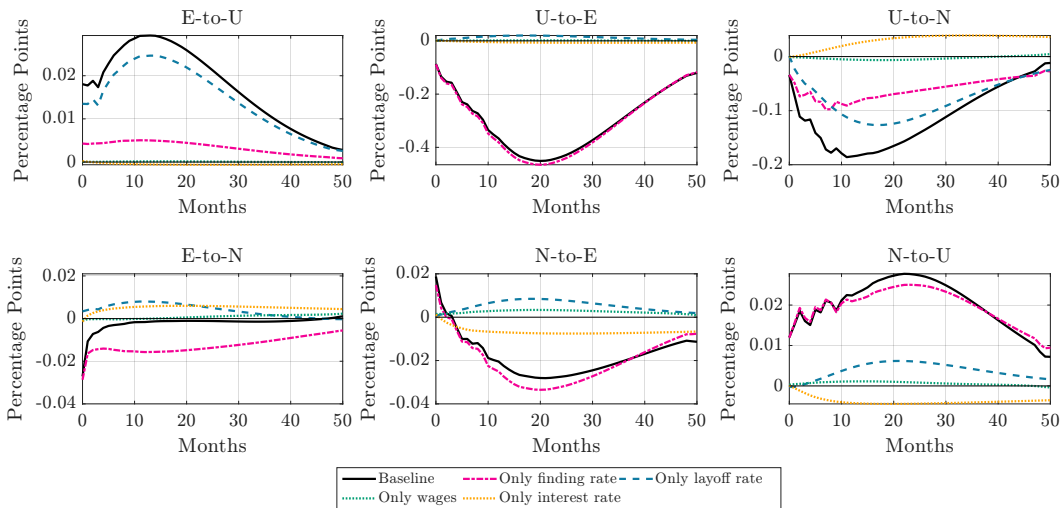
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Response of Labor Market Stocks: Model vs Data



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Decomposed Response of Labor Market Flows



- ▶ Drop in quits due to drop in job-finding rate
- ▶ Increase in layoffs reduces U-to-N flows through **composition effect**

Related Literature

- ▶ **Labor Market Flows:** Fujita & Ramey (2009), Elsby et al (2009), Shimer (2012), Elsby et al (2015), Hobijn & Şahin (2021), Fujita et al (2023)
 - ▶ We provide a **new decomposition** of EN transitions into **quits/layoffs**

Related Literature

- ▶ **Labor Market Flows:** Fujita & Ramey (2009), Elsby et al (2009), Shimer (2012), Elsby et al (2015), Hobijn & Şahin (2021), Fujita et al (2023)
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- ▶ **Labor Market Response To Monetary Policy:** White (2018), Broer et al (2022), Faia et al (2022), Cantore et al (2023)
 - ▶ We **extend** proxy SVAR to consider response of **labor market flows**
 - ▶ Document a **quantitatively important** response of **supply-driven flows**

Related Literature

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 - ▶ We argue for importance of **labor supply** in shaping **employment response** to monetary policy

Related Literature

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- ▶ **Models with Frictional Labor Markets:** Krusell et al (2017), Cairo et al (2022), Alves & Violante (2023)
 - ▶ Provide evidence showing importance of **participation margin**
 - ▶ New empirical estimates that NK **search and matching** models can target

