The Political Economy of Macroprudential Policies and Capital Flows

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- Macroprudential policy is now part of the policy toolkit
- Growing literature analyzing macroprudential policy from a normative standpoint

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Q. What is the role of political economy considerations in shaping the financial and regulatory cycle?

Today

- We extend a standard open-economy model of financial crises and pecuniary externalities with political economy frictions
    - Two parties/policymakers alternate in power
    - Responsible party, r: sets macroprudential policy optimally
    - Irresponsible party, i: never uses macroprudential policy
- Analytical characterization and quantitative analysis of how political turnover affects optimal policy
- Evaluate empirical literature on macroprudential policy through the lens of our model

Preview of Results

Key insight. Political economy frictions lead the responsible policymaker to set a more aggressive macroprudential policy.

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Connect to empirical lit on effectiveness of macropru policy

- We show OLS is biased & propose IV spec. using political frictions

Model

Main ingredients

Dynamic small open-economy model with tradable and non-tradable goods

- Households
  - Face a borrow. constraint linked to income
  - Access to a regulated international market w/ a tax τ_t
  - Choose debt based on expectations of current and future regulations
- Responsible party (r)
  - Benevolent and uses macroprudential policy
  - Take into account they would remain in power with exogenous prob. Γ_r
- Irresponsible party (i)
  - Sets taxes equal to zero

Households

Preferences:

$$\mathbb{E}_0 \sum_{t=0}^{\infty} \left(\prod_{j=0}^{t} \beta_j \right) u(c_t)$$

$$c = \left[\omega \left(c^T \right)^{\frac{\gamma-1}{\gamma}} + (1-\omega) \left(c^N \right)^{\frac{\gamma-1}{\gamma}} \right]^{\frac{\gamma}{\gamma-1}}, \qquad \beta_t = \overline{\beta}(1+\iota_t)$$

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Budget constraint:

$$p_t^N c_t^N + c_t^T + \frac{1}{R(1+\tau_t)} b_{t+1} = p_t^N y^N + y_t^T + b_t + T_t$$

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Credit constraint:

$$b_{t+1} \geq -\kappa(y_t^T + p_t^N y^N)$$

Optimality conditions

- Static FOC:

$$p_t^N = \frac{1-\omega}{\omega}\left(\frac{c_t^T}{c_t^N}\right)^{1/\gamma}$$

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- Euler equation:

$$\begin{aligned} u_T(c_t^T, y_t^N) &= \beta R(1+\tau_t)\mathbb{E}[u_T(c_{t+1}^T, c_{t+1}^N)] + \mu_t^H \\ 0 &= \mu_t^H\Big(b_{t+1} + \kappa(y_t^T + p_t^N y^N)\Big) \end{aligned}$$

Government - Political process

- Voters derive diff. utility from r vs. i in office
  - Fixed utility if r in office: $\overline{\nu}$
  - Stochastic utility if i in office: $\nu_t = \lambda \chi_t + (1 - \lambda) \varrho_t$

    where $\chi_t \sim AR(1)$, $\varrho_t \sim i.i.d$ and $\lambda \in [0, 1]$

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- The election rule for the government g_t is

$$g_t = \begin{cases} r & \text{if} \quad \nu_t < \overline{\nu}, \\ i & \text{otherwise.} \end{cases}$$

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- We map the political process to a Markov chain, where

$$\Gamma = \begin{bmatrix} \Gamma_r & 1-\Gamma_r \\ 1-\Gamma_i & \Gamma_i \end{bmatrix}$$

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Goverment - Budget Constraint

Budget constraint:

$$T_t = -\frac{\tau_t}{1+\tau_t}\frac{B_{t+1}}{R}$$

Recall: irresponsible sets $\tau_t = 0$ for all t

Equilibrium Conditions

CE definition

- Implementability constraints:

$$p_t^N = \frac{1-\omega}{\omega}\left(\frac{c_t^T}{c_t^N}\right)^{1/\gamma}$$

$$\begin{aligned} u_T(c_t^T, y_t^N) &= \beta R(1+\tau_t)\mathbb{E}[u_T(c_{t+1}^T, c_{t+1}^N)] + \mu_t^H \\ 0 &= \mu_t^H\Big(B_{t+1} + \kappa(y_t^T + p_t^N y^N)\Big) \end{aligned}$$

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- Resource constraints:

$$\begin{aligned} c_t^N &= y^N \\ c_t^T &= y_t^T + B_t - \frac{B_{t+1}}{R} \end{aligned}$$

Normative Analysis

- Constrained-efficient allocations – Bianchi (2011)

- Political game

- Exogenous states

  * Economic state $s \equiv \{y^T, \beta\}$
  * Political state g

Constrained efficient: planner's problem

$$
\begin{aligned}
V^{SP}(s,B) &= \max_{c^T,B'} u(c^T,y^N) + \beta \mathbb{E} V^{SP}(s',B') \\
c^T + \frac{B'}{R} &= y^T + B && (\lambda) \\
B' &\geq -\kappa(\mathcal{P}^N(c^T) y^N + y^T) && (\mu_{SP})
\end{aligned}
$$

where $\mathcal{P}^N(c^T) = \frac{1-\omega}{\omega}\left(\frac{c^T}{y^N}\right)^{1/\gamma}$

The planner internalizes the effect on prices.

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- Euler eq. for the SP, when the constraint is not binding in t:

$$u_T(c^T,y^N) = \beta\, R\, \mathbb{E}[u_T(c^{T'},y^N)] + \beta R \mathbb{E}\left[\mu'_{SP} \frac{\partial \mathcal{P}^N(c^{T\prime})}{\partial c^{T'}} \kappa y^N\right]$$

Political Game - Responsible government

$$V^r(s,r,B) = \max_{c^T,B',\tau} \; u\left(c^T, y^N\right) + \beta\Big[\Gamma_r \; \mathbb{E} \; V^r(s',r,B') + (1-\Gamma_r)\mathbb{E} \; V^r(s',i,B')\Big]$$

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subject to

$$c^T + \frac{B'}{R} = y^T + B$$

$$B' \geq -\,\kappa\left[y^T + \frac{1-\omega}{\omega}\left(\frac{c^T}{y^N}\right)^{1/\gamma} y^N\right]$$

$$u_T\left(c^T, y^N\right) = \beta R\,\mathbb{E}\left[\Gamma_r\; u_T(\mathcal{C}^T(s',r,B'), y^N) + (1-\Gamma_r)\; u_T\left(\mathcal{C}^T(s',i,B'), y^N\right)\right](1+\tau) + \mu^H$$

$$0 = \mu^H\left(B' + \kappa\left[y^T + \frac{1-\omega}{\omega}\left(\frac{c^T}{y^N}\right)^{1/\gamma} y^N\right]\right)$$

Political Game - Irresponsible government

$$V^i(s,i,B) \quad = \quad u\left(c^T, y^N\right) \; + \; \beta\Big[\Gamma_i \mathbb{E} V^i(s',i,B') \; + \; (1-\Gamma_i)\,\mathbb{E} V^i(s',r,B')\Big]$$

subject to

$$c^T + \frac{B'}{R} = y^T + B$$

$$B' \geq -\kappa\left[y^T + \frac{1-\omega}{\omega}\left(\frac{c^T}{y^N}\right)^{1/\gamma} y^N\right]$$

$$u_T\left(c^T, y^N\right) = \beta R \mathbb{E}\left[\Gamma_i\, u_T(\mathcal{C}^T(s', i, B'), y^N) + (1-\Gamma_i)\; u_T\left(\mathcal{C}^T(s', r, B'), y^N\right)\right] + \mu^H$$

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Properties of the Optimal Tax Function

GEE

Using a Generalized Euler Equation we can show that:

A. Macroprudential Policy is **always active**

Proposition 1. *Let* μ_t^r *be the Lagrange multiplier on the borrowing constraint, and let* τ_t *be the tax that solves the problem of the responsible government. Assume there exist* $\mu_{t+h}^r(s_{t+h}, g_{t+h}, B_{t+h}) \neq 0$ *for any* $h > 0$*. Then* $\tau_t > 0$*.*

Properties of the Optimal Tax Function

GEE

Using a Generalized Euler Equation we can show that:

A. Macroprudential Policy is **always active**

Proposition 1. *Let μ^r_t be the Lagrange multiplier on the borrowing constraint, and let τ_t be the tax that solves the problem of the responsible government. Assume there exist $\mu^r_{t+h}(s_{t+h}, g_{t+h}, B_{t+h}) \neq 0$ for any $h > 0$. Then $\tau_t > 0$.*

B. Macroprudential policy is **more aggressive**

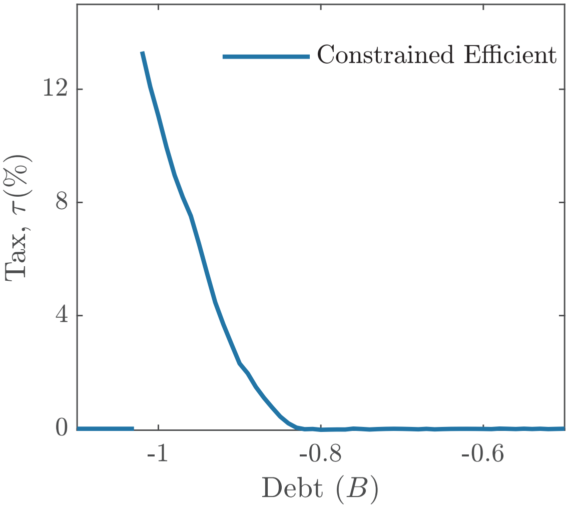
Proposition 2. *Define τ^{SP}_t denote the tax debt function of the constrained efficient problem. Assume there exist $\mu^r_{t+h}(s_{t+h}, g_{t+h}, B_{t+h}) \neq 0$ for at least one $h > 0$. Then $\tau_t > \tau^{SP}_t$.*

Numerical Results

Calibration

	Value	Source
Interest rate	$R = 1.04$	Bianchi (2011)
Risk aversion	$\sigma = 2$	Bianchi (2011)
Elasticity of substitution	$\gamma = 0.83$	Bianchi (2011)
Weight on tradable in CES	$\omega = 0.45$	Trad. Output Share
Stochastic structure	$\rho = 0.46$	Argentinean economy
Credit coefficient	$\kappa = 0.32$	Frequency of crises
Mean of discount factor	$\bar{\beta} = 0.904$	Average NFA-GDP ratio
Stochastic part of discount factor	$[-0.05 \;\; 0.05]$	Uniform distribution
Reelection Prob. Responsible gov.	$\Gamma_r = 0.22$	Mean in data
Reelection Prob. Irresponsible gov.	$\Gamma_i = 0.78$	Mean in data

Quantitative Results: Tax Policy



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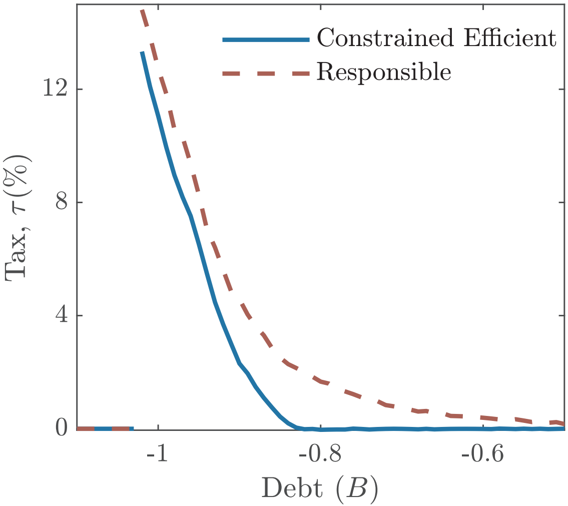
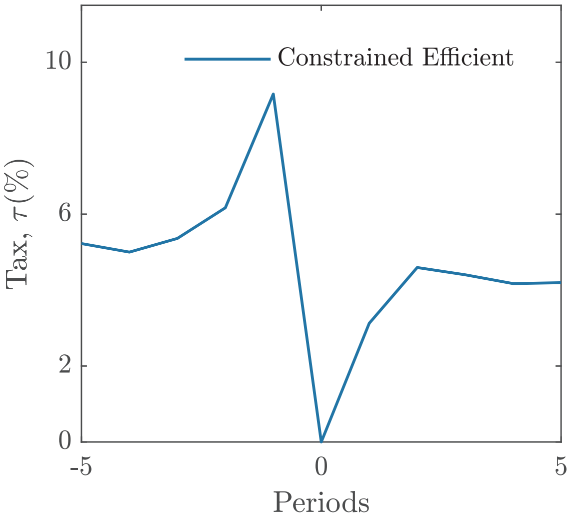


More aggressive macroprudential policy than the constrianed-efficent

Tax on Borrowing around Crises



Without pol. frictions → more regulation before a typical crisis

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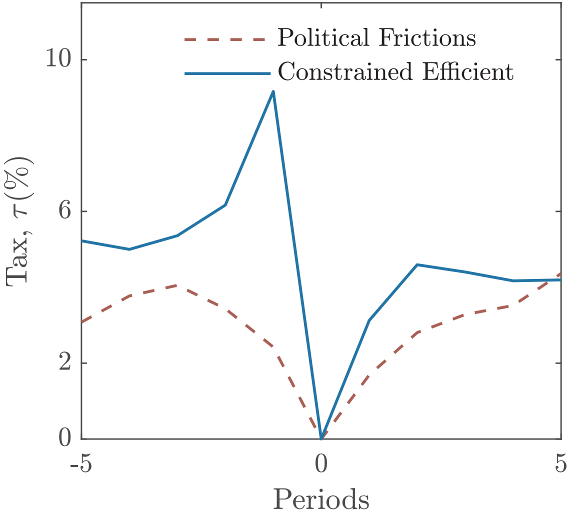

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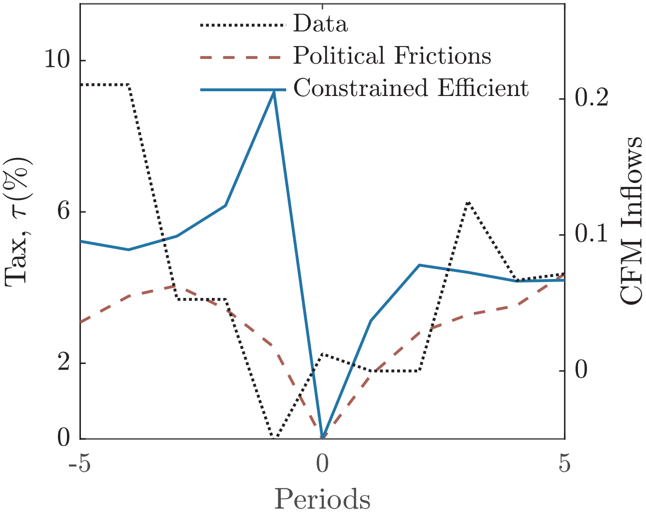

Data source: Binici and Das (2021)

Political frictions make macropru policy less effective

Compared to the constrained efficient

- Capital controls are higher
- ... but sudden stops are more frequent (5.3% vs 2.2%)

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⏩ welfare ⏩ policies

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- Capital controls are higher
- ... but sudden stops are more frequent (5.3% vs 2.2%)

Not surprisingly, welfare costs are not trivial

- They average 1.4%
- Increasing in debt, higher for low y^T

Connection with Empirical Literature

Econometric Analysis

Assume we are interested in estimating the effect of macroprudential policy on the current account

$$\underbrace{CA_t}_{B_{t+1}-B_t} = \delta_0 + \delta_\tau \tau_t + \delta_b B_t + \delta_y y_t^T + \epsilon_t \quad s.t \quad \mathbb{E}[\epsilon_t] = 0$$

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Our model features two key structural relationships:

$$\begin{aligned} B_{t+1} &= \Upsilon_0 + \Upsilon_b B_t + \Upsilon_\tau \tau_t + \Upsilon_y y_t^T + \Upsilon_\beta \beta_t + \Upsilon_g g_t + o_t \\ \tau_t &= \gamma_0 + \gamma_b B_t + \gamma_y y_t^T + \gamma_\beta \beta_t + \gamma_g g_t + u_t \end{aligned}$$

OLS is Biased

The mapping between the error term of the regression model and the structural relations is:

$$
\begin{aligned}
\delta_0 &= \Upsilon_0 + \Upsilon_\beta \, \bar{\beta} + \mathbb{E}[o_t] \\
\epsilon_t &= (o_t - \mathbb{E}[o_t]) + \Upsilon_\beta \, \bar{\beta} \, \iota_{i,t}
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Recall: $\tau_t = \gamma_0 + \gamma_b B_t + \gamma_y y_t^T + \gamma_\beta \hat{\beta}(1 + \iota_{i,t}) + \gamma_g g_t + u_t$

Then: $\mathrm{cov}(\tau_t, \epsilon_{i,t}) \neq 0$

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$$\epsilon_t = (o_t - \mathbb{E}[o_t]) + \Upsilon_\beta \bar{\beta} \iota_{i,t}$$

Proposition 3. *Given $\Upsilon_\beta < 0$ and $\gamma_\beta > 0$, let $\hat{\delta}_\tau$ be the OLS estimation of δ_τ. Then the OLS estimator is biased. That is: $\mathbb{E}[\hat{\delta}_\tau - \delta_\tau] < 0$.*

Instrumental Variable Approach

Recall political shock structure:

* Stoch. utility if irresponsible in office: $\nu_t = \lambda\chi_t + (1-\lambda)\varrho_t$

  where $\chi_t \sim AR(1)$, $\varrho_t \sim i.i.d$ and $\lambda \in [0,1]$

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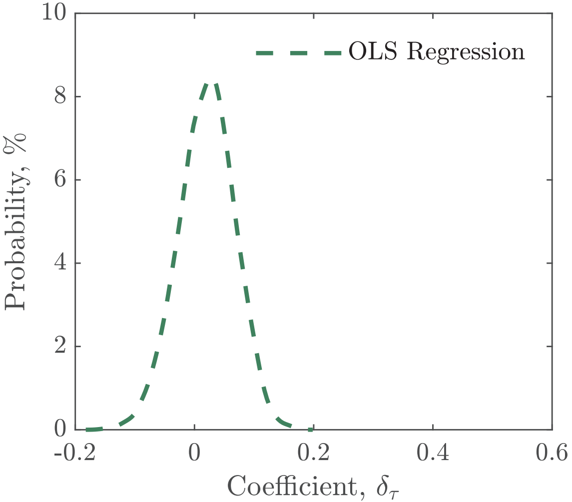
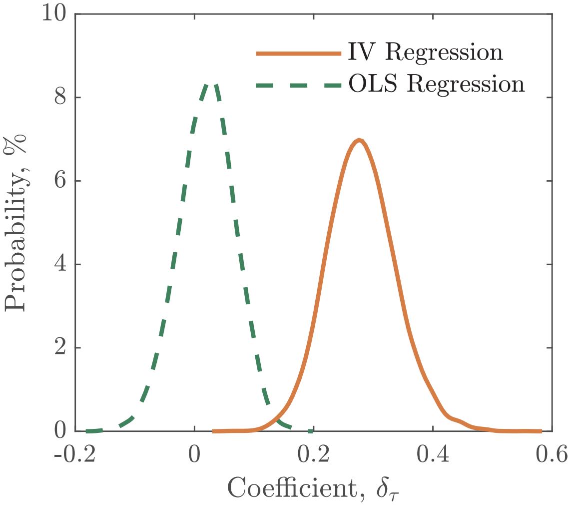
If $\lambda = 0$ we can use the identity of the incumbent (g_t) as instrument

Monte Carlo Simulations



$\hat{\delta}_\tau$ can be either negative or positive using model-based OLS regressions

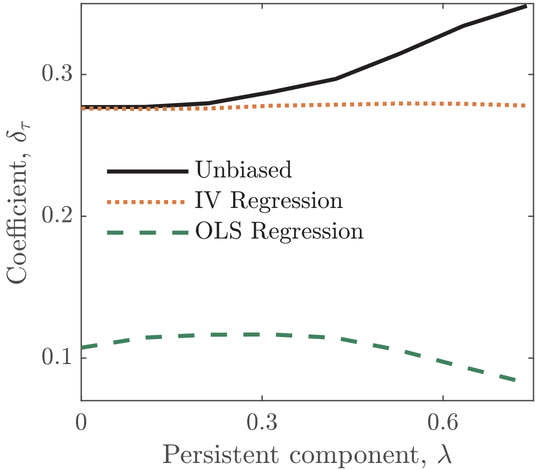
Monte Carlo Simulations



All the regressions estimated w/ IV give a positive effect

Persistence

⏩ predictions



When the political process is persistent, IV is biased but better than OLS

An Empirical Estimation of this Econometric Model

$$CA_{i,t} = \alpha_i + \alpha_\tau \tau_{i,t} + \alpha_X X_{i,t} + \epsilon_{i,t}$$

- We use quarterly data for 36 countries. Time: 2008q1 – 2019q1
- From Binici and Das (2021): index of Capital Flow Mgmt tools (inflows)
- Include macro controls from IFS

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- Instrument macroprudential policy
  * Political Orientation, from Database of Political Institutions (IADB)
  * Populism, from Global Populisms Data (Stanford)
  * Instrument = $\text{Populist}_{it} \times \text{Left}_{it}$

An Empirical Estimation of this Econometric Model

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	OLS	IV
Capital controls, τ	0.02	1.63**
	(0.017)	(0.80)
Obs.	786	590
No. of countries	18	14

Conclusions

- Explored the role of political frictions in the design of macropru policy
- Responsible government chooses a stronger macropru policy
    * Capital flow taxes are positive all the time
    * Crises preceded by low regulation (as in data)
    * Welfare losses from pol. frictions are non-trivial (esp. in low-income states)
- Link with the empirical literature
    * Propose a way to deal w/ endogeneity of macropru taxes

THANKS!

Competitive Equilibrium

Back

Definition 1. (Competitive Equilibrium) Given initial assets b_0, sequences of an exogenous process $\{g_t \in \{i, j\}, y_t^T, y_t^N\}_{t=0}^{\infty}$ and a sequence of government policies $\{\tau_t(i), \tau_t(j), T_t(i), T_t(j)\}_{t=0}^{\infty}$; a *competitive equilibrium* is a sequence of household allocations $\{c_t^T, c_t^N, b_t\}_{t=0}^{\infty}$, and a sequence of prices $\{p_t^N\}_{t=0}^{\infty}$ such that: (i) households solve their optimization problem, (ii) all market clears.

Generalized Euler Equation

Back

Lemma 1 (GEE). *Let $\mu_t^r(s)$ be the Lagrange multiplier on the borrowing constraint. The Generalized Euler Equation (GEE) for the responsible party satisfies:*

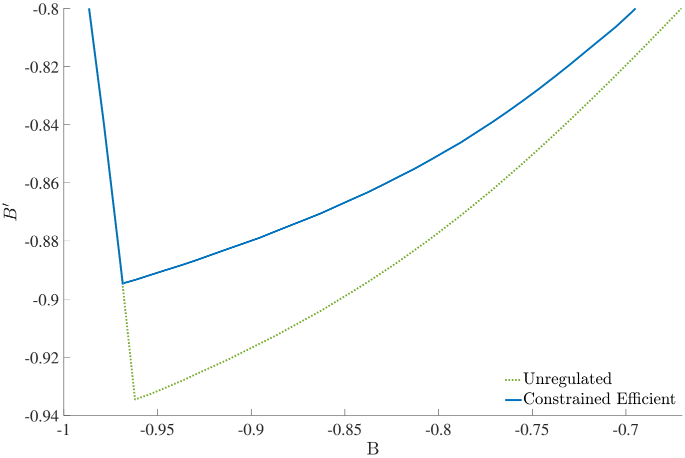
$$u_T(c_t^T, c_t^N) = \beta_t R \left[\Gamma_r \mathbb{E}\left(u_T(c_t^T, c_t^N) + \frac{\partial \mathcal{P}_t^N}{\partial c_t^T} \kappa \mu_{t+1}^r \right) + (1-\Gamma_r) \left[\sum_{n=1}^{\infty} (\Gamma_i)^n \prod_{j=t}^{t+n} \beta_j \left(\frac{\partial \mathcal{B}}{\partial B} \right) \right.\right.$$

$$\left[\mathbb{E}\left(u_T(c_{j+1}^T, c_{j+1}^N) \left(1 - \frac{1}{R} \frac{\partial \mathcal{B}}{\partial B} \right) \right) + (1-\Gamma_i) \mathbb{E}_r \left(u_T(c_{j+1}^T, c_{j+1}^N) + \frac{\partial \mathcal{P}_{j+1}^N}{\partial c_{j+1}^T} \kappa \mu_{j+1}^r \right) + \right.$$

$$\left.\left.\left. \frac{\partial \mathcal{P}_j^N}{\partial c_j^T} \kappa \mu_j^r \right]\right] + \mu_t^r \left(1 - \frac{\partial \mathcal{P}_t^N}{\partial c_t^T} \frac{\kappa}{R_t} \right) \right]$$

Policy functions

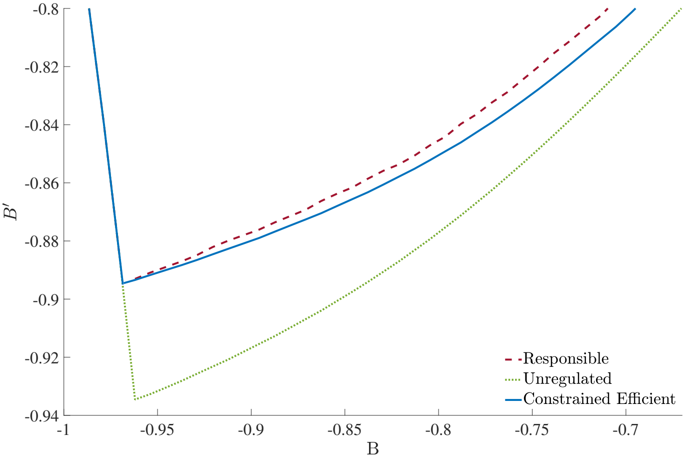
Back



Households take more debt in an unregulated economy.

Policy functions

Back



Households take even less debt under a responsible goverment

Policy functions

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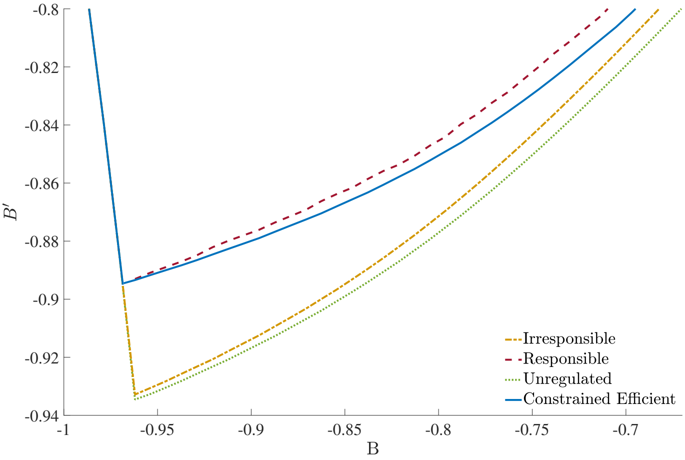

They take less debt under an irresponsible government than in an unregulated economy.

Macropudential policy loses effectiveness

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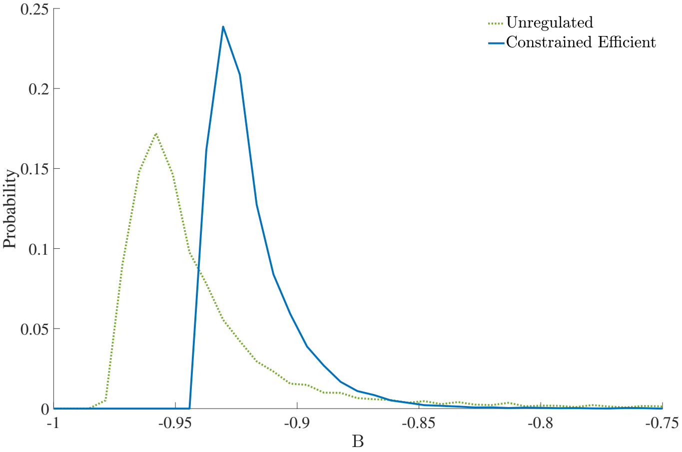

Macropudential policy loses effectiveness

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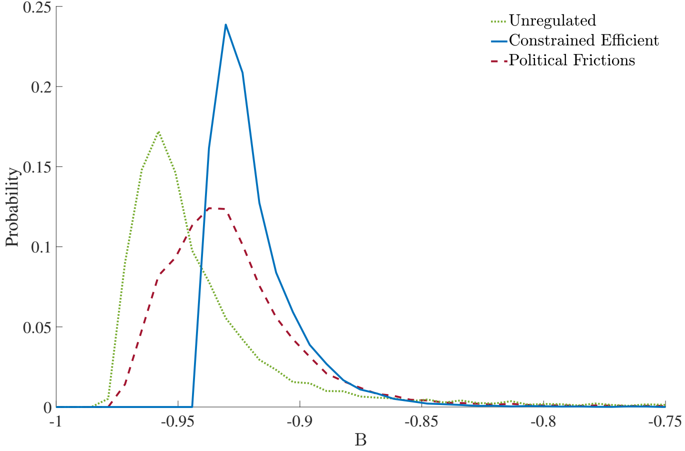

Walfare Cost of Political Frictions (low y^T)

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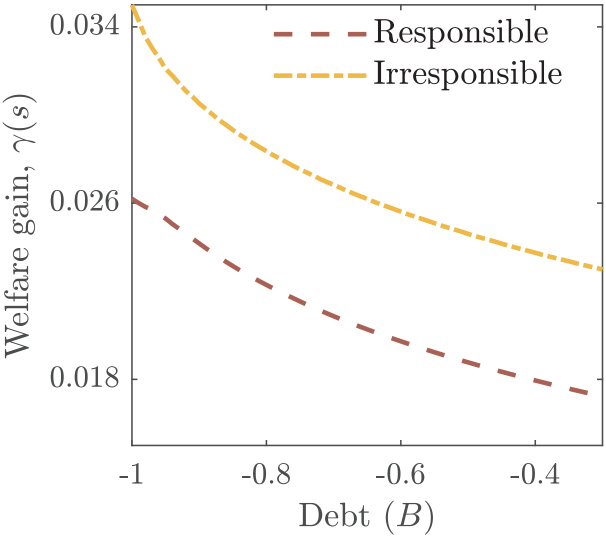

Performance in small samples

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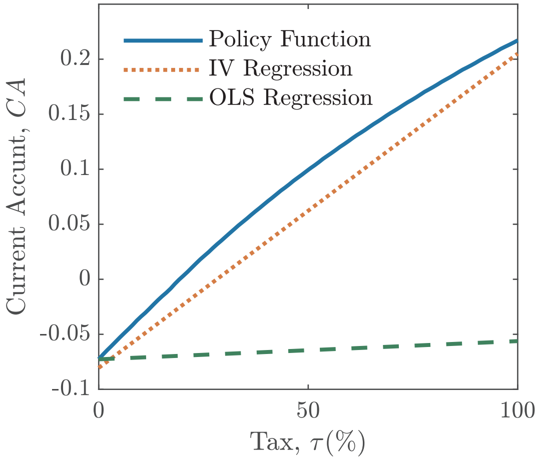

Mean prediction errors are lower using IV