Political Distribution Risk and Aggregate Fluctuations

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Federal Reserve Bank of Philadelphia

Big picture

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"A popular framework for thinking about labor law is to consider a **pendulum that can range from strong bargaining power for labor** ... **to strong bargaining power for companies** ...."
Budd (2012), 'Labor Relations – Striking a Balance,' 4th ed.

Changes in

1. statutory labor law,
2. case law, and
3. political climate

matter for aggregate fluctuations, income shares, and asset prices.

What we do

1. Empirics:
   - International evidence: Redistribution risk after political events.
   - U.S. states: Right-to-work legislation.
   - U.S. time series: Proxy VAR to identify redistribution shocks.
2. Theory:
   - RBC model with labor frictions and bargaining.
   - Political distribution risk as shocks to workers' bargaining power.

Related literature

Determinants of factor shares:

Castañeda *et al.* (1998), Choi and Ríos-Rull (2009), Karabarbounis and Neiman (2014), Elsby *et al.* (2013), Oberfield and Raval (2014), Ríos-Rull and Santaeulalia-Llopis (2010), Rognlie (2015).

Bargaining power and factor shares:

Blanchard and Giavazzi (2003), Kumhof and Ranciere (2010), Kumhof *et al.* (2012), Liu *et al.* (2013), Figura and Ratner (2015), Furlanetto *et al.* (2016).

Bargaining and aggregate fluctuations:

Hall and Milgrom (2008), Hall (2009), Shimer (2005 and 2009).

Macro asset pricing:

Danthine *et al.* (2008), Lansing (2015), Greenwald *et al.* (2016).

Fluctuations in income shares

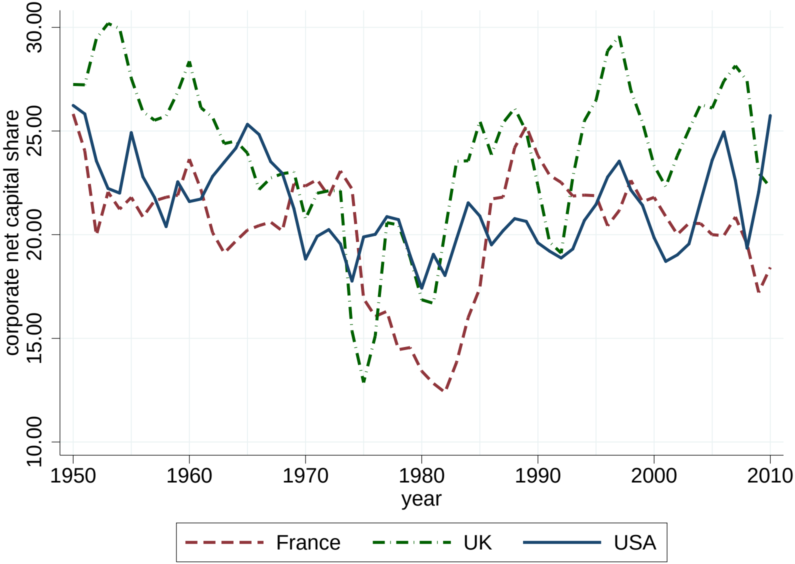

Figure: Data from Piketty and Zucman (2014)

International case studies

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Argentina: Anti J.&I. Perón coups, democratic transition

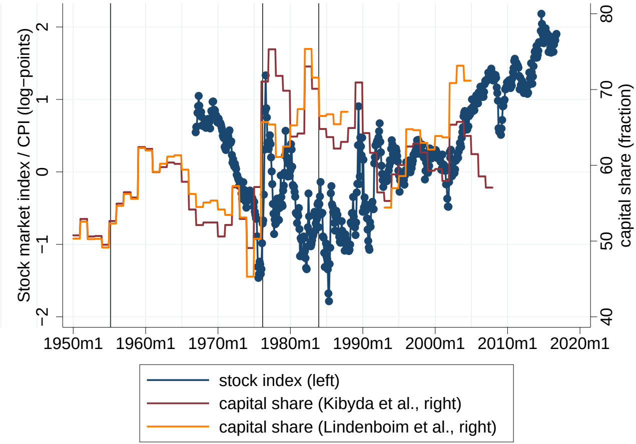
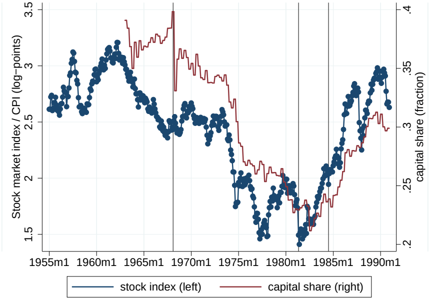


Figure: Capital share, stock market indices, and major government changes

International case studies

France: Mitterrand's election and turn



Germany: Brandt and Kohl

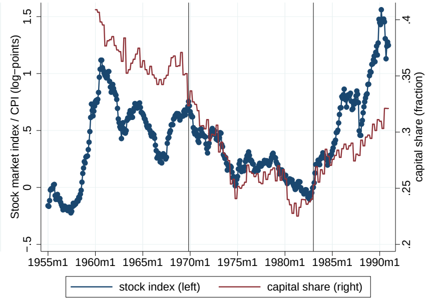


Figure: Capital share, stock market indices, and major government changes

International labor law

- CBR Leximetric data on labor law (Adams *et al.*, 2016)

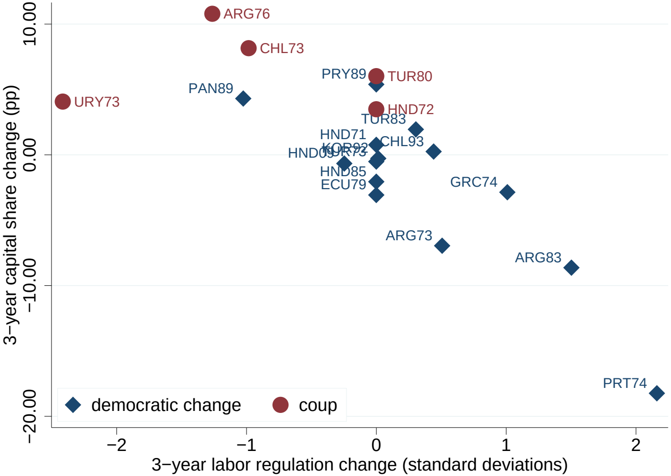
  117 countries, 1970–2013.

- Instrument with large political events: Coups and democratic transitions.

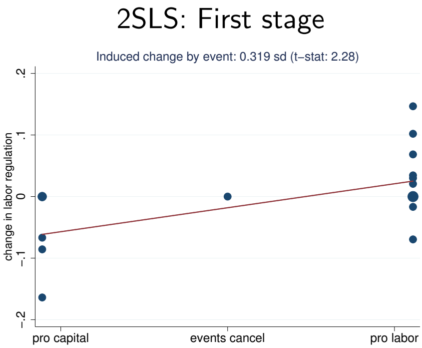
  Coups from Powell and Thyne (2011), democratic elections from Bormann and Golder (2013).

- Placebo effect regressions in paper.

Political transitions: Δlabor law vs. Δcapital shares



Regression results



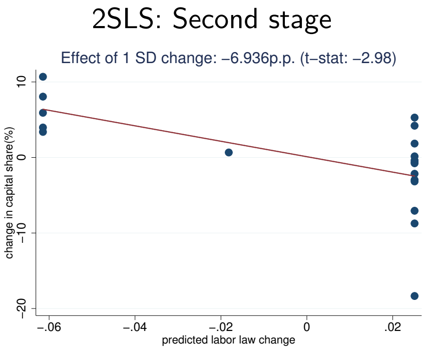


Figure: Political events and labor regulation changes

U.S. labor law

- Modern labor law introduced in New Deal era:
  - Norris-La Guardia act (1932): Protects unions from courts.
  - Wagner Act (1935): Right to bargain, Illegal employer actions, National Labor Relations Board.
- Post WWII: Taft-Hartley act (1947)
  - Restricts union actions, reforms National Labor Relations Board.
  - Right-to-work legislation.
- Today: "Static" statutes, "dynamic and voluminous" NLRB case law (Budd, 2012).
  - Only change from 1970 to 2013 in Adams *et al.* (2016): WARN Act (1987)
  - But: Late adopters of right-to-work legislation.

Evidence from right-to-work (I)

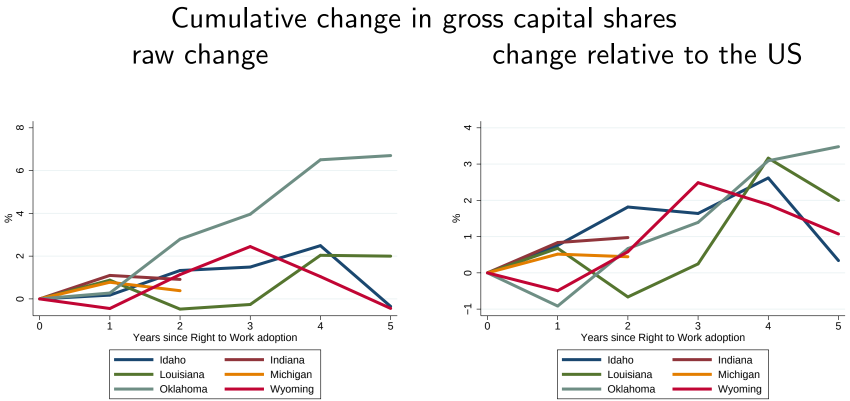


Figure: Change in state private industry capital shares after right-to-work adoption.

Evidence from right-to-work (II)

Table: State-Industry panel regression: Right-to-work laws and gross capital share

Controlling for census region FE, year FE, and industry FE

	Level	1y change	2y change	3y change	4y change	5y change
Right to Work	1.38					
	(0.00)					
Change in RtW		0.77	0.88	1.04	1.35	1.53
		(0.48)	(0.34)	(0.22)	(0.12)	(0.07)

Controlling for state FE, and industry FE

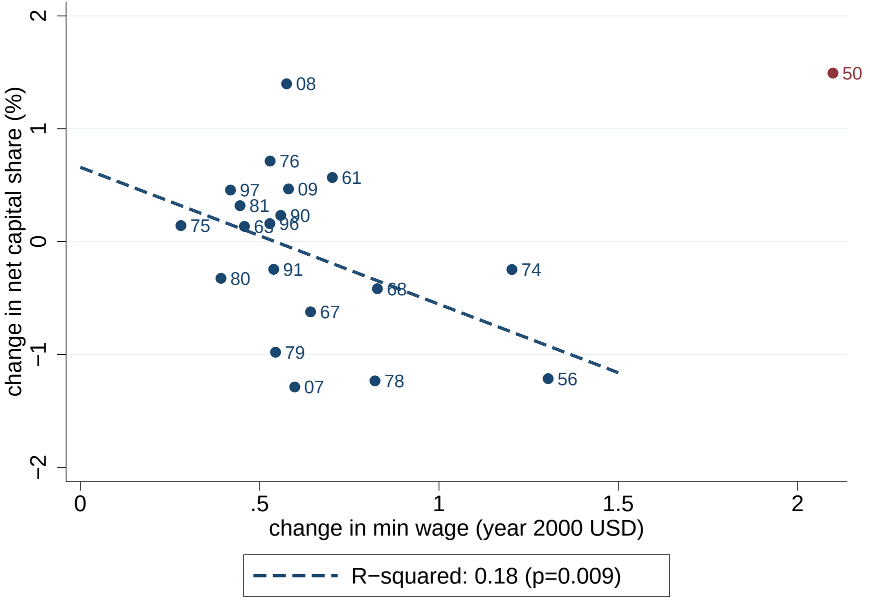
	Level	1y change	2y change	3y change	4y change	5y change
Right to Work	-0.20					
	(0.85)					
Change in RtW		0.61	1.24	1.86	1.78	1.64
		(0.59)	(0.19)	(0.04)	(0.04)	(0.06)

- Before 1997: Private SIC industries. From 1997: Private NAICS industries.
- Standard errors clustered by state and industry. 2-sided *p*-values in parentheses.

Proxy VAR

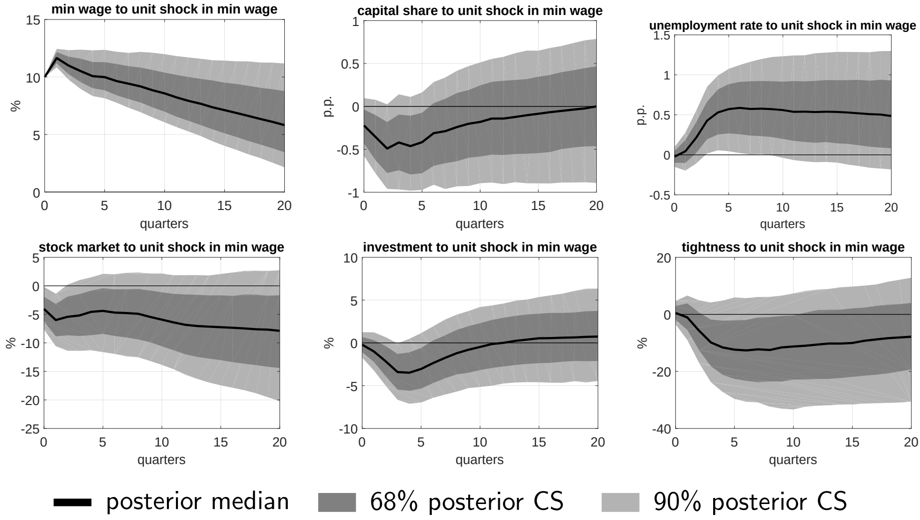
- Proxy VAR (Stock and Watson, 2012; Mertens and Ravn, 2013):
  - Identify shock under IV assumptions instead of zero or sign restrictions.
  - Use Bayesian version in Drautzburg (2016).
- Proxy: Changes in statutory minimum wage, converted to $2000.
  - Akin to increase in effective bargaining power (Flinn, 2006).
  - Spillover effects: Autor, Manning, and Smith (2016).
- VAR specification:
  - 10 variables covering production, labor market, and industry returns.
  - Sample period: 1951q1 to 2014q2.
  - 4 lags, quadratic trend.

Capital share vs. proxy variable



Impulse-responses

- Quadratic trend



Model

- RBC model with search and matching frictions.
  (Andolfatto, 1996; Merz, 1995; Shimer, 2010)
  - Household with a continuum of members. Members are either employed or unemployed.
  - Household insures members against idiosyncratic employment risk.
  - Competitive firms that choose recruiting intensity.
  - Government.
  - Complete markets.
- Bargaining power subject to persistent redistribution shocks.

Model: Wage determination

- Generalized Nash bargaining between firms and households. Households' bargaining power: ϕ.

- Equilibrium wage solves

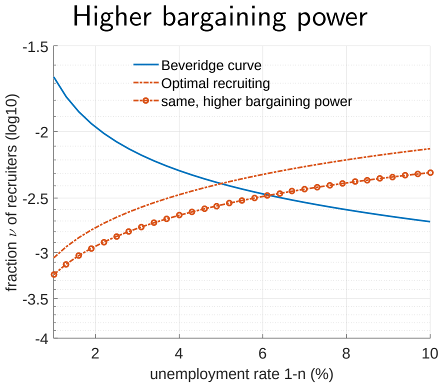
$$w = \arg\max_{\tilde{w}} \tilde{V}_n(\tilde{w})^{\phi} \tilde{J}_n(\tilde{w})^{1-\phi}.$$

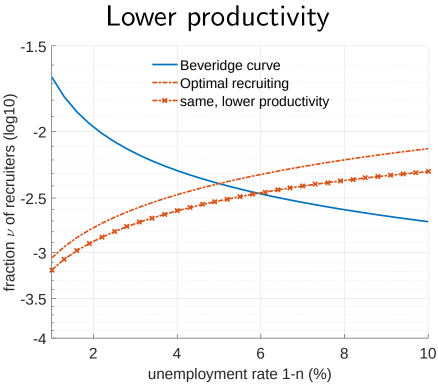
$\tilde{V}_n$ and $\tilde{J}_n$ are marginal values of employment for households and firms given an arbitrary wage $\tilde{w}$.

- Equilibrium wage along the balanced growth path:

$$\bar{w} = \bar{\phi} \times (1 + \bar{\theta})\overline{mpl} + (1 - \bar{\phi}) \times \frac{\sigma}{1 - \tau_n} \left(\frac{\gamma \bar{c}}{1 + (\sigma - 1)\gamma \bar{n}} \right).$$

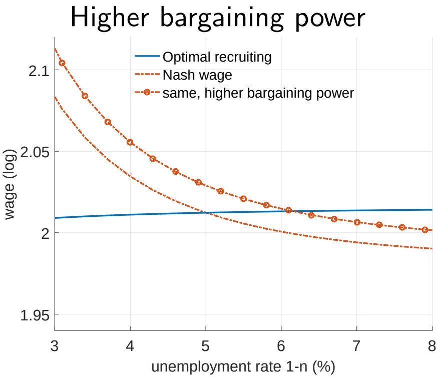
Identification (I)

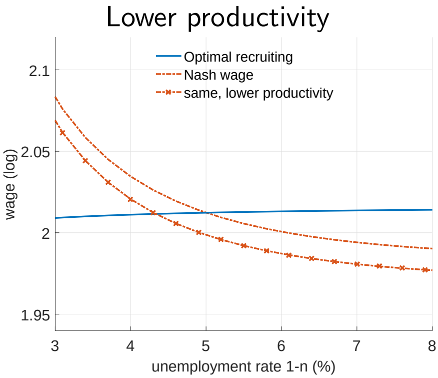




No constant consumption

Identification (II)





Identification (III)

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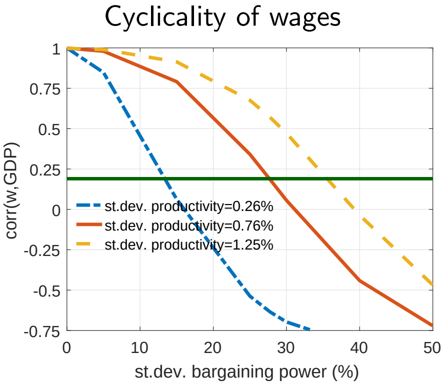

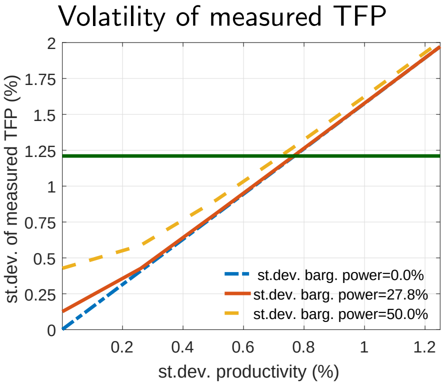

Moment matching

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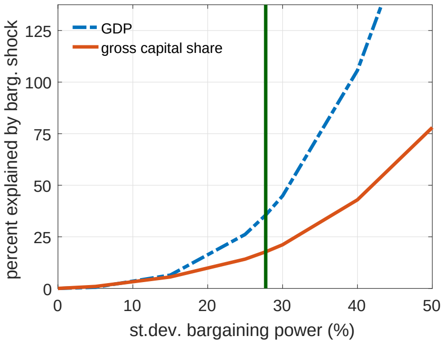
- Solve using pruned 3rd-order approximation (Andreasen *et al.*, 2017).
- Select β, δ_0, α, and τ_k to match moments from corporate non-financial business sector:
    1. 31.2% gross capital share.
    2. 12.7% gross depreciation share.
    3. 29.9% share of taxes in net surplus.
    4. 2.3 annual K/Y ratio.
- Match labor market statistics following Shimer (2010).
- Parametrized productivity and bargaining power process to match:
    1. 1.6% annual labor productivity growth.
    2. Volatility of measured TFP given persistence $0.95^{1/3}$.
    3. Cyclicality of wages for half-life of 8–9 years (3–4yrs, 20 yrs).
    4. Relative standard deviation of investment I relative to Y.

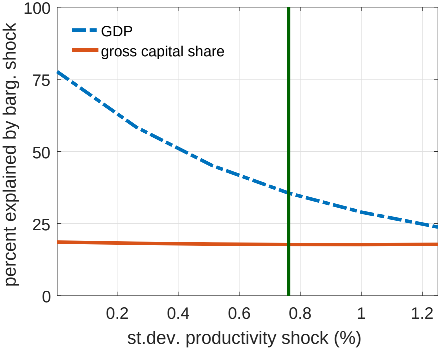
Approximation quality | NIPA mapping | All parameters

Volatility explained by bargaining shocks

Size of bargaining power shocks



Size of productivity shocks



Business cycle statistics

Table: Standard deviations – 1947Q1–2015Q2

	Y [%]	$\frac{std(I)}{std(Y)}$	$\frac{std(C)}{std(Y)}$	std(ncs) [pp]	std(cs) [pp]	std(w) [%]	std(TFP) [%]
U.S. data	1.99	3.28	0.58	1.07	0.86	0.95	1.21
Baseline model	2.01	3.28	0.59	0.36	0.17	1.31	1.21
No barg. shock	1.31	3.73	0.49	0.18	0.02	1.14	1.20
RBC model	1.89	3.28	0.60	0.25	0.00	0.92	1.21

- Hansen (1985)-Rogerson(1988): Labor supplied one period in advance, wages set on the spot.
- Also, less interesting, RBC model with α shocks.

alternative RBC

Business cycle statistics

Table: Cyclicality – 1947Q1–2015Q2

	Y	I	C	ncs	cs	w	TFP
U.S. data: cyclicality	1.00	0.91	0.84	0.57	0.36	0.19	0.78
Baseline model: cyclicality	1.00	0.96	0.98	0.87	0.33	0.19	0.71
No barg. shock: cyclicality	1.00	0.99	0.99	0.97	0.89	1.00	1.00
RBC model: cyclicality	1.00	0.98	0.99	0.98	NaN	0.96	0.99

alternative RBC

Model variations

- Calibrate to composition-adjusted wage rate post 1980. show
- Match UE volatility instead of wages. show
- Lower and higher persistence of bargaining power shocks. show
- Lower and higher elasticity of substitution in CES production. show
- Monopolistic competition with and without fixed cost. show
- Systematic redistribution. show

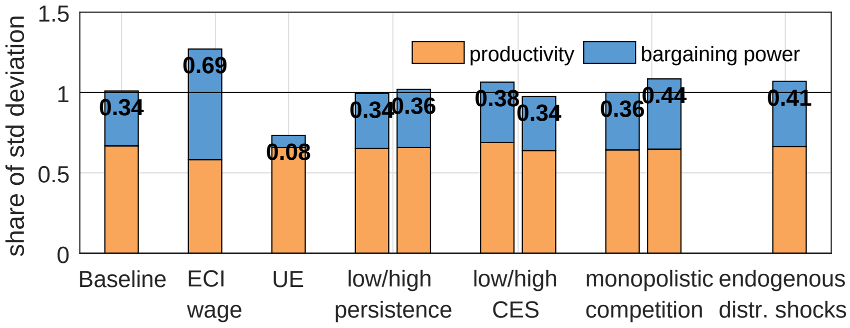


Figure: GDP

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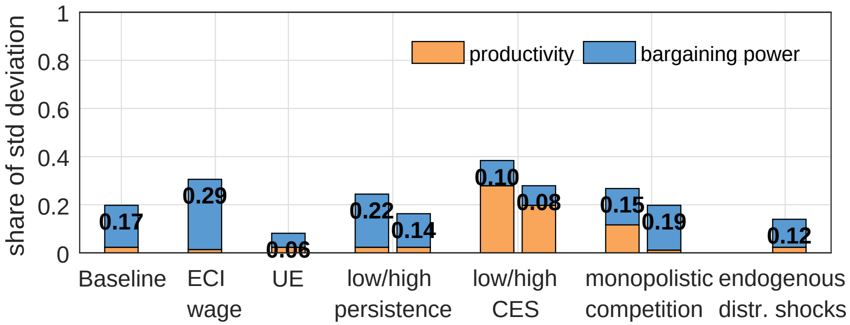
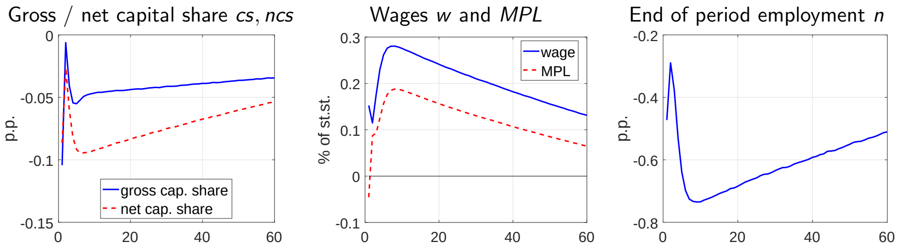
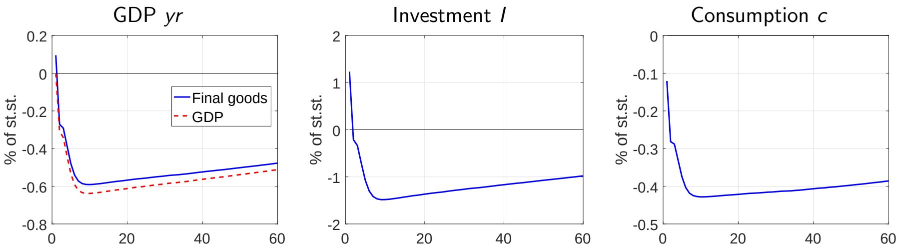


Figure: Gross capital share

Dynamic effects of bargaining shock



Dynamic effects of bargaining shock



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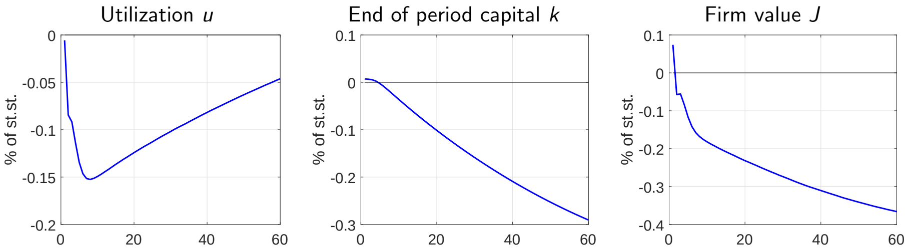
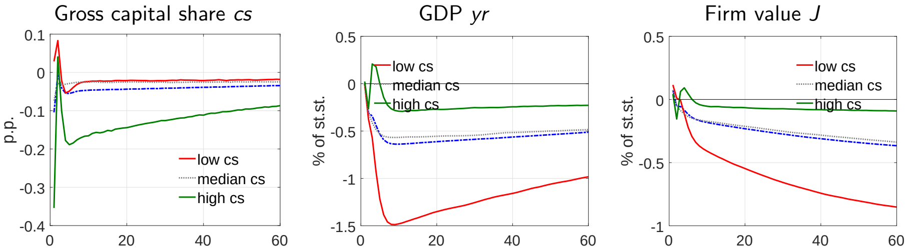


State-dependent dynamics after bargaining shock



Welfare effects of bargaining power volatility

- U.S. capital share 98% more volatile from 1929–1949 than from 1950-2010.
- U.K. capital share 39% more volatile from 1950–2010 than in the U.S.

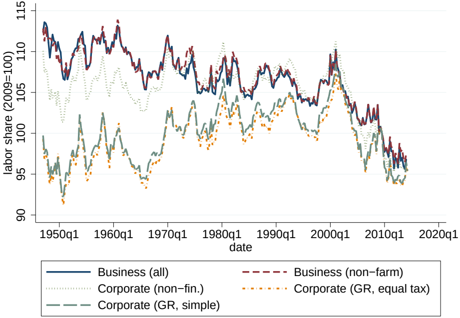
Table: Welfare effects of increased or reduced political distribution risk

Specification	std(Y) [%]	$\frac{\text{Std(C)}}{\text{StdY}}$	Std(n) [%]	Welfare: Δ baseline Consumption units
Baseline	2.01	0.59	1.86	0
40% higher capital share volatility	2.43	0.60	2.50	–0.9%
100% higher capital share volatility	3.11	0.60	3.48	–2.1%
No redistribution risk	1.31	0.49	0.15	+2.7%

Summary

1. Document redistribution between capital and labor after political events
   - Change in government.
   - Right to work.
   - Minimum wages.
2. Quantify potential redistribution risk for U.S. economy
   - Redistribution risk accounts for 6–29% of capital share in calibration and 8–69% of output fluctuations.
   - Bargaining power shocks generate volatile unemployment rate.
   - Permanently increasing redistribution risk by 40% (U.S. $\nearrow$ U.K.) makes output 20% more volatile and lowers welfare by 0.9 p.p. of consumption.
   - Small one-time redistribution shock leads to 0.6% contraction for 0.1 p.p. increase in the labor share.
   - Further redistribution more harmful when income distribution polarized.

Different sectoral definitions matter little



	std($\ln ls_t$)	
Sector	Raw	HP-filtered
Business (all)	3.6	1.09
Business (non-farm)	3.49	1.07
Corporate (non-fin.)	3.32	1.2
Corporate (GR, equal tax)	3.29	1.46
Corporate (GR, simple)	3.37	1.36

back

Different sectoral definitions matter little

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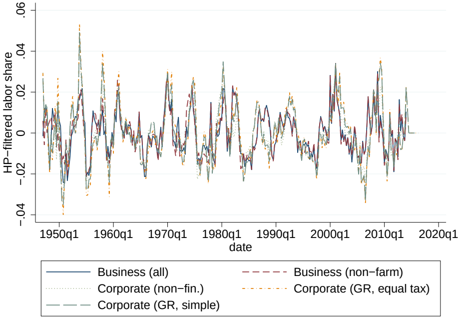

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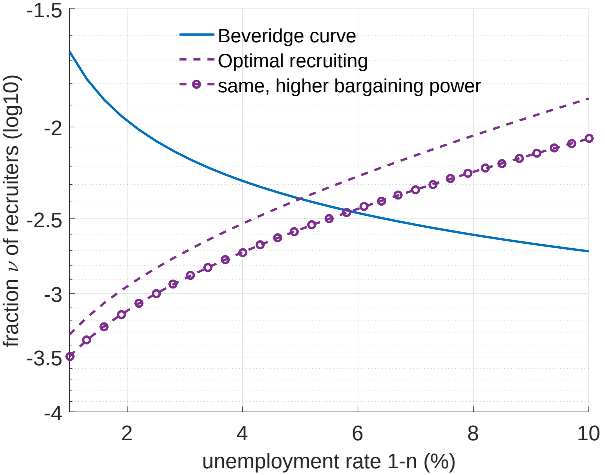
No constant v. constant consumption

- Here: constant consumption.



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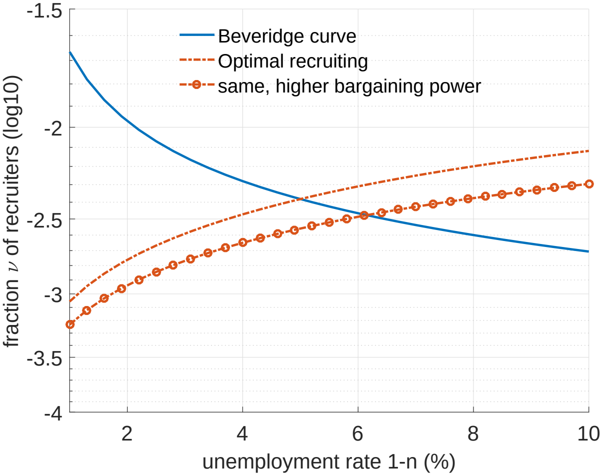

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Approximation quality

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$$EE(s_t) = \left| 1 - \frac{u_c^{-1}\left(\mathbb{E}_t\left[\beta_t g_z^{-\sigma} u_c(c(s_{t+1}); n(s_{t+1}))R^i(s_{t+1})\right]; n(s_t)\right)}{c(s_t)} \right|$$

(a) Baseline search and matching model

Euler Equation	Mean	Min	p1	p5	Median	p95	p99	Max
Capital EE	-3.12	-7.67	-5.58	-4.98	-3.86	-2.42	-2.03	-1.56
Recruiting EE	-2.67	-6.38	-4.48	-3.84	-2.79	-2.25	-1.97	-1.55

(b) Search and matching model without bargaining shocks

Euler Equation	Mean	Min	p1	p5	Median	p95	p99	Max
Capital EE	-4.35	-8.87	-6.16	-5.49	-4.42	-3.97	-3.84	-3.64
Recruiting EE	-3.70	-8.04	-5.47	-4.83	-3.78	-3.29	-3.14	-2.87

(c) Hansen-Rogerson RBC model

Euler Equation	Mean	Min	p1	p5	Median	p95	p99	Max
Capital EE	-4.04	-8.41	-6.05	-5.34	-4.29	-3.52	-3.08	-2.53
Labor supply EE	-3.37	-7.51	-5.58	-4.86	-3.76	-2.77	-2.39	-1.86

back

Mapping the model to NIPA

- GDP = Final Goods Production + Recruiting.
- Consumption = Non-durable Goods + Services.
- Investment = Gross Private Domestic Investment + Durable Goods.
- $\frac{\text{Net operating surplus}_t}{\text{GVA}_t - \text{Indirect Taxes}_t}$ of nonfinancial corporate businesses Different sectors.

$$= \underbrace{cs_t - \bar{\delta}\frac{K_{t-1}}{\text{GDP}_t}}_{\equiv ncs_t}.$$

$$cs_t = 1 - \frac{n_{t-1} w_t}{yr_t}$$

- Measured TFP $= \widehat{GDP}_t - cs_t \hat{k}_{t-1} - (1 - cs_t)\hat{n}_{t-1}$.

back

Moment matching: All parameters back

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Parameter	Value	
Risk aversion σ	2	Consumption of unemployed
Discount factor β	$0.976^{1/12}$	Corp. non-financial sector
Disutility of working γ	such that $\bar{n} = 0.95$	5% unemployment rate
Capital share α	0.31	Corp. non-financial sector
Elasticity of substitution ε	1	Cobb-Douglas
Depreciation δ_0	5.5%/12	Corp. non-financial sector
Trend productivity growth g_z	$1.016^{1/12}$	Cooley and Prescott '95
Inv. adj. cost κ	$0.0575 \times (\delta_0)^{-2}$	Rel. volatility of I
Capacity util. cost δ_1	such that $\bar{u} = 1$	Normalization
Capacity util. cost δ_2	$2\delta_1$	BGP ela. w.r.t. $\frac{mpk_t}{u_t}$ of $\frac{1}{2}$
Separation rate x	3.3%	Shimer '05
Bargaining power $\bar{\phi}$	0.5	
Matching elasticity η	0.5	
Matching efficiency $\bar{\mu}$	2.3 ($\mu(\bar{\theta}) = 8.4$)	Recruiting efficiency
Income tax rate τ_n	0.4	Prescott '04
Corporate tax rate τ_k	0.3	Corp. non-financial sector
Productivity persistence ρ_z	$0.95^{1/3}$	Cooley and Prescott '95
Productivity s.d. ω_z	0.76%	TFP volatility
Barg. power persistence ρ_ϕ	$0.98^{1/3}$	8 year half-life
Bargaining power s.d. $\approx 0.25 \times \omega_\phi$	6.9pp	Wage cyclicality

Bargaining vs. factor share shock

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- Hansen (1985)-Rogerson(1988): Labor supplied one period in advance, wages set on the spot.
- Introduce shock to labor share in production.
- Calibrate factor share volatility and adjustment cost to relative volatility of investment and volatility of GDP.

Table: Standard deviations – 1947Q1–2015Q2

	Y [%]	$\frac{std(I)}{std(Y)}$	$\frac{std(C)}{std(Y)}$	std(ncs) [pp]	std(cs) [pp]	std(w) [%]	std(TFP) [%]
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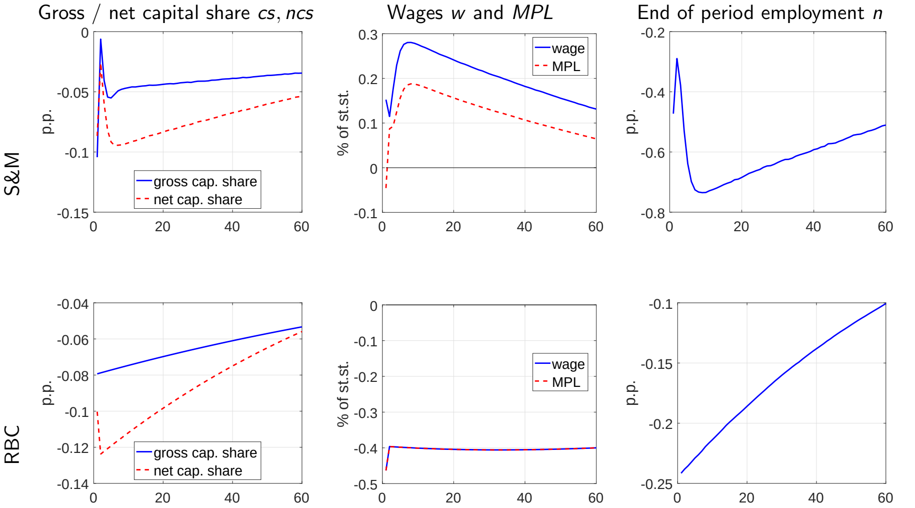
Baseline model	2.01	3.28	0.59	0.36	0.17	1.31	1.21
No barg. shock	1.31	3.73	0.49	0.18	0.02	1.14	1.20
RBC model with factor share shock	1.58	3.28	0.60	0.36	0.16	0.83	1.21
RBC without factor share shock	0.10	3.18	0.58	0.01	0.00	0.05	0.06

back

Bargaining vs. factor share shock

- RBC model: $w_t = (1-\alpha_t)\left(\frac{k}{n}\right)^{\alpha_t} \Rightarrow \frac{\partial \ln w_t}{-\partial \alpha_t} = \frac{1}{1-\bar{\alpha}} - \ln \frac{\bar{k}}{\bar{n}} \approx 1.5 - 5.7 < 0$



Bargaining vs. factor share shock

- RBC model: $w_t = (1-\alpha_t)\left(\frac{k}{n}\right)^{\alpha_t} \Rightarrow \frac{\partial \ln w_t}{-\partial \alpha_t} = \frac{1}{1-\bar{\alpha}} - \ln \frac{\bar{k}}{\bar{n}} \approx 1.5 - 5.7 < 0$

Table: Cyclicality and persistence – 1947Q1–2015Q2

	Y	I	C	ncs	cs	w	TFP
U.S. data: cyclicality	1.00	0.91	0.84	0.57	0.36	0.19	0.78
Baseline model: cyclicality	1.00	0.96	0.98	0.87	0.33	0.19	0.71
No barg. shock: cyclicality	1.00	0.99	0.99	0.97	0.89	1.00	1.00
RBC model with factor share shock	1.00	0.98	0.99	0.99	0.99	0.98	0.99
RBC without factor share shock	1.00	1.00	1.00	0.98	NaN	0.98	0.99

	Y	I	C	ncs	cs	w	TFP
U.S. data: persistence	0.87	0.82	0.78	0.76	0.74	0.67	0.78
Baseline model: persistence	0.83	0.79	0.85	0.78	0.66	0.79	0.78
No barg. shock: persistence	0.79	0.80	0.80	0.78	0.60	0.78	0.78
RBC model with factor share shock	0.79	0.79	0.80	0.80	0.78	0.77	0.78
RBC without factor share shock	0.80	0.80	0.80	0.82	NaN	0.76	0.78

back

Match ECI wage and post 1980 sample

Table: Standard deviations – 1980Q2–2015Q2

	Y [%]	$\frac{\text{std(I)}}{\text{std(Y)}}$	$\frac{\text{std(C)}}{\text{std(Y)}}$	std(ncs) [pp]	std(cs) [pp]	std(w) [%]	std(TFP) [%]
U.S. data	1.77	3.06	0.47	0.94	0.72	0.48	0.96
Baseline model	2.01	3.28	0.59	0.36	0.17	1.31	1.21
No barg. shock	1.31	3.73	0.49	0.18	0.02	1.14	1.20
Recalibrated model	2.25	3.06	0.60	0.45	0.22	1.23	0.96
No barg. shock	1.03	3.57	0.48	0.15	0.01	0.90	0.95

back

Match ECI wage and post 1980 sample

FEDERAL RESERVE BANK OF PHILADELPHIA

Table: Cyclicality and persistence – 1947Q1–2015Q2

	Y	I	C	ncs	cs	w	TFP
U.S. data: cyclicality	1.00	0.95	0.81	0.46	0.21	-0.25	0.68
Baseline model: cyclicality	1.00	0.96	0.98	0.87	0.33	0.19	0.71
No barg. shock: cyclicality	1.00	0.99	0.99	0.97	0.89	1.00	1.00
Recalibrated model: cyclicality	1.00	0.96	0.98	0.84	0.33	-0.25	0.59
No barg. shock: cyclicality	1.00	0.99	0.99	0.97	0.91	1.00	1.00

	Y	I	C	ncs	cs	w	TFP
U.S. data: persistence	0.89	0.86	0.76	0.78	0.74	0.78	0.79
Baseline model: persistence	0.83	0.79	0.85	0.78	0.66	0.79	0.78
No barg. shock: persistence	0.79	0.80	0.80	0.78	0.60	0.78	0.78
Recalibrated model: persistence	0.84	0.78	0.86	0.77	0.67	0.79	0.79
No barg. shock: persistence	0.79	0.80	0.80	0.79	0.61	0.78	0.78

back

Match UE volatility instead of wages volatility

Federal Reserve Bank of Philadelphia

Table: Standard deviations – 1947Q1–2015Q2

	Y [%]	$\frac{\text{std(I)}}{\text{std(Y)}}$	$\frac{\text{std(C)}}{\text{std(Y)}}$	std(ncs) [pp]	std(cs) [pp]	std(w) [%]	std(u) [%]
U.S. data	1.99	3.28	0.58	1.07	0.86	0.95	0.83
Baseline model	2.01	3.28	0.59	0.36	0.17	1.31	1.86
No barg. shock	1.31	3.73	0.49	0.18	0.02	1.14	0.15
Recalibrated model	1.46	3.28	0.57	0.23	0.07	1.19	0.83
No barg. shock	1.31	3.47	0.54	0.18	0.02	1.16	0.14

back

Match UE volatility instead of wages volatility

FEDERAL RESERVE BANK OF PHILADELPHIA

Table: Cyclicality and persistence – 1947Q1–2015Q2

	Y	I	C	ncs	cs	w	u
U.S. data: cyclicality	1.00	0.91	0.84	0.57	0.36	0.19	-0.76
Baseline model: cyclicality	1.00	0.96	0.98	0.87	0.33	0.19	-0.76
No barg. shock: cyclicality	1.00	0.99	0.99	0.97	0.89	1.00	-0.96
Recalibrated model: cyclicality	1.00	0.98	0.99	0.93	0.38	0.76	-0.57
No barg. shock: cyclicality	1.00	0.99	0.99	0.98	0.87	1.00	-0.96

	Y	I	C	ncs	cs	w	u
U.S. data: persistence	0.87	0.82	0.78	0.76	0.74	0.67	0.90
Baseline model: persistence	0.83	0.79	0.85	0.78	0.66	0.79	0.81
No barg. shock: persistence	0.79	0.80	0.80	0.78	0.60	0.78	0.82
Recalibrated model: persistence	0.80	0.79	0.81	0.78	0.55	0.78	0.84
No barg. shock: persistence	0.79	0.80	0.80	0.78	0.57	0.78	0.82

back

Elasticity of substitution

Federal Reserve Bank of Philadelphia

Table: Standard deviations – 1947Q1–2015Q2

	Y [%]	$\frac{\text{std(I)}}{\text{std(Y)}}$	$\frac{\text{std(C)}}{\text{std(Y)}}$	std(ncs) [pp]	std(cs) [pp]	std(w) [%]	std(u) [%]	std(TFP) [%]
U.S. data	1.99	3.28	0.58	1.07	0.86	0.95	0.83	1.21
				$\varepsilon = .75$				
S&M I	2.12	3.28	0.58	0.43	0.33	1.67	1.92	1.21
S&M II	1.37	3.68	0.50	0.08	0.24	1.47	0.27	1.20
RBC	2.22	3.28	0.61	0.14	0.18	1.04	2.41	1.21
				$\varepsilon = 1.25$				
S&M I	1.94	3.28	0.59	0.41	0.24	1.08	1.81	1.21
S&M II	1.27	3.76	0.48	0.33	0.17	0.93	0.09	1.20
RBC	1.62	3.28	0.59	0.35	0.14	0.83	0.63	1.21

back

Elasticity of substitution

Federal Reserve Bank of Philadelphia

Table: Cyclicality and persistence – 1947Q1–2015Q2

	Y	I	C	ncs	cs	w	u	TFP
U.S. data	1.00	0.91	0.84	0.57	0.36	0.19	-0.76	0.78
				$\varepsilon = 0.75$				
S&M I	1.00	0.97	0.98	0.61	-0.02	0.19	-0.79	0.72
S&M II	1.00	0.99	0.99	-0.79	-0.99	1.00	-0.95	0.99
RBC	1.00	0.97	0.99	0.80	-0.95	0.95	-0.77	0.99
				$\varepsilon = 1.25$				
S&M I	1.00	0.96	0.97	0.84	0.42	0.19	-0.75	0.70
S&M II	1.00	0.99	0.99	0.99	1.00	1.00	-0.96	1.00
RBC	1.00	0.99	0.99	0.99	0.98	0.98	-0.93	0.99

back

Elasticity of substitution

Table:

	Y	I	C	ncs	cs	w	u	TFP
U.S. data	0.87	0.82	0.78	0.76	0.74	0.67	0.90	0.78
				$\varepsilon = 0.75$				
S&M I	0.83	0.79	0.85	0.75	0.72	0.78	0.80	0.79
S&M II	0.80	0.80	0.80	0.62	0.79	0.78	0.82	0.78
RBC	0.80	0.80	0.80	0.24	0.75	0.75	0.79	0.79
				$\varepsilon = 1.25$				
S&M I	0.83	0.78	0.84	0.77	0.74	0.79	0.81	0.78
S&M II	0.79	0.79	0.79	0.79	0.78	0.78	0.82	0.78
RBC	0.80	0.80	0.80	0.79	0.78	0.77	0.79	0.78

back

Monopolistic competition

Table: Standard deviations – 1947Q1–2015Q2

	Y [%]	$\frac{std(I)}{std(Y)}$	$\frac{std(C)}{std(Y)}$	std(ncs) [pp]	std(cs) [pp]	std(w) [%]	std(u) [%]	std(TFP) [%]
U.S. data	1.99	3.28	0.58	1.07	0.86	0.95	0.83	1.21
				Fixed cost				
S&M I	1.99	3.28	0.54	0.49	0.23	1.14	1.66	1.21
S&M II	1.28	3.73	0.41	0.28	0.10	0.99	0.14	1.18
RBC	1.81	3.28	0.54	0.39	0.13	0.78	0.87	1.21
				No fixed cost				
S&M I	2.16	3.28	0.59	0.38	0.17	1.25	1.95	1.21
S&M II	1.29	3.75	0.48	0.18	0.01	1.12	0.15	1.18
RBC	1.89	3.28	0.60	0.25	0.00	0.92	1.06	1.21

back

Monopolistic competition

Table: Cyclicality – 1947Q1–2015Q2

	Y	I	C	ncs	cs	w	u	TFP
U.S. data	1.00	0.91	0.84	0.57	0.36	0.19	-0.76	0.78
				Fixed cost				
S&M I	1.00	0.96	0.96	0.95	0.83	0.19	-0.78	0.79
S&M II	1.00	0.99	0.99	0.99	1.00	1.00	-0.97	1.00
RBC	1.00	0.99	0.99	0.99	1.00	0.97	-0.97	0.99
				No fixed cost				
S&M I	1.00	0.96	0.98	0.87	0.33	0.19	-0.79	0.74
S&M II	1.00	0.99	0.99	0.97	0.88	1.00	-0.96	1.00
RBC	1.00	0.98	0.99	0.98	NaN	0.96	-0.95	0.99

back

Monopolistic competition

Table: Persistence – 1947Q1–2015Q2

	Y	I	C	ncs	cs	w	u	TFP
U.S. data	0.87	0.82	0.78	0.76	0.74	0.67	0.90	0.78
	Fixed cost							
S&M I	0.83	0.78	0.85	0.83	0.79	0.79	0.82	0.79
S&M II	0.80	0.80	0.80	0.80	0.78	0.78	0.82	0.79
RBC	0.80	0.80	0.80	0.81	0.80	0.77	0.79	0.79
	No fixed cost							
S&M I	0.83	0.79	0.85	0.79	0.64	0.78	0.80	0.79
S&M II	0.80	0.80	0.80	0.79	0.60	0.78	0.82	0.78
RBC	0.80	0.80	0.80	0.81	NaN	0.77	0.79	0.79

back

Persistence of redistribution shocks

Table: Standard deviations and cyclicality – 1947Q1–2015Q2

ρ_ϕ^3		Y [%]	$\frac{std(I)}{std(Y)}$	$\frac{std(C)}{std(Y)}$	std(ncs) [pp]	std(cs) [pp]	std(w) [%]	std(u) [%]
	U.S. data	1.99	3.28	0.58	1.07	0.86	0.95	0.83
0.95	Baseline model	1.98	3.28	0.57	0.38	0.21	1.34	1.84
	No barg. shock	1.30	3.52	0.53	0.18	0.02	1.14	0.14
0.98	Baseline model	2.01	3.28	0.59	0.36	0.17	1.31	1.86
	No barg. shock	1.31	3.73	0.49	0.18	0.02	1.14	0.15
0.99	Baseline model	2.03	3.28	0.61	0.35	0.14	1.28	1.98
	No barg. shock	1.31	3.88	0.46	0.18	0.02	1.13	0.16

back

Systematic component of bargaining shocks

Federal Reserve Bank of Philadelphia

$$\phi_t = (1-\rho_\phi)\left(\bar{\phi} + \frac{(1-n_{t-1})-(1-\bar{n})}{0.01}\omega_\phi\right) + \rho_\phi \phi_{t-1} + \omega_\phi \epsilon_t^\phi.$$

Table: Standard deviations – 1947Q1–2015Q2

	Y [%]	$\frac{\text{std(I)}}{\text{std(Y)}}$	$\frac{\text{std(C)}}{\text{std(Y)}}$	std(ncs) [pp]	std(cs) [pp]	std(w) [%]	std(TFP) [%]
U.S. data	1.77	3.06	0.47	0.94	0.72	0.48	0.96
Baseline model	2.01	3.28	0.59	0.36	0.17	1.31	1.21
No barg. shock	1.31	3.73	0.49	0.18	0.02	1.14	1.20
Recalibrated model	2.13	3.28	0.65	0.34	0.12	1.28	1.21
No barg. shock	1.32	4.03	0.43	0.19	0.02	1.13	1.20

back

Systematic component of bargaining shocks

FEDERAL RESERVE BANK OF PHILADELPHIA

$$\phi_t = (1-\rho_\phi)\left(\bar{\phi} + \frac{(1-n_{t-1})-(1-\bar{n})}{0.01}\omega_\phi\right) + \rho_\phi\phi_{t-1} + \omega_\phi\epsilon_t^\phi.$$

Table: Cyclicality and persistence – 1947Q1–2015Q2

	Y	I	C	ncs	cs	w	TFP
U.S. data: cyclicality	1.00	0.95	0.81	0.46	0.21	-0.25	0.68
Baseline model: cyclicality	1.00	0.96	0.98	0.87	0.33	0.19	0.71
No barg. shock: cyclicality	1.00	0.99	0.99	0.97	0.89	1.00	1.00
Recalibrated model: cyclicality	1.00	0.92	0.94	0.91	0.29	0.19	0.72
No barg. shock: cyclicality	1.00	0.99	0.99	0.97	0.92	1.00	1.00

	Y	I	C	ncs	cs	w	TFP
U.S. data: persistence	0.89	0.86	0.76	0.78	0.74	0.78	0.79
Baseline model: persistence	0.83	0.79	0.85	0.78	0.66	0.79	0.78
No barg. shock: persistence	0.79	0.80	0.80	0.78	0.60	0.78	0.78
Recalibrated model: persistence	0.84	0.75	0.86	0.80	0.66	0.78	0.79
No barg. shock: persistence	0.80	0.80	0.80	0.79	0.62	0.78	0.78