

Discussion of Cairo & Sim (2017) Income Inequality, Financial Crises, and Monetary Policy

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¹The views expressed herein are solely mine and do not necessarily reflect the ones of the Federal Reserve Bank of San Francisco or the Federal Reserve System.

An Intuitive Story

Following an increase in income inequality ...

- ... wealthy individuals lend their unused income to less wealthy individuals,
- ... increasing aggregate credit, the debt-to-income ratio of the less wealthy,
- ... and raising the probability of a crisis

→ Empirics – Supported by the data?

→ Model – Description & Comments

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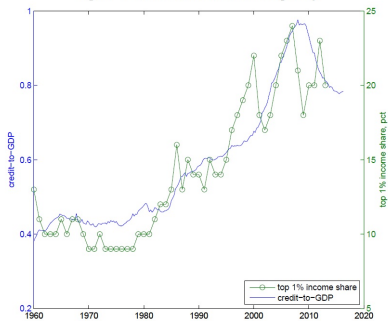
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Great Recession

Figure 1: Credit and Income Inequality



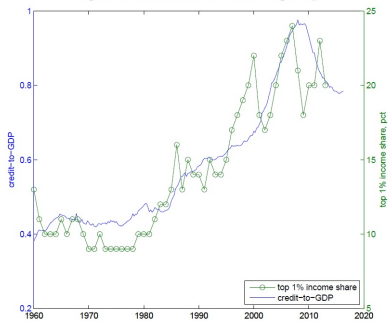
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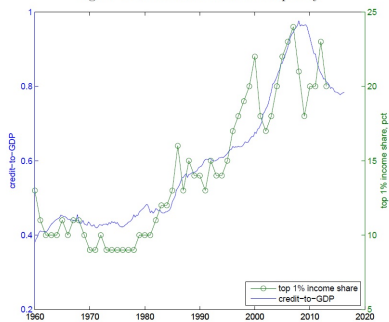
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Paul (2017) Historical Patterns of Inequality and Productivity around Financial Crises

Data

- Combining data on crises dates with data on inequality
- 17 advanced economies
- Sample: 1870 – 2013

$$FC_{k,t} = \alpha^k + \beta L \Delta \log(\text{Inequality}_{k,t}) + \gamma L \Delta \log(X_{k,t}) + u_{k,t}$$
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	OLS	Logit	OLS	Logit
Δ Income Share 1% $_{t-1,t-5}$	0.015*** (0.004)	0.481*** (0.133) [0.012]		
Δ Income Share 10% $_{t-1,t-5}$			0.011*** (0.003)	0.426*** (0.115) [0.009]
Number of crises	27	27	24	24
Observations	831	742	746	671
Countries	15	13	15	13
Country FE	✓	✓	✓	✓
Test for Country FE = 0	0.668	5.907	0.779	7.085
<i>p</i> -value	0.807	0.921	0.692	0.852
R ²	0.032	0.092	0.034	0.111
Pseudolikelihood	—	-105.260	—	-92.017
Overall test statistics	1.769**	25.428**	1.719**	30.868***
<i>p</i> -value	0.035	0.020	0.043	0.004
AUROC	0.774***	0.742***	0.795***	0.777***
Standard error	0.041	0.048	0.039	0.048

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Model - Kumhof, Rancière, and Winant (2015)

- **Heterogeneous Agents**

Share χ : Wealthy – Shareholders – Creditors

$$U_t^T = \mathbb{E}_t \sum_{t=0}^{\infty} (\beta^T)^t \left\{ \frac{(c_t^T)^{1-1/\sigma_c}}{1-1/\sigma_c} + \psi^B \frac{[1 + b_t \left(\frac{1-\chi}{\chi}\right)]^{1-1/\sigma_b}}{1-1/\sigma_b} + \psi^G \frac{[1 + b_t^G \left(\frac{1-\chi}{\chi}\right)]^{1-1/\sigma_g}}{1-1/\sigma_g} \right\}$$

Share $(1 - \chi)$: Less Wealthy – Workers – Borrowers

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- **Financial Crises**

Default iff $\chi_t < U_t^{D,B} - U_t^{N,B}$ & occur cost $v_t y_t$ with $v_t = \rho_v v_{t-1} + \gamma_v$

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Model - New Elements

- Production: $y_t = z_t (k_{t-1})^\alpha (n_t)^{1-\alpha}$
- Search and matching frictions in the labour market (nash bargaining)
- Real wage rigidities (quadratic cost of changing wage)
- Pricing frictions (Calvo, partial inflation indexation)
- Capital good producers (adjustment costs)
- Government (taxes, unemployment benefits, b_t^G)
- Monetary policy: $i_t = \rho_i i_{t-1} + (1 - \rho_i) \left[i_t^* + \rho_\pi \left(\frac{\pi_t^Y - \pi^*}{4} \right) \right] + \sigma_m \sum_{j=1}^n \epsilon_{j,t-j} + \sigma_m \epsilon_{0,t}$
- Aggregate shocks: Risk premium, χ_t , z_t , Nash bargaining power

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Findings

- 1 Aggregate demand insufficiency driven by heterogeneity in MPCs
- 2 Income inequality positively correlated with probability of a crisis
- 3 Endogenous prices and quantities skewed due to ZLB & Financial Crises
- 4 Monetary Policy
 - 1 Raising ρ_π increases p(crisis) (higher borrowing costs) ...
 - 2 ... but makes them less severe (more aggressive).
- 5 Optimal Monetary Policy (Loss Function with π -Skewness)
 - 1 Lean mildly with wind in normal times ... aggressive reduction in crises.
 - 2 Natural rate adjusted rule (reduces quickly, but inertia to stay at ZLB longer)

$$i_t^* = (1 - \rho_{i^*}) i^* + \rho_{i^*} i_{t-1}^* - \sigma_{i^*} \delta_t^B$$

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② Maximize welfare (aggregation difficult, bonds in utility)

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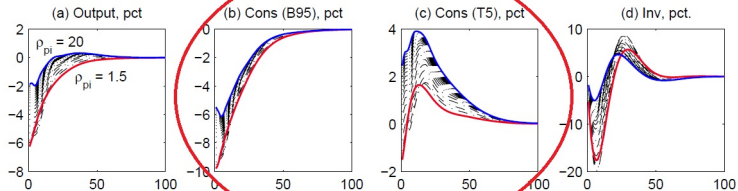
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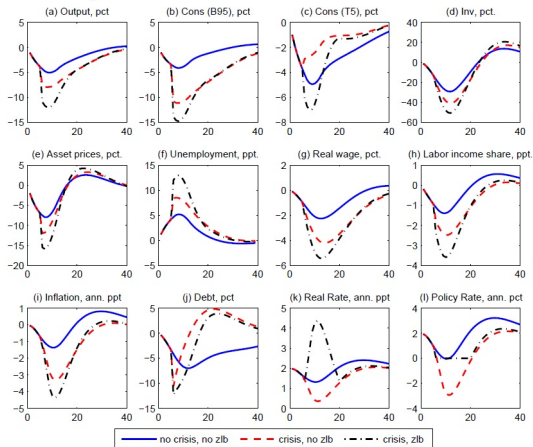
Result

Figure 9: Impact of Crisis under Alternative Inflation Targeting Rules



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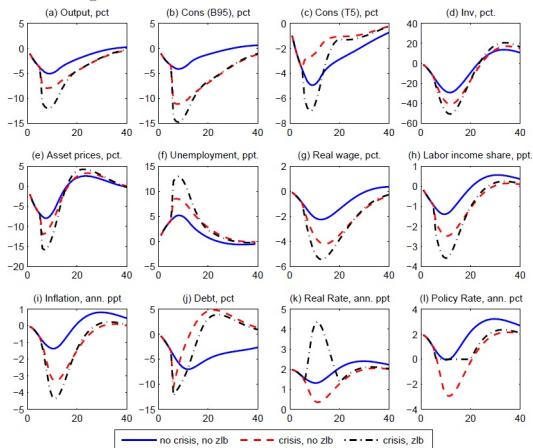
Figure 5: Nonlinear Effects of ZLB and Financial Crisis



→ That's for a $\epsilon_{\lambda,1:12} = \sigma_{\lambda} \cdot [3 \ 3 \ 3 \ 3 \ 3 \ 3 \ 2.5 \ 2 \ 1.5 \ 1 \ 0.5]'$!!!

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References

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