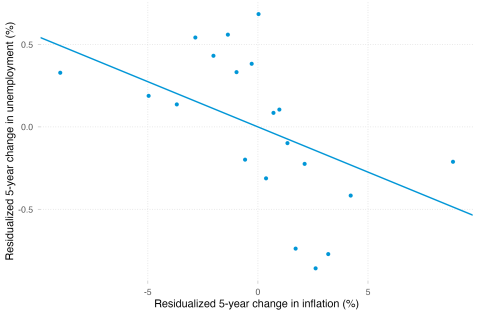
Grease or Grit? Optimal Inflation with Labor-Market Conflict

Chen Gao Joao Guerreiro Jonathon Hazell Chen Lian Christian Patterson

July 2026

Inflation and Labor Markets

Regression Table



Strong negative association between inflation and unemployment in data

Tobin view: inflation greases the labor market by eroding real wages trapped above productivity and saving matches.

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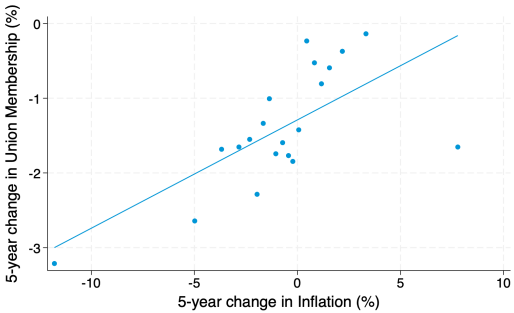

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1. Unionization rates

Conflict view: the same real-wage erosion pushes more workers into costly conflict.

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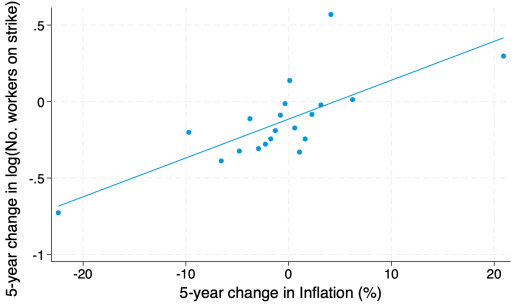

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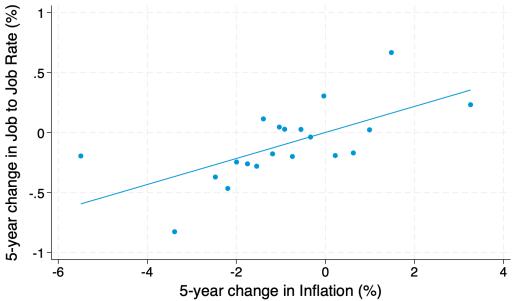

Strong positive association between inflation and labor market conflict

1. Unionization rates
2. Workers on strike
3. Workers in costly job search and switching employers

Conflict view: the same real-wage erosion pushes more workers into costly conflict.

The labor market consequences of inflation:

+ Grease

Inherited nominal wages can sit too high relative to productivity.

Inflation erodes real wages and saves efficient matches.

Positive: unemployment falls, so welfare rises.

[Tobin (1972), Akerlof et al. (1996), Card and Hyslop (1997)]

- Grit

Nominal wage growth is not automatic.

Workers must sometimes renegotiate, search, or switch jobs to restore wages.

Negative: conflict costs rise, so welfare falls.

[Guerreiro et al. (2026), Afrouzi et al. (2026), Pilossoph et al. (2024)]

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This paper: characterize optimal long-run inflation when the same wage erosion preserves matches and provokes conflict.

What we do

1. Build a labor-market model of Tobin grease and conflict grit

2. Decompose the welfare effect of inflation

3. Quantify the long-run optimum:

- Model calibrated to micro data on wages and employment
- Labor-market forces imply a positive optimum
- Conflict costs lower the optimum by about 4 pp

Model

Model environment

Search and matching in the labor market

- Unemployed search for vacancies
- Employers post job openings

Worker productivity – evolves stochastically over time

Nash bargaining on nominal wages

Conflict: workers and firms may pay cost to renegotiate wages.

Endogenous separations: quits and firing/layoffs

Workers and firms

Time is discrete $t = 0, 1, 2, \ldots$

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Workers

Unit mass of workers

$$\mathbb{E}_t \left[\sum_{s=0}^{\infty} \beta^t (c_{t+s} - \kappa_{w,t} \mathcal{I}_{w,t+s}) \right]$$

If employed: $c_t = \exp\{w_t\}$

If unemployed: $c_t = \exp\{\bar{b}\}$

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If vacancy open: $\pi_t = -k_v$

If vacancy filled: $\pi_t = \exp\{z_t\} - \exp\{w_t\}$

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Worker productivity follows a Markov process: $z'|z \sim f$

➢ For quantitative purposes: $z' = \rho_z z + z^+(\iota - \zeta) + \sigma\varepsilon$, $\varepsilon \sim N(0,1)$ and $\iota \sim Bernoulli(\zeta)$

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Matching function $M(u, v) = \Psi u^\eta v^{1-\eta}$. Job finding rate $f(\theta) = \Psi\theta^{1-\eta}$. Job filling rate $q(\theta) = \Psi\theta^{-\eta}$

Free entry: Exp. value of vacancy $= 0$

Search and wage determination

Incumbent Matches: state (z, w_-)

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Exogenous separation probability s

Firing and quit decisions:

- ➢ Firm can fire if w^d too high rel. z, pay cost $\chi \sim U[0, \overline{\chi}]$
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Conflict decisions: Worker can pay $\kappa_{w,t}$ (Firm can pay $\kappa_{f,t}$) to renegotiate wage

- ➢ New wage via Nash Bargaining $w^*(z)$

Today: $\kappa_{f,t} \to \infty$ (no wage cuts)

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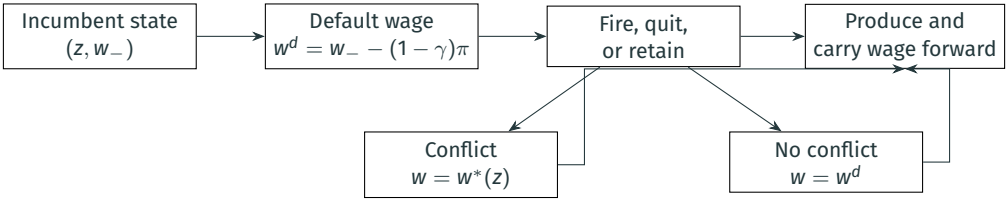
New Hires: state z

Match with probability $f(\theta)$

New hire wage: $w^*(z)$

Model – Grease and Grit Margins



+ Grease

- ➢ lower real wage pressure
- ➢ fewer inefficient fires
- ➢ more job creation

- Grit

- ➢ more costly wage conflict
- ➢ some workers quit before bargaining
- ➢ more low-surplus matches retained

Output, unemployment, and conflict

Define: $\phi(z, w_{-}) \sim$ Dist. incumbent post exog. s, and $\psi(z) \sim$ Dist. unemployed.

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Flows accounting:

$$\text{New Hires} = s(1-u) + \text{Fires} + \text{Quits}$$

- New Hires $= f(\theta) \int_{\underline{z}}^{\infty} \psi(dz)$
- Fires $\equiv \int \int_{\overline{w}(z)+(1-\gamma)\pi}^{\infty} \phi(dz, dw_-)$
- Quits $\equiv \int \int_{-\infty}^{\underline{w}^{quit}(z)+(1-\gamma)\pi} \phi(dz, dw_-)$

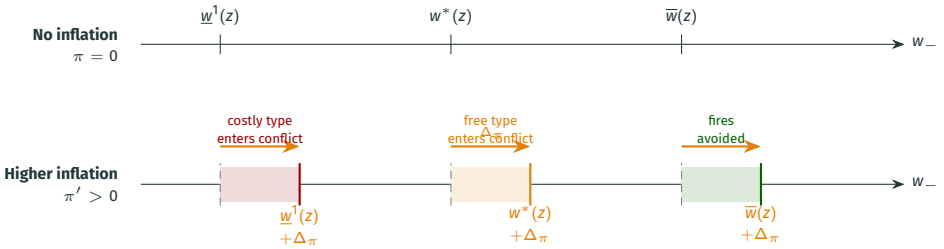
Output: $Y = \int \int_{\underline{w}^{quit}(z)+(1-\gamma)\pi}^{\overline{w}(z)+(1-\gamma)\pi} \exp\{z\}\phi(dz, dw_-) + f(\theta) \int_{\underline{z}}^{\infty} \exp\{z\}\psi(dz)$

Conflict: $\text{Conflict}_i = \lambda_i \int \int_{-\infty}^{\underline{w}^i(z)+(1-\gamma)\pi} \phi(dz, dw_-)$ [Only worker]

- Conflict_0: Conflict is free ($\kappa_{w,t} = 0$)
- Conflict_1: Conflict is costly ($\kappa_{w,t} > 0$)

Wage Regions

For fixed z, raising inflation from 0 to $\pi' > 0$ shifts each cutoff in inherited-wage space by $\Delta_\pi \equiv (1-\gamma)\pi'$.



- More conflict: inherited wages near the lower cutoffs are pushed into bargaining regions.
- More grease: inherited wages near $\overline{w}(z)$ are no longer high enough to trigger firing.

Welfare Consequences of Inflation

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Goal: What is the optimal level of long-run inflation?

Study the welfare consequences of changing **steady-state inflation**

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Welfare: "Utilitarian" $\Leftrightarrow$ Total surplus workers+firms [With linear utility $\Leftrightarrow$]

- ➢ Also measure of economic efficiency

  [Kaldor (1939), Hicks (1939), Dávila-Schaab (2025), Baqaee-Burstein (2025)]

- ➢ Redistribution does not matter for this planner [Guerreiro–Baqaee–Burstein (2026)]

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Why does it matter?

- ➢ Inflation erodes wages –> affects employment and conflict
- ➢ but, also redistributes surplus between workers and firms
- ➢ Linear utility/Total surplus approach nets out the redistribution effect

Welfare Consequences of Inflation

Proposition 1

The marginal impact of inflation on welfare is given by

$$\frac{d\mathcal{W}}{d\pi} = \overline{\mathcal{S}} \cdot \frac{dE}{d\pi} - k_v \frac{dv}{d\pi} + E \cdot \frac{d\overline{\mathcal{S}}}{d\pi} - \int_0^{\overline{\chi}} \chi \frac{d\ \text{Fires}_\chi}{d\pi} d\chi - \sum_i \kappa_{w,i} \frac{d\text{Conflict}_i}{d\pi}$$

The welfare consequences of inflation can be decomposed into:

1. **Tobin/Employment Effects**: $\overline{\mathcal{S}} \cdot \frac{dE}{d\pi} - k_v \frac{dv}{d\pi} + E \cdot \frac{d\overline{\mathcal{S}}}{d\pi}$
   - Employment rises, so welfare rises, firms post fewer vacancies
   - Composition effect $E \cdot \frac{d\overline{\mathcal{S}}}{d\pi}$
2. **Firing costs:** $\int_0^{\overline{\chi}} \chi \frac{d\ \text{Fires}_\chi}{d\pi} d\chi$
   - Firing costs fall, so welfare rises
3. **Conflict Costs**: $\sum_i \kappa_{w,i} \frac{d\text{Conflict}_i}{d\pi}$
   - Costly conflict rises, so welfare falls

Inflation is not only a wage-adjustment device.

- **Grease:** lower real default wages can preserve matches and stimulate vacancy creation.
- **Grit:** lower real default wages also push workers into costly conflict and can induce quits.
- The optimal inflation rate trades off these margins in the stationary distribution of matches.

However, these margins interact with each other as well:

- Firing risk makes workers more reluctant to conflict
- Conflict aversion dampens wage growth, which changes the size of the grease effect

Calibration

Externally Calibrated Parameters

Standard externally calibrated parameters

Parameter	Role	Value	Source
β	Discount factor	0.995	6% annual rate
π_{ss}	Steady-state inflation	0.17%	2% per year
γ	Default-wage indexation	0	Guerreiro–Hazell–Lian–Patterson (2025)
η	Matching elasticity	0.7	Shimer (2005)
α	Nash bargaining weight	0.7	Hosios $\alpha = \eta$
Ψ	Match Efficiency	0.5	Normalization
$f(\theta)$	Job-finding rate	0.4	US data

Internally Calibrated Parameters

Remaining parameter are calibrated to match: $[\rho, \sigma, \zeta, z^+, \lambda, \kappa_w, s, k_v, b, \theta, \overline{\chi}]$

1. Unemployment rate of 5.5%

2. Flow of unemployment is 50% of average wage

3. Avg. match duration 30 months

4. Exp. vacancy posting costs are 10% of wage

5. **Wage dynamics** [Grigsby, Hurst, Yildirmaz, 2021]

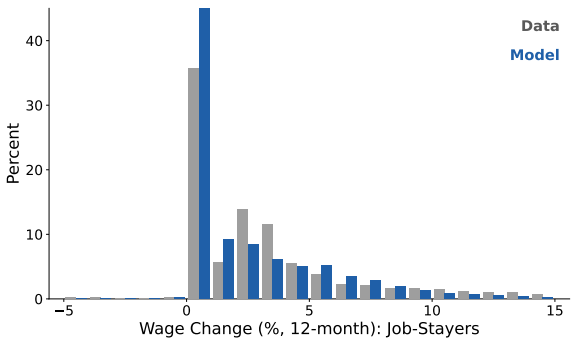
   ➢ GHY (2021): (1) Autocorrelation of wages, (2) frequency of wage changes, and (3) average, (4) st. dev., (3) skewness, (4) kurtosis of **distribution conditional** $\Delta w > 0$

6. **Firing:** 1 st. dev. drop in z triggers firing in 1.8% of matches [Ilut-Kehrig-Schneidere, 2018]

Calibration

Parameters			Matched moments		
Param.	Description	Value	Moment	Model	Data
s	Exog. separation	0.03	Avg. duration match [Shimer, 2005]	30	30
κ_V	Vacancy cost	0.12	Exp. costs to fill job [Silva–Toledo, 2009]	10% of wages	10% of wages
θ	Tightness	1.57	Unemployment rate	5.5%	5.5%
ρ	Persistence z	0.985	Persistence of wages	0.74	0.78
σ	Standard deviation z	0.02	S.d. wage raise	6.84 p.p.	7.00 p.p.
z^+	Jump size z	0.29	Skewness wage raise	2.50	2.20
ζ	Jump rate z	0.004	Kurtosis wage raise	8.9	10.5
κ_W	Conflict cost	0.048	Avg. wage raise	5.99%	6.30%
λ	Free-conflict prob.	17.8%	Frequency Ann. Wage Change	55.9%	63.9%
$\bar{\chi}$	Firing-cost UB	48.1	Firing increase [Ilut et al., 2018]	1.8%	1.8%
b	Home-prod. level	-0.719	Replacement rate	50%	50%

Wage Dynamics Fit (Untargeted)



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1. Workers
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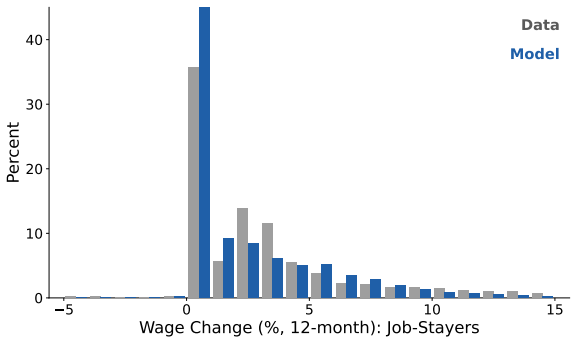

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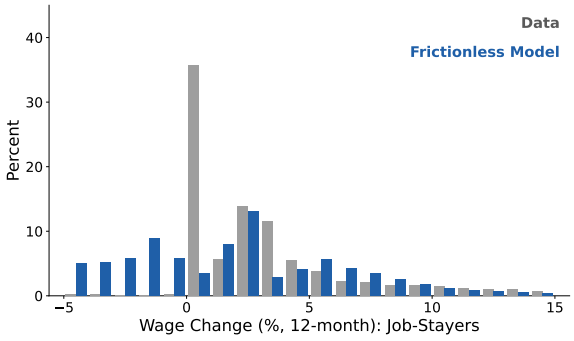
What would happen if $\kappa_w = \kappa_f = 0$?

Wage Dynamics Without Conflict Costs



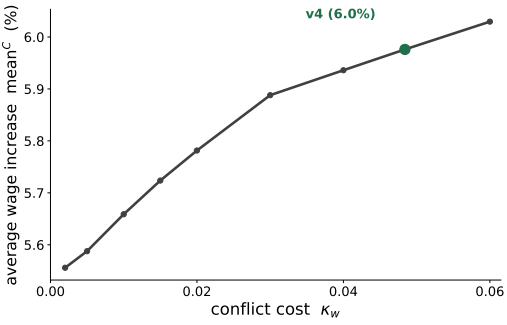
Without conflict costs, model produces:

1. Too many small changes – very high frequency of wage changes

2. Few large changes

3. Counterfactual large number of negative wage changes – not observed in data

Worker Conflict Costs and the Average Wage Growth



GHY (2021) – Average wage growth conditional on $\Delta w > 0$ is 6.3%

Worker conflict costs essential to generate **large average wage growth** (conditional on change)

Untargeted: the implied conflict threshold close to the estimated in Guerreiro–Hazell–Lian–Patterson (2025)

$$\mathbb{T} \in [1\%, 2\%]$$

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3. **Firing Effects**
4. **Conflict Effects**

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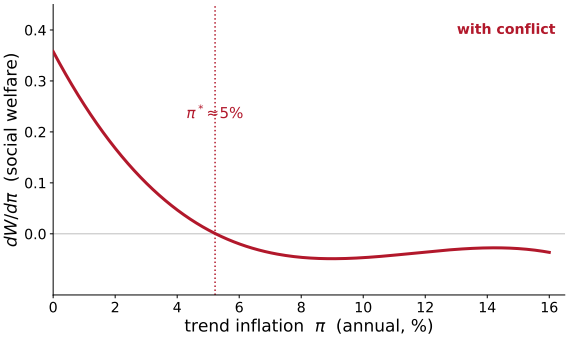


The optimal inflation rate sets

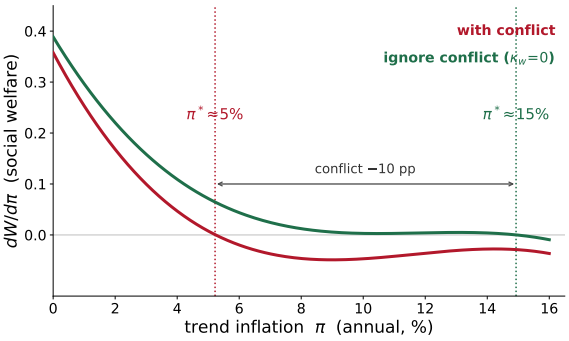
$$dW/d\pi = 0$$

$\pi^* = 5\%$ a year

The Tobin force is strong: many fires are inefficient

- ➢ But conflict costs are also strong: workers are conflict averse
- ➢ These costs limit very high inflation rates

The Optimal Inflation Rate



What would be the optimal inflation rate if conflict costs were zero?

With $\kappa_w = 0$, the labor-market optimum is much larger

$\pi^* = 15\%$ a year

Conclusion: conflict costs lower optimal inflation by about 10 pp.

Decomposing Welfare Gains

Table 1: Welfare decomposition

Effect	Inflation increase	
	5% Optimal	15% Tobin
Total welfare	$+0.22\%$	-0.13%
Tobin effect	$+0.28\%$	$+0.38\%$
Firing relief	$+0.14\%$	$+0.18\%$
Conflict cost	-0.20%	-0.69%

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Instead, conflict costs keep rising with inflation

As inflation becomes moderate, losses from conflict outweigh gains from employment and firing

Conclusion

Inflation greases labor markets, but it also creates labor-market grit.

1. **Question:** revisit the Tobin argument with several labor-market benefits and costs of inflation.
2. **Tobin force:** lower real default wages preserve matches and raise employment.
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Scope and next step: so far, we study only labor-market impacts. Future work = add standard New Keynesian inflation costs: price dispersion and related monetary distortions.

Appendix

Back

	(1)	(2)	(3)	(4)
$\Delta_5 \pi_{it}$	-0.0976***	-0.0982***	-0.0443**	-0.0548**
Std. error	(0.0150)	(0.0159)	(0.0184)	(0.0209)
p-value	0.0000	0.0000	0.0198	0.0117
Observations	847	836	847	836
Countries	66	66	66	66
Years	1975–2024	1975–2024	1975–2024	1975–2024
Country FE	No	Yes	No	Yes
Year FE	No	No	Yes	Yes

Back

	5-Year Difference			2-Year Difference		
	Job-to-Job (1)	Union (2)	Strikes (3)	Job-to-Job (4)	Union (5)	Strikes (6)
$\Delta_{t,t-5}$ Inflation	10.017***	11.150**	2.361***			
	(3.435)	(5.187)	(0.478)			
$\Delta_{t,t-2}$ Inflation				3.486	7.468**	0.929**
				(2.496)	(3.093)	(0.400)
Observations	282	1,308	1,962	381	1,419	2,196