Wage Bargaining, Job Matching, and the Great Depression

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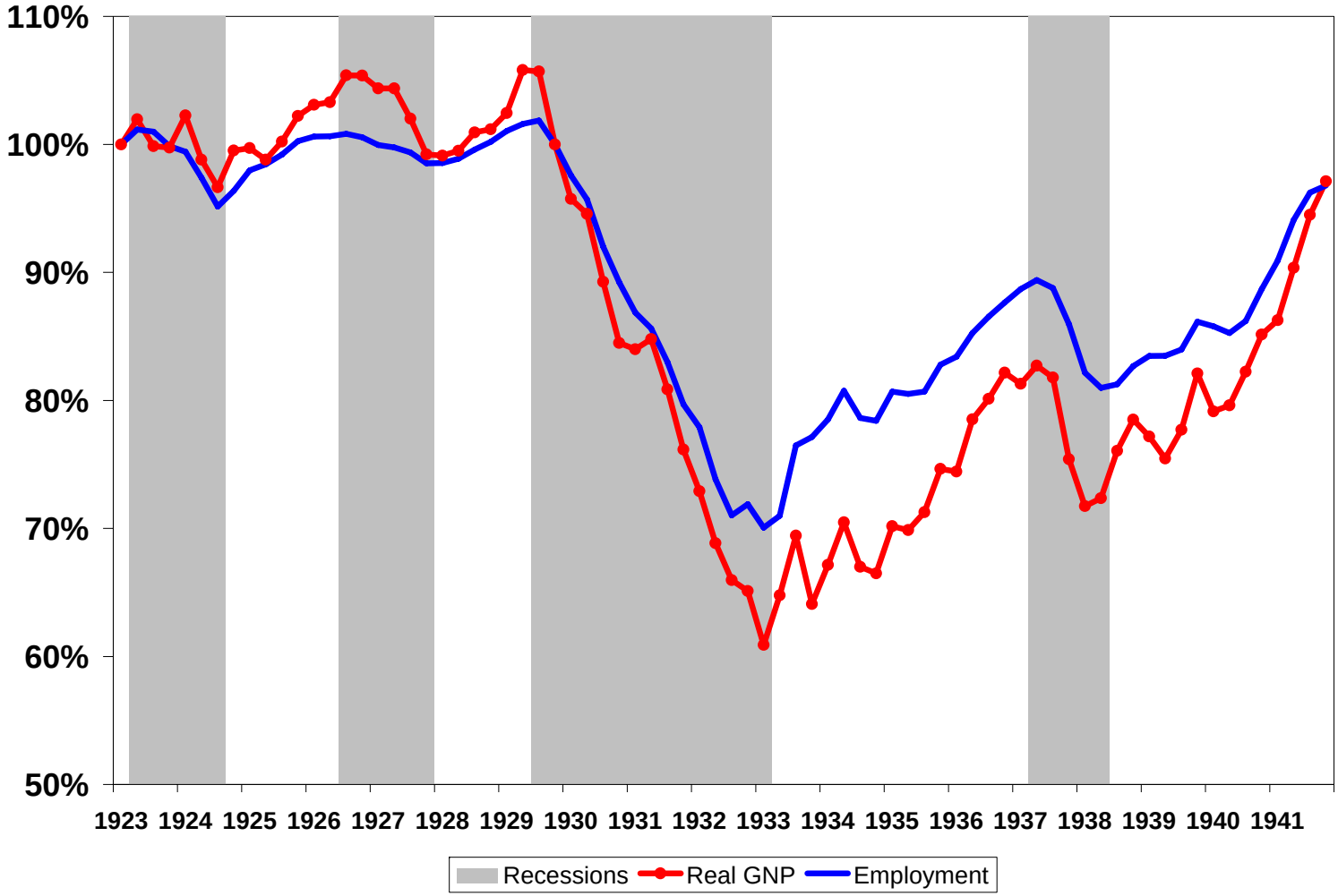
Output, employment (% of trend): 1923-1941

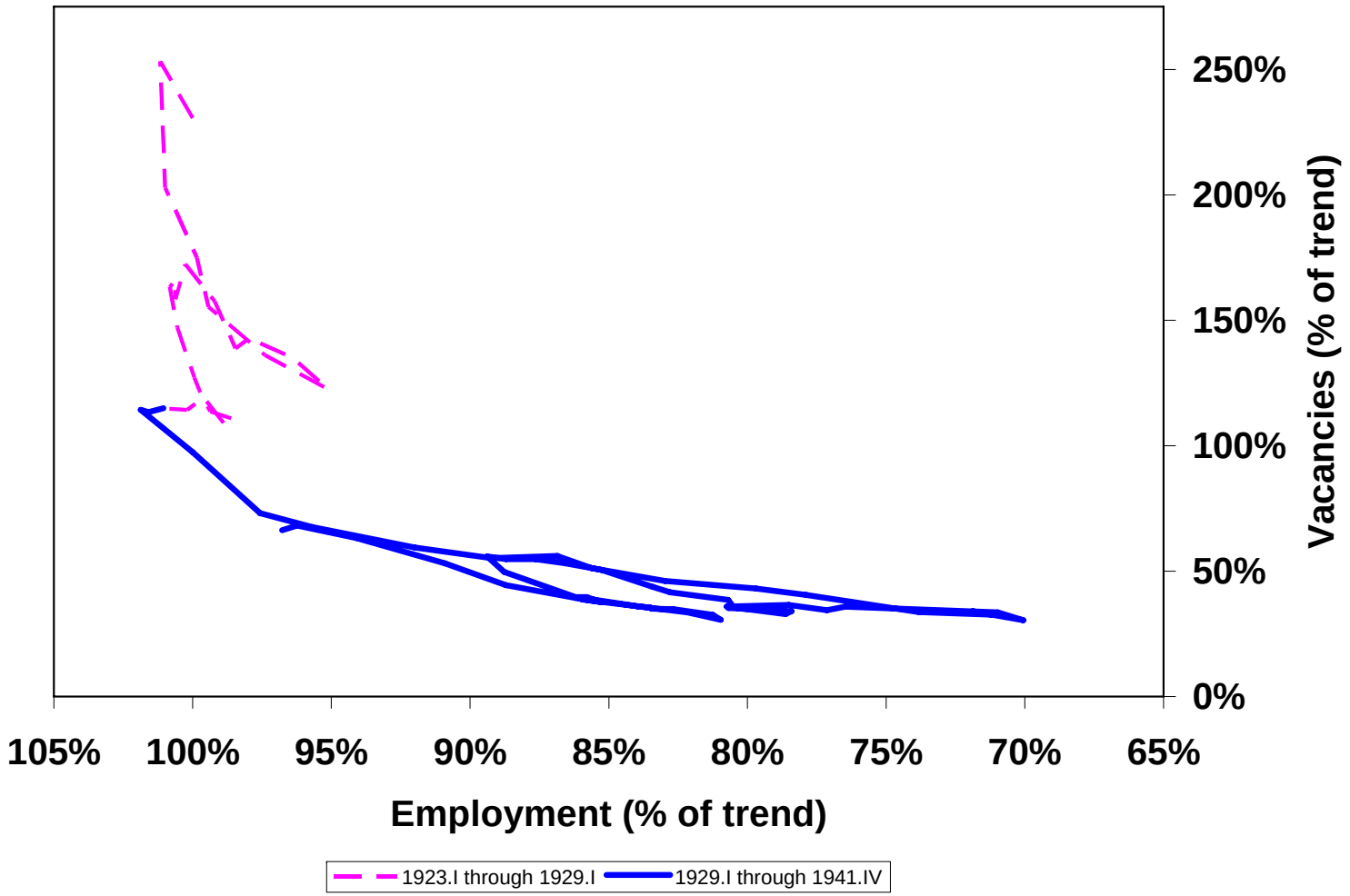


The role of labor policy?

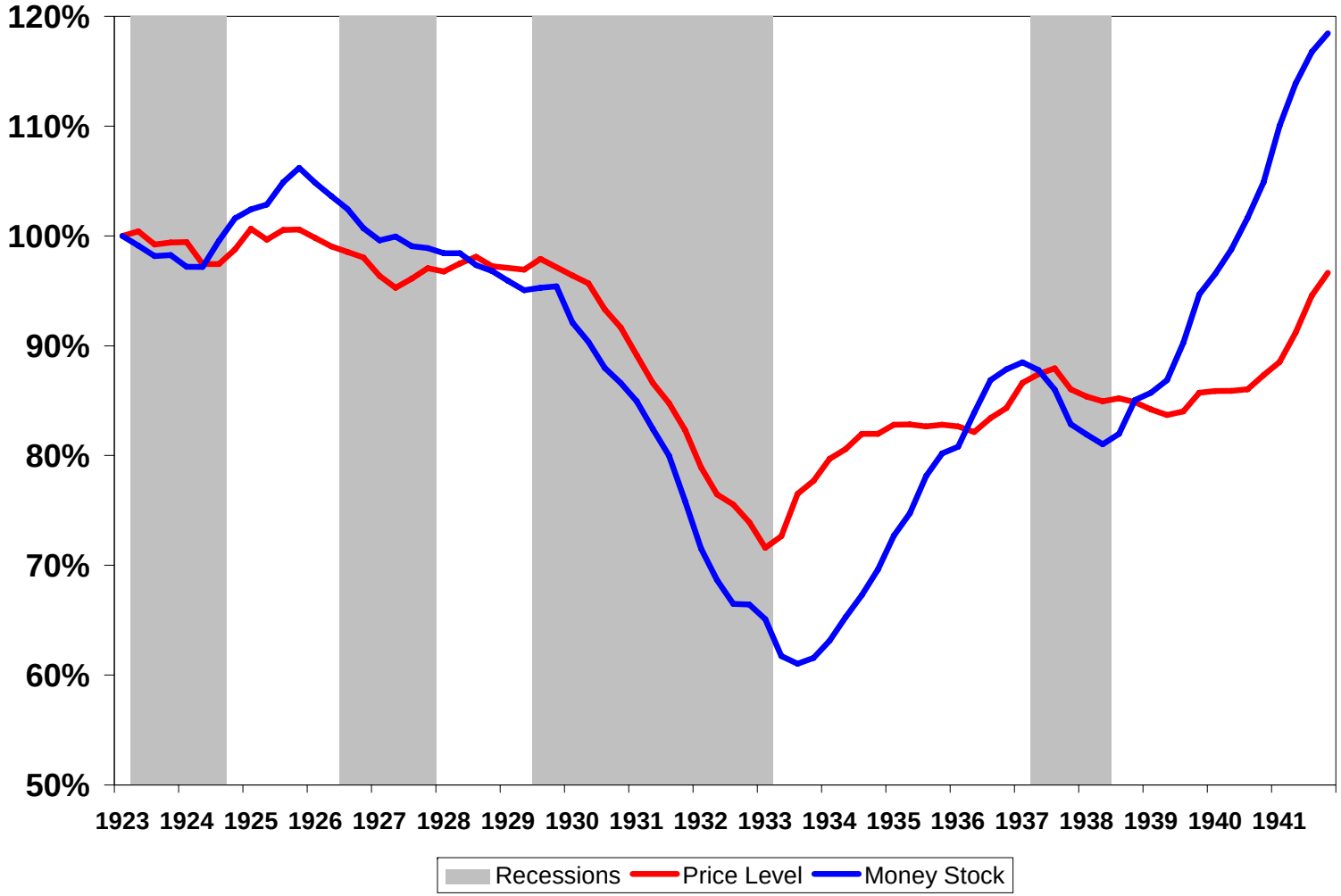
- Bernstein (1963): 1920s “lean years” for workers.
- Gitelman (1992): Anti-union policies, “welfare capitalism,” company unions.
- Railway Labor Act, Norris-LaGuardia Act, court cases.
- Barber (1985), Kennedy (1999), Hoover (1952): Hoover’s policies and views on wages vs. FDR.
- Trade union density: 9.6% in 1928 vs. 20.7% in 1939.

Labor's share of gross income, 1919-1941

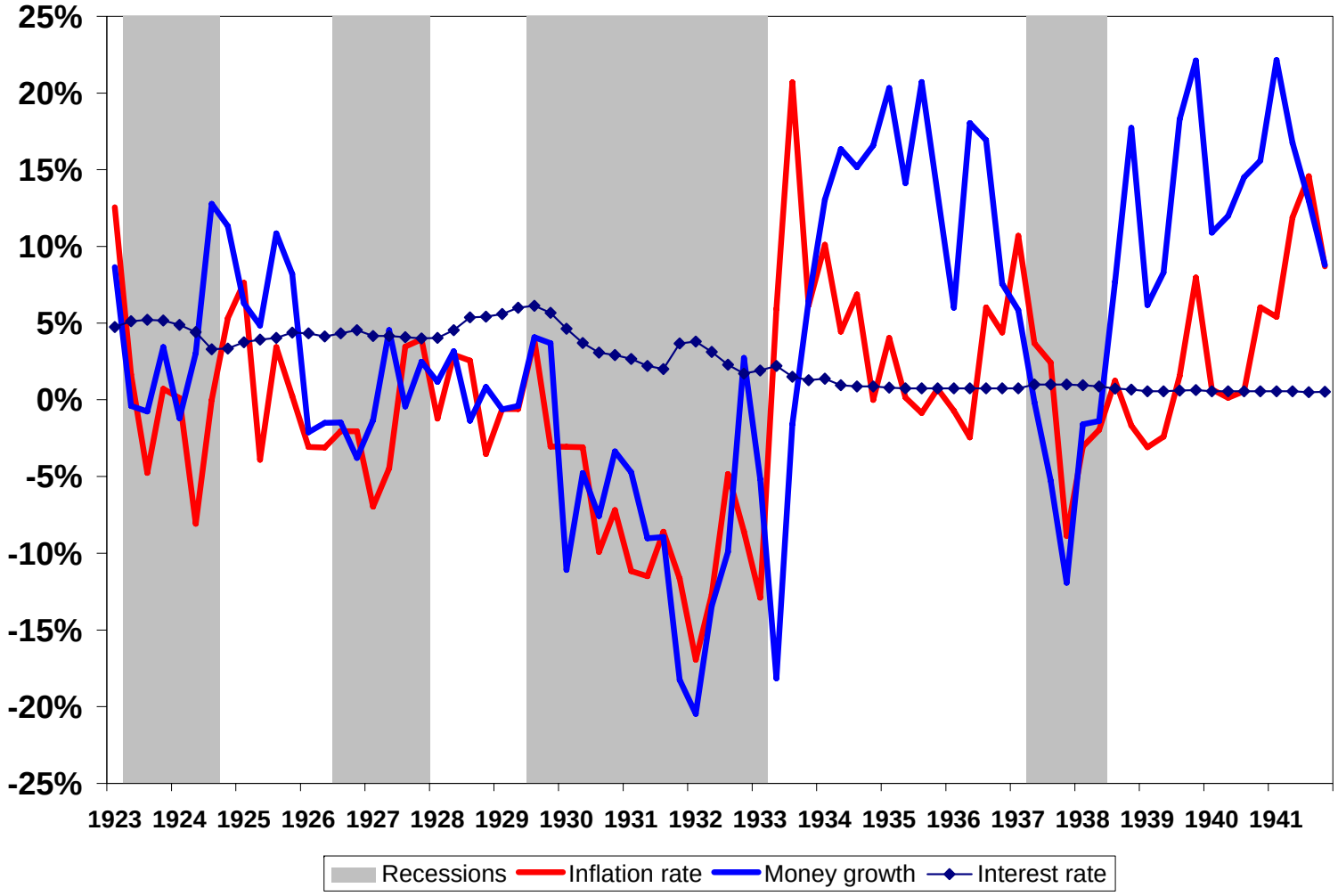
Vacancies, employment (% of trend), 1923-1941



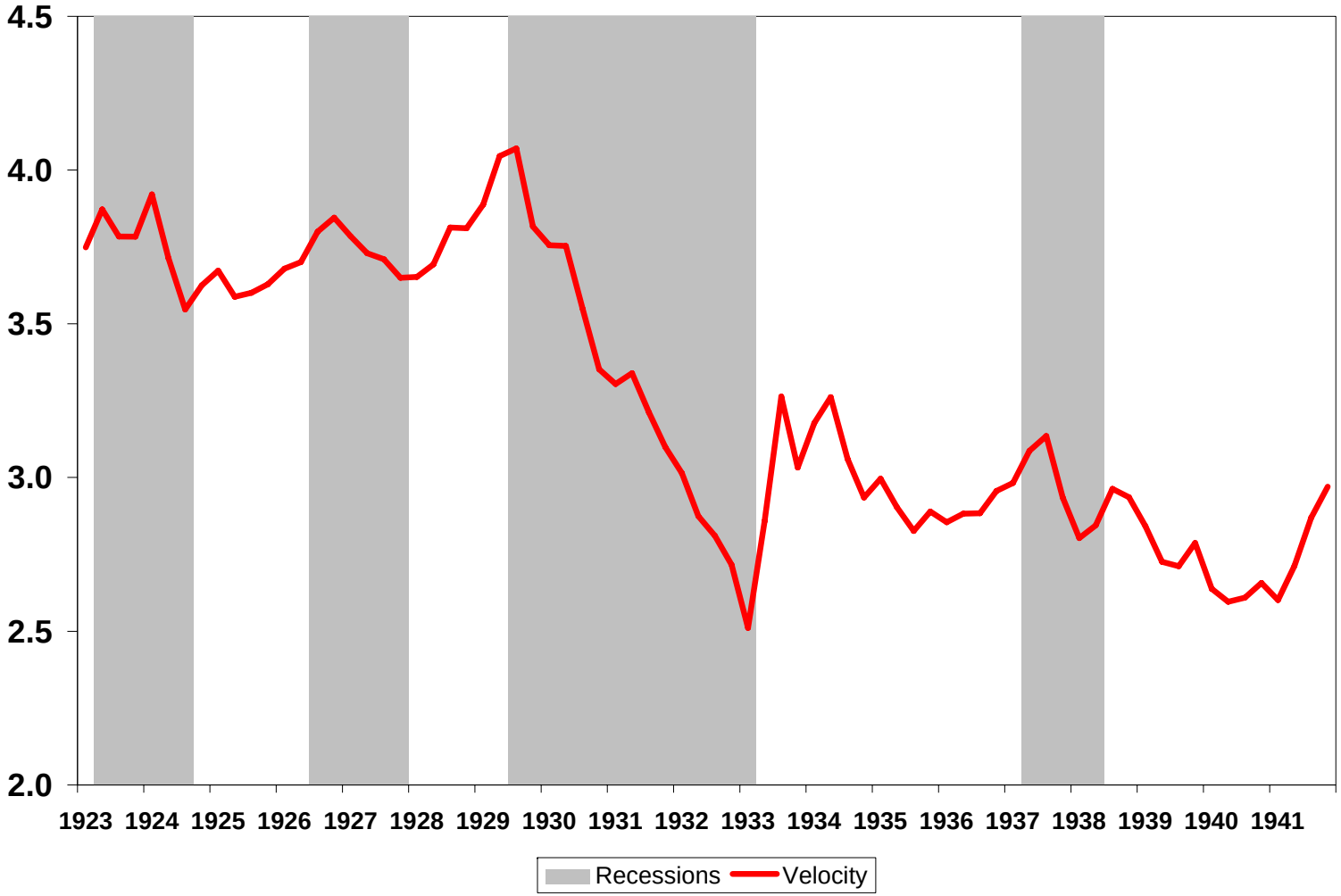
Prices, money stock (% of trend), 1923-1941



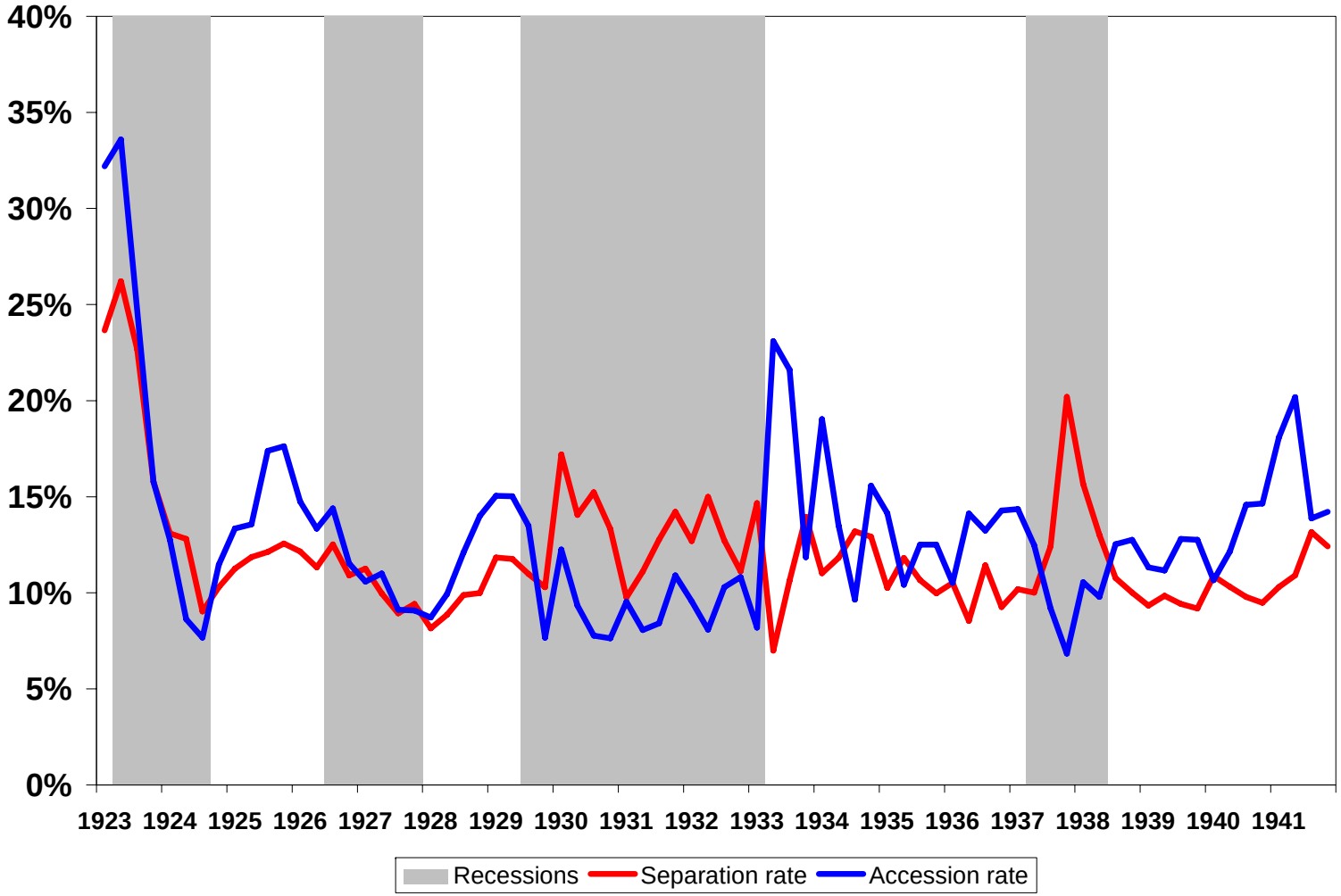
Inflation, money growth, and interest, 1923-1941



Velocity of money stock (PY / M), 1923-1941



Worker turnover rates, 1923-1941



Outline of a structural model - Wholesalers

- Production happens in a worker-firm match:

$$y_{it} = a_{it} \bar{z}_t z_t \ .$$

- Worker gets share η_t of surplus from Nash bargaining.

- Wholesalers post vacancies freely at marginal cost $\gamma \bar{z}_t$.

- Matches made through a matching function.

Outline of a structural model - Retailers

- Buy output from wholesalers competitively, mark it up.
- Face downward-sloping demand curve.
- Can change their retail prices with frequency $1 - \omega$.
- This all yields a “New Keynesian Phillips Curve”.

Outline of a structural model - Households

- Households' utility over consumption and labor:

$$E_t \sum_{i=0}^{\infty} \beta^i \left[\frac{C_{t+i}^{1-\sigma}}{1-\sigma} - \chi_{t+i} A_{t+i} \bar{z}_{t+i} \right]$$

- Stochastic transactions technology:

$$P_t C_t = V_t M_{t+1}$$

Outline of a structural model – Shock processes

$$\ln(\Theta_t) = (1-\rho_m)\ln(\overline{\Theta}) + \rho_m \ln(\Theta_{t-1}) + \varepsilon_t^{\Theta}$$

$$\ln(\bar{z}_t) - \overline{\Gamma} t = \rho_{\bar{z}}\left[\ln(\bar{z}_{t-1}) - \overline{\Gamma}(t-1)\right] + \varepsilon_t^{\bar{z}}$$

$$\ln(z_t) = \rho_z \ln(z_{t-1}) + \varepsilon_t^{z}$$

$$\ln(V_t) = (1-\rho_V)\ln(V) + \rho_V \ln(V_{t-1}) + \varepsilon_t^{V}$$

$$\ln(\eta_t) = (1-\rho_\eta)\ln(\eta) + \rho_\eta \ln(\eta_{t-1}) + \varepsilon_t^{\eta}$$

$$\ln(A_t) = (1-\rho_A)\ln(A) + \rho_A \ln(A_{t-1}) + \varepsilon_t^{A}$$

Estimation strategy

- State-observer setup with Kalman filter:

$$x_t = A_1 x_{t-1} + B_1 \varepsilon_t$$

$$x_t^* = D_1 x_t + \varepsilon_t^*$$

- Variances of driving processes estimated by MLE.

- Variances of measurement errors set using likelihood.

Calibration

- Model calibrated to match some long-run ratios:

Real interest rate	=	4.5% / yr
Output growth per capita	=	1.7% / yr
Unemployment rate	=	5.0%
Worker finding rate	=	70% / qtr
Job finding rate	=	60% / qtr
Total separation rate	=	10% / qtr
Exogenous separation rate	=	6.8% / qtr
Frequency of price changes	=	0.33 / qtr
Gross markup rate	=	110%
Consumption utility parameter	=	2
Contribution of u to matching	**=**	***0.4***
Vacancy posting costs	**=**	***1.0% of Y***
Std. of log(a_{it})	=	0.13

Calibration

- More calibrations – quarterly persistence coefficients:

Persistence on money growth	=	0.75
Persistence on temp. productivity	=	0.4
Other persistence coefficients	=	0.999

- As a result:

Disutility of work A	=	0.835
Labor's bargaining power η	=	0.461

Calibration

- More calibrations – observation errors via likelihood.

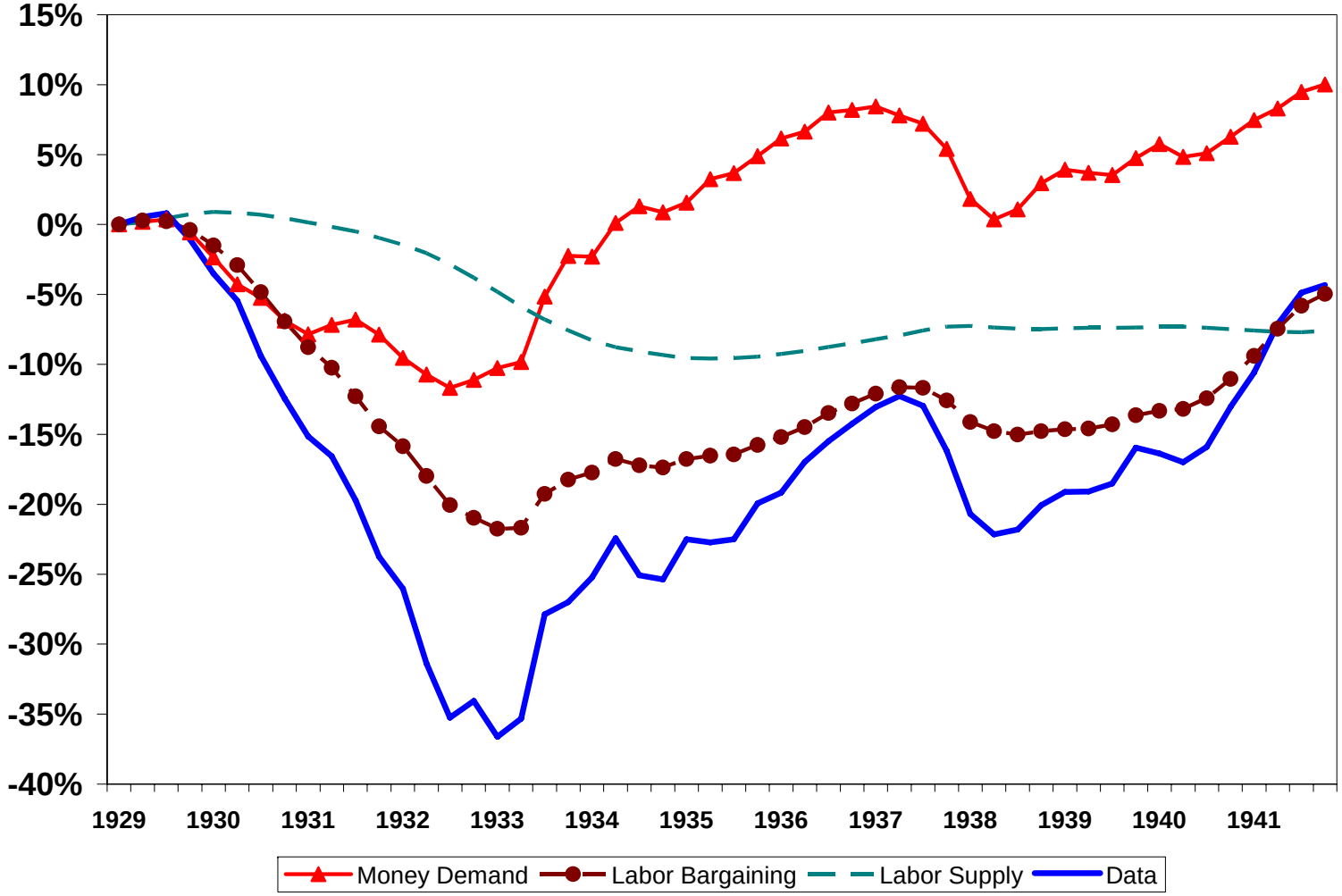
Std. Dev:	Inflation	=	0.015
	Output	=	0.015
	Employment	=	0.01
	M growth	=	0.025
	Interest rate	=	0.001
	Labor share	=	0.055
	Vacancies	=	0.40
	Separation rate	=	0.17
	Accession rate	=	0.17

Estimated parameters

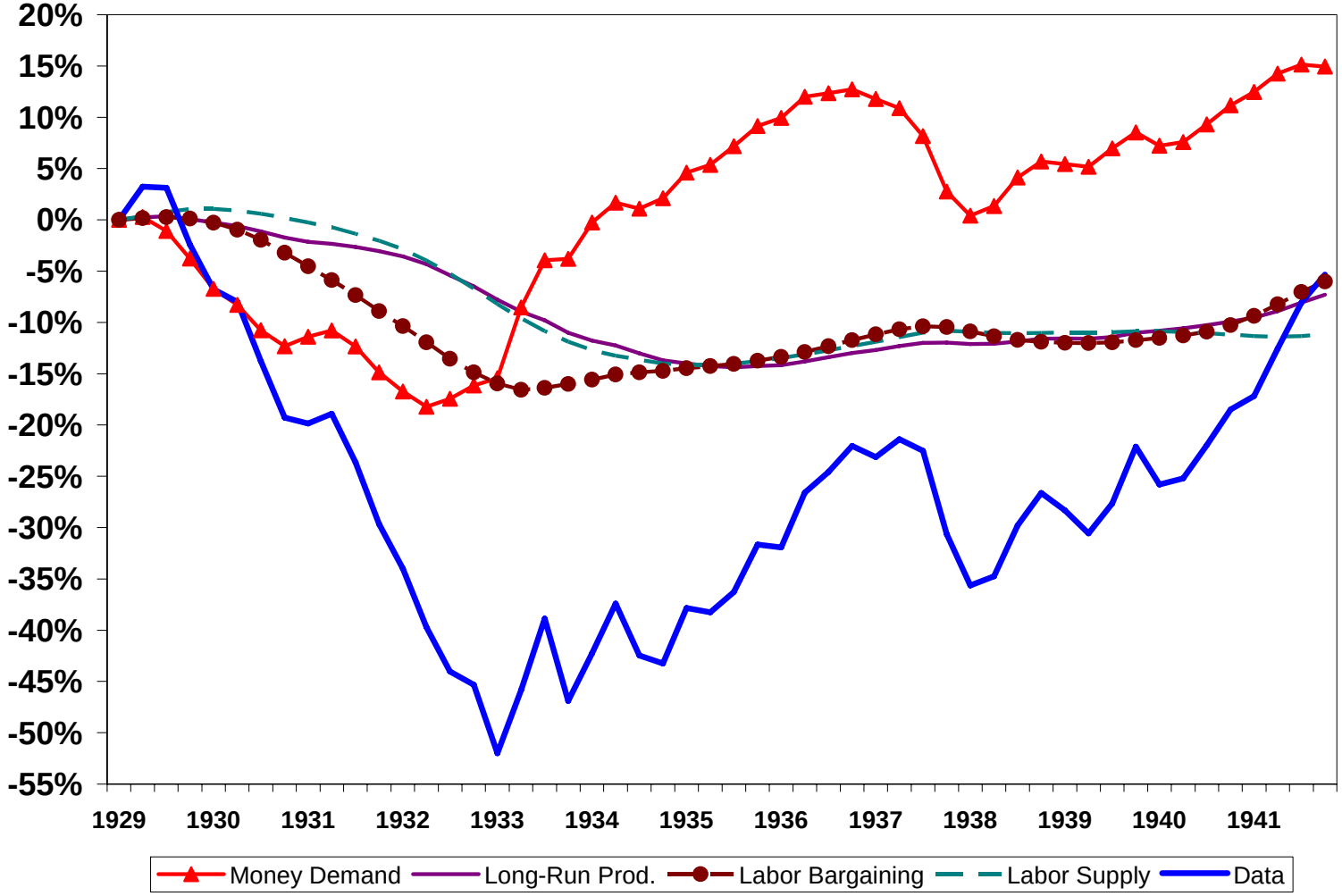
- Shocks to driving processes:

Std. Dev:	Money growth	=	0.0009
	Money demand	=	0.0336
	Short-run prod.	=	0.0124
	Long-run prod.	=	0.0136
	Bargaining power	**=**	***0.1365***
	Labor disutility	=	0.0063

Effects of shocks on employment (1929.I = 0)



Effects of shocks on output (1929.I = 0)



Discussion – Bargaining shocks

- Bargaining shocks: Most important residual.

- Account for most of the behavior of employment.

  22% fall in employment, 1929.I to 1933.I.

  17% fall in employment, 1929.I to 1935.II.

- Persistent increase in labor's share.

- Persistent downward shift in Beveridge Curve.

Discussion – Labor supply, money, productivity

- Labor supply shocks: Large part of slow recovery.

  Small role in contraction.

- Productivity shocks affected output, not employment.

- Nominal shocks play some role in contraction, none in slow recovery.

  See also Bordo, Erceg, and Evans (2000).

Conclusions

- The bargaining power hypothesis fits the macro data.

  Large, persistent increase in labor's share.

  Reduced vacancies, hiring.

  Slow recovery.

- Less reliance on labor supply shocks than other models.

- Monetarist / New-Keynesian, RBC hypotheses do not fit these facts.