A Theory of How Workers Keep Up With Inflation

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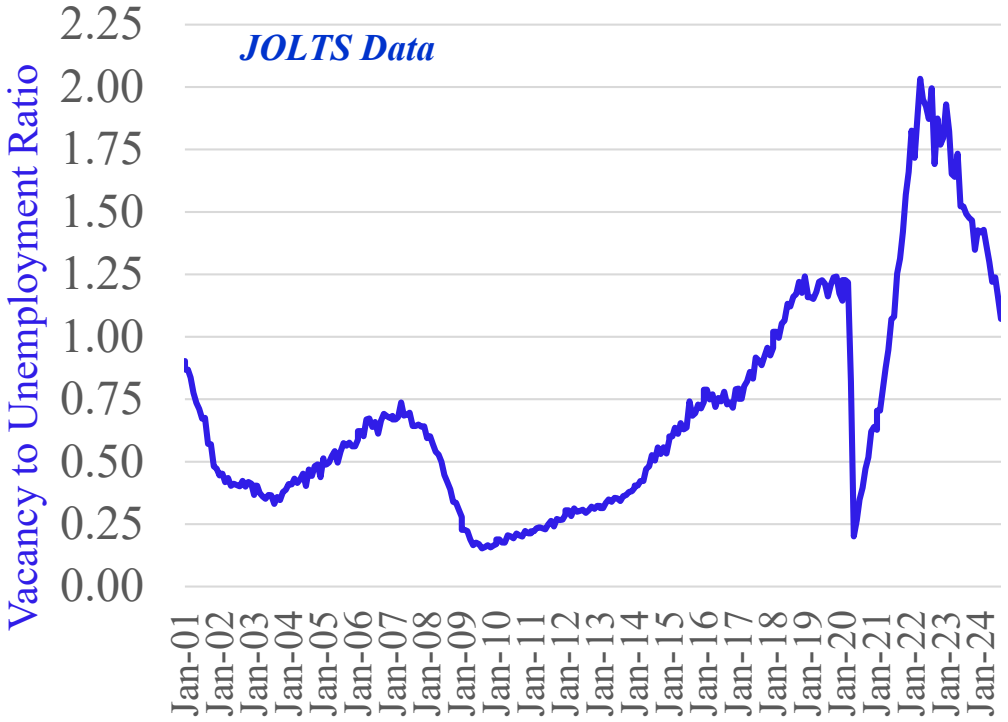
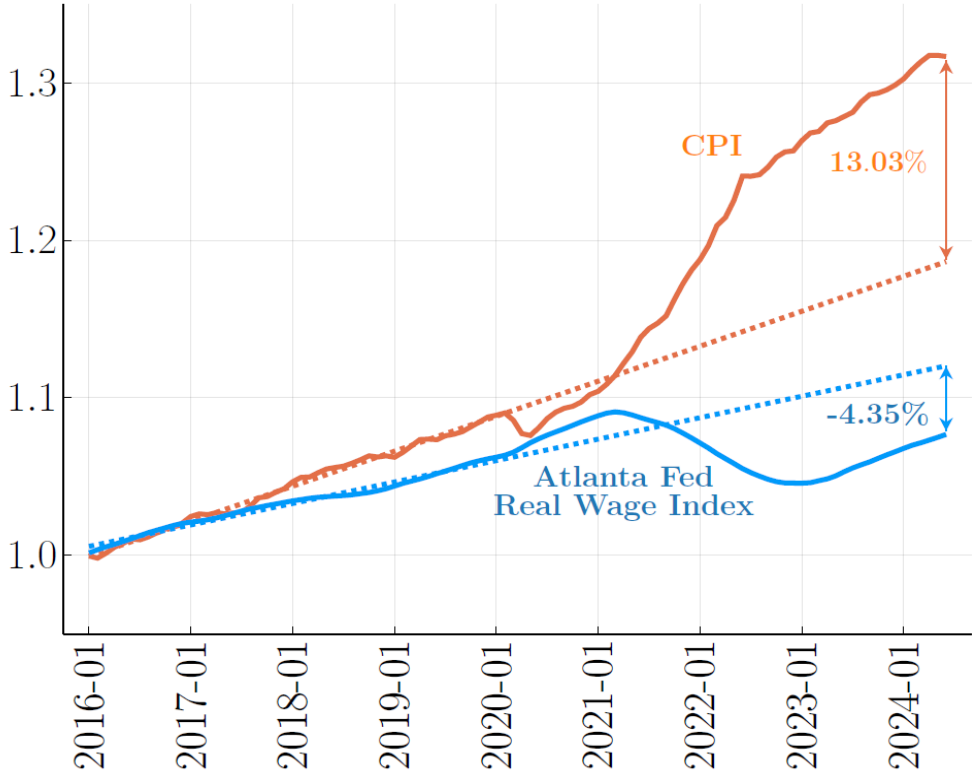
Evolving…..

"Hot" Labor Market: 2021-2024?



- The ***vacancy-to-unemployment ratio*** was at a historically high level in recent years.
- Based on this statistic, academics and policy makers concluded that the labor market was "hot".
- Jerome Powell has cited labor market tightness as the reason the Fed kept interest rates high.
- *Common narrative*: Labor market flows (rising V/U ratio) → inflation

“Hot” Labor Market: 2021-2024?



- ***Median real wages fell sharply during inflationary period.***
- Real wages still 4.4% below trend (as of fall 2024).
- Consistent with survey evidence showing workers reporting disliking current inflation (Stantcheva 2024).

This Paper

- Common narrative: *Labor market flows → Inflation*
- **Our paper**: Show both theoretically and empirically that the causation between labor market flows and inflation can go in the other direction: *Inflation → Labor market flows*
- Augment a modern model of labor market flows with New-Keynesian sticky wage features.
- Show a *burst of "inflation"* – all else equal – can generate a sharp rise in the vacancy-to-unemployment ratio through additional labor market churn, a decline in real wages, and relatively small effects on employment.
- Show a variety of evidence that support model predictions.

Quick Preview of Findings

1. **Show that a temporary increase in inflation can cause a rise in the vacancy-to-unemployment ratio creating the *appearance* of a tight labor market without any additional labor market shock.**

   - Inflation can causes an increase in labor market churn among the employed looking to escape rigid nominal wages at their job.
   - Existing firms post vacancies to replace departing workers. The additional worker search makes posting vacancies "cheaper".
   - Quantify model using pre-2020 data. Show an "inflation shock" alone can match many labor market patterns observed during the 2021-2024 period *both in the aggregate and the cross-section*.

Quick Preview of Findings

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2. **Explore historical data in the United States. Highlight that prior periods of inflation are also associated with a surge in vacancies and an upward shift in the Beveridge Curve (controlling for level of U).**

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3. **Other stories of "hot labor" markets (that can increase V/U) struggle to match many of the other empirical patterns in the US labor market during the last few years.**

Quick Preview of Findings

4. Provide a model driven reason why workers dislike inflationary periods with the only friction being sticky nominal wages.

- Recent inflation reduced welfare by about 80% and 110% of monthly income for bottom and top wage decile workers, respectively.
- Decompose welfare losses into (1) *real wage losses*, (2) *search costs*, (3) *renegotiation costs*, and (4) *gains from reduced layoff margin*
- Estimate that additional search and renegotiation costs combined are about one-fifth of real wage loss during the recent inflation period.

Quick Summary of Key Takeaways

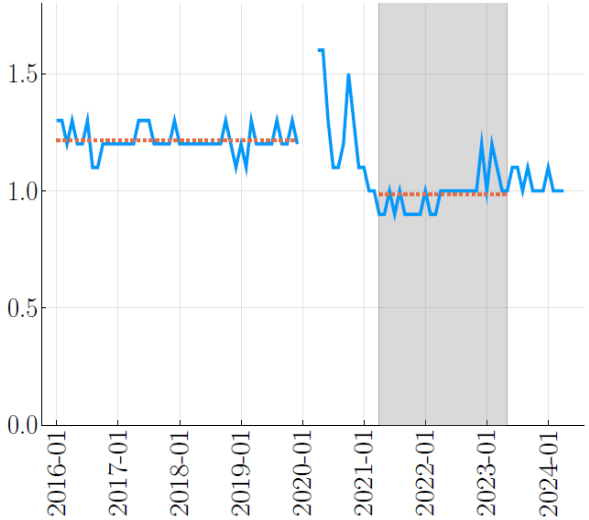
- Policy-makers and academics should be cautious about viewing the rise in V/U as a sign of a “hot labor market” during inflationary periods without holistically looking at other labor market indicators.

- Highlight additional real costs of inflation that arise through the labor market.

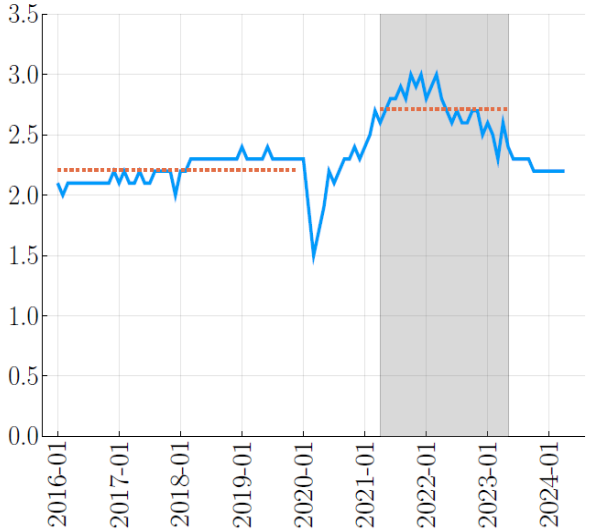
- Provide a model based reason why workers report disliking inflation so much during the recent 2022-2024 period (Stantcheva 2024)

Some Motivating Data

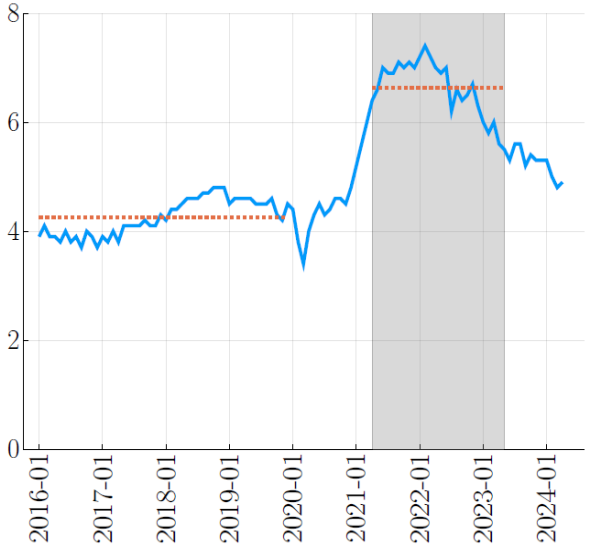
Monthly Quits, Vacancies, Layoffs, Worker Flows (JOLTS)



PANEL A:
LAYOFF RATE



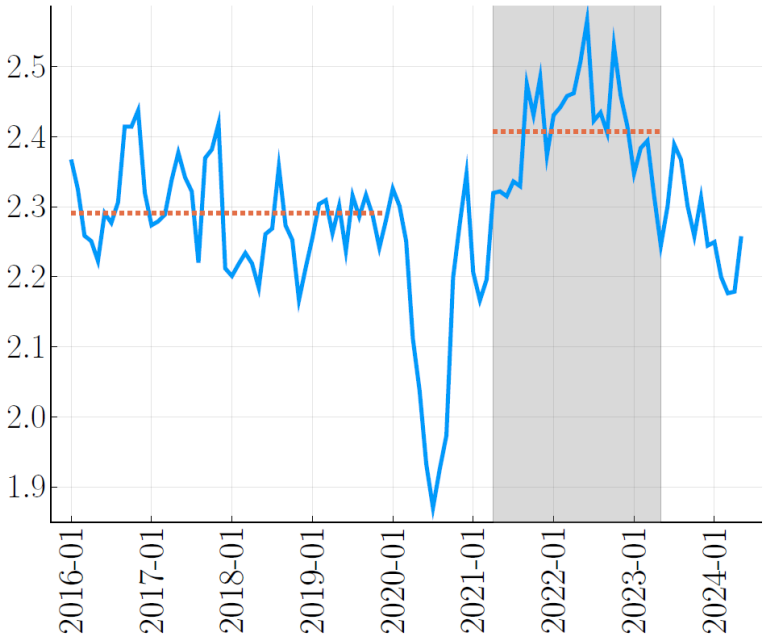
PANEL B:
QUIT RATE



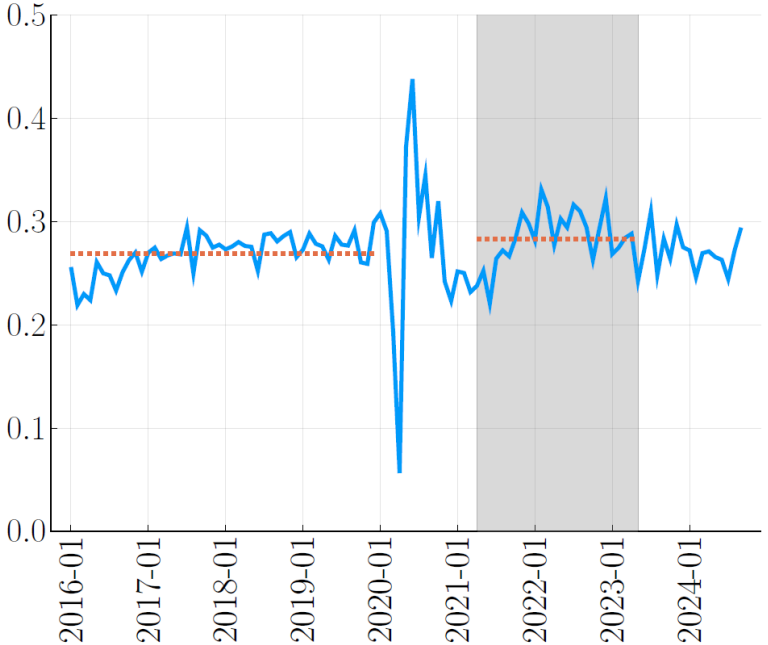
PANEL C:
VACANCY RATE

- ***Note: Vacancy rate increased sharply in all industries.***

Job-to-Job Flows (E-E rate) and Job Finding Rate (U-E rate)



PANEL A: E-E RATE



PANEL B: U-E RATE

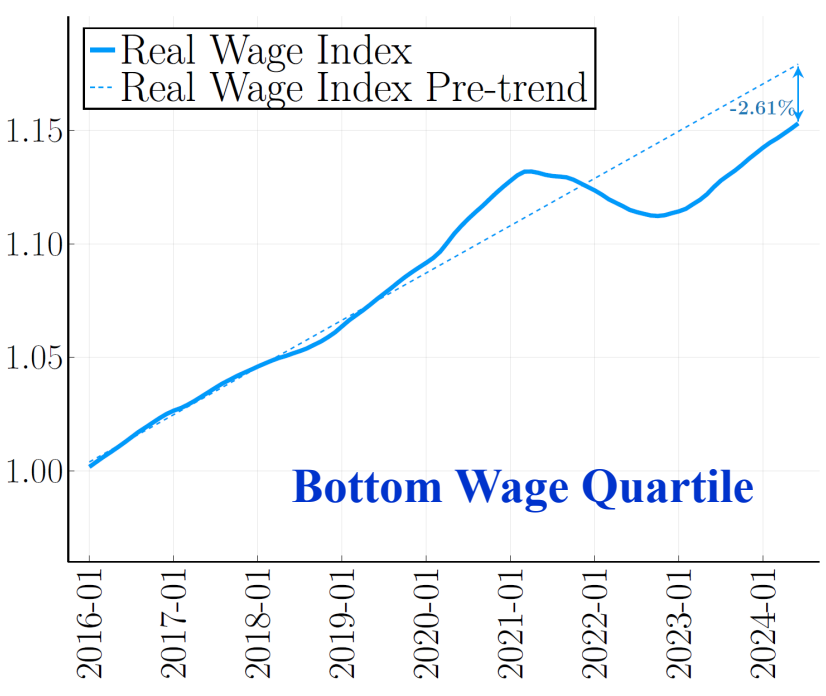
- ***Note: Increase in EE rate was larger for lower educated individuals (see paper).***

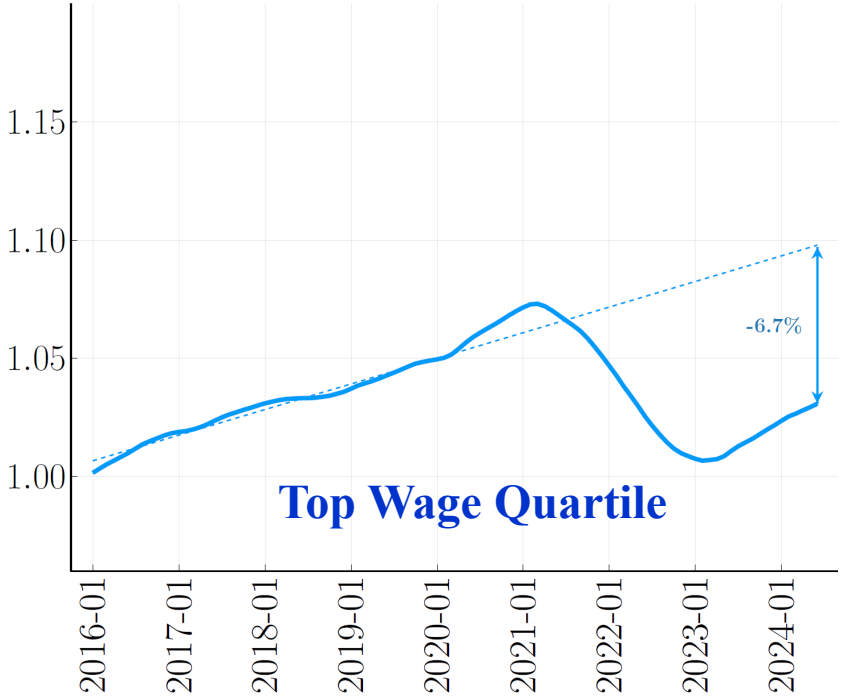
Change in Employment Rates By Group During Inflation Period

Education	2016M1-2019M12	2021M4-2023M5
Men: Less than Bachelors	0.789	0.781
Men: Bachelors or More	0.899	0.900
Women: Less than Bachelors	0.617	0.617
Women: Bachelors or More	0.754	0.774
All	0.744	0.752

- **Relative to 2016-2019 period, employment rates are essentially the same during the inflation period (little selection on worker types). CPS data, 25-55 year olds.**

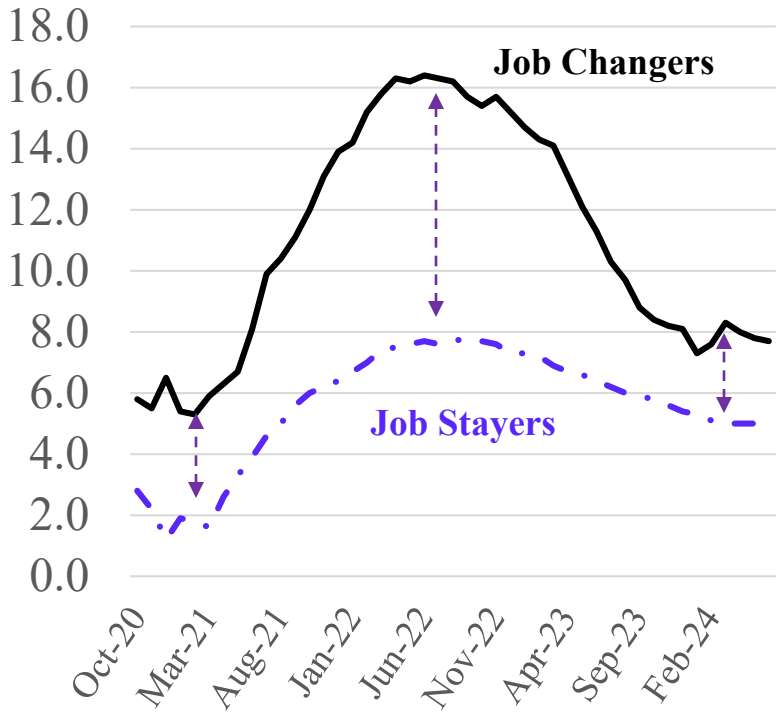
Wage Growth Throughout The Wage Decile





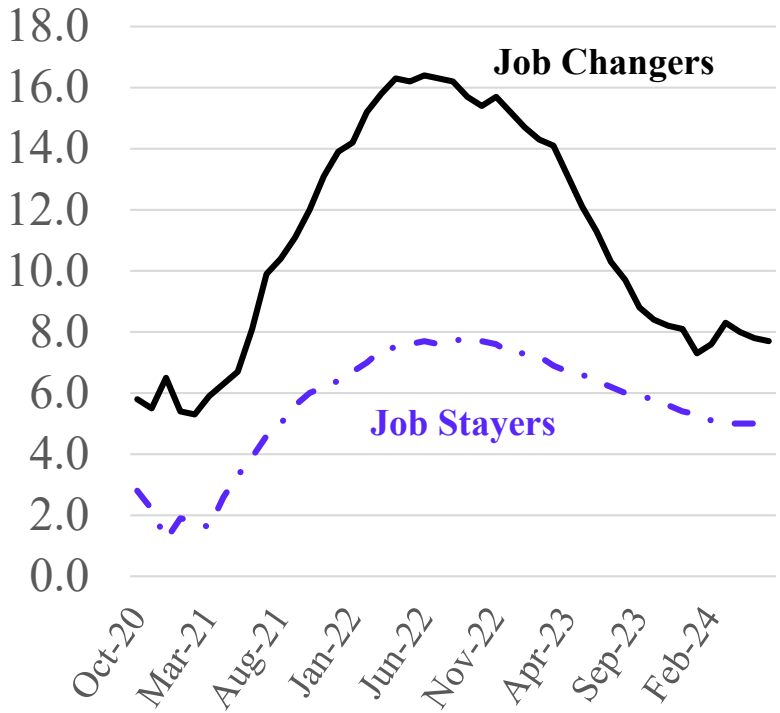
- ***Note: Real wages fell sharply in all industries.***

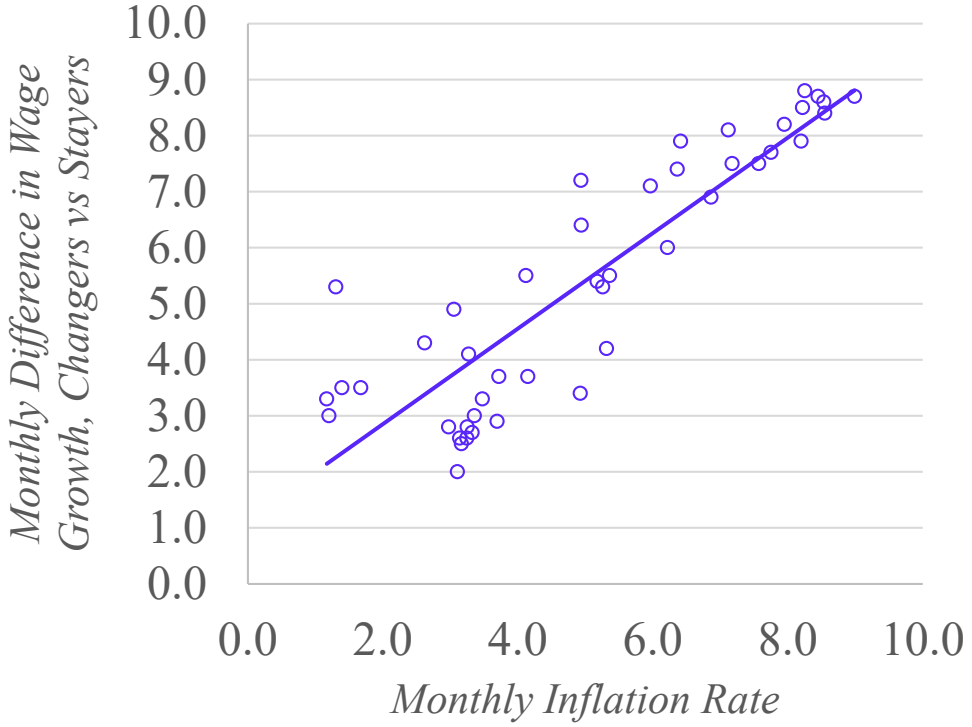
Nominal Earnings Growth: Switchers and Stayers, ADP Data



- **Nominal wage growth of job switchers grew sharply during the inflation period relative to job-stayers**
- **Similar patterns in *Atlanta Fed Wage Tracker Index*.**

The Gap Between Switchers and Stayers is Higher When Inflation is Higher





Summary of Labor Market Facts During Inflation Period

- E-E transitions increase sharply but U-E rate was relatively stable.
- Real wages fell sharply and catch up slowly. Real wage declines larger at the top of the wage distribution.
- Real wage change of job changers increased much more (relative to trend) compared to job stayers.
- Vacancies increased sharply but unemployment was relatively constant → shift up in Beveridge Curve (V/U increases for a given U)

Model

Overview of Model Ingredients

- Model of labor market flows with **two additional frictions**:
  - *Frictions in nominal wage adjustments*
  - *Lack of commitment on the part of workers and firms*
- Endogenous worker flows: quits to unemployment, layoffs, job-to-job flows
- The frictions imply that some of the flows will be inefficient
- Heterogeneous workers: differ in productivity, job posting costs, value of non-employment.
- Homogeneous employers

"Inflation Shock"

- In older version of paper, the shock to inflation comes from a monetary expansion in a world with flexible output prices.
- In talk today, I will abstract from the micro foundations of the inflation shock for exposition.
- We are not interested in explaining the cause of the current inflation.
- Our goal is to assess how inflation itself may effect worker well-being through the labor market, all else equal.
- At the end of the talk, assess how other types of shocks can affect worker well-being through lens of our model (holding inflation constant).

Workers Heterogeneity in Productivity

- Time is continuous and workers die at an exogenous rate $\chi > 0$
- Workers can be either employed ($E_{it} = 1$) or unemployed ($E_{it} = 0$)
- Heterogeneous workers differ in their labor productivity, Z_{it}
- Initial worker productivity drawn at birth from truncated log normal distribution.
- Evolves thereafter following a Brownian motion with drift.
- *Note: Drift, $\gamma(E)$, depends on employment status with $\gamma(E=1) > \gamma(E=0)$.*

Production Technology

- **Value of market production** :
  - Firm output, X, from hiring worker i in period t:

$$X_{it} = A_t Z_{it}$$

- **Some notation…..**
  - Nominal wage: $\tilde{W}_{it}$
  - Real wage: $W_{it} = \tilde{W}_{it} / P$
  - Markdown: $\hat{w}_{it} = w_{it} - z_{it} = \log W_{it} - \log Z_{it}$

Home Sector Technology

- **Value of non-market production (real)**:
  - value of not-working = $BZ_{it}^{\phi_B}$
  - ϕ^B allows for the value of not-working to arbitrarily scale with productivity
  - $\phi^B < 1$ means that low productivity employed workers closer to outside option

Vacancy Posting

- Directed search model where firms post a vacancy *(v)* in a market offering real wage *W* and productivity *Z*. Infinite mass of potential homogenous firms than can open a vacancy and hire a worker in any of these markets.

- **Vacancy posting cost**: $\kappa(Z) = KZ^{\phi_K}$

  - ϕ^K measures extent to which vacancy posting cost scales with worker productivity.

  - When $\phi^K > 1$ it is relatively more expensive for firms to hire a more productive worker.

Search and Matching Technology

- Workers search effort, s, faces a convex costs $S(s; Z, E)$
- *Cobb Douglas matching function* where $\theta(Z,W)$ is a measure of market tightness (v/s) in markets posting real wage W for workers Z.
- Job finding probability: $s\, f(\theta)$
- Job filling probability: $q(\theta) = f(\theta)/\theta$
- Exogenous separation shock: $\delta(Z)$
- *Workers differ in productivity, value of non-employment, vacancy posting costs, cost of search, and exogenous separation rates; all functions of Z*

Preferences

- Households choose consumption, C_{it}, search effort, s_{it}, and whether to try to renegotiate wage with employer so as to maximize:

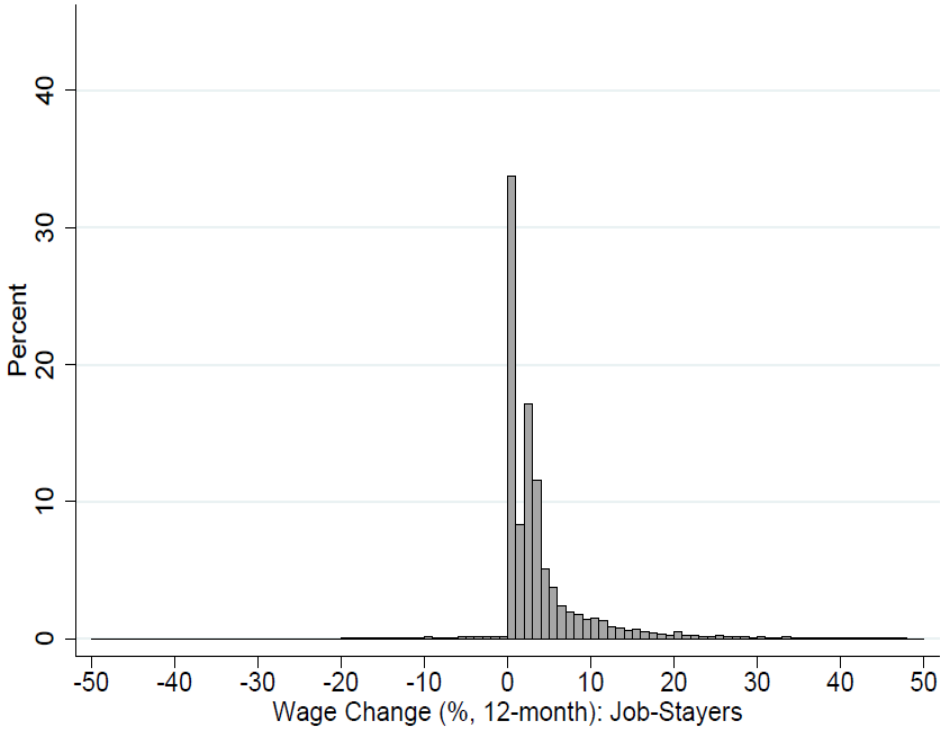
$$E_t\left[\int_t^{\infty} e^{-(\rho-\chi)(\tau-t)}\left(C_{i\tau}-S\left(s_{i\tau};Z_{i\tau},E_{i\tau}\right)-R(\psi_{i\tau};Z_{i\tau},E_{i\tau}\right)d\tau\right]$$

where:

$$S(s;Z,E)=\eta(E)^{1/\phi_s}\frac{s^{1+1/\phi_s}}{1+1/\phi_s}Z$$

- *R(.)* is the utility loss associated with renegotiating your existing wage with firm. Discuss this process in a few slides …..

Wage Change Distribution: 2008-2016



- Use data from Grigsby et al (2021) on the frequency of wage changes and the size of wage changes to help pin down the wage adjustment parameters.

Wage Determination Within a Match

- Three frictions in wage adjustments for matched workers

1. Nominal wages are sticky. Workers can get free wage increase up to some preset limit as a separate Poisson arrival rate (*Calvo part of adjustment*).

   - With arrival rate λ get opportunity to adjust wages for free
   - These wage increases are bounded between 0 and $\bar{\pi}^w$
   - $\bar{\pi}^w$ is number (e.g., 2%); could be target inflation rate or target inflation plus productivity drift. We will set this exogenously.
   - If Nash Bargain wage growth is between 0 and $\bar{\pi}^w$, go with Nash Bargain wage growth. Otherwise, wage growth is at bounds.

Wage Determination Within a Match

2. Nominal wages are sticky. Workers can initiate an upwards wage renegotiation process subject to a randomly drawn fixed utility cost (*Menu cost part of adjustment – this is the R(.) function in utility*).

   - Then draw cost ψ from distribution $\Psi(\psi)$ with non-negative support.
   - If renegotiation is initiated, wage is set according to Nash Bargaining solution with the outside option being the dissolution of the match.

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   - Note: In paper, costs are allowed to differ for upward vs downward wage renegotiation (ignore that today..).

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   - Note: In paper, costs are allowed to differ for upward vs downward wage renegotiation (ignore that today..).
   - *Note: In model, decouple the cost of renegotiation from the cost of search. However, part of the renegotiation cost could be getting an outside offer (which is costly).*

Wage Determination Within a Match

3. Neither firms or workers can commit to staying in a match. Allows either party to endogenously dissolve the match through unilateral layoffs or quits.

    - Two-sided lack of commitment

Summary: Nominal Stickiness Assumption

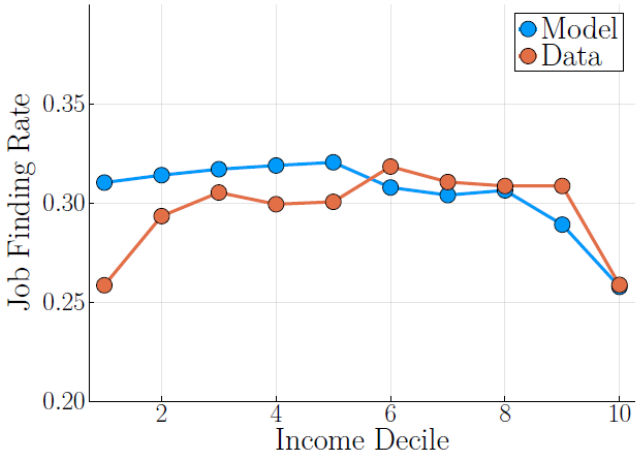
- *Nominal wages are sticky within a match.*
- Additional assumptions:
  - New hire wages (both real and nominal) are perfectly flexible (consistent with much of literature).
  - Value of non-employment set in real terms (consistent with Chodorow-Reich and Karabarbounis (2016)).
- Qualitative predictions of model go through as long as wages on a match are stickier than new hire wages and value of non-employment.

Calibration and Steady State

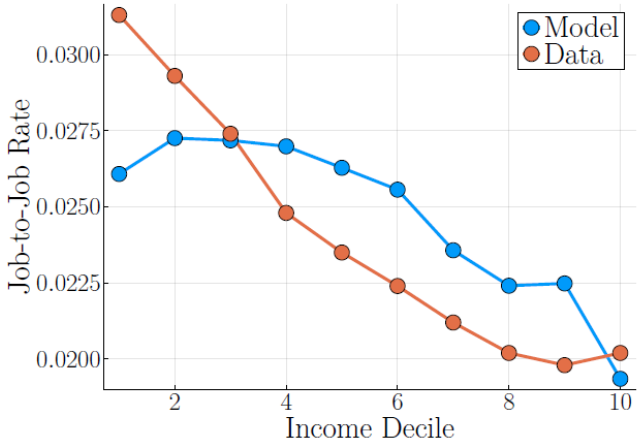
Broad Calibration Strategy

- Use micro data estimates from a variety of sources during the pre-2020 period (mostly 2016-2019) to use as model targets.
- Average EE rates, UE rates, EU rates, unemployment rate help pin down many of the search parameters
- Average earnings growth over the life cycle, variance of wages over the life cycle and at age 25, and average earnings loss for the unemployed help pin down the productivity parameters.
- Elasticity of search effort to wages helps pin down ϕ_s (*Faberman et al 2022*)
- *Target parameters of the wage change distribution from my ADP paper.*

Disciplining how value of leisure and vacancy costs vary with Z



PANEL A: U-E RATE



PANEL B: E-E RATE

- *Steady-state UE and EE rates by income help pin down ϕ^B and ϕ^K*
- *$\phi^B < 1$ → U-E rate lower for low Z (low income); little effect on E-E rate*
- *$\phi^K > 1$ → U-E rate lower for high Z and E-E lower for high Z*

Labor Market Effects of Inflation Shock

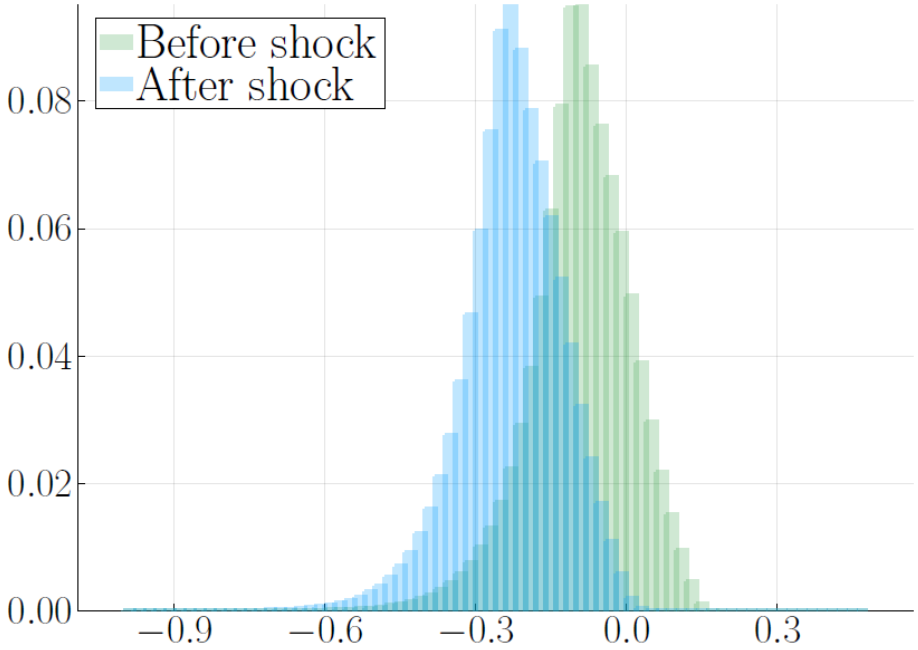
"Inflation" Experiments

Steady state inflation rate assumed to be 2% - annually

1. Assume the price level unexpectedly increased by 13%; we then trace out the effect on labor market flows, worker wages, and welfare for workers of differing productivities.

2. Assume inflation dynamics matched the inflation dynamics in the data. Each period workers expect a 2% inflation rate (annually) and get an MIT shock of the actual inflation rate in each period. Inflation rate increased by 13% over a 26 month period.

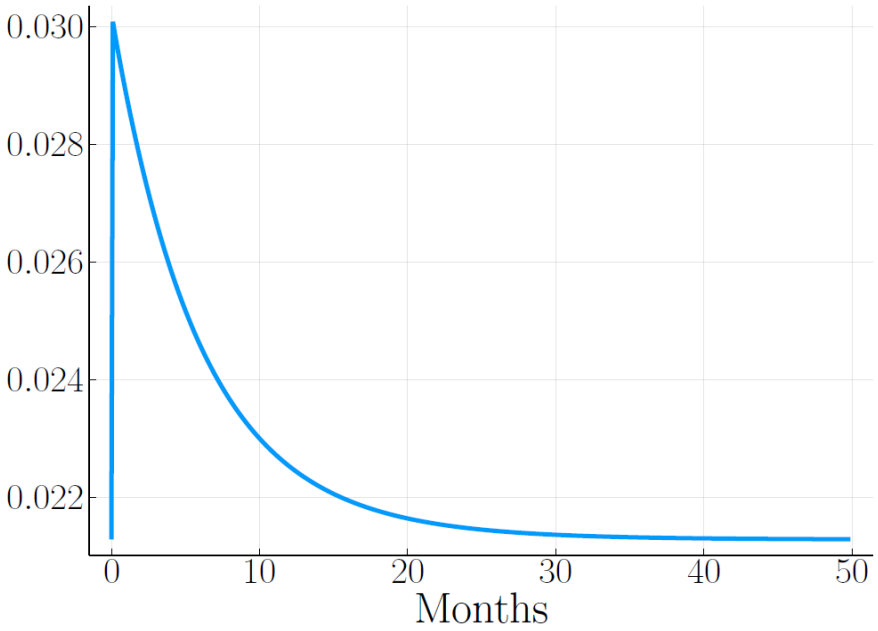
Distribution of Markdowns Before and After Inflation Shock



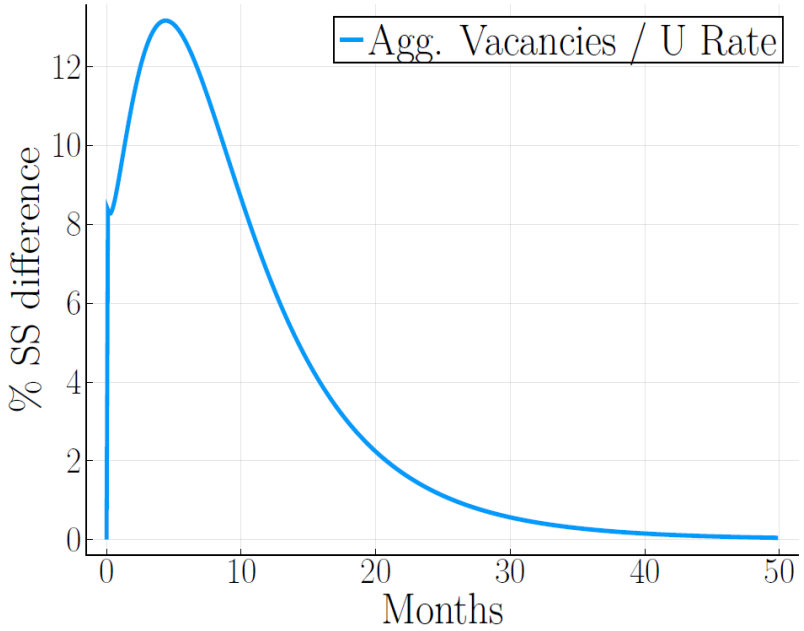
- Distribution of markdowns shift to the left after the inflation shock
- Workers are closer to quit margin
- Workers are farther from layoff margin

E-E Flows and Vacancy-Unemployment Rate

E-E Rate

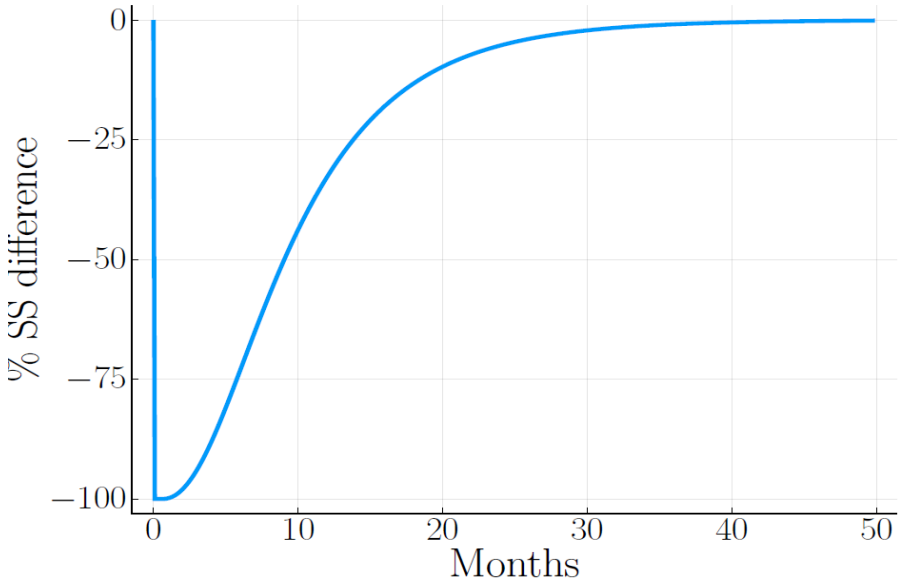


Vacancy-to-Unemployment Rate

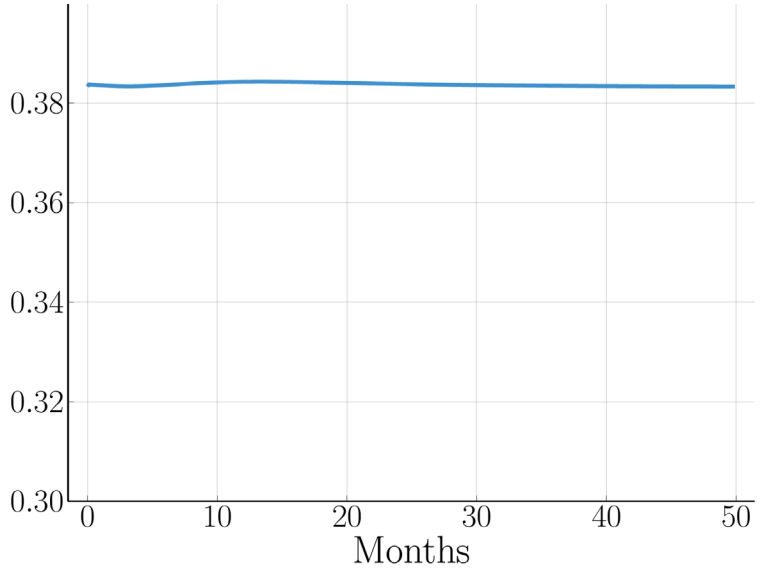


Layoff Rate and UE Rate

Layoff Rate

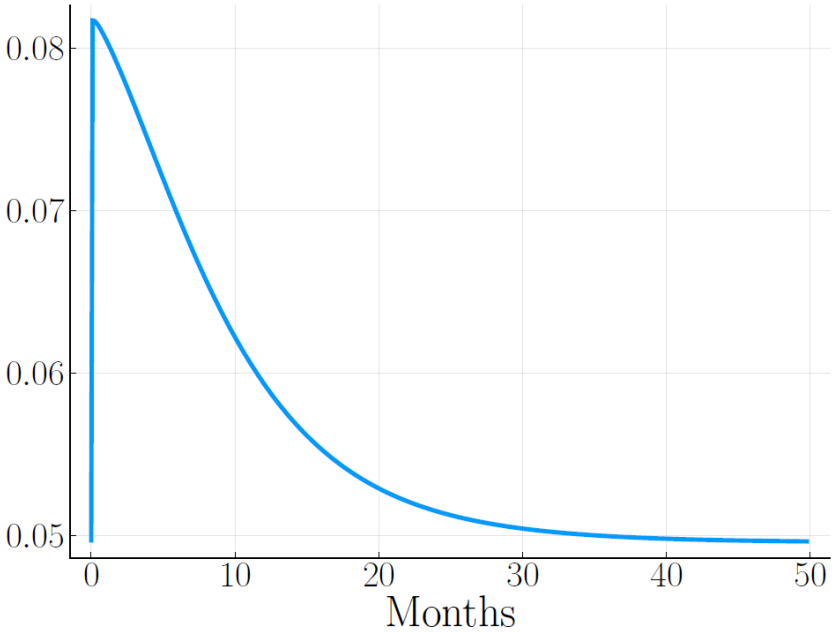


UE Rate

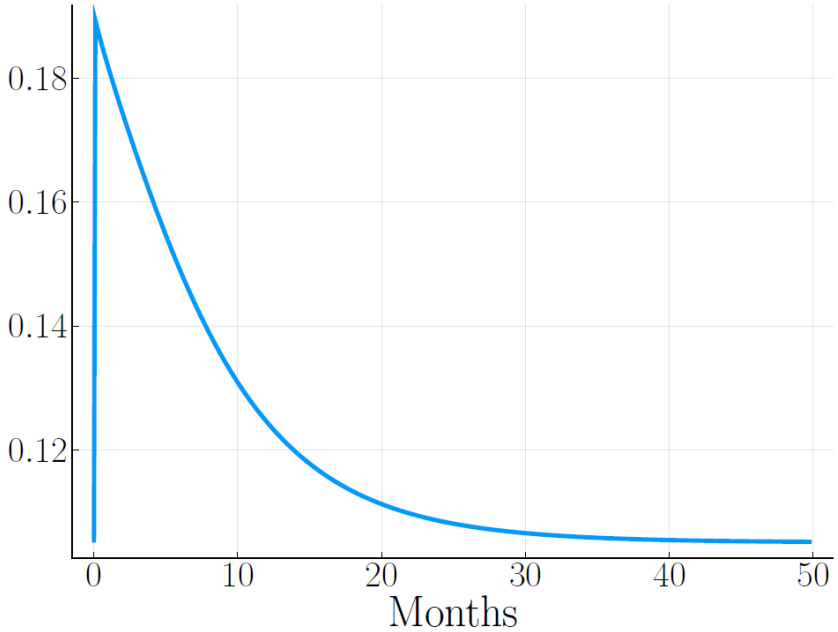


- Large decline in the layoff rate and no change in the UE rate.

Wage Change for Stayers and Changers, conditional on $\Delta W > 0$



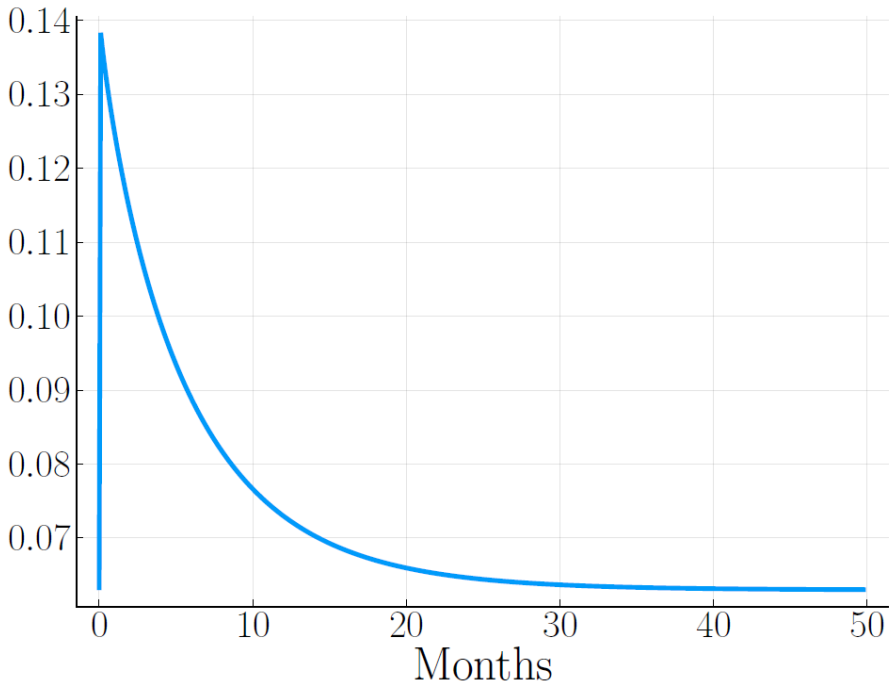
PANEL A: JOB-STAYERS



PANEL B: JOB-CHANGERS

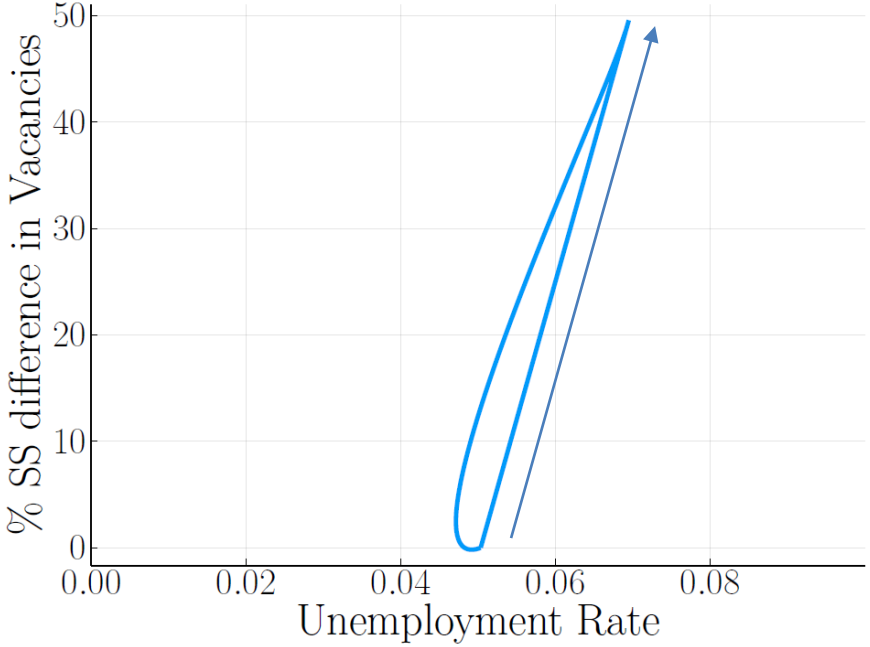
- Wage change of job-changers much higher than job-stayers

Frequency of Wage Increases of Job-Stayers



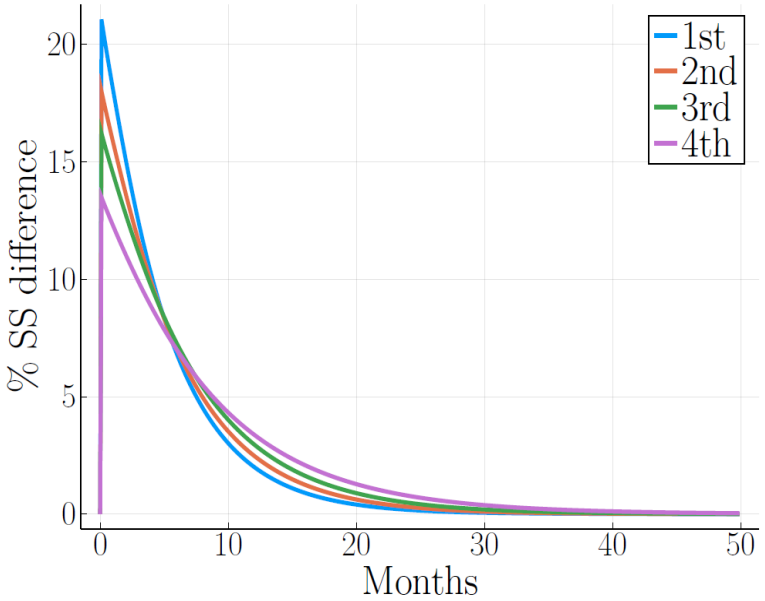
- The fraction of job stayers getting a wage increase during a given month jumps after the inflation shock.
- Consistent with data from the Atlanta Fed's wage tracker index.

Beveridge Curve Shift

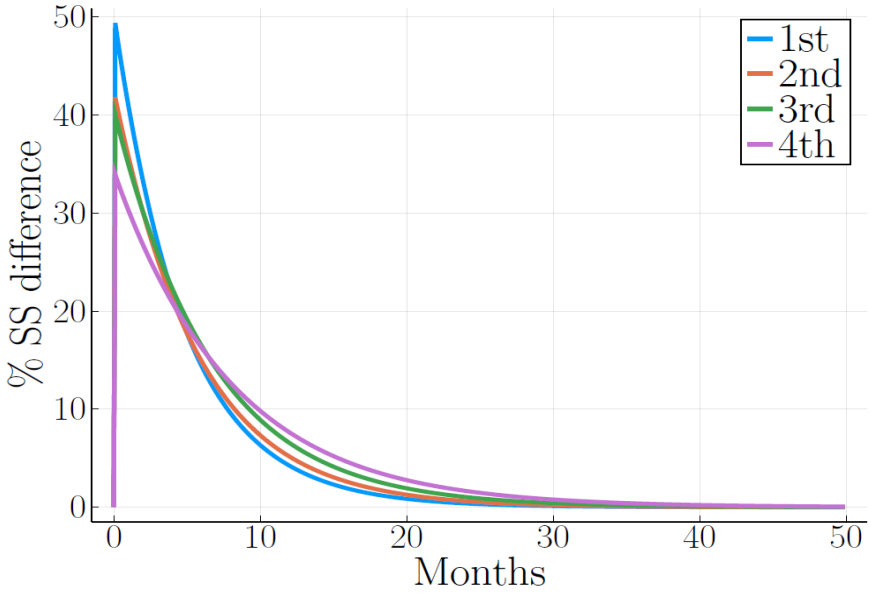


- Generates an upward shift in the Beveridge Curve.
- Vacancy's increase with little effect on unemployment rate.
- Consistent with observed shift in the Beveridge Curve seen in US data (and in other countries)

Search and E-E Flows by Productivity Quartile



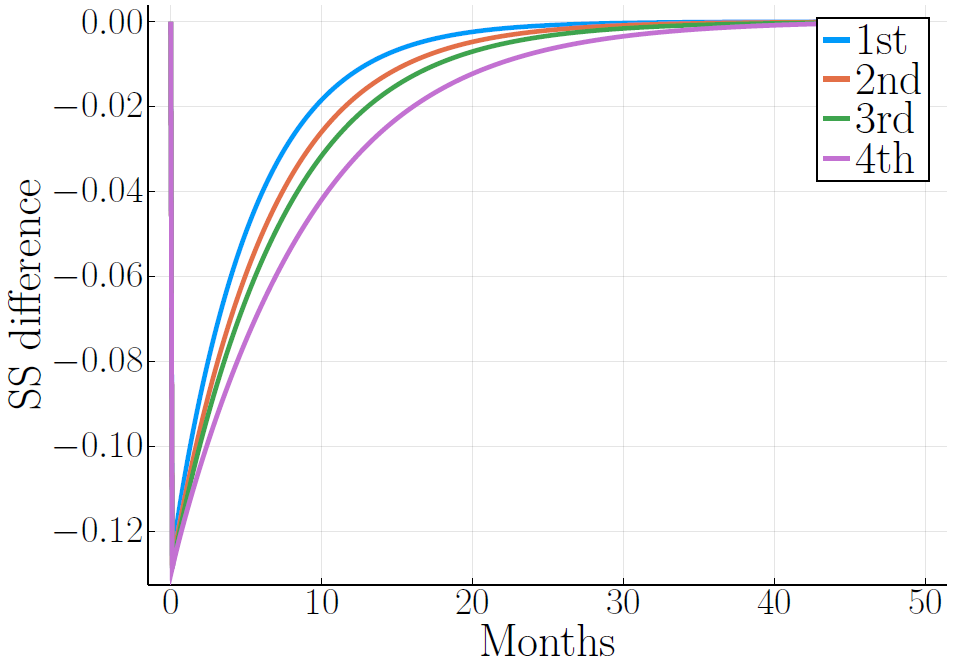
PANEL D: JOB SEARCH, BY PRODUCTIVITY QUARTILE



PANEL B: E-E RATE, BY PRODUCTIVITY QUARTILE

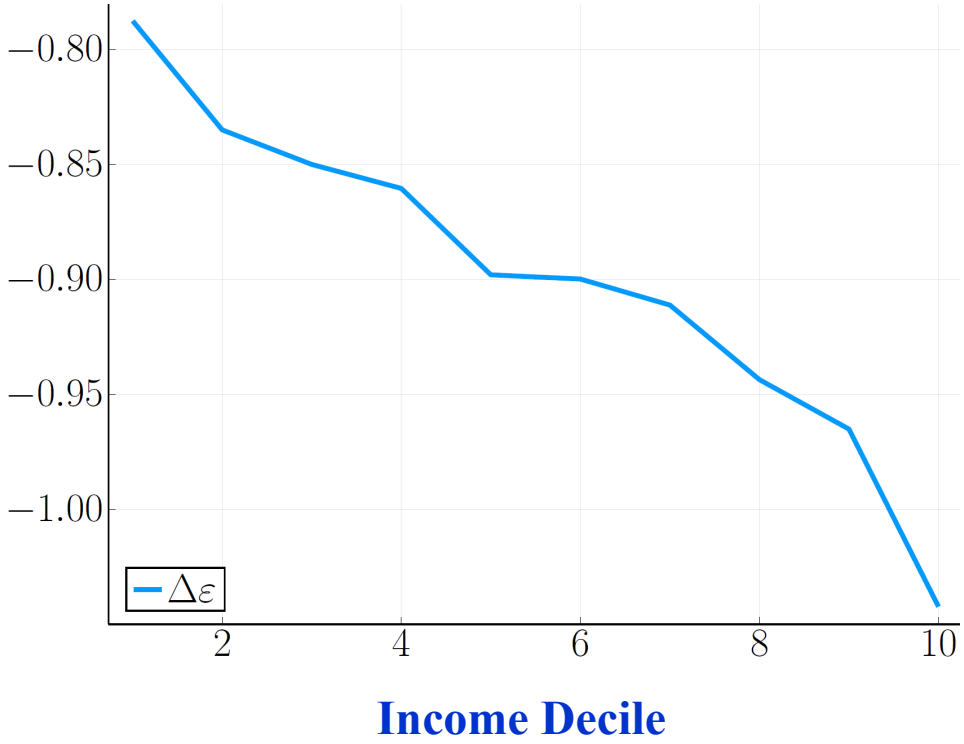
- Low productivity workers search more and have higher EE transitions

Real Income Growth by Productivity Quartile



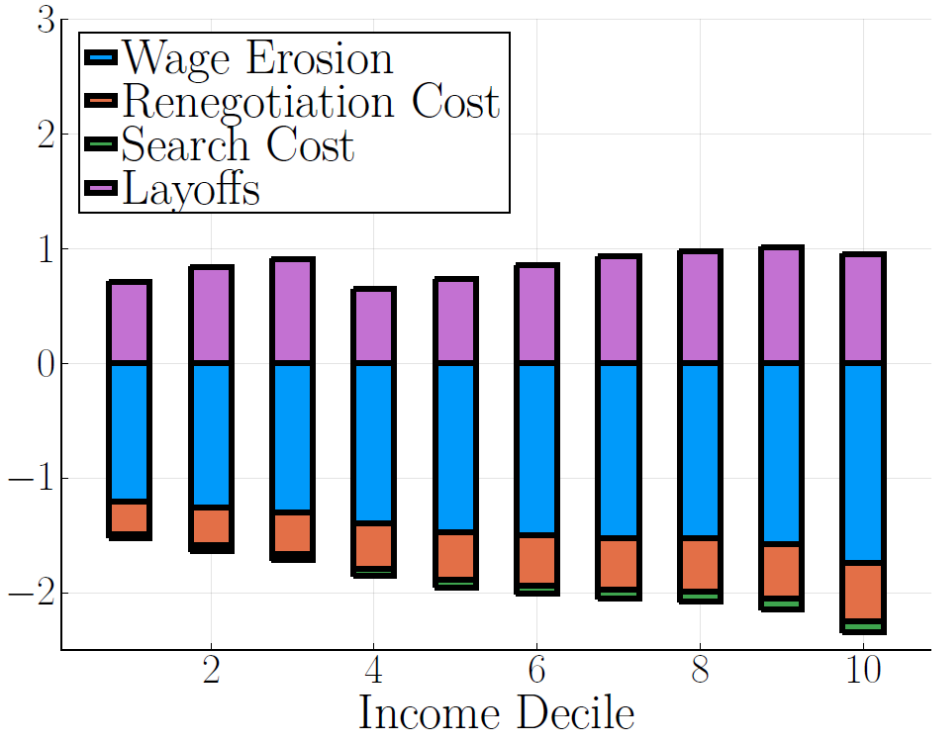
- On impact, all workers wages fall by 13%.
- Wages of low productivity workers recover faster.
- More E-E flows (but are searching more, searching is costly).

Consumption Equivalent Loss in Welfare (Share of Monthly Consumption)



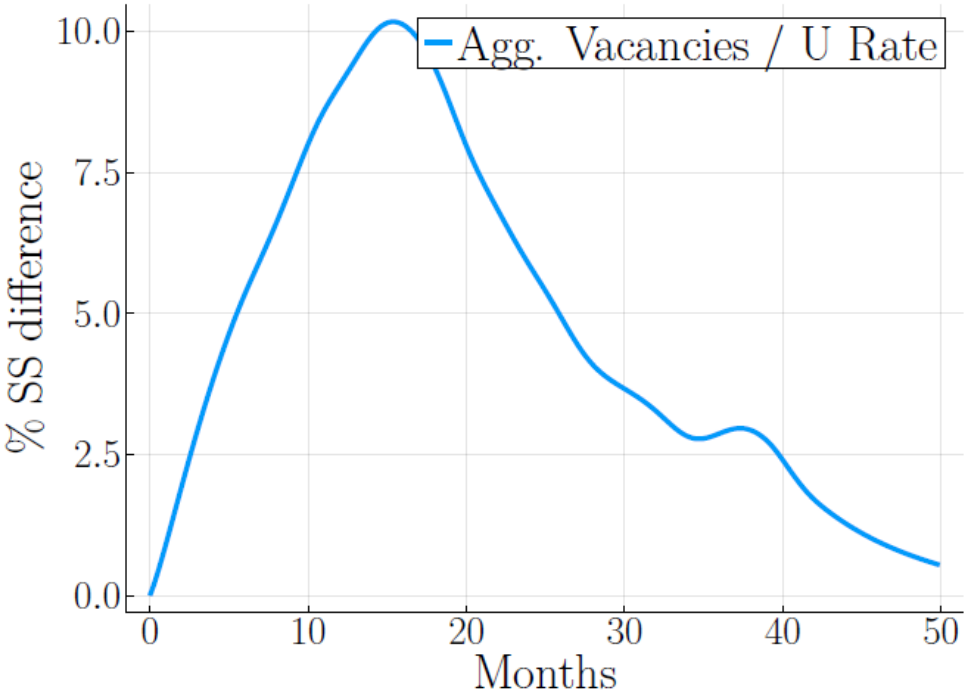
- *All workers are worse off from the inflation!*
- *Welfare loss ranges from about 80% to 110% of monthly consumption (depending on income group)*

Decomposition of Welfare Loss



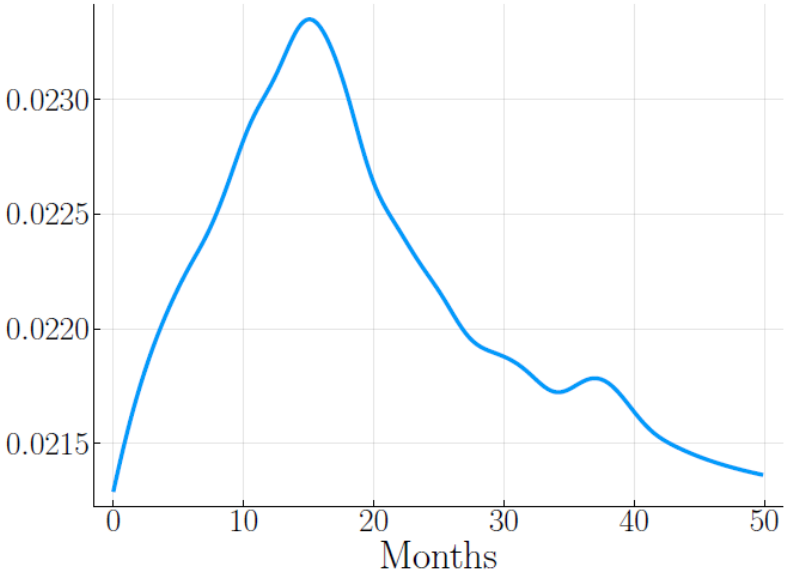
- *Four components:*
  - *Real wage losses (**blue**)*
  - *Search costs (**green**)*
  - *Renegotiation costs (**orange**)*
  - *Gains from less layoffs (**purple**)*
- *Search and renegotiation costs about 20% of wage losses*
- *Welfare gains from reduced layoff margin (magnitude sensitive to parameters)*

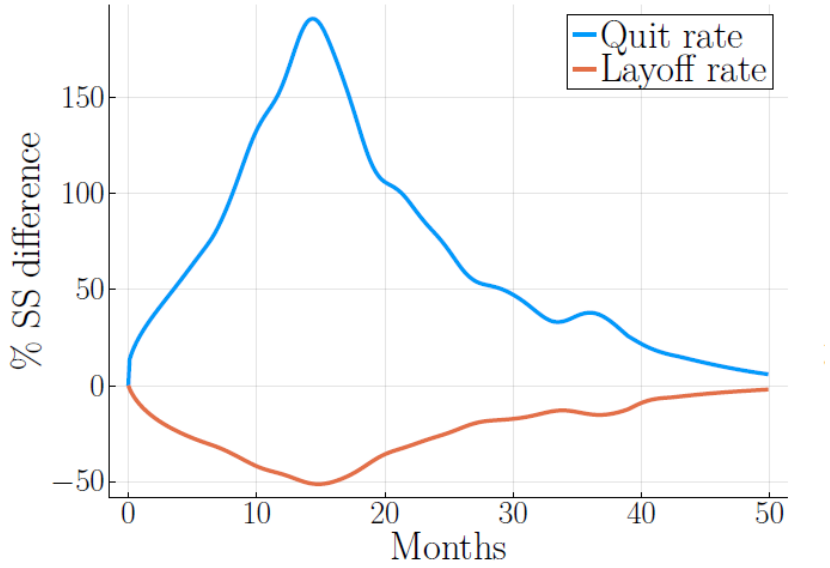
Experiment 2: Feed in Actual Time Series of Inflation



- Feeding in the time series of shocks generates something similar to the time series pattern of the vacancy-to-unemployment ratio.
- Still fine tuning calibration (getting large effect on layoffs….)

Experiment 2: Feed in Actual Time Series of Inflation



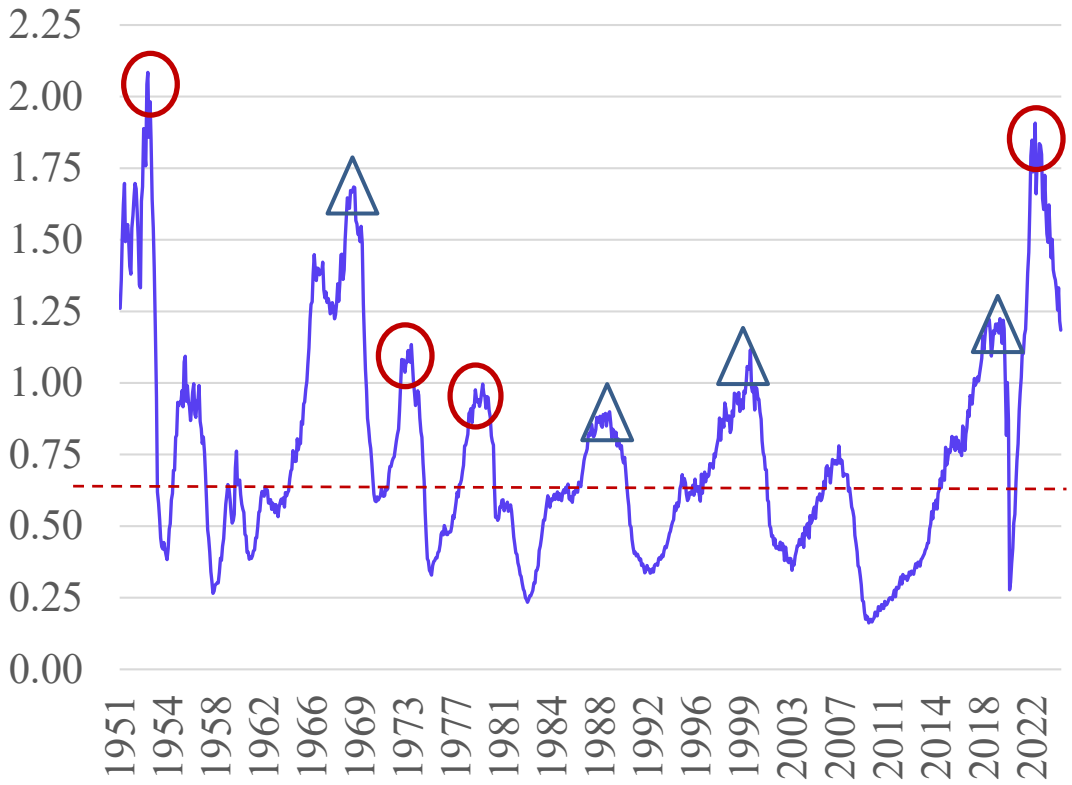


Panel A: E-E Flows

Panel B: Layoffs/Quits

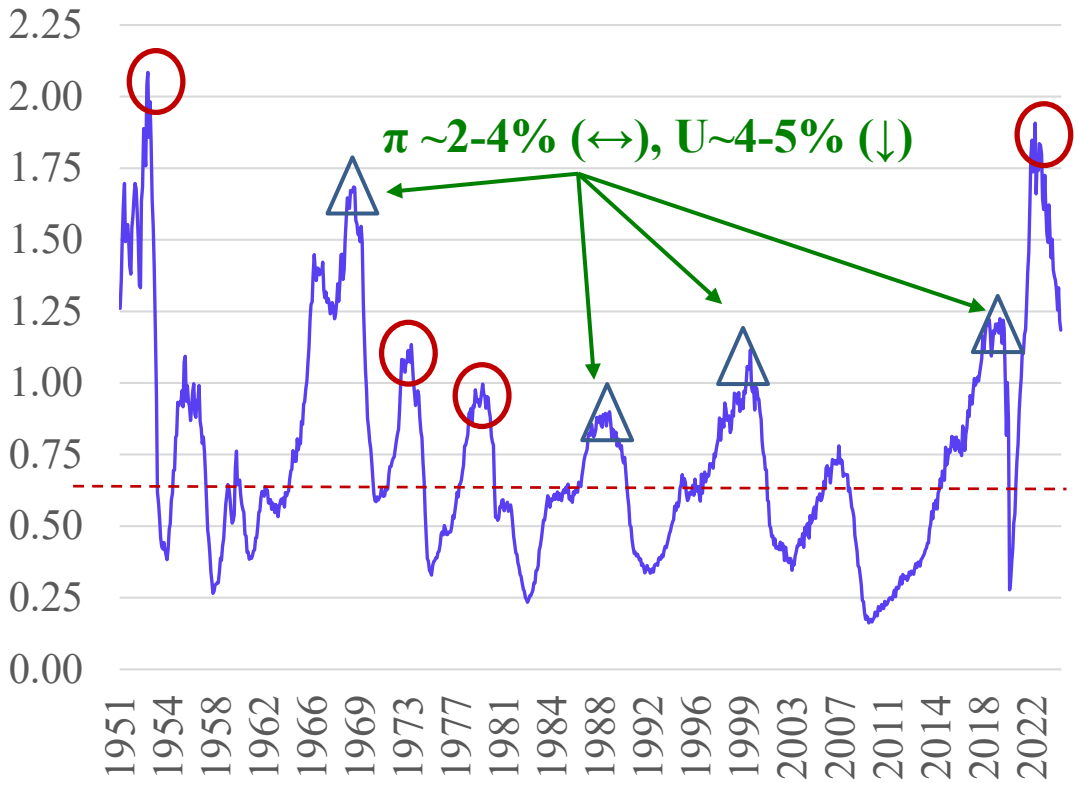
Additional Evidence

Vacancy-to-Unemployment Rate Over Time



- Use vacancy data from Conference Board's Help Wanted Index for 1951-2000 (Barnichon (2010))
- 9 periods since 1950 with spikes in the V/U rate
- Green triangles – traditional Beveridge curve periods (low inflation and declining unemployment).
- Red circles – periods of very high inflation and non-declining unemployment

Vacancy-to-Unemployment Rate Over Time



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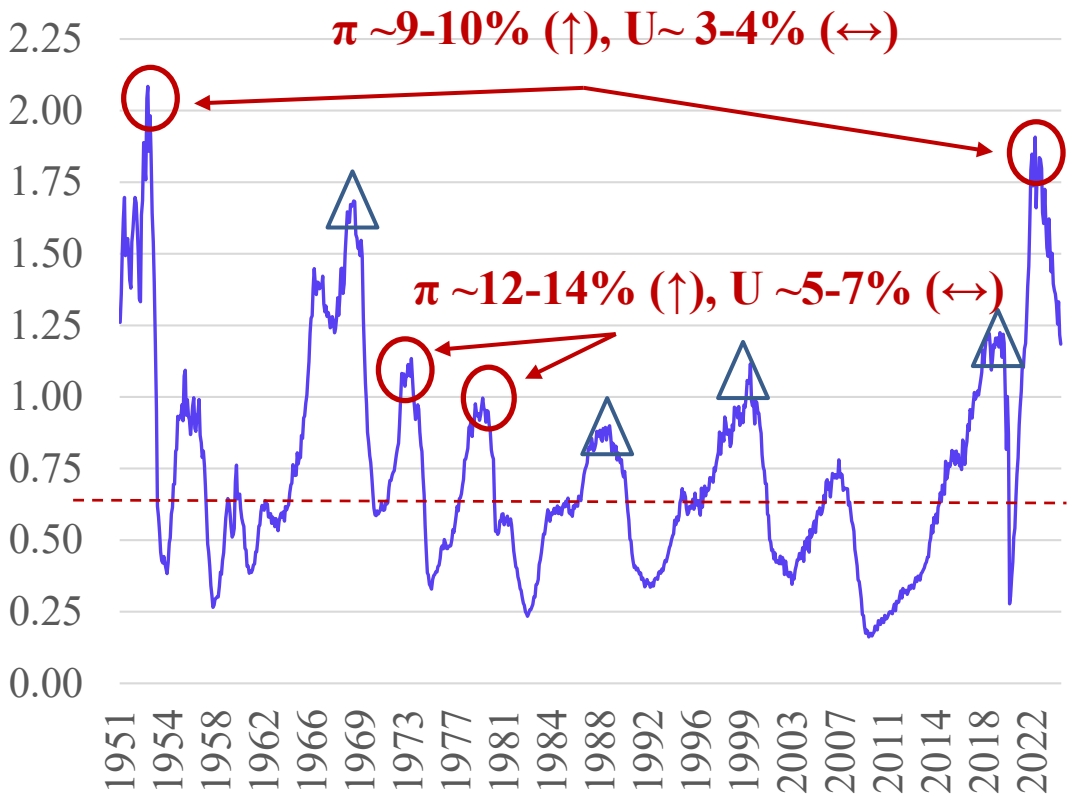
Vacancy-to-Unemployment Rate Over Time



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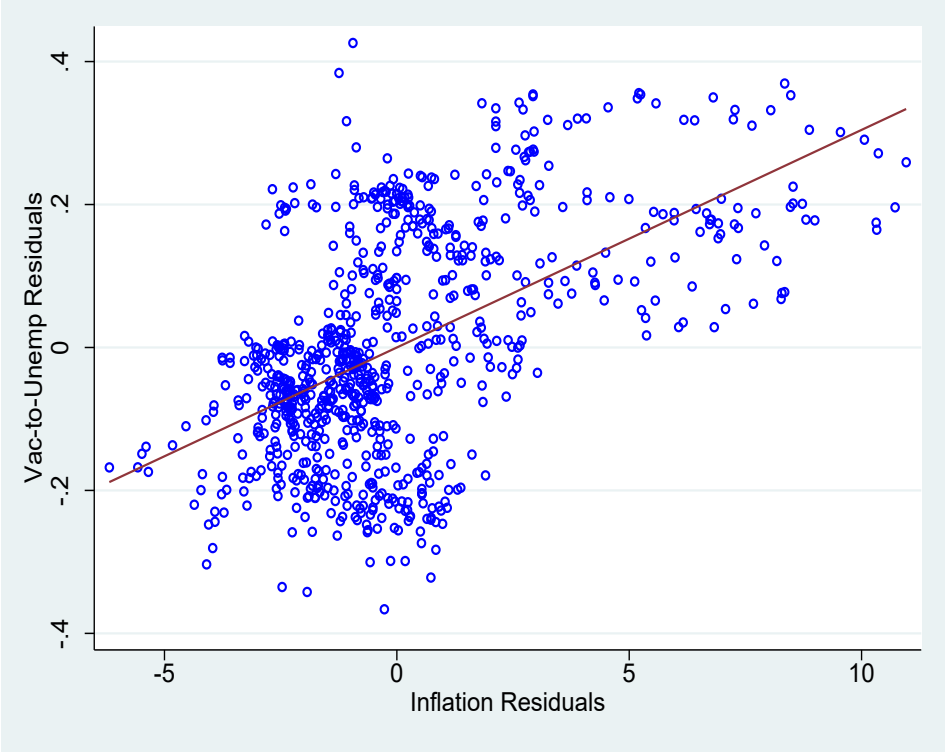
Residualized Scatter Plot: Market Tightness and Inflation



- Residualized both vacancy-to-unemployment ratio and inflation rate after controlling for unemployment rate and unemployment rate squared
- Monthly data: 1950-2019

Other Shocks

Other Shocks: Hot Labor Market?

- In paper, we show results from feeding in other shocks into our model and seeing labor market effects.
  - Productivity shock (shift in A_t)
  - Labor demand shocks (lower K and lower ρ)
  - Labor supply shock (increase B)
- All shocks can increase the vacancy-to-unemployment rate (calibrate to match the change in V-U in our baseline model).
- *However, all above shocks fall to match other aspects of the labor market data during the 2021-2024 period.*

Counterfactuals Other Shocks

Variable	Baseline	Higher Agg. TFP	Lower ρ	Lower K	Lower B
Δ V/U Ratio	8.4	8.4	8.7	8.7	8.4
% Δ EE Rate	41.3	7.5	2.9	5.3	2.6
% Δ UE Rate	0.3	2.9	5.5	4.2	5.3
% Δ Layoff Rate	-100.0	-70.7	-4.6	44.7	-3.1
% Δ Avg. Log Real Wage	-2.3	1.4	-0.5	0.2	-0.5
Avg. Log Real Wage Growth (Stayers)	8.2	5.3	4.8	5.0	4.8
Avg. Log Real Wage Growth (Switchers)	18.9	11.9	10.4	10.5	10.4
Δ Unempl. Rate	-0.3	-0.2	-0.4	-0.1	-0.4

Why Did Inflation Increase?

- **<u>Negative aggregate supply shocks</u>** (supply chain disruption, oil prices increasing) which causes:
  - Prices to increase and *labor demand to fall* → low V/U, low real wages, declining U-E rate, falling employment

- **<u>Positive aggregate demand shocks</u>** (pent up saving from Pandemic, increased fiscal stimulus, delayed monetary policy) which causes:
  - Prices to increase and *labor demand to rise* → high V/U, higher real wages, increasing U-E rate, rising employment

- *Both shocks have offsetting effects on labor demand implying a labor market may be neither "hot" nor "cold".*

Conclusion

- Modern macro models of labor market flows with labor market frictions provide a rational for why periods of inflation make workers worse off.
  - Reconciles survey evidence of workers (without relying on behavioral stories).
  - Show heterogeneity in welfare loss across worker types.
  - Decompose welfare losses into various channels.

- More importantly, show that periods of inflation, all else equal, can make the labor market appear "hot" by causing the vacancy to unemployment rate to rise even when there are no other underlying labor market shocks.

Extra Slides

Historical Relationship Between Inflation and Vacancy-Unemployment Rate

- Regress: V/U on unemployment rate, unemployment rate squared, and annualized cpi inflation rate during 1951-2019 (monthly observations)

		(1)	(2)
Unemployment Rate (%)	-0.152 (0.004)	-0.158 (0.003)	-0.531 (0.016)
Unemployment Rate Squared			0.030 (0.001)
CPI Inflation Rate (%)		**0.023 (0.002)**	**0.026 (0.002)**
R-Squared	0.67	0.72	0.83

- **Mean market tightness during this period ≈ 0.6**

Historical Relationship Between Inflation and Vacancies (Beveridge Curve)

- Regress: V/U on unemployment rate, unemployment rate squared, and annualized cpi inflation rate during 1951-2019 (monthly observations)

		(1)	(2)
Unemployment Rate (%)	-0.251 (0.016)	-0.289 (0.013)	-0.509 (0.079)
Unemployment Rate Squared			0.017 (0.006)
CPI Inflation Rate (%)		**0.142 (0.008)**	**0.144 (0.008)**
R-Squared	0.24	0.46	0.46

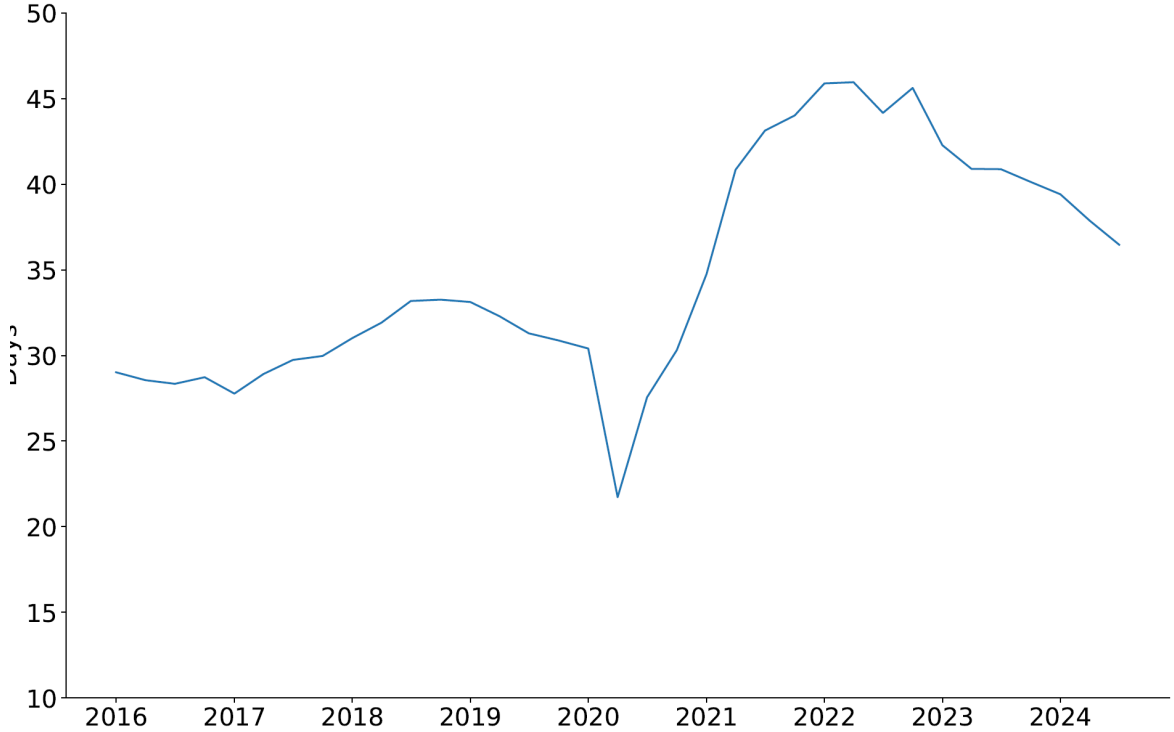
Change in EE Flows By Education During Inflation Period

Education	2016M1-2019M12	2021M9-2022M12	Change
Less than Bachelors	2.34%	2.57%	0.23 p.p. (0.04)
Bachelors or More	2.22%	2.33%	0.11 p.p. (0.05)

- **The increase in EE rates are higher for lower educated workers (CPS data).**

Duration of Vacancies

Figure B.3: Duration of Vacancy



Value of Unemployed for Worker with Productivity z: $U(z)$

$$(\rho+\chi)U(z) = \underbrace{Be^{z\phi_B}}_{\text{Flow Benefit of Non-Employment}} + \underbrace{\gamma_u \partial_z U(z) + \frac{\sigma_u^2}{2}\partial_z^2 U(z)}_{\text{Law of motion of } z \text{ during unemployment}} +$$

$$\underbrace{\max_{s_u,\hat{w}_u}\left\{ s_u f(\theta(\hat{w}_u,z))(H(\hat{w}_u)-U(z)) - \eta_u^{1/\phi_s}\frac{s_u^{1+1/\phi_s}}{1+1/\phi_s}e^z \right\}}_{\text{Expected value of searching for a job}}$$

- *A few key parameters (in blue):*
  - ϕ^B: How the value of non-employment scales with productivity
  - γ_u: Productivity drift when unemployed
- Note: Both $H(\hat{w}_u)$ and $U(z)$ are in real terms.

Value of Employed Worker: *H(z,w)*

$$(\rho+\chi)H(z,w)=\underbrace{e^{w}}_{\text{Wage}}-\underbrace{\partial_{w}H(z,w)\pi}_{\text{Real wage decline from inflation}}+\underbrace{\gamma_{e}\partial_{z}H(z,w)+\frac{\sigma_{e}^{2}}{2}\partial_{z}^{2}H(z,w)}_{\text{Law of motion of } z \text{ during employment}}$$

$$-\underbrace{\delta\left(H(z,w)-U(z)\right)}_{\text{Separation shock}}+\underbrace{\lambda\left(H(z,w^{*}_{\bar{\pi}}(z,w))-H(z,w)\right)}_{\text{Value of free wage adjustment}}$$

$$+\underbrace{\beta I_{\left\{w_{b}^{*}(z,w)>w\right\}}\int\max\left\{H(z,w_{b}^{*}(z,w))-H(z,w)-\psi e^{z},0\right\}\Psi(d\psi)\Big\}}_{\text{New value of costly wage increases}}$$

$$+\underbrace{\max_{se,w_{jj}}\left\{s_{e}f(\theta(z,w_{jj}))(H(z,w_{jj})-H(z,w))-\eta_{e}^{1/\phi_{s}}\frac{s_{e}^{1+1/\phi_{s}}}{1+1/\phi_{s}}e^{z}\right\}}_{\text{Expected value of searching for a job}}$$

- *where* $w_{b}^{*}(z)=\max_{w_{b}}\left(J(z,w_{b})\right)^{1-\tau}\left(H(z,w_{b})-U(z)\right)^{\tau}$ *and* τ *is worker bargaining weight*

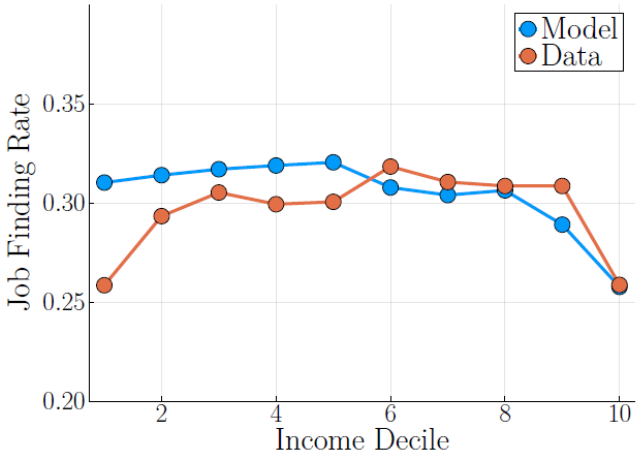
Value of Firm

$$\rho J(z,w) = e^z - e^w + \partial_z J(z,w)\gamma_e + \frac{\sigma_e^2}{2}\partial_z^2 J(z,w) - \partial_w J(z,w)\pi^*$$
$$+ \beta(z,w)\left(J(w_b^*(z,w),z) - J(z,w)\right) + \beta^{\pi}\left(J(z,w_{\pi^*}^*(z,w)) - J(z,w)\right)$$
$$- \left(\delta + \chi + s_e(z,w_{jj}^*(z,w))f(\theta(z,w_{jj}^*(z,w)))\right).$$

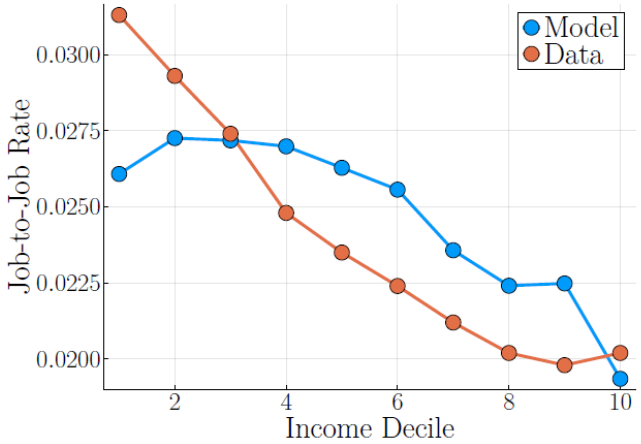
Equilibrium Strategies

- Consider Markov strategies in the game between firms and workers (recast problem as a two-sided mean field game).
- The payoff relevant states within a match are productivity and the real wage
- Given a wage and productivity,
  - a matched firm chooses the set of wages at which it continues the match
  - a matched worker chooses search intensity, a target submarket for on-the-job search, when to pay the renegotiation costs, and a set of wages at which it continues the match
- The *continuation region* for a match with productivity z is the set of wages at which both the worker and firm are willing to continue the match

Disciplining how value of leisure and vacancy costs vary with Z



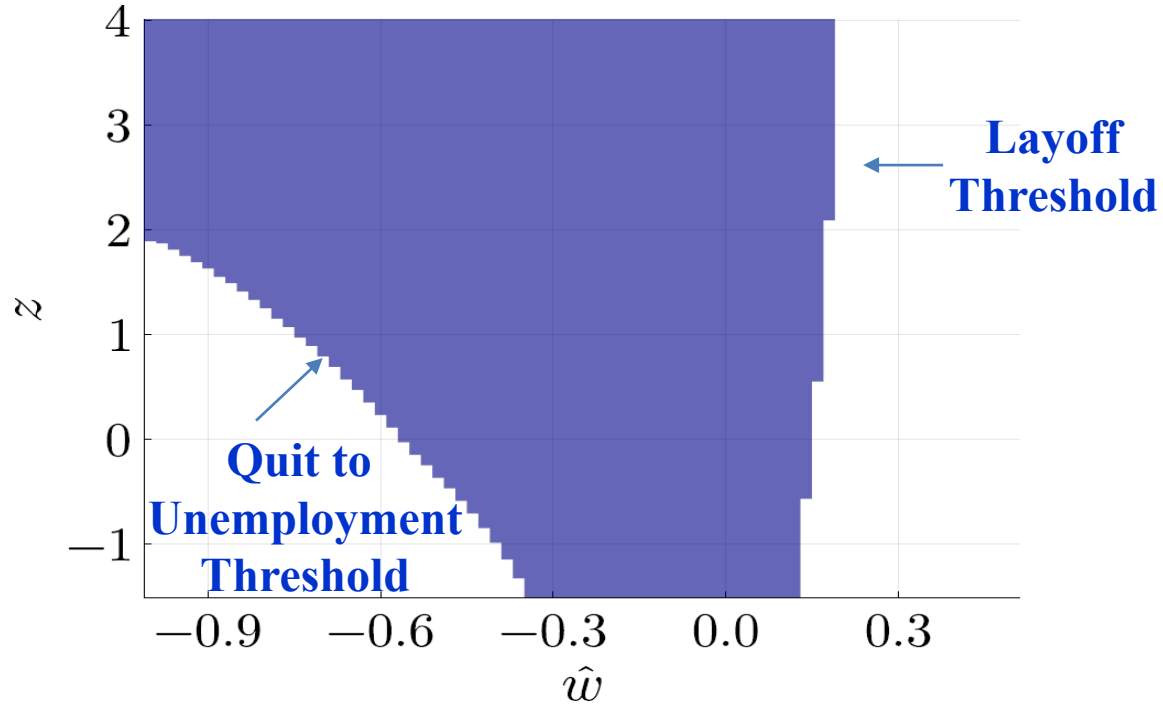
PANEL A: U-E RATE



PANEL B: E-E RATE

- *Steady-state UE and EE rates by income help pin down ϕ^B and ϕ^K*
- *$\phi^B < 1$ → U-E rate lower for low Z (low income); little effect on E-E rate*
- *$\phi^K > 1$ → U-E rate lower for high Z and E-E lower for high Z*

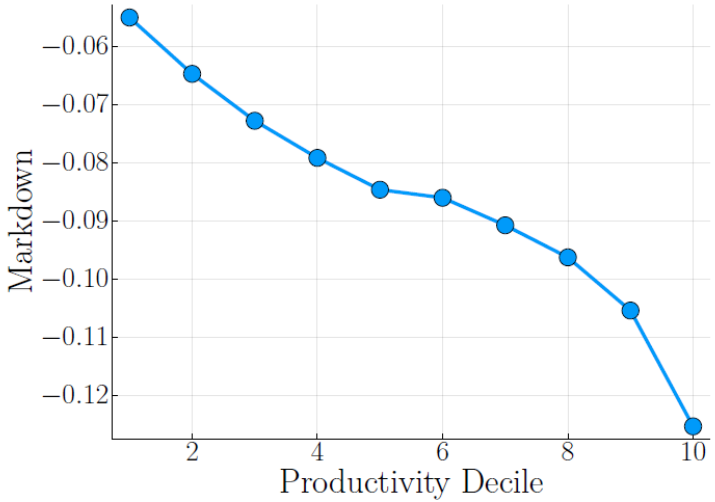
Continuation Regions For Worker and Firms



- Low productivity workers are more likely transition to quit margin when markdown gets larger.

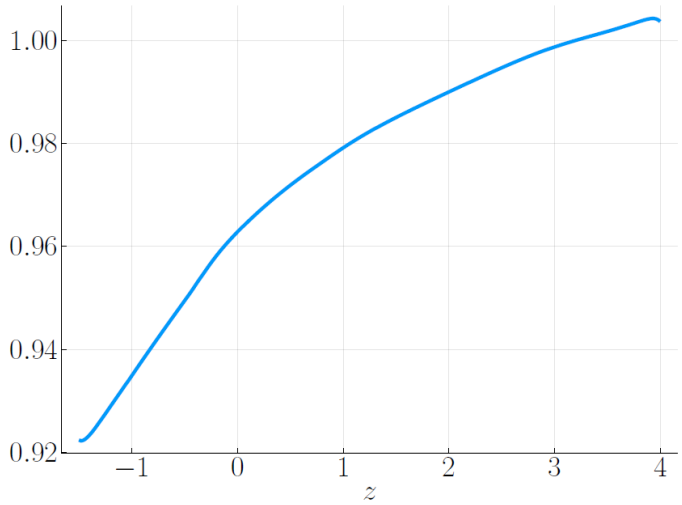
Out of Sample Test: Equilibrium Markdowns vs Z

Figure 7: Equilibrium Markdowns by Productivity Decile

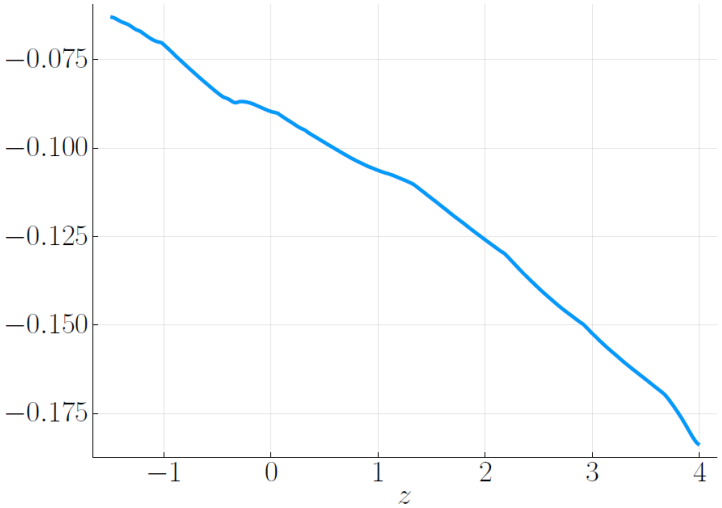


- Markdowns are larger for higher Z workers.....Consistent with the findings both qualitatively and quantitatively with measures of markdowns from Chan et al (2023) using Danish microdata.

Search Effort and Starting Markdowns, Conditional on U-E Transition



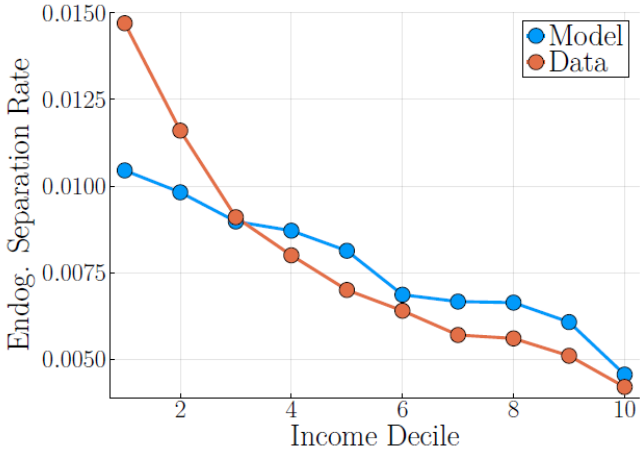
PANEL A: SEARCH EFFORT



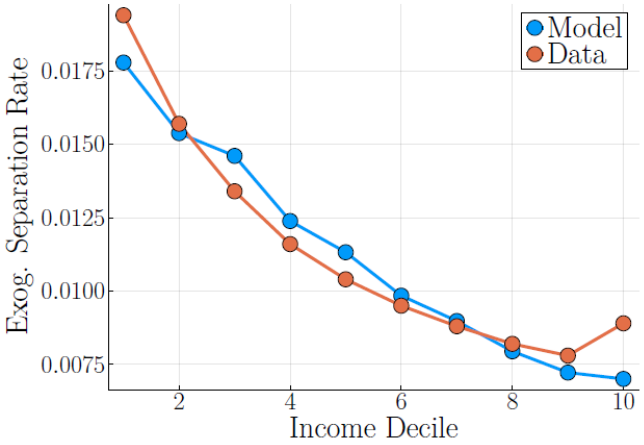
PANEL B: STARTING MARKDOWNS

- Higher productivity workers search more and are willing to take a larger markdown on their new job when unemployed.

Disciplining how separation shocks vary with Z



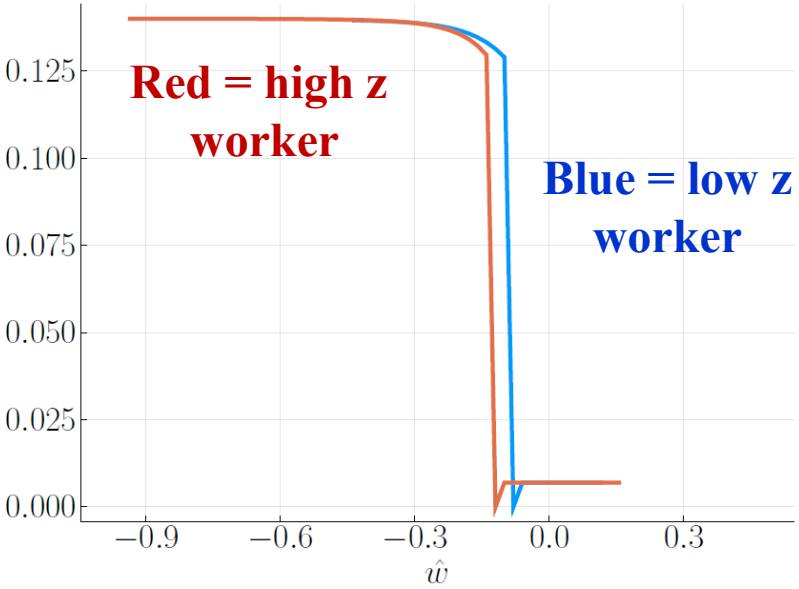
Panel C: Endogenous E-U Rate



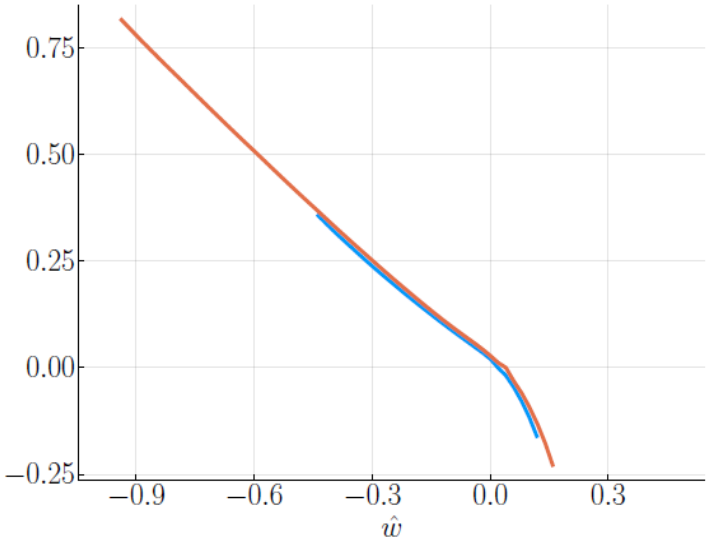
Panel D: Exogenous E-U Rate

- *E-U rates help discipline how separation shocks vary with Z.*
- *Measure all E-U's in the data. Separate endogenous from exogenous by assuming the exogenous are driven by....*

Monthly Bargaining Probabilities and E-E Flows by Wage Markdown



Panel A: Bargaining Rates



Panel C:
E-E Wage Changes