# Some Like it Hot: Inclusive Monetary Policy Under Okun's Hypothesis

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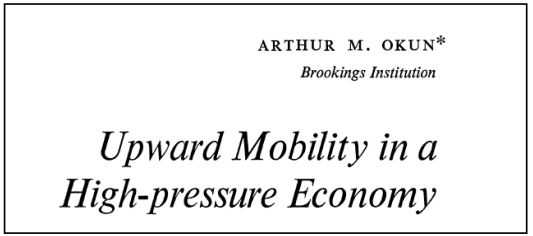
# Okun's hypothesis




- Okun (BPEA, 1973): A high-pressure economy has the potential to persistently improve the economic circumstances of less advantaged workers, allowing them to find steady employment, build their skills, and climb the job ladder
- *The sacrifice of upward mobility must be carefully reckoned as one high cost of accepting slack as an insurance policy against inflation*

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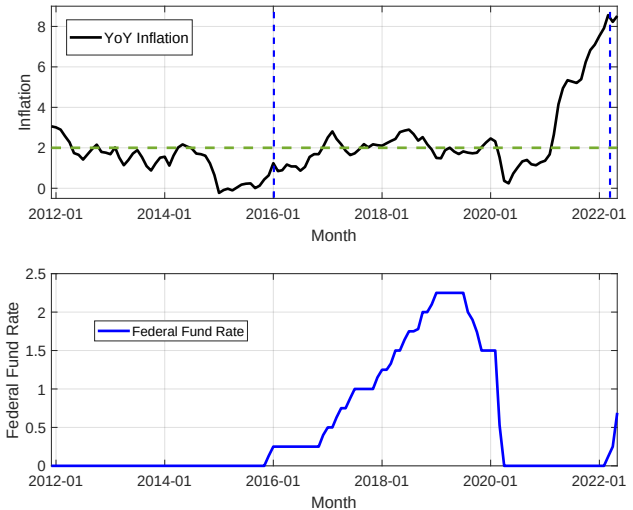

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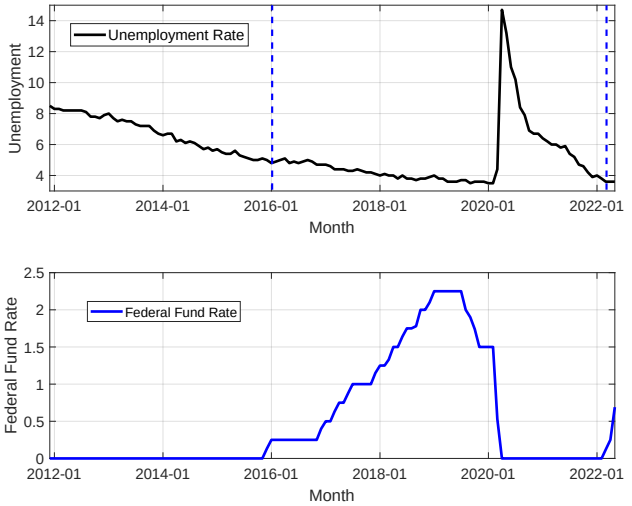

# This paper

Motivated by this policy shift which seems inspired by Okun's hypothesis...

1. We build a quantitative HANK model with a three-state (E,U,N) labor market model
2. Incorporate several mechanisms giving rise to Okun's hypothesis
3. Calibrate to US economy and simulate counterfactuals under 'inclusive' monetary policy rules
4. Assess the tradeoff of inflation vs aggregate (and distributional) labor market outcomes

# Preview of our Findings

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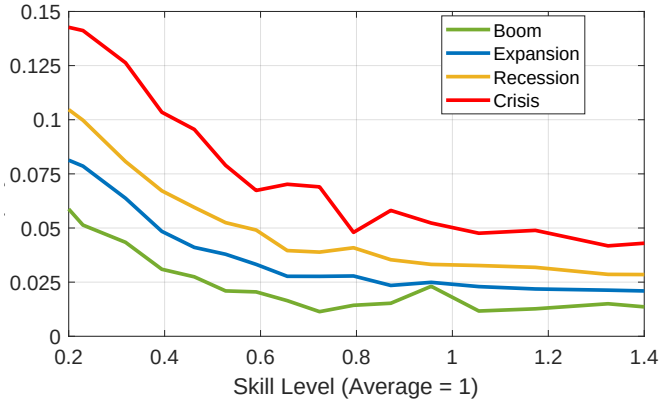
- AIT does not look like an 'inclusive' policy rule
- An asymmetric policy rule that runs a high-pressure economy at the cost of 2-3 ppts of additional inflation on average
  - Lowers average unemployment by 0.5 ppt, increases labor force participation by 0.5 ppt
  - Larger effects at the bottom of the distribution
    - At the P10, participation increases by nearly 2 ppts, labor income increases by 6%
    - Reduces earnings inequality (P90-10 ratio) by over 5 ppts

# The Mechanics of Okun's Hypothesis

# Okun's hypothesis: Mechanism I

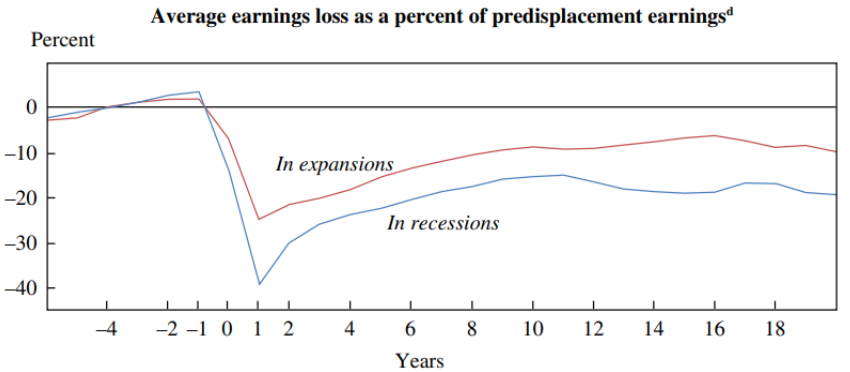
- Uneven effects of business cycles (Aaronson et al., 2019)
  - Low-skill workers are much more sensitive to the cycle




- *High-pressure economy is especially beneficial to low-income groups*

# Okun's hypothesis: Mechanism II

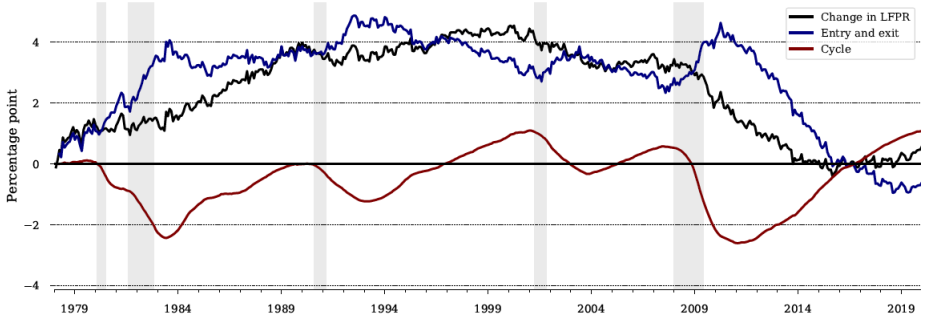
- Human capital accumulation (Davis-von Wachter, 2011)
  - Stable employment leads to earnings growth
  - Earnings losses upon displacement are large, persistent and cyclical




- *High-pressure economy can raise (limit the loss of) the stock of human capital*

# Okun's hypothesis: Mechanism III

- Participation cycle (Hobijn-Sahin, 2021)
  - Participation to the labor force falls during recessions
  - $E \leftrightarrow U$ flows are the key driver of this cyclicality ($UN >> EN$)




- *High-pressure economy sustains attachment to the labor force*

# The Model

# Individual Skill and Labor Market Dynamics

- Skill level: $z$
- Labor market state: $s$

$$s = \begin{cases} e, & \text{employed} \\ u_0, & \text{unemployed, ineligible for UI} \\ u_1, & \text{unemployed, eligible for UI} \end{cases} \qquad \begin{cases} n_0, & \text{passive non-participant} \\ n_1, & \text{active non-participant} \end{cases}$$

- Transition across labor market states:
  - Exogenous $e \to u$, $u \to e$, $n_1 \to e$ as a function of skills $z$
  - Exogenous switch into and out of passive non-participation $n_0$
  - Endogenous participation choices: $n_1 \to u, \quad u, e \to n_1$

# Individual Skill and Labor Market Dynamics

- State-dependent skill dynamics:

$$d \log z_t = \Big\{ -\theta \log z_t + \mathbb{I}_{\{s_t = e\}} \, \delta_z^+ - \mathbb{I}_{\{s_t \neq e\}} \, \delta_z^- \Big\} dt + \sigma_z dW_t$$

- Workers who do not remain employed see:
  1. their skills depreciate
  2. their job finding and separation rates deteriorate

$\rightarrow$ Slippery slope leading to long-lasting impact of job displacement

# Individual Problem

- Period utility:

$$u^s(c,h) = \log c - \kappa^s - \psi \frac{h^{1+\frac{1}{\sigma}}}{1+\frac{1}{\sigma}}, \qquad s \in \{e, u_0, u_1, n_0, n_1\}$$

- Budget constraint:

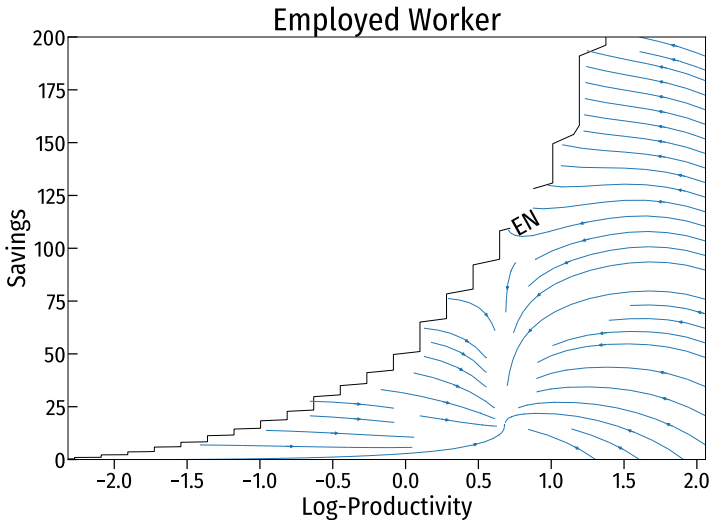
$$s = e \quad : \quad c_t + \dot{a}_t = r_t a_t + \phi_t + (1-\mathfrak{t}_t) w_t z_t h_t \qquad s = u_1 : \quad c_t + \dot{a}_t = r_t a_t + \phi_t + (1-\mathfrak{t}_t) b(z_t)$$

$$s \in \{u_0, n_0, n_1\} \quad : \quad c_t + \dot{a}_t = r_t a_t + \phi_t$$

- Borrowing constraint: $a_t \geq 0$
- Choices:
  - consumption / saving (optimal control)
  - participation (optimal stopping)

# Participation Decision over the State Space

- Optimal policy splits state space into participation and non-participation regions
- Participation is more likely if currently productive (substitution effect) or poor (wealth effect)



# Remaining Model Ingredients

## Production and wage setting

- Monopolistic producers with flexible prices and linear technology $Y_t = N_t$
- Labor unions set wages subj. quadratic adjustment cost (Erceg et al. 2000, Auclert et al. 2019)
- Wage Phillips Curve determining $\pi_t^w$ as function of MRS (employed) and $w - \pi_t = \pi_t^w$

## Mutual Fund

- Household wealth = shares of the mutual fund
- Fund owns firms' equity and government bonds

## Labor Market Frictions

- Calibrate their level to match the average flows in steady state
- Function of average hours per worker out of steady state

# Remaining Model Ingredients

## Government

- Fiscal authority issues debt, taxes, and spends on transfers
- Monetary authority sets the nominal rate based on a policy rule

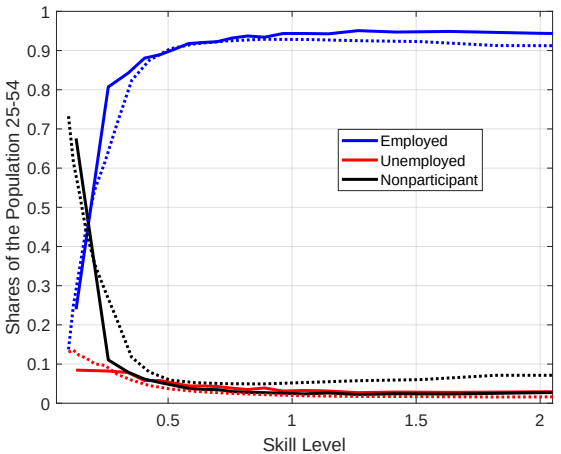
## Sources of Aggretate Fluctuations

- Wedge to Euler equation (demand)
- Wedge to wage Phillips Curve (supply)

# The Labor Market Through the Lenses of the Model

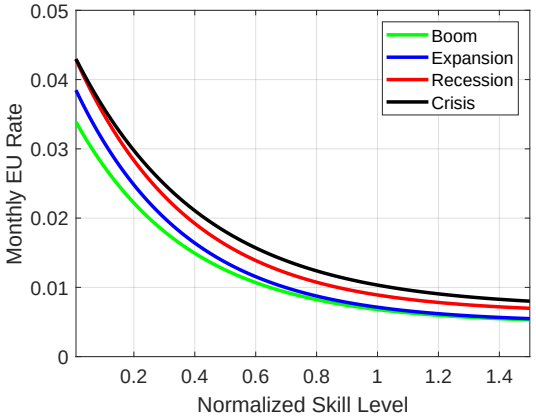
# Labor Market Stocks and Flows

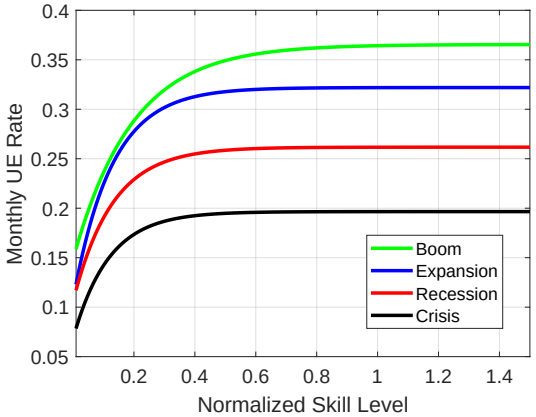
| | Data | Model |
|---|---|---|
| EU | 0.017 | 0.017 |
| **EN** | 0.011 | 0.011 |
| UE | 0.242 | 0.304 |
| **UN** | 0.189 | 0.202 |
| NE | 0.065 | 0.043 |
| NU | 0.064 | 0.077 |




- We match both average worker flows, and stocks by skill level

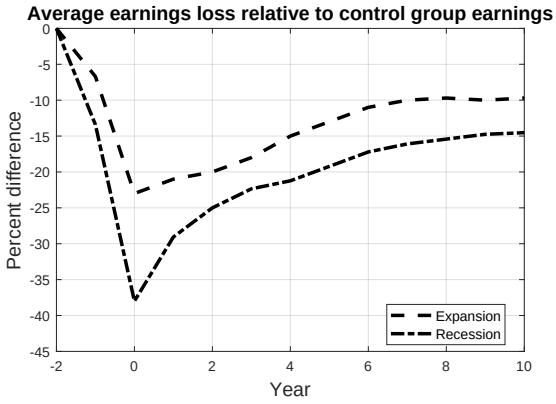
# Mechanism I: Uneven Incidence of Business Cycles




- Low-skill are more exposed to aggregate fluctuations (akin to incidence functions)

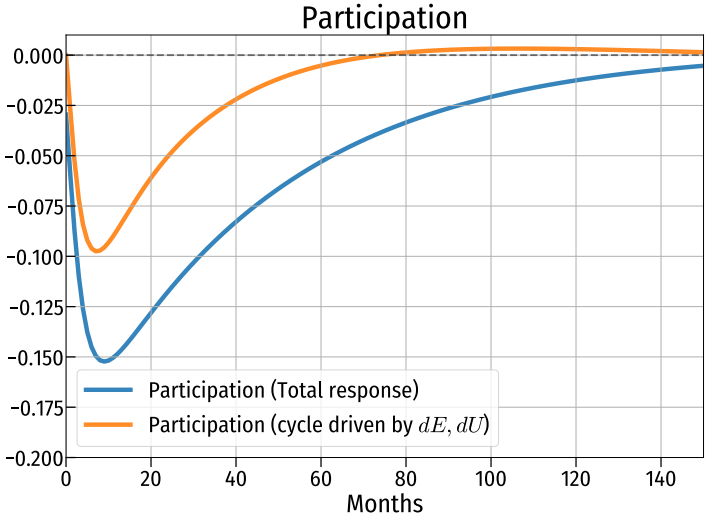
# Mechanism II: Earnings Losses from Job Displacement





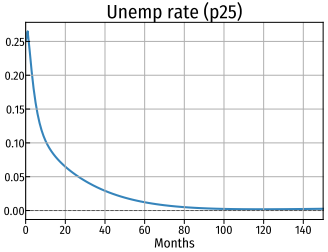
- Losses from displacement are large, persistent and countercyclical

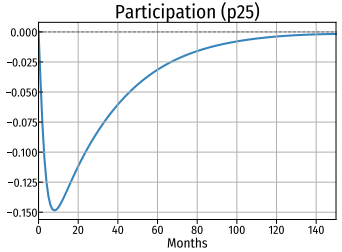
# Mechanism III: Participation Cycle



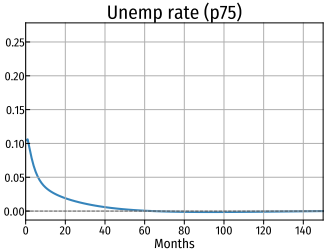

- Larger pool of unemployment drives down participation

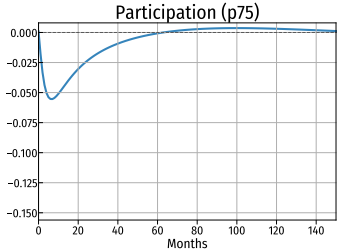
# Putting all mechanisms together









- Fluctuations at P25 of the skill distribution are stronger and more persistent than P75.

# Counterfactual Policy Experiments

# Baseline Model Simulation (1990-2019)

- Assume that the Fed follows a standard Inflation Targeting (IT)
- Invert the model to obtain path of demand and supply shocks that match U and inflation rates

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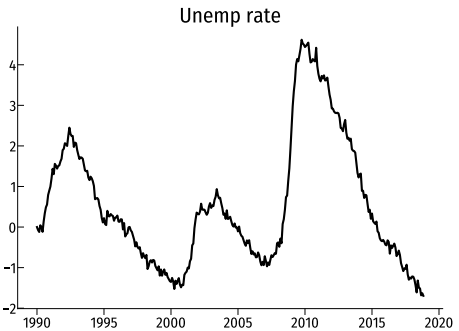
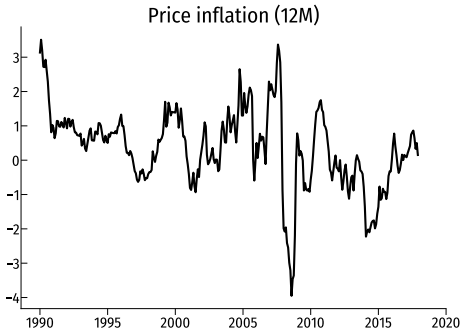


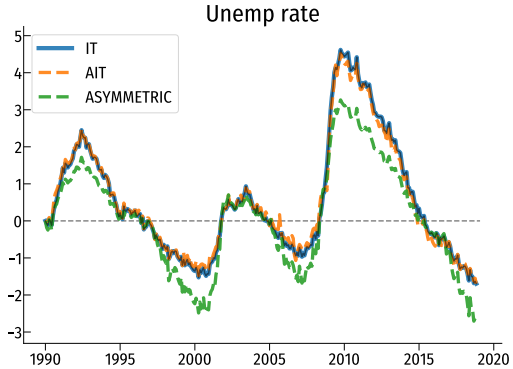
# Design of Counterfactual Experiments

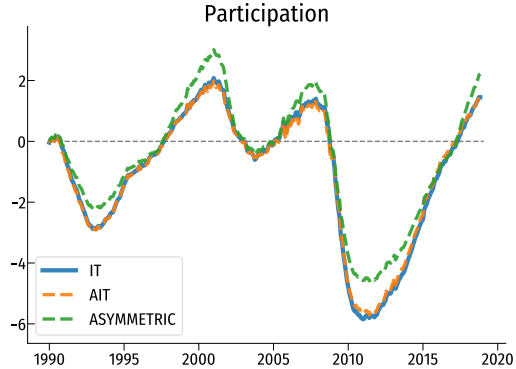
*Question: how would the US labor market and inflation dynamics have looked like had the Fed followed a more inclusive rule in the 1990-2019 period?*

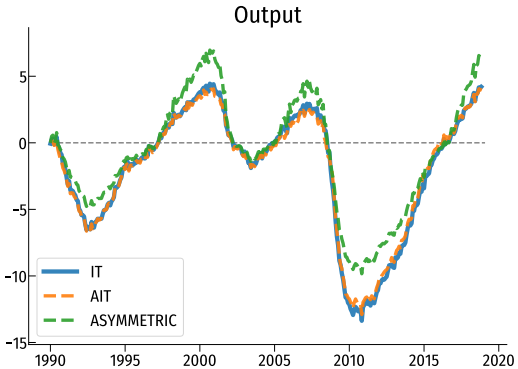
- Use IT filtered shocks to simulate economy under more 'inclusive' policy rules

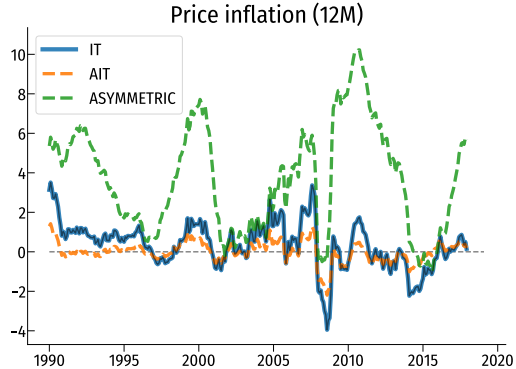
| | |
|---|---|
| Inflation Targeting (IT) | $r_t = i^* + 1.25\pi_t + 0.05 \log\left(\frac{Y_t}{Y^*}\right)$ |
| Average Inflation Targeting (AIT) | $r_t = i^* + 1.25\pi_t + 0.05 \log\left(\frac{Y_t}{Y^*}\right) + 2.00\Gamma_t^\pi, \quad \Gamma_t^\pi = (1 - 1/48)\pi_t + 1/48\Gamma_{t-1}^\pi$ |
| Asymmetric (Inclusive) | $r_t = i^* + 1.25\pi_t + 0.00 \log\left(\frac{Y_t}{Y^*}\right)^+ + 0.10 \log\left(\frac{Y_t}{Y^*}\right)^-$ |

# Aggregate Implications of Different Rules

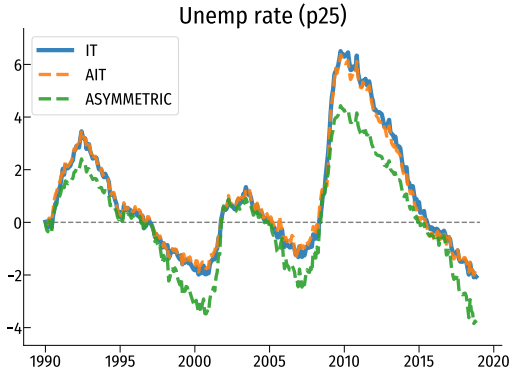


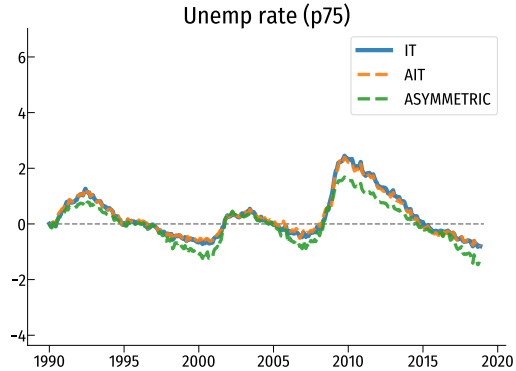



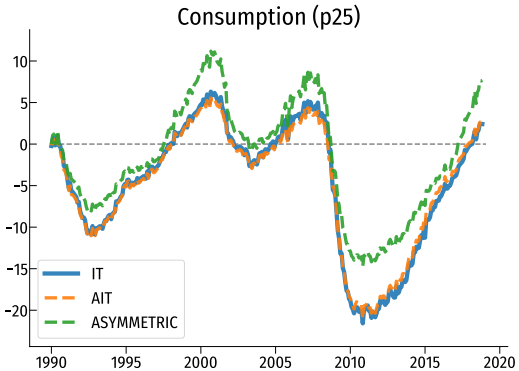



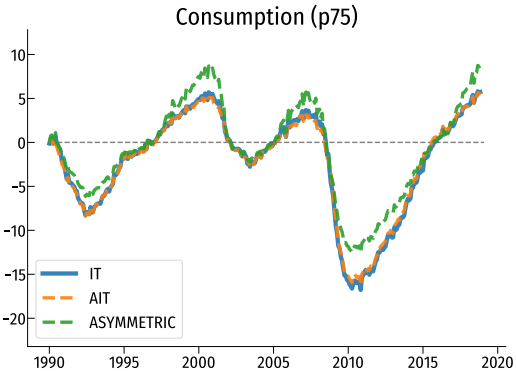



# Distributional Implications of Different Rules



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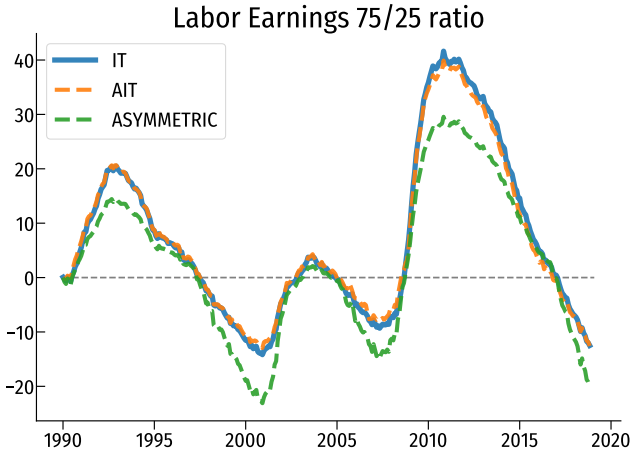
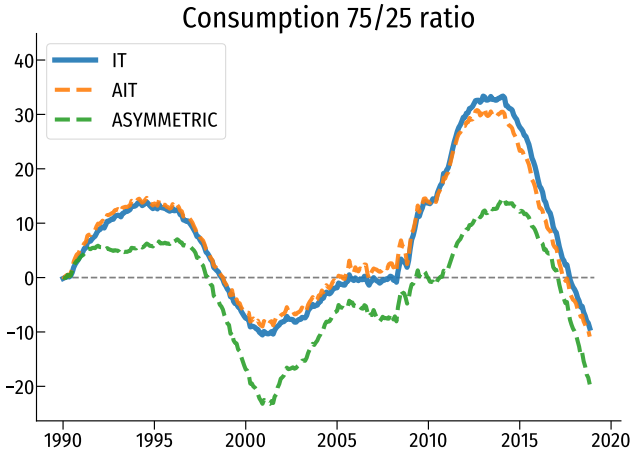
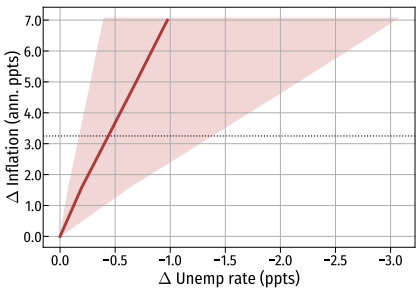
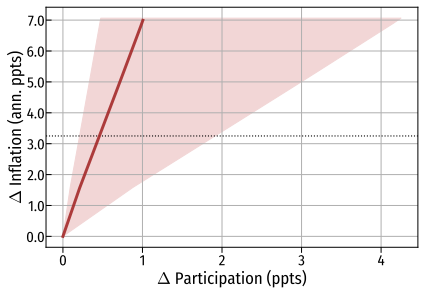


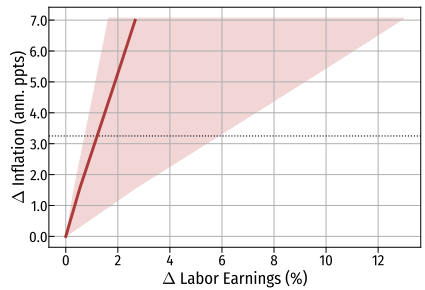



# Measuring the trade-off: Okun's curves

- Okun (BPEA, 1973): *The sacrifice of upward mobility must be carefully reckoned as one high cost of accepting slack as an insurance policy against inflation*
- Varying the coefficients in our inclusive rule traces out this trade-off relative to baseline IT rule



# Conclusion and Going Forward

- **Today**: Monetary policy can run a high-pressure that improves the labor market prospects of low-skill workers at the cost of higher inflation

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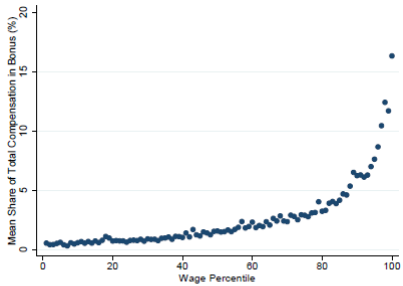
- **Today**: Monetary policy can run a high-pressure that improves the labor market prospects of low-skill workers at the cost of higher inflation
- **Going forward**:
  - Comparison to fiscal policy ('asymmetric' fiscal rules?)
  - Who bears the cost of inflation? Potentially many channels...




PANEL A: SHARE IN BONUS OUT OF TOTAL EARNINGS

Source: Grisby-Hurst-Yildirmaz (2021)

# Thanks!