The Political Economy of Credit Booms and Macroprudential Regulation *

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Abstract

This paper explores the implications of political economy frictions on the dynamics of credit booms and the design of macroprudential policy. We present an open-economy model of financial crises extended with political turnover, where political parties vary in their inclinations toward regulating financial markets. We show that when the more responsible party is in office, it implements regulations that exceed those that would be optimal in the absence of political frictions. We also draw lessons for the empirical literature on the effectiveness of macroprudential regulation, and show that accounting for political economy frictions can help reconcile the theory with the mixed results from the empirical literature.

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1 Introduction

Financial deregulation episodes follow a consistent pattern: they stimulate credit and output booms in the short run, but are often followed by financial crises. This recurring pattern—long emphasized by Minsky (1977)—has fueled the view of financial crises as credit booms gone bust, prompting a large empirical literature aimed at identifying the drivers of the credit cycle and a growing theoretical literature emphasizing the role of macroprudential regulation in containing the vulnerability to these crises.

Currently, in the United States, a renewed political shift toward deregulation is underway, reigniting concerns that such policies may once again sow the seeds of financial instability.[1] Similar dynamics have played out across advanced and emerging economies alike, where political cycles often coincide with shifts in regulatory stance, amplifying financial vulnerabilities. The association between financial deregulation and crises raises important questions. What are the implications of political economy factors for the dynamics of credit booms and busts? And how should policymakers adjust the regulatory design in the face of political uncertainty?

To address these questions, this paper develops a dynamic quantitative model of macroprudential policy with political economy frictions. Unlike the existing literature, which assumes a single benevolent social planner, we consider an environment where policymakers with different ideological backgrounds alternate in power. Taking the political cycle as given, we show that a responsible forward-looking policymaker has incentives to tighten regulation above and beyond what would be optimal in a setting without political frictions. The model illustrates how the dynamics of the regulatory cycle can generate an extended period of financial tranquility, followed by a wave of financial deregulation that ultimately culminates in a financial crisis. Finally, we show how these political economy dynamics help shed light on confounding effects in the empirical literature regarding the effectiveness of macroprudential regulation. Our model shows that this may reflect an endogeneity bias and we propose a way to address it incorporating political economy factors.

We consider a small open economy model with tradable and non-tradable goods and imperfect capital markets, building on Mendoza (2002) and Bianchi (2011). Households face uninsurable income shocks and borrow from foreign investors, subject to an occasionally binding constraint linked to their income. In this benchmark economy, the feedback between consumption, the relative price of non-tradables, and the borrowing constraint generate a pecuniary externality by which households overborrow because they do not internalize that

[1] See, for example, the Financial Times editorial board article on "*Trump's reckless experiment with financial deregulation*", Feb 17, 2025.

higher aggregate debt contributes to a tighter borrowing constraint for other households and call for a strictly positive tax on borrowing whenever there is a positive probability of a binding constraint in the next period (e.g., Bianchi, 2011).

We study a Markov equilibrium in which two types of policymakers alternate in power. An "irresponsible" policymaker lets capital flow freely and, because of an ideological bias (or other reasons), fails to impose any regulations. On the other hand, the "responsible" policymaker sets a tax on borrowing optimally, anticipating that it might be replaced by an irresponsible policymaker in the future. In contrast to the constrained-efficient solution, we demonstrate that the responsible policymaker implements a strictly positive tax on borrowing, even when the probability of a crisis occurring in the following period is zero.

If a responsible policymaker perceives that she will be in power forever, she realizes that it can loosen regulation in the present and tighten it in the future to correct future externalities. However, a responsible policymaker who might be replaced by an irresponsible one finds it optimal to take a more restrictive stance on macroprudential policy because she may not be able to take action in the future. Underlying this result is an envelope condition that fails to apply because of the political economy friction. We derive a Generalized Euler Equation (GEE) that shows the responsible policymaker internalizes how a lower debt level has a direct higher marginal utility from higher resources tomorrow as well as an additional marginal gain from the fact that lower borrowing today induces relatively lower borrowing tomorrow by the irresponsible policymaker. Therefore, by borrowing less today, the responsible policymaker can mitigate the negative externalities that result from overborrowing in the future.

Turning to our quantitative results, we show that the dynamics of capital flows differ sharply with and without political economy frictions. Using an event analysis, we first show that in the absence of political economy frictions, financial crises tend to be preceded by restrictive financial regulation. This may seem paradoxical, but it is a result of selection: absent political frictions, crisis events in the simulations tend to be preceded by tight financial regulation because governments that anticipate a crisis tend to tighten financial regulation. On the other hand, in the presence of political economy frictions, financial crises tend to be preceded by loose regulation on average, as in the data. This is because financial crises now tend to follow credit booms, which are more likely to emerge when the irresponsible policymaker is in power.

Finally, we draw lessons from the empirical literature on the effectiveness of macroprudential policies. A well-known challenge in the literature trying to assess how financial regulation affects credit flows is that the regulatory changes are endogenous to the economic environment. In particular, policymakers typically tighten regulation in response to rising

credit growth or relax it in the aftermath of financial stress. As a result, estimates of the impact of regulatory changes on credit flows or financial stability may conflate policy effects with the underlying economic dynamics. Through the lens of our model, we show how the endogeneity bias in a standard OLS regression understates the effects of financial regulation and we propose an instrumental variable specification that can overcome this endogeneity bias. Adopting a two-stage least squares approach with model-simulated data, we recover sizable effects of regulation on capital flows. We then validate this finding using data from a panel of emerging economies.

Related Literature. Our paper belongs to the literature on macroprudential regulation. This literature has examined how tightening borrowing limits can help correct pecuniary externalities that emerge because of price-dependent financial constraints (e.g., Lorenzoni, 2008; Bianchi, 2011; Bianchi and Mendoza, 2018; Jeanne and Korinek, 2018). The literature has focused on second-best environments in which a benevolent policymaker chooses regulation to maximize average welfare. One notable exception is Rola-Janicka (2020). In an environment with heterogeneous borrowers that differ in the level of political connectedness, she shows that depending on the electoral power of the connected borrowers, the outcome may be a macroprudential policy that is either too lax or too strict. Our focus is different in that we take the political economy process as given and use our framework to understand the dynamic effects of political economy frictions for the design of macroprudential policy.

Herrera, Ordonez and Trebesch (2020) document how political booms, measured as increases in the popularity of incumbents, precede financial crises. They find that political booms predict future financial crises above and beyond credit booms in emerging markets. They rationalize this fact with a model in which incumbents of differing quality have a preference for staying in office. Faced with a 'bad boom,' a poor-quality government may find it too costly (from a reelection point of view) to implement regulatory policy and may then choose to let the boom happen, increasing both its popularity and the probability of a future crisis.[2] Different from their work, we focus on an environment where the scope for regulation emerges because of excessive private borrowing.

Our paper is also related to an extensive literature on the effectiveness of macroprudential policy (e.g., Alfaro, Chari and Kanczuk, 2017; Das, Gopinath and Kalemli-Özcan, 2022; Drechsel and Miura, 2025; Forbes, Fratzscher and Straub, 2015a; Forbes, 2007; Forbes, Fratzscher and Straub, 2015b; Richter, Schularick and Shim, 2019; Rojas, Vegh and Vuletin, 2022) and the link between financial liberalization, credit booms and financial crises (Kaminsky

[2] Müller (2023) uses cross-country panel data and finds that changes in macroprudential regulation exhibit a predictable electoral cycle in the run-up to elections.

and Schmukler, 2008; Jordà, Richter, Schularick and Taylor, 2021; Sufi and Taylor, 2022; Jordà, Schularick and Taylor, 2017). One challenge in this literature has been the endogeneity bias that is present because macroprudential policy responds to the economic environment. We use an IV approach that can remedy this bias by incorporating political economy factors that create an exogenous source of variation in macroprudential policies.[3]

Outline. Section 2 presents the model. Section 3 describes the optimal policy and presents the analytical results of the model. Section 4 provides quantitative results. Section 5 discusses the implications of political economy frictions for the empirical literature on the effectiveness of macroprudential policy. Section 6 concludes.

2 Model

We consider a dynamic small open-economy model with tradable and non-tradable goods. The economy is populated by a continuum of identical households that borrow externally subject to an occasionally binding borrowing constraint linked to their income. Policymakers set taxes on borrowing and alternate in power stochastically.

2.1 Households

Households have time separable preferences over consumption bundles of tradable and non-tradable goods:

$$\mathbb{E}_0 \sum_{t=0}^{\infty} \left(\prod_{j=0}^{t} \beta_j \right) u(c_t) \,. \tag{1}$$

We use a CRRA utility function over a consumption composite, c. The composite has a CES form:

$$c = \left[\omega \left(c^T \right)^{\frac{\eta-1}{\eta}} + (1-\omega) \left(c^N \right)^{\frac{\eta-1}{\eta}} \right]^{\frac{\eta}{\eta-1}}$$

with $\omega \in (0,1)$ denoting the weight on tradable consumption and where $\eta > 0$ is the elasticity of substitution between tradable and non-tradable goods, and β_t denotes the stochastic impatience of the households with the following process:

$$\beta_t = \bar{\beta}(1+\iota_t) \,, \tag{2}$$

[3] A recent paper by Drechsel and Miura (2025) adopts a high-frequency identification strategy to capture news about banking regulation that can also help remedy endogeneity concerns.

here $\bar{\beta} \in (0,1)$ denotes the average impatience, $\iota_t \in [\underline{\iota}, \bar{\iota}]$ is i.i.d, and $\mathbb{E}[\iota_t] = 0$.

Households receive a stochastic endowment of tradable goods y_t^T and a constant endowment of nontradable goods y^N. We assume that y_t^T follows a first-order Markov process. The budget constraint of the households is

$$p_t^N c_t^N + c_t^T + b_t = p_t^N y^N + y_t^T + \frac{1}{R(1+\tau_t)} b_{t+1} + T_t \,, \tag{3}$$

where b_t denotes a one-period non-state-contingent debt, which pays an interest rate R, τ_t is a tax on borrowing, and T_t are lump-sum transfer from the government. We normalize the price of tradable goods to one, and p_t^N stands for the relative price of nontradable goods.

Household's debt (b_{t+1}) cannot exceed a fraction κ of the total value of their endowment:

$$b_{t+1} \geq \kappa(y_t^T + p_t^N y^N) \,. \tag{4}$$

The constraint captures, in a parsimonious way, the empirical fact that income is critical in determining households' credit-market access (e.g., Jappelli, 1990; Lian and Ma, 2021), and from a macro perspective, it has been shown to be important for accounting for the dynamics of capital flows in emerging markets (e.g., Mendoza, 2002; Bianchi, 2011).

The problem of households is to maximize (1) subject to (2)–(4) taking prices and taxes as given. The first optimality condition of this problem yields a standard condition equating the marginal rate of substitution between tradable and non-tradable goods to their relative price:

$$p_t^N = \frac{1-\omega}{\omega} \left(\frac{c_t^T}{c_t^N} \right)^{1/\eta} . \tag{5}$$

The intertemporal Euler equation is:

$$u_T \left(c_t^T, c_t^N \right) = \beta R(1+\tau_t) \mathbb{E} u_T \left(c_{t+1}^T, c_{t+1}^N \right) + \mu_t \,, \tag{6}$$

where μ_t is the non-negative Lagrange multiplier on the borrowing constraint and u_T denotes the derivative of the household's utility with respect to the consumption of tradable goods.

2.2 Government

The budget constraint of the government is

$$T_t = \frac{\tau_t}{1+\tau_t}\frac{B_{t+1}}{R}\,, \tag{7}$$

where we use upper-case B to denote the aggregate debt level.

Political parties rotate in power following an exogenous stochastic process. Let $g_t \in \{i, r\}$ be an indicator variable representing the identity of the incumbent party in period t, with i referring to the "irresponsible" party and r to the "responsible" one.

In particular, we assume that the identity of the incumbent party follows a Markov process characterized by a transition probability matrix:

$$\Gamma = \begin{bmatrix} \Gamma_i & 1-\Gamma_i \\ 1-\Gamma_r & \Gamma_r \end{bmatrix}\,, \tag{8}$$

where Γ_g is the probability that the incumbent party $g \in \{i, r\}$ remains in power in the next period.

2.3 Competitive Equilibrium

Market clearing in the non-tradable goods market implies that

$$c_t^N = y_t^N\,. \tag{9}$$

Combining this market clearing condition with households and government budget constraints, we arrive at a country resource constraint for tradables:

$$c_t^T + B_t = y_t^T + \frac{B_{t+1}}{R}\,. \tag{10}$$

We are now ready to define a competitive equilibrium.

Definition 1. (Competitive Equilibrium) Given the initial debt B_0, the sequences of government policies $\{\tau_t, T_t\}_{t=0}^{\infty}$; 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. Given prices, and government policies, $\{c_t^T, c_t^N, b_t\}_{t=0}^{\infty}$ maximize (1) subject to (3) and (4);

ii. The government budget constraint is satisfied. That is, (7) holds;

iii. Market clears. That is, (9) holds.

Discussion of the political structure The structure of the political block of the model deserves a brief discussion at this point. One interpretation of the political transition game is that parties may have a different ideological bias for or against regulation. An alternative interpretation is that some policy makers may not want to implement optimal policy because they have concerns about their reelection prospects (e.g., Herrera, Ordonez and Trebesch, 2020 and Cotoc, Johri and Sosa-Padilla, 2025) or because they represent a constituency that is particularly affected by the regulation. We make the simplifying assumption that the irresponsible party sets prudential taxes to zero at all times. Relaxing this assumption and considering instead that this party faces private costs of introducing regulation would not change the main message of our paper.

2.4 Constrained-Efficient Allocations

We close the description of the model by defining the constrained-efficient allocations in this environment. Following Bianchi (2011), consider a planner who chooses debt subject to resource and borrowing constraints. These allocations are a helpful benchmark because they are equivalent to the choices of a responsible government if it were immune to political turnover. The problem of the constrained planner is

$$\begin{aligned} V^{SP}(B,s) = \max_{c^T, B'} & \; u(c^T, y^N) + \beta \mathbb{E} V^{SP}(B', s') \\ \text{s.t} \quad & c^T + B = y^T + \frac{B'}{R} \\ & B' \geq \kappa \left[y^T + \mathcal{P}^N(c^T) y^N \right] \end{aligned} \tag{11}$$

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

The Euler equation that characterizes the optimal allocations of the social planner is:

$$\frac{u_T(c^T, y^N)}{R} = \beta \mathbb{E} \left[u_T(c^{T\prime}, y^N) + \frac{\partial \mathcal{P}^N}{\partial c^T} \kappa \mu' \right] + \mu \left(1 - \frac{\partial \mathcal{P}^N}{\partial c^T} \kappa \right) \tag{12}$$

As in Bianchi (2011), the pecuniary externality is reflected in a wedge in the Euler equation of the planner relative to the Euler equation of individual households (6). When

the borrowing constraint binds, $\mu > 0$[4], higher tradable consumption helps to appreciate the real exchange rate (i.e., to increase the relative price of non-tradable goods) and relaxes other households' borrowing constraints. When the borrowing constraint is not binding, $\mu = 0$, higher savings imply higher consumption tomorrow, positively affecting tomorrow's borrowing capacity. These dynamics imply that there is scope for policy intervention in this environment.

3 Macroprudential Policy under Political Frictions

Next, we consider the political game between the two parties, the responsible party which we denoted by r and the irresponsible party that we denoted by i. We solve the problem of each party, subject to the implementability constraints derived from the problem of the households, and taking the other party's policies as given. We focus on Markov equilibria, so the payoff-relevant aggregate state variables are $s \equiv \{y^T, \beta\}$, g and B.

3.1 Responsible government

When the responsible party (r) is at power, it chooses the macroprudential tax τ that maximizes the welfare of households subject to the allocations being competitive equilibrium. The problem can be written as:

$$V^r(B, r, s) = \max_{c^T, B'} u\left(c^T, y^N\right) + \beta \left[\Gamma_r \, \mathbb{E} \, V^r(B', r, s') + (1 - \Gamma_r) \, \mathbb{E} \, V^r(B', i, s')\right] \tag{13}$$

$$\text{subject to}$$

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

$$B' \geq \kappa \left[y^T + \mathcal{P}^N(c^T) y^N\right]$$

The key difference between the responsible party and the social planner problem (11) is that the continuation value reflects that with probability $(1 - \Gamma_r)$, it will not be able to make optimal choices. In particular, its value function for the next period is given by

$$V^r(B, i, s) = u\left(\mathcal{C}^T(B, i, s), y^N\right) + \beta[\Gamma_i \mathbb{E} V^r(\mathcal{B}(B, i, s), i, s') + (1 - \Gamma_i) \, \mathbb{E} \, V^r(\mathcal{B}(B, i, s), r, s')] \tag{14}$$

where $\mathcal{C}^T(B', g, s')$ and $\mathcal{B}(B', g, s^{'})$ stand for the equilibrium consumption of debt functions

[4]With some abuse of notation, we denote by μ the multipliers in the borrowing constraint for all agents in this economy, including the social planner.

when the aggregate debt is B, the exogenous macroeconomic state is s, and $g = \{i, r\}$ depending on whether the responsible or irresponsible government is power.

3.2 Irresponsible government

The irresponsible government is restricted to setting $\tau(B, i, s) = 0$ when in power. Consumption and borrowing satisfy the following.

$$\mathcal{C}^T(B, i, s) = y^T - B + \frac{\mathcal{B}(s, i, B)}{R} \tag{15a}$$

$$\mathcal{B}(B', i, s) \geq \kappa \left[y^T + \mathcal{P}^N \left(\mathcal{C}^T(B, i, s) \right) y^N \right] \tag{15b}$$

$$u_T \left(\mathcal{C}^T(B, i, s), y^N \right) \geq \beta R \left[\Gamma_i \mathbb{E} u_T(\mathcal{C}^T(B', i, s'), y^N) + (1 - \Gamma_i) \mathbb{E}\, u_T \left(\mathcal{C}^T(B', r, s'), y^N \right) \right] \tag{15c}$$

where the last constraints holds with equality if $\mathcal{B}(B', i, s) < \kappa \left[y^T + \mathcal{P}^N \left(\mathcal{C}^T(B, i, s) \right) y^N \right]$. We assume implicitly that the allocations that solve these conditions are unique, which we verify numerically is the case under our calibration.

3.3 Markov Equilibrium

We define the Markov perfect equilibrium of this environment as follows.

Definition 2. (Markov Equilibrium) A Markov perfect equilibrium is defined by policy functions $\{\mathcal{C}^T(B, g, s), \mathcal{B}(B, g, s)\}$; value functions $V^r(B, g, s)$ for $g \in \{i, r\}$ such that; $\{\mathcal{C}^T(B, r, s), \mathcal{B}(B, r, s), V^r(B, g, s)\}$ solve the problem of the responsible party (13), $\{\mathcal{C}^T(B, i, s), \mathcal{B}(B, i, s)\}$ solve (15) and $V^r(B, i, s)$ satisfies (14)

Next, we analytically characterize the optimal policy of the responsible government and compare it to the optimal tax that would implement the solution of a social planner who does not face political frictions.

3.4 The Generalized Euler Equation (GEE)

The first-order condition for debt is:

$$\frac{u_T(c^T)}{R} = \beta \left[\Gamma_r \mathbb{E} \frac{\partial V^r(B', r, s')}{\partial B'} + (1 - \Gamma_r)\, \mathbb{E} \frac{\partial V^r(B', i, s')}{\partial B'} \right] + \left(1 - \frac{\partial \mathcal{P}_t^N(B', r, s')}{\partial c^T} \kappa \right) \mu \tag{16}$$

To calculate the derivative of the value function for the responsible party when it remains in power, we can use the envelop condition:

$$\frac{\partial V^r(B,r,s)}{\partial B} = -u_T(c^T) - \frac{\partial \mathcal{P}^N(B,r,s)}{\partial c^T}\kappa\mu \tag{17}$$

On the other hand, to calculate the derivative when the irresponsible party comes to power, we have:

$$\begin{aligned}\frac{\partial V^r(B,i,s)}{\partial B} = u_T(c^T)\left(\frac{\partial \mathcal{B}(B,i,s)}{\partial B}\frac{1}{R} - 1\right) - \frac{\partial \mathcal{P}^N(B,r,s)}{\partial c^T}\kappa\mu - \\ \beta\frac{\partial \mathcal{B}(B,i,s)}{\partial B} \times \Bigg[\Gamma_i\, \mathbb{E}\, \frac{\partial V^r(s',i,\mathcal{B}(B,i,s))}{\partial B'} + \ (1-\Gamma_i)\mathbb{E}\, \frac{\partial V^r(s',r,B')}{\partial B'} \\ + \left(1 - \frac{\partial \mathcal{P}^N(B',i,s')}{\partial c^{T\prime}}\kappa\right)\mu'\Bigg]\end{aligned} \tag{18}$$

From now on, we will focus on the macroprudential motives of the responsible government. So, we will focus on states where the borrowing constraint is not binding ($\mu = 0$). We combine (16)–(18) to obtain:

$$\begin{aligned}u_T(c^T) = \beta R\Bigg[\Gamma_r\mathbb{E}_r\ \left(u_T(c^{T\prime}) + \frac{\partial \mathcal{P}^N(B',r,s')}{\partial c^{T\prime}}\kappa\mu'\right) + \\ (1-\Gamma_r)\ \mathbb{E}_r\Bigg[\left(u_T(\mathcal{C}^T(B',i,s')) + \frac{\partial \mathcal{P}^N(B',i,s')}{\partial c^{T\prime}}\kappa\mu'\right)\left(\frac{\partial \mathcal{B}(B,i,s)}{\partial B} - \frac{1}{R}\right) - \\ \beta'\frac{\partial \mathcal{B}(B',i,s')}{\partial B'}\Bigg[\ u_T(\mathcal{C}^T(B'',i,s'')) - (1-\Gamma_i)\ \frac{\partial V^i(B'',r,s'')}{\partial B''} - \Gamma_i\ \frac{\partial V^i(\mathcal{B}(B'',r,s''),r,s'')}{\partial B''} \\ - \left(1 - \frac{\partial \mathcal{P}^N(B''),r,s''}{\partial c^{T\prime}}\kappa\right)\mu''\Bigg]\Bigg]\Bigg]\end{aligned} \tag{19}$$

Suppose that the household chooses the optimal consumption and debt policy when the irresponsible party is at power. In that case, we can use the envelope theorem to cancel the second line in (19) and recover the Euler equation that characterizes the solution of the constrained efficient allocations (12). Instead, the FOC of the responsible government accounts for the deviations from the optimal policy when the irresponsible party is in power. In particular, the responsible party reduces debt because there might be the case that in the future they will get out of power. Consequently, households would overborrow due to the lax macroprudential policy of the irresponsible party. The best response of the responsible party is to increase current taxes to reduce the exposure of the economy and reduce future

overborrowing. In the next subsection, we will show that this effect leads to the responsible government's more aggressive macroprudential policy than to the constrained efficient policy. Iterating forward, the GEE of the responsible party is

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

$$u_T(c_t^T) = \beta_t R \Bigg[\Gamma_r \mathbb{E} \left(u_T(c_{t+1}^T) + \frac{\partial \mathcal{P}_t^N}{\partial c_t^T} \kappa \mu_{t+1} \right) + (1 - \Gamma_r) \Bigg[\sum_{n=1}^{\infty} (\Gamma_i)^n \prod_{j=t}^{t+n} \beta_j \left(\frac{\partial \mathcal{B}}{\partial B} \right) \Bigg[\mathbb{E} \left(\left(u_T(\mathcal{C}^T(s_{j+1}, i, B_{j+1})) + \frac{\partial \mathcal{P}_j^N}{\partial c_j^T} \kappa \mu_j \right) \left(\frac{1}{R} \frac{\partial \mathcal{B}}{\partial B} - 1 \right) \right) + (1 - \Gamma_i) \mathbb{E}_r \left(u_T(c_{j+1}^T) + \frac{\partial \mathcal{P}_{j+1}^N}{\partial c_{j+1}^T} \kappa \mu_{j+1} \right) \Bigg] \Bigg] \Bigg] \quad (20)$$

Proof. See Appendix A.1. □

The GEE of the responsible government equates the marginal utility of current consumption with the cost of carrying higher debt into the future. The cost of the debt depends on which party will be in power in all possible future histories. The first term on the right-hand side of the equation is the marginal cost of one unit of debt if the responsible party remains in power. The second term measures the cost of one unit of debt if the irresponsible party takes power in any history in the future. Note that the future cost of one unit of debt when the irresponsible party is in power depends on the derivatives of the optimal debt policy function of the irresponsible government and on the sequence of Lagrange multipliers of the borrowing constraints.

3.5 Macroprudential Tax

One of the key results in the literature on macroprudential policy is that the competitive equilibrium is inefficient if and only if, at least for some states, the borrowing constraint is binding in the next period. This, in turn, implies that macroprudential policy has no role in states where the probability of the borrowing constraint binding the next period is zero. This result no longer holds for an economy with political frictions.

Proposition 1. *(Macroprudential Policy is always active.) Define* $s_t = \{y_t^T, \beta_t\}$. *Let* $\mu_t^r(B_t, g_t, s_t)$ *be the Lagrange multiplier on the borrowing constraint, and let* $\tau_t(B_t, r, s_t)$ *be the state contingent tax that implements the solution of the problem of the responsible government. Assume that there exists* $\mu_{t+h}^r(B_{t+h}, g_{t+h}, s_{t+h}) \neq 0$ *for any* $h > 0$ *in a given state* s_{t+h}. *Then* $\tau_t(B_t, r, s_t) > 0$.

Proof. See Appendix A.2. □

Proposition 1 summarizes a key difference between the optimal policy in our model and the one typically found in the literature. In the model, households do not internalize the effect of their decisions on the price of non-tradable goods. They do not consider that by taking more debt they are reducing their expected consumption of tradable goods in the next period, thus reducing prices and increasing the probability of the borrowing constraint binding. In a model without political frictions, the externality is irrelevant in states where the probability that the constraint binds in the next period is zero. In those states, the household's debt policy coincides with the efficient one, and the optimal tax is zero. The key is that, without political friction, the government will adjust macroprudential policy if risk increases to prevent households from overborrowing.

In contrast, with political frictions, even if the probability of a crisis in the next period is nil, there is still a chance that some macroprudential policy would be necessary down the road if the risk were to increase. It might also be that future governments will be irresponsible and do not implement the necessary regulations. This implies that if the risk increases, the economy will overborrow. In response, optimal regulation is more aggressive in reducing risk.

4 Quantitative Analysis

In this section, we describe the solution of the quantitative model to explore the implications of political frictions. We solve the model for three different economies: (i) an "Unregulated" economy where the irresponsible party is always in power, (ii) a "constrained efficient" economy where the responsible party is always in power, and (iii) a regulated economy with political frictions.

4.1 Calibration

We calibrate the model to Mexico, and follow the approach in Bianchi (2011). One period corresponds to one year. Table 1 reports all parameter values used in the baseline. The coefficient of relative risk aversion is set to $\sigma = 2$, the world interest rate to $R = 1.04$, and the elasticity of substitution to $\eta = 0.83$.

To estimate the stochastic process for the tradable endowment, we use value-added data from the primary and manufacturing sectors. We assume a first-order autoregressive process for the cyclical component:

$$\ln y_t^T = \rho^y \ln y_{t-1}^T + \varepsilon_t^y \quad \text{with} \quad \varepsilon_t^y \sim N(0, \sigma_y),$$

and estimate $\rho^y = 0.5$ and $\sigma_y = 0.034$.[5]

We normalize non-tradable output to one and set $\omega = 0.31$ to match Mexico's average tradable output share of 33%. The mean discount factor is set to $\bar{\beta} = 0.904$ to match the average net foreign asset (NFA) to GDP ratio. We assume that ι is uniformly distributed over the support $[-0.05, 0.05]$, and set $\kappa = 0.32$ to match the observed frequency of sudden stops.

The political process is governed by the transition matrix Γ. In the baseline, we assume no persistence, so the process is summarized by a single parameter. We calibrate this parameter using data on party orientation and capital inflow restrictions, such that the party more likely to impose capital controls is in office 22% of the time.[6] We also perform a sensitivity analysis to show that our main results are robust to alternative specifications of the political process.

[5] We use annual value-added data for manufacturing and agriculture from the WDI (1970–2024). The cyclical component of tradable output is extracted using the Hodrick-Prescott filter with a smoothing parameter of 100.

[6] See Section 5.7 for further details.

Table 1: Parameters

Parameter	Value	Source
Interest rate	$R = 1.04$	Bianchi (2011)
Risk aversion	$\sigma = 2$	Bianchi (2011)
Elasticity of substitution	$\eta = 0.83$	Bianchi (2011)
Weight on tradable in CES	$\omega = 0.31$	Share of tradable GDP = 33%
Tradable output persistence	$\rho = 0.5$	WDI data
Tradable output volatility	$\sigma_T = 0.034$	WDI data
Mean discount factor	$\bar{\beta} = 0.904$	NFA-GDP ratio
Discount factor shock	$\iota \in [-0.05, 0.05]$	Uniform distribution
Credit constraint parameter	$\kappa = 0.32$	Frequency of crises
Prob. responsible party in office	$\Gamma_r = 0.22$	Political data
Prob. irresponsible party in office	$\Gamma_i = 1 - \Gamma_r$	Baseline

We solve the Markov equilibrium using a combination of value function iteration and time iteration as explained in Appendix B.

4.2 Optimal Tax Policy

Figure 1 shows the tax policy of the responsible party and the social planner for the mean values of the tradable endowment and the impatience of households. First, note that the optimal tax is zero for high debt levels in both economies. In those states, the borrowing constraint is already binding, so there is no scope for macroprudential policy. The social planner and the responsible party set high taxes for intermediate debt levels to reduce the probability of a crisis. However, the responsible government adopts a more aggressive policy. Finally, for low levels of debt, the optimal tax converges to zero, while the tax of the responsible party does not, which is consistent with the analytical results (see Proposition 1).

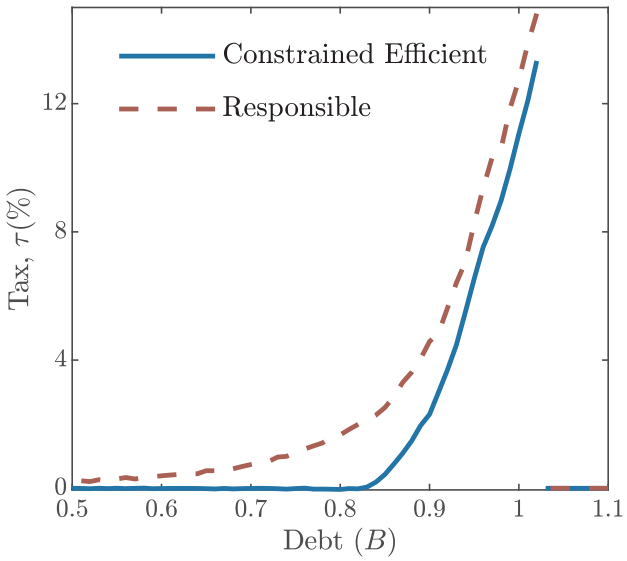


Figure 1: Macroprudential Tax

Note: This figure is computed assuming the endowment of tradable goods and the impatience of the households are their respective means ($y^T = 1$ and $\beta = 0.904$).

Next, we perform an event analysis that compares the macroprudential policy in the model and the data. We analyze episodes of sudden stops. For the model, we follow the literature in classifying an event as a sudden stop if the borrowing constraint binds and the current account falls by more than one standard deviation compared to the historical mean. Also, we follow the empirical literature for the data to define a sudden stop as any event in which the current account falls two standard deviations below its mean.

In Figure 2, we use data from Das et al. (2022) on changes in capital controls to construct measures of how countries use macroprudential policy around episodes of sudden stops. In particular, we use a measure that increases by one if a country introduces a capital control and decreases by one if it removes a capital control. We focus on capital controls on inflows because these better represent the type of macroprudential policy studied in the model. We can see that in the data, the typical crisis is preceded by periods in which countries tend to remove capital controls.

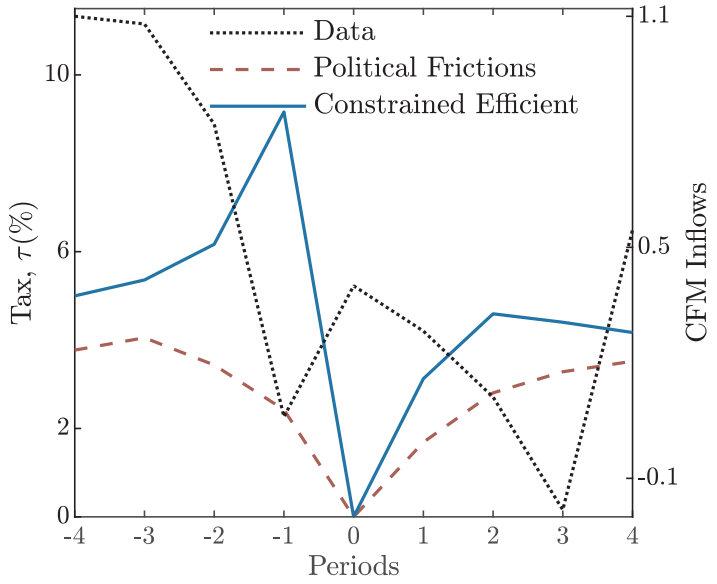


Figure 2: Tax on Borrowing around Crises

Note: This figure plots the simulation results of both the constrained-efficient and the political-frictions economies. Period zero corresponds to a sudden stop. We present the average tax policy for five periods before and after the sudden stop. CFM increases by one if a country introduces a capital control and decreases by one if it removes a capital control.

In Figure 2, we also present an event analysis of the optimal tax in economies with and without political frictions. We can see two very different patterns of optimal policy in these economies. On average, in a constrained-efficient economy, the planner increases taxes just before a sudden stop episode because she perceives that risk builds up and tries to avoid the crisis. On the other hand, in an economy subject to political frictions, macroprudential regulation, on average, decreases in periods before an episode of sudden stop. As in the data, in this economy, the typical crises follow credit booms fueled by lax regulation.

4.3 Optimal Debt Policy

Figure 3 plots the optimal policy functions for debt when the endowment is one standard deviation below the mean and the impatience of the households is at the mean. For an economy with political frictions, we plot the optimal policy when both the irresponsible and the responsible parties are in power. The numerical results show that households take, in general, less debt when there is a responsible party at power compared to the constrained-efficient economy. This is explained by the fact that the responsible government uses a more aggressive macroprudential policy than the constrained social planner.

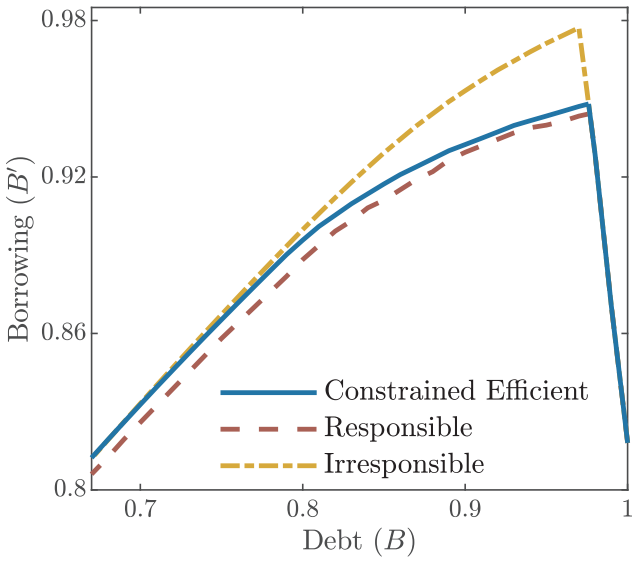


Figure 3: Policy functions

Note: This figure is computed assuming the endowment of tradable goods is 1 std. dev. below mean and the impatience of the households is at its mean.

Figure 4 shows the ergodic distribution of debt in the three economies. 56.2% of the time, the unregulated economy visits a level of debt that the constrained efficient one never does. Moreover, 23.8% of the time, the economy with political frictions visits levels of debt that the constrained efficient never achieves. We can see a loss in the macroprudential policy's effectiveness in reducing the economy's debt level in an environment with political frictions. However, the effect of prudential policy remains large.

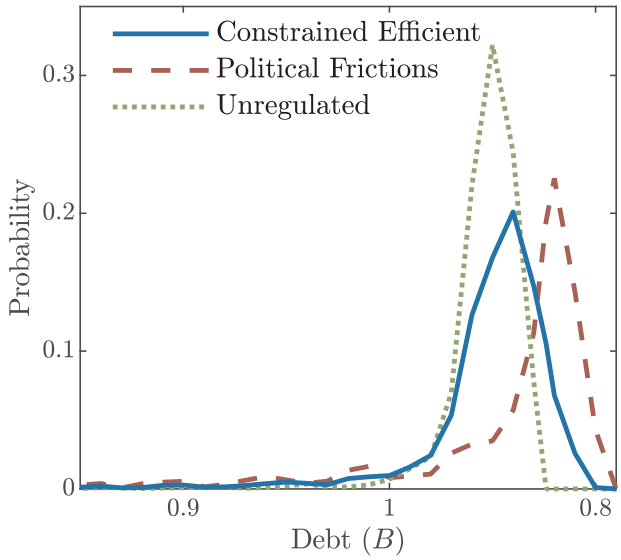


Figure 4: Ergodic Distributions

Finally, we perform a simulation exercise to evaluate the probability of sudden stops in the three economies. Table 2 presents the probability of a sudden stop derived from the models' simulations. The social planner effectively reduces the probability of crises from 11.1% to 2.2%, while the responsible government reduces it to 5.3%.

Table 2: Probability of Sudden Stop

Constrained Efficient	2.2%
Political Frictions	5.3%
Unregulated Economy	11.1%

4.4 Welfare Analysis

Now, let us measure the welfare cost of political frictions. For every initial state, we compute the percentage increase in consumption in all possible future histories that the household would require to be indifferent between living in an economy with political frictions or in a constrained-efficient economy. Due to the homotheticity of the utility function, the welfare gain γ in state s is given by:

$$(1+\gamma(B,g,s))^{(1-\sigma)}V^r(B,g,s) = V^{SP}(B,s)\,.$$

Figure 5 shows the welfare cost of political friction as a function of current debt. In panel 5a, we show the cost for a low level of the tradable endowment (1 std. dev. below mean), when the government in power is responsible or irresponsible. Panel 5b shows similar welfare costs but for the case of a high tradable endowment (1 std. dev. above mean). We can see in Panel 5a that for very high levels of debt, the cost of political friction is relatively low because the economy is already in the crisis zone. The cost increases for intermediate debt levels, but increases more when the irresponsible party is in power. On the other hand, the risk is lower for high levels of endowments (panel 5b), so both the cost of the distortion and the difference between parties are smaller. Intuitively, when risk is low—either due to a high endowment or low debt—the need for macroprudential policy diminishes, reducing the cost of the political frictions. Instead, for a combination of endowment and debt close to the crisis zone, having an irresponsible government is costly for the economy because those are the states where having an active macroprudential policy has a higher impact on welfare.

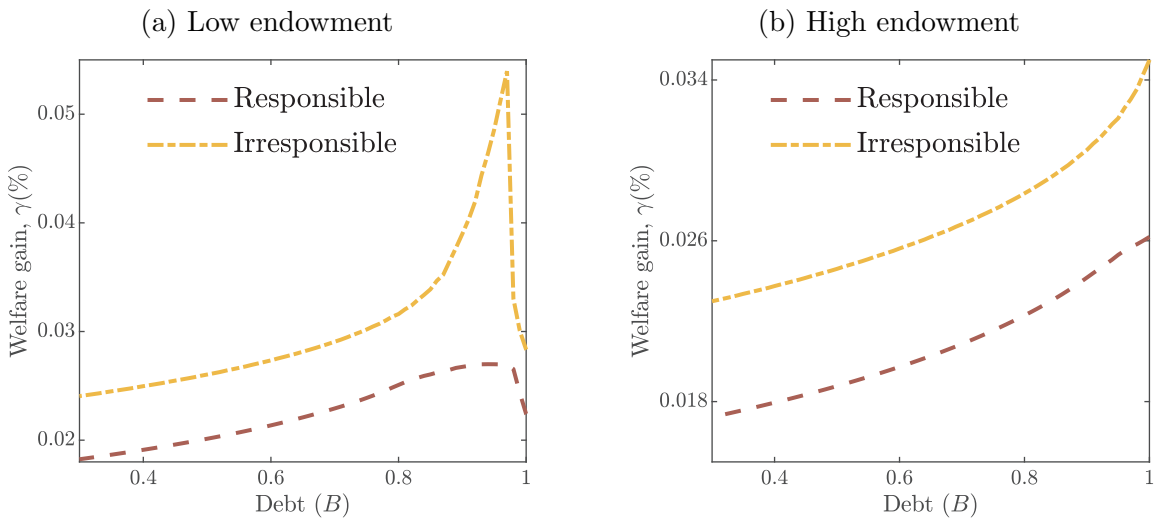


Figure 5: Welfare Losses of Political Frictions

Note: This figure is computed assuming the impatience of the households is at the mean $\beta = 0.904$.

On average, a household would require an increase in consumption of 0.021% to be indifferent between living in an economy subject to political frictions and moving to the constrained-efficient one.

4.5 Sensitivity Analysis

This subsection studies how our main results change when we modify the parameters that govern the political process. We focus on two measures: the mean of the welfare cost and the mean tax conditional on the responsible party being in power. To do so, we fix all other parameters to their values in the baseline calibration and change the values in the transition matrix of the political process (Γ). For each exercise, we only change one probability of reelection at a time. As we change the probability of reelection, the political process has persistence.

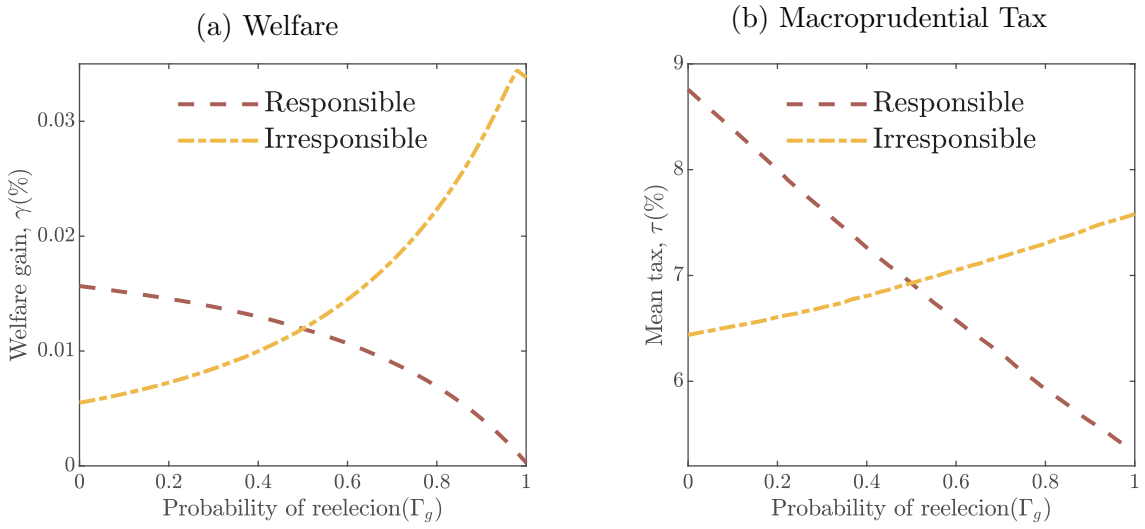


Figure 6: Sensitivity Analysis

Note: In this figure, we keep fixed all parameters at the value in the baseline and change only the probability of re-election (Γ_g) of one party at the time. The average tax is conditional on a responsible government. The welfare corresponds to the gains from removing the political economy friction.

Figure 6a shows the sensitivity analysis for the welfare cost of political frictions. The dashed red line shows how the welfare cost changes as we increase the probability that the responsible government is reelected, Γ_r. The yellow dotted line plots how the welfare cost changes as we increase the probability that the irresponsible government is reelected Γ_i. We can see that the welfare costs of political frictions go down as the probability of reelection of the responsible party goes to one. On the other hand, these welfare costs increase as we increase the probability of the irresponsible party being in power.

In Figure 6b, we show how the tax chosen by the responsible party changes as we vary the probabilities of reelection. As expected, the mean tax increases as the probability of the irresponsible party being in power increases. This reflects the fact that the responsible party sets more aggressive regulations when the probability of losing power in the next period is higher.

5 The Effectiveness of Regulation: Bridging Theory and Evidence

A vast amount of empirical literature has focused on estimating the effects of capital controls on different variables of interest and assessing the effectiveness of preemptive policy measures of the kind we study in this paper. A significant challenge in this literature revolves around endogeneity concerns, which arise from the potential presence of omitted variables and reverse causality.[7] Using structural relations implied by our model, we first establish that the typical OLS estimation suffers from endogeneity bias and then propose an IV specification that corrects this bias and performs better prediction.

5.1 Political Process

At this point, it is useful to put more structure on the political process. Each period, an election is held during which voters decide which party will be in office. We assume that voters derive a stochastic utility ν_t if the irresponsible party is at power (see Lindbeck and Weibull, 1987 and Davis, DeGroot and Hinich, 1972 for references on this type of preferences). Additionally, we assume that voters derive a fixed utility $\overline{\nu}$ if the responsible party is at power. Therefore, the voting rule is as follows.

$$g_t = \begin{cases} i & \text{if} \quad \nu_t \geq \overline{\nu}, \\ r & \text{otherwise.} \end{cases} \tag{21}$$

We model ν_t as a convex combination of a persistent component χ_t (which itself follows an AR(1) process) and an i.i.d. component ϱ_t. Therefore, we have:

$$\nu_t = \lambda \chi_t + (1 - \lambda)\varrho_t \,, \tag{22}$$

where $\lambda \in [0, 1]$. From (21) and (22), we can derive a Markov process for the identity of the incumbent party (g_t), mapping the probabilities of χ_t and ϱ_t to the transition matrix that we used in the model analysis (equation 8).

[7] There are, of course, attempts to alleviate partially such endogeneity concerns by resorting to microdata and by using high-frequency data that allows to control better for variables that are correlated with the use of preemptive capital controls (e.g., Das et al., 2022; Andreasen, Schindler and Valenzuela, 2019).

5.2 Structural Linear Relations

Our model features key structural relations for the debt and the tax, both as functions of the initial states. According to Lemma 2, we can approximate these (potentially non-linear) relations as simple linear functions of the initial states.

Lemma 2. *(Structural relations of the model) Let* $\{\mathcal{B}(B,g,s), \tau(B,g,s)\}$ *denote the debt and tax policies part of the Markov equilibrium. Then, it is possible to write the linear approximations of the policy functions as:*

(i) $B_{t+1} = \Upsilon_0 + \Upsilon_B B_t + \Upsilon_\tau \tau_t + \Upsilon_y y_t^T + \Upsilon_\beta \beta_t + \Upsilon_g g_t + o_t$, *and*

(ii) $\tau_t = \gamma_0 + \gamma_B B_t + \gamma_y y_t^T + \gamma_\beta \beta_t + \gamma_g g_t + u_t$,

where $\Upsilon_g = 0$ *if and only if the political process is not persistent (i.e.,* $\lambda = 0$*).*

Proof. See Appendix A.3. □

First, o_t and u_t represent the non-linearities of the debt and tax policy functions. In addition, Υ_g accounts for the persistence of the political process. In particular, if $\lambda \neq 0$, the political process is persistent and the identity of the incumbent party has explanatory power over the level of external debt beyond the effect of the current tax. The intuition is the following: When the political process is persistent, the identity of the incumbent affects the probability of political turnover in the next period, and, in turn, this affects the expected sequence of future taxes and the current borrowing choices of the household. Note that (i) $\Upsilon_\beta > 0$ because the more patient the households, the less debt they will accumulate, and (ii) $\gamma_\beta < 0$ because when the households are more patient, the government uses macroprudential policy less aggressively. This occurs because households take less debt; therefore, the economy is exposed to less risk.

Next, we will use the structural linear relations derived in Lemma 2 to analyze a common econometric model used to estimate the effect of capital controls on the current account. Critically, we will establish that when $\Upsilon_g = 0$, it is possible to obtain an unbiased estimation of the coefficient of interest (that is, the effect of capital controls on the current account) using the identity of the political party in power as an instrument of capital controls. Instead, when $\Upsilon_g \neq 0$, we need to identify the non-persistent shocks to the political process (ϱ_t) and use them as an instrument to obtain an unbiased estimate of the coefficient of interest.

5.3 Endogeneity Bias in the OLS Estimation

Consider the following econometric model aimed at estimating the effect of macroprudential policy on the current account:

$$CA_t = \delta_0 + \delta_B B_t + \delta_\tau \tau_t + \delta_y y_t^T + \epsilon_t \quad s.t. \quad \mathbb{E}[\epsilon_t] = 0 \tag{23}$$

We do not include shocks to the impatience of households in (23). We do so to acknowledge that this is an unobservable variable in most relevant empirical applications. Next, we investigate the consequences of this omitted variable in the properties of the estimation.

First, we use the definition of the current account ($CA_t \equiv B_t - B_{t+1}$), Lemma 2 and (23) to get a mapping between the parameters of the regression model and the structural relations of the endogenous variables:

$$\begin{aligned}
\delta_0 &= \Upsilon_0 + \Upsilon_\beta \, \bar{\beta} + \mathbb{E}[o_t] \\
\delta_b &= \Upsilon_b - 1 \\
\delta_y &= \Upsilon_y \\
\delta_\tau &= \Upsilon_\tau \\
\epsilon_t &= (o_t - \mathbb{E}[o_t]) + \Upsilon_\beta \, \bar{\beta} \, \iota_{i,t}
\end{aligned} \tag{24}$$

The main coefficient of interest in (23) is δ_τ. Next, we investigate whether the estimation of (23) using an OLS regression produces a biased estimate for δ_τ. Recalling that we have argued above that $\Upsilon_\beta > 0$ and $\gamma_\beta < 0$, it is possible to establish the following proposition.

Proposition 2. *(OLS estimation is biased) Given $\Upsilon_\beta > 0$ and $\gamma_\beta < 0$, let $\hat{\delta}_\tau$ be the OLS estimation of δ_τ in (23). Then, we can show that the OLS estimator is downward biased: $\mathbb{E}[\hat{\delta}_\tau - \delta_\tau] < 0$.*

Proof. See Appendix A.4. □

The negative sign of bias is related to the structural relation between the omitted variable, macroprudential policy, and new borrowing. In particular, the omission of impatience shocks from the regression model introduces a negative correlation between the current account and the capital controls, making the OLS estimator smaller than the true coefficient.

5.4 Instrumental Variable

We propose using the political process as an instrument in a two-stage IV regression to correct for the endogeneity in (23). Let z_t be the instrument proposed in the estimation of (23). As usual, for z_t to be a valid instrument, we must confirm three conditions, which we restate below using the notation in our model.

i) Exogeneity. First, the proposed instrument should not be correlated with the error term in (23). This is:

$$Cov(z_t, \epsilon_t) = 0\,. \tag{25}$$

ii) Relevance. Second, we need to establish that the instrument is correlated with the endogenous regressor τ_t conditional on the exogenous variables of the model. This implies:

$$Cov(z_t, \tau_t \,|\, y_t^T, B_t, \beta_t) \neq 0\,. \tag{26}$$

iii) Exclusion. Finally, we need to confirm the exclusion restriction, which states that the instrument only affects the dependent variable CA_t through its effect on the endogenous regressor τ_t:

$$Cov(z_t, CA_t \,|\, \tau_t) = 0\,. \tag{27}$$

Usually, this condition is the most difficult to establish because it is typically impossible to test. In our case, however, we know the data-generating process, and this allows us to analyze conditions under which exclusion holds using the structural relations of the model derived in Lemma 2. It is possible to establish:

Proposition 3. *(IV estimation is unbiased) Let ϱ_t be the non-persistent component of the political process, and $\overline{\delta}_\tau$ be the IV estimation of δ_τ in (23), using ϱ_t as the exogenous instrument. Assume $\lambda \neq 1$. Then, the IV estimator is unbiased: $\mathbb{E}\left[\,\overline{\delta}_\tau - \delta_\tau\right] = 0$.*

Proof. See Appendix A.5. □

The proposition 3 implies that the non-persistent political process component is a valid instrument to solve the endogeneity problem in the estimation of δ_τ. In Proposition 3, we exclude the case of $\lambda = 1$. In this case, the nonpersistent shock does not have predictive power over which party will be in office, so ϱ_t would not be a valid instrument because it would violate the relevance condition.

Proposition 3 also implies that if there was no persistence in the political process ($\lambda = 0$), one could use the identity of the incumbent party directly as an instrument in the estimation,

formally, in that case $g_t = \varrho_t$, therefore, setting $z_t = g_t$ delivers a valid instrument. Instead, suppose that there is persistence in the political process. In that case, one needs to identify the non-persistent shocks to the political process and use them as a valid instrument in the estimation. In the numerical section, we explore the performance of the estimation on finite samples. We also provide a numerical estimation of the bias on the OLS and IV estimations when we use g_t (the incumbent's identity) directly as an instrument and the political process has persistence.

We also highlight that in this structure, there is a role for ϱ_t (or g_t when $\lambda = 0$) as an instrument for τ_t rather than as a control variable in (23). In fact, one implication of Proposition 3 is that the exclusion restriction is satisfied, which in turn implies $\text{Cov}(\varrho_t, CA_t \,|\, \tau_t) = 0$. Consequently, if we were to use ϱ_t as a control variable in (23), the expected value of its coefficient should be zero.

5.5 Model Based Regressions

Next, we will explore numerically the performance of the OLS and IV estimators in finite samples. To do so, we performed a Monte Carlo simulation using the calibrated model and estimating (23) using both OLS and IV regressions. For this exercise, we simulate the model and create 30,000 samples of 700 observations each. For each sample, we discard the initial 300 observations. We used the following 300 observations to estimate the econometric model. Finally, we save 100 observations for prediction error tests.

Figure 7 shows the distribution of the coefficient of interest (δ_τ) for both regressions. The OLS estimator is negative or positive with roughly similar probabilities. Instead, for the IV exercise, the mean of the estimated coefficients is higher and its value is never negative.

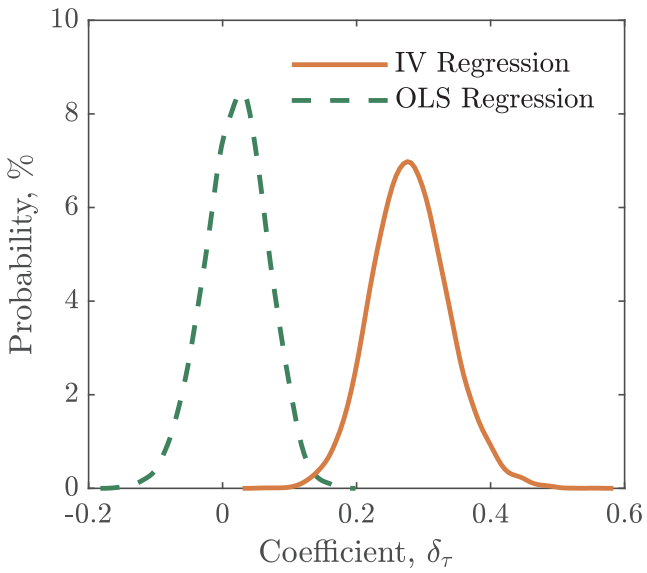


Figure 7: Monte Carlo Comparison

In Table 3, we use large samples. We used a sample size of 10,000 observations. The OLS coefficient is close to zero and the IV identifies an effect of the macroprudential policy that is roughly an order of magnitude larger.

Table 3: Large Samples

Variables	**OLS**	**IV**
τ	0.02	0.28
P-value	0.0001	0.00007
Observations	10,000	10,000

We conclude this subsection by comparing the prediction performance of both econometric models. In Figure 8, we plot the current account as a function of the macroprudential tax. We first plot the policy functions of the structural model (the data-generating process). In addition, we used the means of the coefficients estimated in the Monte Carlo simulations to construct the linear relations predicted by the OLS and IV estimators. We plotted all three models using the mean values for all state variables. We can see that the IV econometric model predicts a linear relation between macroprudential policy and the current account closer to the one in the data-generating process.

Furthermore, we conducted a formal prediction error test using 100 observations. For

most of the observations in the sample, the government tax was between zero and ten percent. As shown in Figure 8, the prediction errors are relatively small in that region. However, we find that, on average, the prediction error of the OLS model has a standard deviation of 0.032, while, for the IV regression model, it is 0.028.

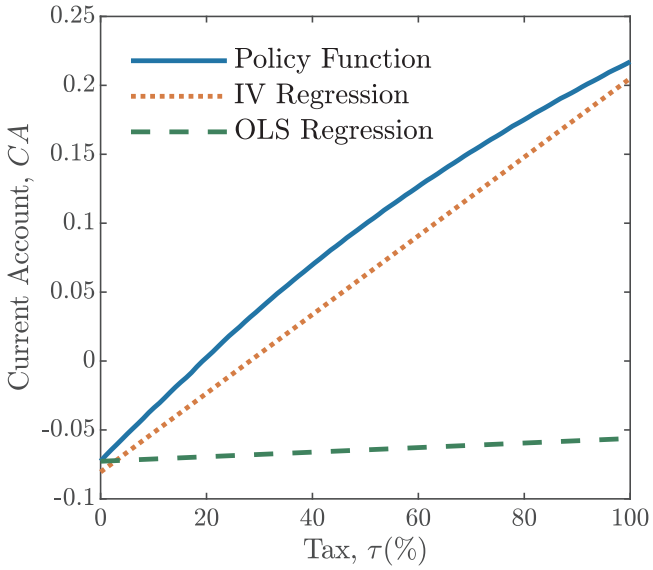


Figure 8: Prediction of the Current Account

Note: This figure is computed assuming the endowment of tradable goods and the impatience of the households are at the mean. This is, $y^T = 1$ and $\beta = 0.904$. The initial debt position is $b_t = 0.7$

5.6 Persistence in the Political Process

Next, we analyze how the results of the econometric analysis change when we change the persistence of the political process, λ. Recall that if the political process has a persistent component ($\lambda > 0$), the exclusion restriction is violated, and the estimation using the identity of the incumbent (g_t) as an instrument is biased. In Figure 9, we explore the size of the bias in the estimation of δ_τ as we change λ.

We plot the mean of the estimated δ_τ using three approaches: an OLS regression, an IV estimation where the instrument is the identity of the political party in power g_t, and an unbiased estimation using the non-persistent shock to the political process (ϱ_t) as the instrument. Consistent with our analytical results, when λ goes to zero, the political process is an i.i.d. process, and the IV estimator using the political party in power as an instrument coincides with the unbiased estimation. On the other hand, as we increase the persistence of the political process (by increasing λ), the IV specification produces a biased estimate of δ_τ.

In this case, it is below the true parameter. Additionally, we can see that the OLS estimation is an order of magnitude lower than the true parameter. In addition, the IV estimator is always closer to the true parameter for our calibration.

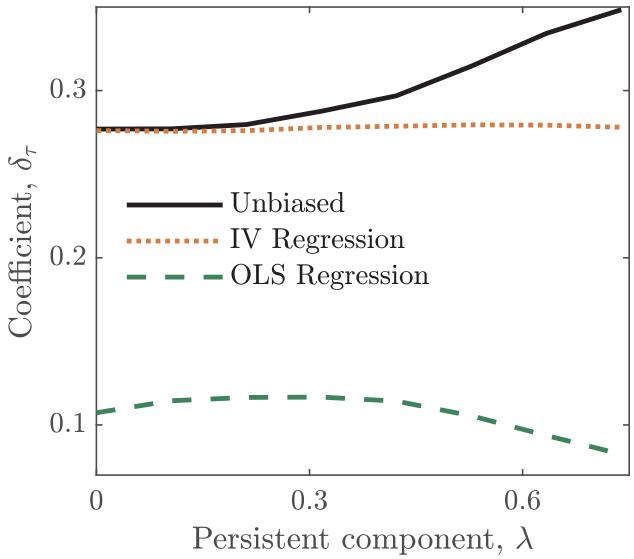


Figure 9: Sensitivity of the Empirical Results

Note: In this figure, we keep all parameters fixed at their values in the baseline calibration and only vary the persistence of the political process, λ.

In many applications, the exclusion restriction may not be satisfied. The exclusion restriction is violated when the covariance of the CA and macroprudential tax, conditional on debt and income, differs from zero. It could happen because the change in the political party is correlated with other variables that affect CA (for example, the risk-free interest rate could be correlated with the incumbent government).

We explore the performance of the IV estimator when the exclusion restriction is violated by considering an economy where the political process has persistence.

5.7 Empirical Application

In this section, we use quarterly data for 36 countries from $2008q1$ to $2019q1$ to estimate an empirical version of the econometric model presented before. We include this as a proof-of-concept and emphasize that we use it merely as an illustration of the methodology.

We used data from Binici and Das (2021) on capital controls to construct a measure of changes in macroprudential policy. In particular, we focus on changes in "Capital Flow Management" (CFMs) tools targeting inflows because they are closer to the type of policy

we consider in the model. Let us define an empirical version of (23) as:

$$CA_{it} = \delta_i + \delta_b CA_{i,t-1} + \delta_\tau \tau_{it} + \delta_y GDP_{it} + \epsilon_{it} \quad s.t. \quad \mathbb{E}[\epsilon_{it}] = 0\,, \tag{28}$$

where τ_{it} is a cumulative index that accounts for every new capital control the government introduced since the sample began. In particular, the index increases by one every time the country introduces a capital control measure and decreases by one every time the country removes one capital control.[8] We also used data on capital flows and GDP growth from the IMF International Financial Statistics database. Finally, we include fixed effects δ_i.

To construct a proxy for the political process, we use the Global Populisms Data (from Stanford University) to classify governments as populist or nonpopulist. Also, we use data from the Database of Political Institutions (2020 vintage) to classify countries as either left- or right-wing. We use the interaction of these two variables as proxies of political conditions. In particular, the specification of the first stage in our IV estimation is:

$$\tau_{it} = \gamma_0 + \gamma_b CA_{i,t-1} + \gamma_y GDP_{it} + \gamma_{g,1}\text{Populist}_{it} + \gamma_{g,2}(\text{Populist}_{it} \times \text{Left}_{it}) + u_{it}\,, \tag{29}$$

where Populist_{it} is an indicator variable that takes the value of one if the party in power is classified as populist, and Left_{it} is an indicator variable that takes the value of one if the party in power is classified as left-wing.

In Table 4, we compare the empirical estimate of (28) using OLS and IV regressions. In line with the numerical results, we find that the IV regression produces an estimated coefficient that is an order of magnitude higher than the one from the OLS regression. In addition, the $p-value$ in the IV estimate is lower than in the OLS estimate. In Appendix C, we show tables with the complete results for the estimation of (28).

Table 4: Empirical Regression

Variables	**OLS**	**IV**
τ	0.024	1.517
P-value	0.167	0.035
Observations	786	590
Number of countries	18	14

This simple exercise illustrates how the insights from the model regarding the interaction

[8] See Das, Gopinath and Kalemli-Özcan (2022) for details on the construction of this index

between political frictions and macroprudential policy can be used to discipline the related empirical work.

6 Conclusions

This paper explores the implications of political economy frictions for implementing macroprudential policy and the dynamics of capital flows. We extend a workhorse open-economy model of financial crises and macroprudential policy with political turnover where "responsible" and "irresponsible" policymakers alternate in power. Our analysis shows that a responsible policymaker has incentives to tighten regulation above and beyond what would be the desired regulation in an environment without political-economy frictions, how the dynamics of the regulatory cycle can contribute to an extended period of financial tranquility followed by a wave of deregulation that ends up in financial crisis, and how these dynamics can help shed light on the empirical evidence on the effectiveness of financial regulation.

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A Proofs

A.1 Proof Lemma 1

Proof. Let us start by analyzing the responsible government's Generalized Euler Equation:

$$\frac{u_T}{R} = -\beta \left[\Gamma_r \mathbb{E} \frac{\partial V^r(B_{t+1}, r, s_{t+1})}{\partial B_{t+1}} + (1-\Gamma_r)\, \mathbb{E} \frac{\partial V^i(B_{t+1}, i, s_{t+1})}{\partial B_{t+1}} \right] + \mu_t \left(1 - \frac{\partial p_t^N}{\partial c_t^T} \kappa \right) \tag{A.1}$$

For the i party, we can use the envelope condition:

$$\frac{\partial V^r(B_t, r, s_t)}{\partial B} = -u_T(c^T, c^N) - \frac{\partial p_t^N}{\partial c_t^T} \kappa \mu_t$$

When the party j is in power:

$$\frac{\partial V^i(B_t, y_t^T, i)}{\partial B_t} = -u_T(c_t^T, c_t^N) \left(1 - \frac{1}{R} \frac{\partial \mathcal{B}(B_t, y_t^T, i)}{\partial B_t} \right) -$$
$$\beta \frac{\partial \mathcal{B}(B_t, y_t^T, i)}{\partial B_t} \left[(1-\Gamma_i) \mathbb{E} \frac{\partial V^r(B_{t+1}, y_{t+1}^T, r)}{\partial B_{t+1}} + \Gamma_i\, \mathbb{E} \frac{\partial V^i(\mathcal{B}(B_{t+1}, y_{t+1}^T, i), y_{t+1}^T, i)}{\partial B_{t+1}} \right] - \frac{\partial p_t^N}{\partial c_t^T} \kappa \mu_t$$

Updating one period and replacing in (A.1):

$$u_T(c_t^T, c_t^N) = \beta R \left[\Gamma_r \mathbb{E} \left(u_T(c_t^T, c_t^N) + \frac{\partial p_t^N}{\partial c_t^T} \kappa \mu_{t+1} \right) + (1-\Gamma_i)\ \mathbb{E} \left[u_T(c_{t+1}^T, c_{t+1}^N) \left(1 - \frac{1}{R} \frac{\partial \mathcal{B}(B, i, s_t)}{\partial B_t} \right) \right.\right.$$
$$\left.\left. + \ \beta \frac{\partial \mathcal{B}(B_t, i, s_t)}{\partial B_t} \left[(1-\Gamma_i) \frac{\partial V^r(B_{t+1}, r, s_{t+1})}{\partial B_{t+1}} + \Gamma_i \ \frac{\partial V^i(\mathcal{B}(B_t, i, s_t), r, s_{t+1})}{\partial B_{t+1}} \right] + \frac{\partial P_t^N}{\partial c_{t+1}^T} \kappa \mu_{t+1} \right] \right]$$
$$+ \mu_t \left(1 - \frac{\partial P_t^N}{\partial c_t^T} \kappa \right) \tag{A.2}$$

Finally, if we continue iterating:

$$u_T(c_t^T, c_t^N) = \beta_t R \left[\Gamma_r \mathbb{E} \left(u_T(c_t^T, c_t^N) + \frac{\partial \mathcal{P}_t^N}{\partial c_t^T} \kappa \mu_{t+1}^r \right) + (1-\Gamma_r) \left[\sum_{n=1}^{\infty} (\Gamma_i)^n \prod_{j=t}^{t+n} \beta_j \left(\frac{\partial \mathcal{B}}{\partial B} \right) \right.\right.$$
$$\left[\mathbb{E} \left(u_T(c_{j+1}^T, c_{j+1}^N) \left(1 - \frac{1}{R} \frac{\partial \mathcal{B}}{\partial B} \right) \right) + (1-\Gamma_i) \mathbb{E}_r \left(u_T(c_{j+1}^T, c_{j+1}^N) + \frac{\partial \mathcal{P}_{j+1}^N}{\partial c_{j+1}^T} \kappa \mu_{j+2}^r \right) + \right.$$
$$\left.\left.\left. \frac{\partial \mathcal{P}_j^N}{\partial c_j^T} \kappa \mu_j^r \right] \right] + \mu_t^r \left(1 - \frac{\partial \mathcal{P}_t^N}{\partial c_t^T} \kappa \right) \right] \tag{A.3}$$

□

A.2 Proof of Proposition 1

Proof. The proof is by contradiction. Then, $\mu(s_{t+1}) = 0$ for every s_{t+1} and $\tau(s) = 0$. It implies that the Generalized Euler Equation (GEE) of the responsible party and the Euler Equation of the households in (6) should coincide.

Let us start by analyzing the GEE of the responsible party. First, we replace $\mu = 0$ and $\mu' = 0$ in (A.2):

$$u_T(c^T, c^N) = \beta_t R \left[\Gamma_r \mathbb{E}_r \; u_T(c^{T\prime}, c^{N\prime}) + (1-\Gamma_r) \;\; \mathbb{E}_r \left(u_T(\mathcal{C}^T(B', i, s'), y^N) \left[1 - \frac{1}{R} \frac{\partial \mathcal{B}(B,i,s)}{\partial B} \right] \right.\right.$$
$$\left.\left. + \;\; \beta \frac{\partial \mathcal{B}(B,i,s)}{\partial B} \left[\Gamma_i \; \frac{\partial V^i(B', r, s')}{\partial B'} + (1-\Gamma_i) \;\; \frac{\partial V^i(\mathcal{B}(B,i,s), r, s')}{\partial B'} \right] \right) \right]$$

Reorganizing terms, we can write it as:

$$u_T(c^T, c^N) = \beta_t R \left[\Gamma_r \mathbb{E}_r \; u_T(c^{T\prime}, c^{N\prime}) + (1-\Gamma_r) \;\; \mathbb{E}_r \left(u_T(\mathcal{C}^T(B', i, s'), y^N) - \right.\right.$$
$$\left.\left. \beta \frac{\partial \mathcal{B}(B,i,s)}{\partial B} \left[\; u_T(\mathcal{C}^T(B', i, s'), y^N) - (1-\Gamma_i) \; \frac{\partial V^i(B', r, s')}{\partial B'} - \Gamma_i \;\; \frac{\partial V^i(\mathcal{B}(B,i,s), r, s')}{\partial B'} \right] \right) \right]$$

On the other hand, the Euler equation of household problem is:

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

Then those conditions are equivalent if and only if:

$$u_T(\mathcal{C}^T(B', i, s;), y^N) = u_T(\mathcal{C}^T(B', i, s'), y^N)$$
$$u_T(\mathcal{C}^T(B', i, s'), y^N) = \Gamma_i \; \frac{\partial V^i(B', r, s')}{\partial B'} + (1-\Gamma_i) \;\; \frac{\partial V^i(\mathcal{B}(B,i,s), r, s')}{\partial B'}$$

This implies the irresponsible government's policy functions are optimal, which leads to a contradiction if there exists an s_{t+h} such that $\mu(s_{t+h}) \neq 0$.

□

A.3 Proof of Lemma 2

Proof. Recall $\mathcal{B}(s)$ is defined as the optimal policy function of debt that solves the problem of the households at each state of the economy. In particular, it solves:

$$0 = u_T\left(c^T, c^N\right) - (1+\tau(s))\beta R \left[\Gamma_g \; \mathbb{E} \; u_T\left(c^{T'}, c^{N'}\right) + (1-\Gamma_g) \; \mathbb{E} \; u_T\left(c^{T'}, c^{N'}\right) \right] + \mu$$
$$b_{t+1} = \kappa \left[y^T + P^N(s) y^N \right] \quad if \quad \mu > 0. \tag{A.4}$$

The implicit function theorem implies one could define a function f such that: $\mathcal{B}(s,g,B) \equiv f(s,g,B)$. In particular, note that if the political process is not persistent, then $\Gamma_g = \Gamma_0$ of $g \in \{i,r\}$ and then f is collapsed just to $f(s,g,B)$. This is, if the political process is not persistent, the policy function of debt only depends on g through its effect on current taxes. Next, let's take the first order Taylor expansion of f around the steady state:

$$b_{t+1} - \hat{b} = \frac{\partial f}{y}[y_t - \hat{y}] + \frac{\partial f}{b}[b_t - \hat{b}] + \frac{\partial f}{g}[g_t - \hat{g}] + \frac{\partial f}{\tau}[\tau_t - \hat{\tau}] + \frac{\partial f}{\beta}[\beta_t - \hat{\beta}] + m_t \quad \text{(A.5)}$$

where $\hat{x}$ accounts for the steady state value of each variable, $\frac{\partial f}{x}$ is the derivative of the function f at the steady state, and m_t accounts for the residual in the Taylor expansion which are the larger orders of derivation. Finally, define:

$$\Gamma_0 \equiv \hat{b} - \frac{\partial f}{y}[\hat{y}] - \frac{\partial f}{b}[\hat{b}] - \frac{\partial f}{g}[\hat{g}] - \frac{\partial f}{\tau}[\hat{\tau}]$$

$$\Gamma_y \equiv \frac{\partial f}{y}, \quad \Gamma_b \equiv \frac{\partial f}{b}, \quad \Gamma_\tau \equiv \frac{\partial f}{\tau}, \quad \Gamma_g \equiv \frac{\partial f}{g}, \quad \Gamma_\beta \equiv \frac{\partial f}{\beta}$$

Finally note if $\lambda = 1$, then $\Gamma_g = \frac{\partial f}{g} = 0$

□

A.4 Proof of Proposition 2

Proof. The proof is by contradiction. Assume $\hat{\delta_\tau}$ is unbiased, then $\mathbb{E}[\hat{\delta_\tau} - \delta_\tau] \geq 0$. Given $\Upsilon_\beta > 0$ and $\gamma_\beta < 0$, it implies

$$\begin{aligned} cov(\tau_t, \epsilon_t) &= 0 \\ \mathbb{E}[\tau_t \epsilon_t] - \mathbb{E}[\tau_t]\mathbb{E}[\epsilon_t] &= 0 \\ \mathbb{E}[\tau_t \epsilon_t] &= 0 \end{aligned} \quad \text{(A.6)}$$

We replace (24)

$$\begin{aligned} \mathbb{E}[\tau_t \epsilon_t] &= \mathbb{E}[(\gamma_0 + \gamma_b b_t + \gamma_y y_t^T + \gamma_\beta \beta_t + \gamma_p \tau_t + u_t)(\nu_t + \Upsilon_\beta \iota_t)] \\ &= \gamma_\beta \Upsilon_\beta \mathbb{E}[\iota_t^2] \\ &= \gamma_\beta \Upsilon_\beta \sigma_\iota^2 \\ &< 0 \end{aligned}$$

Which contradicts (A.6). Following a standard textbook derivation, it is easy to show that

this negative correlation implies that the OLS estimation is biased to be below the true parameter.

□

A.5 Proof of Proposition 3

Proof. First, we check the three conditions for using g_t or ϱ_t as potential instruments.

1. Exogeneity. Note

$$\begin{aligned} cov(g_t, \epsilon_t) &= \mathbb{E}[g_t \epsilon_t] - \mathbb{E}[g_t]\mathbb{E}[\epsilon_t] \\ &= \mathbb{E}[g_t(\nu_t + \gamma_\beta \iota_t)] \\ &= 0 \end{aligned}$$

Similarly, it can be shown that $cov(\varrho_t, \epsilon_t) = 0$.

2. Relevance. First, we will study the exclusion restriction if the proposed instrument is g_t. It is implied by Lemma 2 and $\gamma_g \neq 0$.

Second, we will study the exclusion restriction if the proposed instrument is ϱ_t. Then note that in this case $\text{Cov}(\varrho_t, \tau_t) \neq 0$ if and only if $\lambda \neq 1$. So, the relevance restriction is violated if the proposed instrument is ϱ_t and $\lambda = 1$.

3. Exclusion. When the proposed instrument is the identity of the party in power, we need to confirm $\text{Cov}(g_t, \mathcal{B}(s, g, B)|\tau_t) = 0$. That is, we need to check $\Gamma_g = 0$. From the proof Lemma 2, we know $\Gamma_g = 0$ if $\lambda = 0$. Then, the exclusion restriction is violated if $\lambda \neq 0$.

On the other hand, when the proposed instrument is ϱ_t we need to confirm $\text{Cov}(\varrho_t, \mathcal{B}(s, g, B)|\tau) = 0$. In general, $\mathcal{B}(s, g, B) \equiv f(s, g, B)$ which does not depend on ϱ_t. It implies that $\text{Cov}(\varrho_t, \mathcal{B}(s, g, B)|\tau) = 0$. So, the exclusion restriction always holds.

After checking those three conditions, one could follow the textbook proof to show that the IV estimation is unbiased if the proposed instrument meets these conditions. So we confirm ϱ_t is an unbiased instrument if and only if $\lambda \neq 1$. Also, g_t is an unbiased instrument if and only if $\lambda = 0$.

□

B Algorithm

1. Construct a grid for B and the shocks.

2. Guess value functions V^j and V^i and policy function for consumption and bonds. Choose constrained efficiency as an initial guess.

3. Solve responsible government value function V^r

$$\begin{aligned} V^r(b, y^T, r) &= \max_{b'} u(y^T - b + \frac{b'}{R}, c^N) + \beta\ \Gamma^r\ \mathbb{E}_{y'}\ V^r(b', y^{T\prime}, r) + (1 - \Gamma^r)\ \mathbb{E}_{y^{T\prime}}\ V^r(b', y^{T\prime}, i) \\ b' &\leq \kappa \left(\frac{1-\omega}{\omega} \left(\frac{y^T - b + \frac{b'}{R}}{c^N} \right)^{1/\gamma} y^N + y^T \right) \end{aligned}$$

To solve this problem, notice there is only one choice variable. One could do a grid for b' and choose the one that maximizes the value (setting $-\infty$ for those that violate the constraint).

4. Solve the irresponsible government's value function V^i. Find $C^T(y, b, i^*)$ and $B(y, b, i)$ consistent with equilibrium conditions associated with zero tax.

$$\begin{aligned} C^T(y, b, i^*) + b - \frac{B(y, b, i)}{R} =& y^T \\ B(b, i, y) \leq& \kappa(\frac{1-\omega}{\omega} \frac{C^T(b, i^*, y)}{y^N} y^N + y^T) \\ u_T(c^T, c^N) \geq& \beta R \left[\Gamma^i\ \mathbb{E}_{y'}\ u_T(\mathcal{C}^T(b', r, y')) + (1 - \Gamma^i)\ \mathbb{E}_{y'}\ u_T(\mathcal{C}^T(b', i, y')) \right] \end{aligned}$$

$$(\kappa(p^N y^N + y^T) - b')(u_T(c^T, c^N) - \beta R \left[\Gamma^i\ \mathbb{E}_{y'}\ u_T(\mathcal{C}^T(b', r, y')) + (1 - \Gamma^j)\ \mathbb{E}_{y'}\ u_T(\mathcal{C}^T(b', r, y')) \right]) = 0$$

Then, compute the value function

$$V^i(b, i, y^T) = \ u\left(C^T(b, i, y), y^N\right) + \ \Gamma_i\ \beta \mathbb{E}\ V^i(\mathcal{B}(b, i, y), i, y^{T\prime}) + (1 - \Gamma_i)\ \mathbb{E}\ \beta V^i(\mathcal{B}(b, r, y), r, y^{T\prime})$$

5. Update value functions and go to Step 3 if they do not converge. Otherwise, the equilibrium of the political economy converges.

6. Compute tax as

$$1 + \tau = \frac{u_T(C^T(b, r, y), c^N)}{\beta R \left[\Gamma_i\ \mathbb{E}\ u_T(\mathcal{C}^T(b', r, y')) + (1 - \Gamma_i)\ \mathbb{E}\ u_T(\mathcal{C}^T(b', i, y')) \right]}$$

Remark: $V^i(b, r, y) = V^r(b, r, y)$

7. Simulate the economy.

C Additional Regression Tables

In this Appendix, we present the full regression results for the exercise conducted in section 5.7. First, in Table 5 we report the result of the first stage where τ_t is in the left hand side:

Table 5: First Stage - Empirical Analysis

VARIABLES	First-Stage
Populist_{it}	0.23*
	(0.14)
$\text{Populist}_{it} \times \text{Left}_{it}$	0.89**
	(0.382)
GDP Growth	3.62
	(3.01)
Lag CA	-0.04
	(0.042)
Constant	-1.06***
	(0.406)
Observations	590
R-squared	

Note: Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In Table 6 we report the full results of the second stage.

Table 6: Second Stage - Empirical Analysis

VARIABLES	IV	OLS
CFMs on Inflows Index	1.517**	0.0240
	(0.718)	(0.0174)
GDP Growth	-1.826	1.522
	(12.83)	(10.72)
Lag CA	0.24	0.221***
	(0.096)	(0.0842)
Constant	0.756***	0.284
	(0.289)	(0.225)
Observations	590	786
R-squared		0.676

Note: Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1