Strategic Debt Ceiling Announcements with Intermediate Commitment*

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Abstract

Fiscal rules can help countries with long-term debt overcome time-inconsistent default incentives, but enforcement is often imperfect. We integrate an optimal fiscal policy framework under partial commitment with a sovereign default model featuring long-term debt, introducing an endogenously announced debt ceiling as a fiscal rule. First, we analyze a baseline environment where governments announce a ceiling each period and incur a proportional cost for issuing above it. Second, we extend the model to a political economy setting with heterogeneous agents, where competing parties renegotiate the inherited ceiling, thereby microfounding the cost. The ceiling reduces debt dilution but limits fiscal flexibility. Calibrated to Argentina, our counterfactual shows that welfare gains from such a rule are possible but not guaranteed, a finding that persists in the fully microfounded model.

Keywords: Optimal Policy, Political Constraints, Limited Commitment, Fiscal Announcements, Fiscal rules, Sovereign Default.

JEL Classifications: E32, E44, F41, G01, G28.

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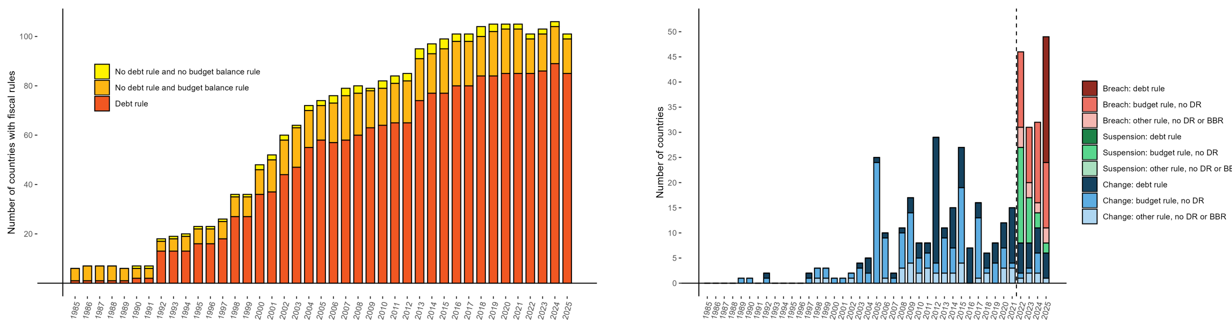
1 Introduction

While the importance of policy anchors is well established in the context of monetary policy, the theoretical underpinnings of fiscal anchors have received comparatively less attention (Leeper, 2010). Nonetheless, over the past four decades, a growing number of countries have adopted fiscal rules as a means to discipline government behavior (Figure 1). This shift reflects a recognition that optimal fiscal policy may require an anchor to mitigate persistent deficit biases arising from government myopia, moral hazard, or dynamic inconsistency.

Figure 1: More countries are adopting fiscal rules but also changing them



Countries with fiscal rules | Changes to fiscal rules

Note: The figure shows that both fiscal rules and changes to them are more common. Data until 2021 comes from the IMF Fiscal Rules database. Data from 2022 onward has been compiled using IMF article IVs, the Inter-American Development Bank's Marcroeconomic country reports, and country sources. The updates were done to the 106 countries in the IMF database in 2021, in future work expand to the dataset to include all countries.

We develop a framework in which the debt ceiling—our chosen fiscal rule—is endogenously announced by the incumbent each period but remains adjustable by the next government. To build intuition, we proceed in two steps. First, we introduce a tractable baseline where a sequence of identical Markov governments make borrowing and default decisions subject to a debt ceiling rule and announce a ceiling for the following period. Crucially, the government can reoptimize away from the current debt ceiling at the cost of an exogenous quadratic penalty on debt issuance above the ceiling—adapting the "partial commitment" mechanism of Clymo, Lanteri and Villa (2023) to sovereign debt limits. Second, we microfound this penalty in a richer political-economy extension with heterogeneous agents, optimal taxation, and alternating governments (building on Arce, Morgan and Werquin 2024), where the incoming administration may renegotiate the inherited ceiling with the opposition before it binds. In both steps, we embed strategic debt ceiling announcements and sovereign default within a microfounded optimal policy framework that captures key institutional features of real-world debt limit rules. Although our primary interest lies in the effects of strategic debt ceiling announcements and renegotiations, embedding them in a sovereign default environment is essential to capture the credibility problem these rules aim to address and to generate a meaningful pricing kernel through endogenous bond pricing.

The underlying mechanism hinges on a simple trade-off that balances two economic forces. On the one hand, carrying the debt ceiling forward as a binding promise gives the government partial commitment not to issue excessive long-term bonds in the future, thereby mitigating the classic "debt dilution" bias in Eaton and Gersovitz (1981)-type models with long-term debt: when additional issuance today raises the probability of default tomorrow, investors anticipate legacy-holder ex-post dilution incentives and demand higher yields, lowering bond prices (Hatchondo and Martinez, 2009; Chatterjee and Eyigungor, 2012). On the other hand, the same ceiling restricts the government's ability to respond to adverse shocks by issuing additional debt, which can make default more attractive in some states and thus raise the risk of actual repayment failure. The overall welfare impact reflects the trade-off between lower borrowing costs through enhanced commitment and higher default risk due to reduced fiscal flexibility. Allowing for intermediate commitment to the rule, either with an exogenous cost of deviation or a microfounded political economy game, increases flexibility in certain states but at the cost of lower commitment in other states.

In this context, we undertake two quantitative exercises. First, we calibrate the simple model to Argentina—where no formal debt ceiling currently exists—and conduct a counterfactual experiment by introducing an optimal debt ceiling within our framework to assess its welfare implications, finding that gains are possible but not guaranteed. Second, we extend the analysis to the fully microfounded political economy model, calibrated using data from Arce et al. (2024), and show that the main welfare results remain robust when the cost of exceeding the debt ceiling is microfounded through political renegotiation, and when heterogeneous agents, optimal taxation, and alternating governments are taken into account.

Related Literature. This paper contributes to two strands of the literature: (i) sovereign default and fiscal rules, and (ii) partial commitment in optimal fiscal policy. One of the main contributions of the paper is to link the first strand - which typically assumes no commitment - with the second strand— which typically abstracts from sovereign default.

Sovereign Default and Fiscal Rules. In sovereign-debt models à la Eaton and Gersovitz (1981) with long-term debt, the "debt-dilution" time inconsistency highlighted by Hatchondo and Martinez (2009) and Chatterjee and Eyigungor (2012) generates persistent deficits: new bond issues dilute legacy claims, raising required yields and lowering bond prices. Subsequent work has quantified the welfare losses from dilution (Aguiar et al., 2020) and proposed both state-contingent rules that eliminate dilution (Hatchondo et al., 2016) and simpler rules that mitigate its impact (Hatchondo et al. 2022; Roch and Roldán 2023), evaluating gains by comparing commitment versus no-commitment equilibria. Our paper contributes to this strand by embedding the fiscal-rule choice with endogenous partial commitment in a quantitative sovereign-default model. Governments set a debt ceiling each period but may renegotiate it ex post, so the degree of commitment is endogenously determined by the political environment, capturing, for example, how U.S. debt-ceiling rules operate in practice. This approach complements the normative "rules versus flexibility" literature initiated by Amador et al. (2006) and developed in Halac and Yared (2014a, 2017, 2020, 2022), while our positive, quantitative framework evaluates how fiscal rules function when political constraints limit full commitment.[1]

Optimal Fiscal Policy with Partial Commitment and Fiscal Announcement. Our framework is related to the literature on optimal fiscal policy under limited commitment and on fiscal announcements. First, on intermediate commitment ("partial commitment"), we build on the idea that governments make noncontingent announcements but face costs when deviating from them. In our simple model, we adapt the costly-deviation mechanism of Clymo et al. (2023)—originally developed for capital and labor taxes—to sovereign debt ceilings and default. Unlike Debortoli and Nunes (2010, 2013), where the timing of re-optimization is exogenous, here the "degree of commitment"—i.e. the extent of reneging—emerges endogenously from the state. This state-dependent slack then shapes strategic debt-ceiling announcements. Relatedly, Farhi (2010), Klein et al. (2008), and Karantounias (2019) use generalized Euler–equation methods to explore time consistency and default, while Clymo and Lanteri (2020) show that even short-horizon commitment can sustain first-best outcomes. We extend their approach by introducing costly, state-contingent reneging of debt ceilings in a stochastic economy with sovereign default and, moreover, provide a microfoundation via a richer political-economy environment. Second, on fiscal announcements per se, we bridge optimal-policy theory with the empirical and quantitative work that treats announcements as exogenous drivers of expectations. Empirical papers such as Mertens and Ravn (2012) and Alesina et al. (2015) document the macro effects of announced plans, and quantitative studies like Mertens and Ravn (2011) and Fernández-Villaverde et al. (2015) embed announcement "shocks" in DSGE settings. By distinguishing between announced and implemented policies—and by endogenizing the cost of deviating from announcements—we embed insights from the empirical literature on fiscal announcements into a fully microfounded optimal-policy framework. Our approach also relates to the fiscal-rules literature (e.g. King et al. 1988; Schmitt-

[1] See also Espino et al. (2022) for an analysis of fiscal-rule suspensions during the COVID-19 crisis, to which we add a microfounded political-economy mechanism for rule renegotiation.

Grohe and Uribe 1997; Athey et al. 2005; Halac and Yared 2014b), which shows that limits on state-contingency can amplify fluctuations. We demonstrate that costly, partial state-contingency—driven by political constraints on commitment and strategic debt-ceiling announcements in a sovereign-default environment—generates rich dynamics with non-trivial policy implications for the design of fiscal rules and debt-management frameworks.

Structure of the Paper. The remainder of the paper is organized as follows. Section 2 presents a simple sovereign default model with endogenous debt ceiling announcements, showing that self-imposed ceilings can improve borrowing terms by mitigating debt dilution, but may also constrain fiscal flexibility and increase default risk. Section 3 introduces a political economy extension that builds on this mechanism, in which the incoming administration may renegotiate the inherited ceiling with the opposition before it binds. Section 4 conducts a quantitative analysis of the calibrated political economy model and shows that strategic negotiations generate an endogenous form of fiscal discipline: opposition parties accommodate debt increases in response to shocks but resist excessive borrowing. These strategic interactions give rise to intermediate, history-dependent fiscal rules that enhance welfare and reduce spreads, consistent with the insights from the simple model. Section 5 concludes.

2 Endogenous Debt Ceiling in a Sovereign Default Model

We build on the canonical Eaton and Gersovitz (1981) framework of sovereign default, incorporating long-term debt and an endogenous debt ceiling. The government chooses both the next period's level of debt and a self-imposed ceiling on future debt, beyond which borrowing incurs a quadratic cost. These costs are only paid when the desired borrowing exceeds the previously promised debt ceiling, which captures frictions such as institutional constraints, political economy considerations, or additional market-imposed discipline from legacy bondholders.

2.1 Environment

Time is discrete and infinite. In each period, the government observes the realization of an exogenous endowment $y \in \mathcal{Y}$, which follows a Markov process with known transition probabilities. The government begins the period with outstanding debt $B \in \mathbb{R}_+$ and a debt ceiling $\bar{B} \in \mathbb{R}_+$. The debt ceiling is a choice variable in repayment and represents the upper bound above which new borrowing incurs additional costs.

2.2 Government Problem

The government chooses whether to repay or default. Let $d \in \{0,1\}$ be the default indicator, where $d = 1$ denotes default. The government's value function is:

$$V(y, B, \bar{B}) = \max_{d \in \{0,1\}} (1-d)V^R(y, B, \bar{B}) + dV^D(y), \tag{1}$$

where V^R is the value of repayment and V^D is the value of default.

Repayment. If the government chooses to repay, it selects next period's debt $B' \in \mathcal{B}$ and a new ceiling $\bar{B}' \in \bar{\mathcal{B}}$. Consumption c satisfies the resource constraint:

$$c + (\delta + z)B = y + q(y, B', \bar{B}')[B' - (1-\delta)B] - \Phi(B', \bar{B}), \tag{2}$$

where $q(y, B', \bar{B}')$ is the price of long-term debt, δ is the fraction of debt maturing each period, and z is the coupon. The function $\Phi(B', \bar{B})$ captures the additional cost of borrowing beyond the ceiling:

$$\Phi(B', \bar{B}) = \begin{cases} 0, & \text{if } B' \leq \bar{B}, \\ \phi(B' - \bar{B})^2, & \text{if } B' > \bar{B}, \end{cases} \tag{3}$$

where $\phi > 0$ governs the severity of the penalty. The government's recursive problem in repayment is thus:

$$V^R(y, B, \bar{B}) = \max_{c, B', \bar{B}'} u(c) + \beta \mathbb{E}_{y'} \left[V(y', B', \bar{B}') \right], \tag{4}$$

subject to the implementability constraint above.

Default. In the event of default, the country is excluded from financial markets and receives autarky consumption $\varrho(y)$. Re-entry occurs with probability $\theta \in (0,1)$, in which case the country returns with zero debt and the maximal allowable ceiling $\bar{B}_{\max}$. The default value function is:

$$V^D(y) = u(\varrho(y)) + \beta \mathbb{E}_{y'} \left[\theta V(y', 0, \bar{B}_{\max}) + (1-\theta) V^D(y') \right]. \tag{5}$$

2.3 The Role of the Debt Ceiling: Commitment vs Flexibility

We calibrate the model without debt ceiling frictions ($\phi = 0$) to match standard moments of sovereign borrowing and default as reported in Table 1, following Chatterjee and Eyigungor (2012). In this benchmark (blue line in Figure 2), bond prices are determined only by borrowing choices and the exogenous income shock.[2] We then introduce a debt ceiling by setting $\phi = 0.4$, which activates the endogenous penalty $\Phi(B', \bar{B})$ when borrowing exceeds the self-imposed ceiling. The debt ceiling modifies equilibrium outcomes by altering the government's intertemporal incentives.

Table 1: Targeted Moments in Percent and Corresponding Parameters

Moment	Target	Model	Parameter	Value
Mean Level of Debt	70	71	β	0.943
Mean Spread	8.2	8.0	d_0	0.017
Volatility of the Spread	4.4	4.1	d_1	0.446

Note: The table reports the internally calibrated parameters and their corresponding targeted moments. We adopt the same default cost function as in Chatterjee and Eyigungor (2012), i.e. $\varrho(y) = y - \max\{0, d_0 y + d_1 y^2\}$. However, we solve the model using the method with extreme value shocks introduced by Dvorkin et al. (2021), with a correlation parameter $p = 0.37$ and shock variance $v = 5.7 \times 10^{-3}$. All other parameters are taken directly from Chatterjee and Eyigungor (2012).

The underlying mechanism hinges on a trade-off between commitment and fiscal flexibility. On the one hand, by choosing and maintaining a ceiling on future borrowing, the government partially commits not to excessively dilute outstanding debt. This mitigates the classic "debt dilution" problem in Eaton and Gersovitz (1981)-type models with long-term debt: when the government issues additional debt today, it lowers the value of legacy bonds tomorrow by raising the probability of default. Anticipating this, investors demand higher yields, which depresses bond prices (Hatchondo and Martinez, 2009; Chatterjee and Eyigungor, 2012). Promising a credible ceiling can reduce this incentive, raise bond prices, and ultimately lower borrowing costs. On the other hand, the same ceiling constrains the government's ability to smooth consumption and respond to adverse shocks by issuing additional debt. In tight fiscal states, this restriction can make default more attractive, increasing the risk of repayment failure.

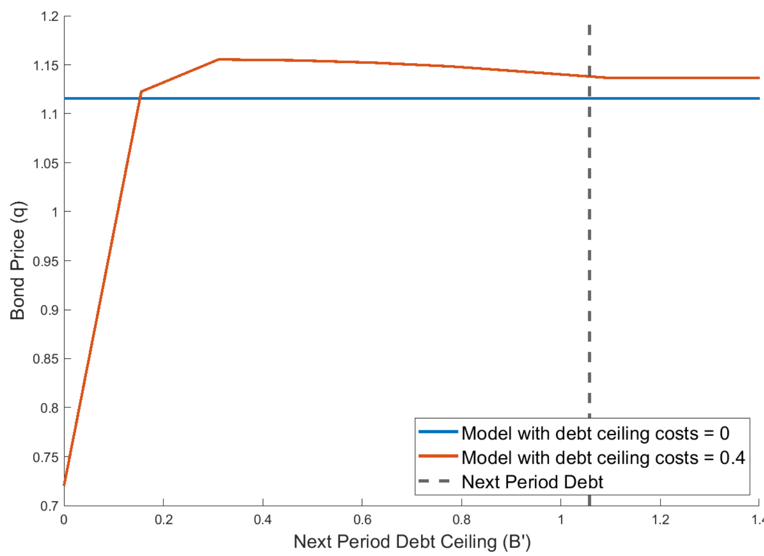
The net effect of promising a "reasonable" value of the tomorrow's debt ceiling thus

[2] If borrowing above the debt ceiling is costless, any debt ceiling announcement is a non informative signal to future bondholders and as a result the model collapses exactly into the set up of Chatterjee and Eyigungor (2012).

reflects the balance of these two forces: lower interest rates in the current period at the cost of more limited borrowing capacity in the next period.

Figure 2 illustrates this mechanism. The horizontal axis plots the level of the promised next-period debt ceiling $\bar{B}'$, while the vertical axis shows the bond price q corresponding to a fixed level of next-period debt (B', dashed line). The blue line depicts the bond price in the benchmark model without ceiling frictions ($\phi = 0$). The orange line shows the price in our model where the debt ceiling cost is $\phi = 0.4$.

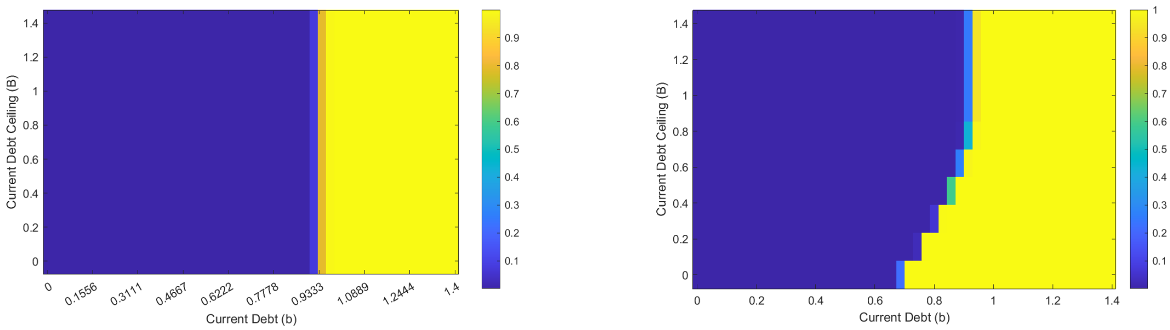
Figure 2: Debt Ceilings and Bond Prices



Note: The figure reports equilibrium bond prices as a function of the next-period debt ceiling announcement. Moderate ceilings increase bond prices by mitigating debt dilution, while excessively tight ceilings raise default risk which leads to depressed prices.

For a wide range of values of $\bar{B}'$, around and below next period debt, the additional commitment lowers borrowing costs, raising bond prices relative to the benchmark. However, if the promised ceiling is too tight—i.e., substantially below the level necessary to roll-over the debt (”unreasonable promises”)—it becomes a constraint that reduces too much policy flexibility. In this case, the prospect of being unable to respond to future shocks raises the risk of default, as illustrated in Figure 3. This heightened default risk, in turn, leads to higher yields and lower bond prices consistently with Figure 2.

Figure 3: Tight Ceilings can Trigger Default



Default probability with $\phi = 0$ Default probability with $\phi = 0.4$

Note: The figure shows that tight debt ceilings can trigger default. When $\phi = 0.4$, high debt levels combined with a binding ceiling significantly increase default risk.

This non-monotonicity highlights a central result: promising reasonable austerity can improve credit conditions, while excessive austerity can backfire by undermining repayment incentives. These considerations suggest that the adoption of a debt ceiling can generate welfare gains. By alleviating debt dilution without excessively restricting fiscal flexibility, a moderate debt ceiling can improve the trade-off faced by the government, enabling it to borrow at lower spreads while preserving enough space to respond to adverse shocks. As we show in Subsection 2.4, this mechanism can raise ex-ante expected utility relative to both the no-ceiling benchmark and overly rigid fiscal rules.

2.4 Welfare Gains from an Endogenous Debt Ceilings

We now quantify the welfare implications of introducing a debt ceiling by computing the lifetime utility of a patient social planner under different values of the debt ceiling penalty parameter ϕ. Specifically, we evaluate the consumption-equivalent welfare gain relative to the benchmark economy without debt ceiling frictions ($\phi = 0$), holding the initial state fixed at (y_0, B_0).

The planner's welfare is computed by simulating the economy under the actual policy functions of the impatient government—that is, taking as given the decision rules $\mathcal{D}_G^\phi$, $\mathcal{B}_G'^\phi$, and $\bar{\mathcal{B}}_G'^\phi$ induced by a given value of ϕ—and integrating discounted utility forward:

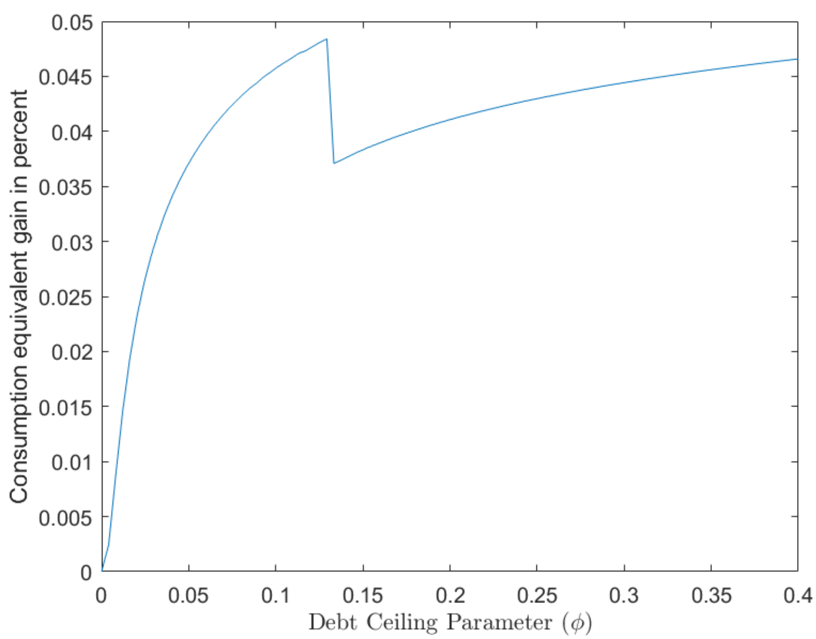
$$V^{SP}(y_0, B_0 \mid \phi) = \sum_{t=0}^{\infty} \frac{u\left[\mathcal{C}(\mathcal{D}_G^\phi(t), \mathcal{B}_G'^\phi(t), \bar{\mathcal{B}}_G'^\phi(t))\right]}{(1+r)^t}. \tag{6}$$

This approach reflects the planner's evaluation of welfare under the actual behavior of the government, capturing both the benefits of enhanced credibility and the costs of reduced fiscal flexibility.

Figure 4 shows the welfare gain, expressed as a consumption-equivalent percentage increase, for values of the penalty parameter ϕ between 0 and 0.4. This parameter governs the marginal cost of exceeding the self-imposed debt ceiling: higher values of ϕ do not mechanically tighten the ceiling, but they increase the incentive for the government to keep future debt issuance within its chosen bound.

The welfare effects of increasing ϕ are non-monotonic. As ϕ rises from zero, the resulting endogenous ceilings become more credible—since the government internalizes a steeper cost of violating them—which mitigates debt dilution and lowers borrowing costs. This enhances welfare by improving the terms of market access without significantly impairing fiscal flexibility. However, as ϕ becomes large, the cost of exceeding the ceiling becomes too steep, limiting the government's ability to respond to adverse shocks, raising default risk and lowering welfare.

Figure 4: Welfare Gains from Debt Ceiling



Note: The figure shows welfare gains from introducing a debt ceiling as a function of the penalty parameter ϕ. Moderate values of ϕ improve welfare by encouraging credible—but not overly restrictive—ceilings. When ϕ is too large, the resulting limits reduce fiscal flexibility and lower welfare.

This non-monotonicity illustrates a broader insight: welfare can be improved when governments are able to credibly commit to sustainable borrowing paths without fully surrendering their fiscal flexibility. In our model, the parameter ϕ captures the strength of that commitment—higher values induce the government to honor self-imposed debt ceilings more strictly. But when this commitment becomes too strong, the loss of flexibility could increase default risk and reduce welfare.

In Figure 4, the presence of an interior optimum for ϕ thus reflects the importance of designing fiscal frameworks that strike a balance between credibility and adaptability. In practice, this speaks to the value of intermediate forms of commitment—such as institutional rules, fiscal compacts, or market-based reputational mechanisms—that discourage over-borrowing but still allow governments to respond to shocks. These "soft" rules can outperform both hard constraints that rigidly bind fiscal policy and unconstrained regimes that allow full discretion.[3]

3 A Political Economy Sovereign Default Model with an Endogenous Debt Ceiling

We develop a dynamic political economy model of a small open economy with sovereign default and endogenous debt ceiling renegotiation, building on the framework of Arce et al. (2024). Time is infinite and discrete. The economy is populated by two types of heterogeneous households, a government subject to partisan conflict—modeled as alternating political parties—and risk-neutral foreign lenders. In each period, the incumbent government sets the fiscal policy package and proposes a debt ceiling for the following period. Upon taking office, the newly elected government may renegotiate the inherited ceiling with the opposition. Once the ceiling is agreed upon, however, borrowing is constrained to remain within the established limit.

3.1 Model Overview and Timing

At the outset of each period t, the aggregate state

$$s_t = \big(A_t,\ B_t,\ \bar{B}_{\text{pre},t},\ i_t\big),$$

[3]By hard constraints, we refer here to rules that are enforced with a very high value of ϕ but can still be changed period-by-period. We consider outside the scope of our paper to compare our rule to fix rules decided with full commitment at the beginning of time and can't be changed. For those type of rules see Hatchondo et al. (2022) and Roch and Roldán (2023).

is realized, where A_t is aggregate productivity, B_t outstanding debt, $\bar{B}_{\text{pre},t}$ the debt ceiling inherited from $t-1$, and $i_t \in \{L, R\}$ the incumbent's party. The opposition then decides whether to raise this ceiling, yielding the post–negotiation limit to $\bar{B}_{\text{post},t}$. Next, the incumbent observes a vector of private taste shocks ε_t, chooses default $d_t \in \{0,1\}$, sets the labor tax schedule τ_t, issues new debt $B_{t+1} \leq \bar{B}_{\text{post},t}$, and proposes a pre-negotiation ceiling $\bar{B}_{\text{pre},t+1}$ for the following period. Households then take (w_t^i, τ_t) and the entire policy package as given and solve their static consumption–labor problem, selecting (N_t^i, C_t^i). Finally, productivity evolves according to

$$\ln A_{t+1} = \rho \ln A_t + \sigma\, \varepsilon_{t+1},$$

and political power transitions to i_{t+1}, completing the period. This sequence is summarized in Figure 5.

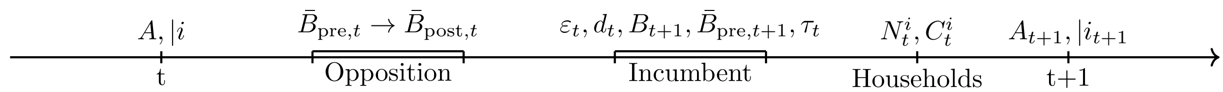


Figure 5: Timing diagram of period t.

3.2 Household Problem

We assume a continuum of households partitioned into two ideological types, $i \in \{L, R\}$, each of mass one. Denote by j the "other" type—i.e. $j = R$ when $i = L$ and vice versa. Type-i households differ in labor productivity θ^i and in their disutility-of-effort parameter ψ^i, with $0 < \theta^L < \theta^R$ and $0 < \psi^L < \psi^R$. Preferences over consumption C and labor supply N are given by

$$u^i(C, N) \;=\; \log C \;-\; \frac{1}{\psi^i\big(1 + 1/\psi\big)}\, N^{1+\frac{1}{\psi}},$$

where $\psi > 0$ denotes the common Frisch elasticity of labor supply.

Households are hand-to-mouth: they consume their entire labor income each period. In deciding on consumption and labor supply, they take the wage rate w^i and all aggregate state variables—including the incumbent's proposed fiscal package—as given. Hence, a type-i household with pre-tax wage w^i chooses consumption and labor supply (C_t^i, N_t^i) to maximize utility given after-tax income, i.e.

$$\max_{C_t^i, N_t^i} \; u(C_t^i, N_t^i) \quad \text{subject to} \quad C_t^i \;=\; \tau_{0,t}\big(w_t^i N_t^i\big)^{1-\tau_{1,t}},$$

where $\tau_{0,t} > 0$ and $\tau_{1,t}) < 1$ are the intercept and progressivity of the labor tax system following Heathcote et al. (2017). If $\tau_1 = 0$, the tax schedule becomes linear with a constant marginal (and average) rate of $1 - \tau_0$. For any $\tau_1 > 0$, the schedule is strictly progressive: both marginal and average tax rates increase monotonically with income.

In this environment, the first-order condition with respect to labor supply yields:

$$N_t^i \;=\; \left[\psi^i \left(1 - \tau_{1,t}\right)\right]^{\frac{\psi}{1+\psi}}.$$

3.3 Production and Pre-Tax Wages

Given the incumbent's default choice $d_t \in \{0, 1\}$ and the realized productivity shock A_t, aggregate output is

$$Y_t \;=\; \varrho(A_t, d_t)\left[(\theta^L N_t^L)\eta + (\theta^R N_t^R)\eta\right]^{1/\eta},$$

where $\eta \in (0, 1)$ governs the substitutability of low- and high-skill labor. We let the productivity process follow

$$\ln A_{t+1} \;=\; \rho \ln A_t \;+\; \sigma\,\varepsilon_{t+1}, \quad \varepsilon_{t+1} \sim \mathcal{N}(0, 1).$$

The function

$$\varrho(A, d) \;=\; \begin{cases} A, & d = 0, \\ A - \max\{0,\, d_0 A + d_1 A^2\}, & d = 1, \end{cases}$$

captures the productivity cost of sovereign default (Chatterjee and Eyigungor, 2012).

Firms take pre-tax wages as given and solve

$$\max_{N^L, N^R}\; \varrho(A_t, d_t)\left[(\theta^L N^L)\eta + (\theta^R N^R)\eta\right]^{1/\eta} \;-\; w^L N^L - w^R N^R,$$

which delivers

$$w_t^L \;=\; \varrho(A_t, d_t)\eta\,\theta^L\left(\frac{\theta^L N_t^L}{Y_t}\right)^{\eta-1}, \qquad w_t^R \;=\; \varrho(A_t, d_t)\eta\,\theta^R\left(\frac{\theta^R N_t^R}{Y_t}\right)^{\eta-1}.$$

3.4 Incumbent's Problem After Debt–Ceiling Renegotiation

For notational simplicity, we suppress the time subscript on all current-period state variables and employ a prime (′) to denote decision rules and next-period variables, with the temporal index understood implicitly. As captured by Figure 5, the state space that the incumbent faces after the renegotiation is

$$s \;=\; \big(A,\; B,\; \bar{B}_{\text{post}},\; i\big).$$

With this state space in hand, the incumbent's makes default decision according to:

$$V^{i|i}(s,\varepsilon) \;=\; \max_{d\in\{0,1\}} \;\; \Big\{d\, V^{i|i}_{\text{def}}(A,\varepsilon) \;+\; (1-d)\, V^{i|i}_{\text{rep}}(s,\varepsilon)\Big\},$$

where in case of default the incumbent government chooses only the vector $\boldsymbol{\tau} = \{\tau_0, \tau_1\}$ and in case of repayment it chooses $(B', \bar{B}'_{\text{pre}}, \boldsymbol{\tau})$. The government budget constraint requires

$$0 = (1-d)Q^{i}\big(A,\, B',\, \bar{B}'_{\text{pre}}\big)\big[B' - (1-\delta)\, B\big] - (\delta + z)\, B + \sum_{j\in\{L,R\}} \Big[w^j\, N^j - \tau_0\, (w^j N^j)^{1-\tau_1}\Big],$$

both under repayment and default, where $Q^{i}(.)$ represents the price of debt issuances in the current period, δ the exponential decay rate of the debt, and z the coupon rate paid on the debt.

Repayment. When the incumbent government repays (i.e. $d = 0$), the incumbent party i with state s solves

$$V^{i|i}_{\text{rep}}(s,\varepsilon) = \max_{B',\, \bar{B}'_{\text{pre}},\, \boldsymbol{\tau}} \left\{ \sum_{j\in\{L,R\}} \omega^{\,j|i}\, u^j\big(s, \boldsymbol{\tau}\big) \;+\; \varepsilon_{B',\, \bar{B}^{\text{pre}\prime},\, \boldsymbol{\tau}} + \beta \mathbb{E}^{\,i|i}\big[W(s',\varepsilon')\big] \right\},$$

where

$$B' \;\le\; \bar{B}_{\text{post}}.$$

Here the welfare weights satisfy $\omega^{\,i|i} > \omega^{\,j|i}$ for $j \neq i$, and the static utility of households of type j is $u^j(s, \boldsymbol{\tau}) = u\Big(\mathcal{C}^j(\tau_0, \tau_1, s), \mathcal{N}^j(\tau_1, s)\Big)$, given the policy functions $\mathcal{C}(.)$ and $\mathcal{N}(.)$. The continuation value of the incumbent party i is given by

$$\mathbb{E}^{\,i|i}\big[W(s',\varepsilon')\big] = \mathbb{E}_{A'|A}\Big[\pi\, W^{i|i}(s',\varepsilon') \;+\; (1-\pi)\, W^{i|j}(s',\varepsilon')\Big],$$

where π captures the probability of reelecting party i and $W^{i|j}(.)$ indicates the value out of office. Note that while the productivity shock (A) is persistent, we follow the literature and assume that the taste shocks (ε) are uncorrelated over time.

Default. When the incumbent government defaults, the incumbent party i with state s solves

$$V_{\text{def}}^{i|i}(A,\varepsilon) = \max_{\boldsymbol{\tau}} \left\{ \sum_{j \in \{L,R\}} \omega^{j|i}\, u^j\big(\rho(A), \boldsymbol{\tau}\big) \;+\; \varepsilon_{\boldsymbol{\tau}}^{D} \;+\; \beta\, \mathbb{E}_d^{i|i}\big[W(s',\varepsilon')\big] \right\},$$

where the utility of the household j is given by

$$u^j(s,\boldsymbol{\tau}) = u\Big(\mathcal{C}^j(\tau_0,\tau_1,s), \mathcal{N}^j(\tau_1,s)\Big).$$

The continuation value of the incumbent party i is given by

$$\begin{aligned} \mathbb{E}_d^{i|i}[W(s',\varepsilon')] \;&= \mathbb{E}_{A'|A}\Bigg[\overbrace{\gamma}^{\text{Reentry}} \times \Big\{ \pi W^{i|i}(A',0,\bar{B}_{\text{pre}}^{\text{Max}},\boldsymbol{\varepsilon}') + (1-\pi)\, \overbrace{W^{i|j}(A',0,\bar{B}_{\text{pre}}^{\text{Max}},\boldsymbol{\varepsilon}')}^{\text{Out of office}} \Big\} \\ &\qquad + (1-\gamma) \times \Big\{ \pi V_{\text{def}}^{i|i}(A',\boldsymbol{\varepsilon}') + (1-\pi) V_{\text{def}}^{i|j}(A',\boldsymbol{\varepsilon}') \Big\} \Bigg], \end{aligned}$$

where γ captures the probability of reentering the international bond markets, while with probability $1-\gamma$ the country remains in autarky and faces the default state again. Here $\pi \in [0,1]$ is the probability that party i is reelected, and $j \neq i$ denotes the opposing party. We assume that upon reentry, the country has no debt and the maximum level of pre-negotation debt ceiling $\bar{B}_{\text{pre}}^{\text{Max}}$.[4]

3.5 Opposition's Value After Debt–Ceiling Renegotiation

Once the opposition party $j \neq i$ has approved the incumbent's proposed ceiling, it faces the same post-negotiation state s_t and forms rational expectations over the incumbent's default choice d and subsequent fiscal policy $(B', \bar{B}_{\text{pre}}', \boldsymbol{\tau})$. Its continuation value satisfies

$$V^{j|i}(s,\boldsymbol{\varepsilon}) = \mathcal{D}^{|i}(s,\boldsymbol{\varepsilon}) {V_{\text{rep}}}^{j|i}(s,\boldsymbol{\varepsilon}) + [1-\mathcal{D}^{|i}(s,\boldsymbol{\varepsilon})] {V_{\text{def}}}^{j|i}(s,\boldsymbol{\varepsilon})$$

where $\mathcal{D}^{|i}(.)$ is the incumbent's policy default function. The value function under repayment satisfies

$$V_{\text{rep}}^{j|i}(s,\boldsymbol{\varepsilon}) = \sum_{k \in \{R,L\}} \omega^{k|j}\, u^k\big(s,\, \boldsymbol{\tau}^{|i}(s,\boldsymbol{\varepsilon})\big) \;+\; \beta\, \mathbb{E}^{j|i}\big[W(s',\varepsilon')\big] \;+\; \varepsilon_{\left(\mathcal{B}'^{|i}(s,\boldsymbol{\varepsilon}),\, \overline{\mathcal{B}}'^{|i}(s,\boldsymbol{\varepsilon}),\, \boldsymbol{\tau}^{|i}(s,\boldsymbol{\varepsilon})\right)},$$

[4]As explained in the quantitative section we assume that the government is also subject to a standard issuance cost. As usual these costs will prevent the government from issuing large amounts of debt in the first few periods upon reentry, but additionally in our context, the issuance costs will also imply that any high enough value of the reentry debt ceiling will not be affect the default or debt issuance choices in the first period.

and in default

$$
{V_{\mathrm{def}}}^{j|i}(A,\boldsymbol{\varepsilon}) = \sum_{k\in\{R,L\}} \omega^{k|j} u^k(\varrho(A), \boldsymbol{\tau}^{|i}(s,\boldsymbol{\varepsilon}) + \beta {\mathbb{E}_d}^{j|i}[W(s',\varepsilon')] + \boldsymbol{\varepsilon}^D_{\boldsymbol{\tau}^{|i}(s,\boldsymbol{\varepsilon})}.
$$

3.6 Debt–Ceiling Negotiation

At the start of period t, the opposition party $j \neq i$ observes the pre–negotiation state

$$
s^n \;=\; \big(A,\ B,\ \bar{B}_{\mathrm{pre}}\big),
$$

and – before observing the taste shocks – selects a post–negotiation debt ceiling $\bar{B}_{\mathrm{post}} \geq \bar{B}_{\mathrm{pre}}$ to maximize its out-of-office continuation value:

$$
\bar{B}_{\mathrm{post}} = \ \arg\max_{B\,\geq\,\bar{B}_{\mathrm{pre}}} \ \mathbb{E}_{\boldsymbol{\varepsilon}}\big[V^{i|j}(A,\ B,\ \bar{B},\ \boldsymbol{\varepsilon})\big].
$$

Once $\bar{B}^{\mathrm{post}}$ is set, both parties' continuation values at s^n are pinned down by evaluating their respective Bellman functions at the agreed ceiling:

$$
W^{\,i|i}(s^n,\boldsymbol{\varepsilon}) = V^{\,i|i}\big(A,\ B,\ \bar{\mathcal{B}}^{j}_{\mathrm{post}}(s^n),\boldsymbol{\varepsilon}\big), \qquad W^{\,j|i}(s^n,\boldsymbol{\varepsilon}) = V^{\,j|i}\big(A,\ B,\ \bar{\mathcal{B}}^{j}_{\mathrm{post}}(s^n),\boldsymbol{\varepsilon}\big).
$$

3.7 Equilibrium

In equilibrium, the debt's price depends on both political turnover and future ceiling negotiations, as captured by zero profit conditions of the risk neutral foreign lenders:

$$
\begin{aligned}
Q^{|i}(A,\,B',\,\bar{B}'_{pre}) = \frac{\mathbb{E}_{A'|A}}{1+r}\Bigg\{ & \big(1-\pi\,\mathcal{D}^{|i}\big(\underbrace{A',B',\bar{B}^{j}_{post}(A',B',\bar{B}'_{pre})}_{\equiv s'_j},\varepsilon'\big)\big)\,\big[\delta+z+(1-\delta)\,Q^{|i}\big(A',\mathcal{B}^{\,i\prime}(s'_j,\boldsymbol{\epsilon}),\bar{\mathcal{B}}^{\,i\prime}_{pre}(s'_j,\boldsymbol{\epsilon}),\varepsilon'\big)\big] \\
& -\ (1-\pi)\,\mathcal{D}^{|j}\big(\underbrace{A',B',\bar{B}^{\,i}_{post}(A',B',\bar{B}'_{pre})}_{\equiv s'_i},\varepsilon'\big)\,\big[\delta+z+(1-\delta)\,Q^{|j}\big(A',\mathcal{B}^{\,i\prime}(s'_i,\boldsymbol{\epsilon}),\bar{\mathcal{B}}^{\,j\prime}_{pre}(s'_i,\boldsymbol{\epsilon}),\varepsilon'\big)\big]\Bigg\}.
\end{aligned} \tag{7}
$$

A *Markov-perfect equilibrium* is a set of decision rules and prices such that:

(i) The incumbent default, taxation, borrowing and debt ceiling announcements decisions satisfy the problem described in Subsection 3.4.

(ii) The opposition debt ceiling negotiation decision satisfy the problem of Subsection 3.6, given the opposition value functions after renegotiation described in Subsection 3.5.

(iii) Households and firms solve their static problems as described in Subsections 3.2 and 3.3, respectively.

(iv) Foreign lenders offer an interest rate schedule consistent with equation (7).

4 Quantitative Analysis

In this section, we calibrate the model of Section 3 to match salient features of the Argentine economy, following a similar approach to Arce et al. (2024). Hence, we use the calibrated model for quantitative analysis.

4.1 Calibration

Table 2 reports the parameters estimated outside the model, while Table 3 presents those calibrated internally to match equilibrium moments.

Externally Estimated Parameters. We fix the risk-free interest rate at $r = 0.01$ and the inverse of the Frisch elasticity at $\psi = 0.5$, both standard values in the literature. The elasticity of substitution between skilled and unskilled labor is set to $\eta = 2/3$, following Gallego (2006).

Labor productivity differences across household types are set to $\theta^R = 0.7$ and $\theta^L = 0.3$, reflecting observed wage premia. The disutility of labor is calibrated as $\psi^R = 0.60$ for skilled and $\psi^L = 0.40$ for unskilled workers, consistent with evidence on hours worked by educational attainment.

The productivity process follows a standard AR(1) in logs, with persistence $\rho^A = 0.95$ and innovation volatility $\sigma^A = 0.03$, based on annual Argentine GDP fluctuations. The average maturity and coupon on public debt are set to $\delta = 0.05$ and $z = 0.03$, respectively.

The reentry probability after default is calibrated to $\gamma = 1/26$, reflecting an average five-year exclusion from capital markets. Finally, reelection odds are set at $\pi^{i|i} = 1 - 1/32$, based on the historical frequency of partisan turnover in Argentina (Morelli and Moretti, 2023).

Table 2: Parameters Estimated Outside of the Model

Parameter	Value	Source/Transition
Risk free rate	$r = .01$	Standard value
Inverse Frisch elasticity	$\psi = .5$	Standard value
Elasticity of substitution	$\eta = 2/3$	Gallego (2006)
Labor productivity	$\theta_R = .7, \theta_L = 1 - \theta_R$	Hourly wage premia
Taste for effort	$\psi^R = .60$	Hours highly educated
Taste for effort	$\psi^L = .40$	Hours lowly educated
Productivity shock	$\rho^A = .95$	Chatterjee and Eyigungor (2012)
$\log(A_t) = \rho^A \log(A_{t-1}) + \epsilon_t^A$	$\sigma^A = .03$	Argentina's GDP
Debt Maturity	$\delta = .05$	Avg. maturity of debt
Debt Coupon	$z = 0.03$	Avg. debt service
Reentry Probability	$\gamma = 1/26$	Average exclusion
Reelection odds	$\pi^{i\|i} = 1 - 1/32$	Morelli and Moretti (2023)

Note: This table reports the parameters estimates outside of the model.

Calibrated Parameters. Internally calibrated parameters are chosen to jointly match the distribution of debt, tax rates, and default frequencies observed in the data. The discount factor is set to $\beta = 0.92$, consistent with observed borrowing spreads and default risk.

Taste shocks to fiscal preferences ε^G follow an AR(1) process with $\sigma^{\varepsilon^G} = 7.5 \times 10^{-3}$ and $\rho^{\varepsilon^G} = 0.37$, capturing persistent shifts in policy orientation. Issuance costs are convex in the debt change, governed by $\iota_1 = 5 \times 10^{-5}$ and $\iota_2 = 28$.

Welfare weights reflect ideological differences, with $\omega_R^R = 0.69$ and $\omega_R^L = 0.31$, implying right-wing governments value skilled households more than unskilled ones. Default costs take the form $A - \max\{\phi_0^D A + \phi_1^D A^2, 0\}$, with $\phi_0^D = -0.19$ and $\phi_1^D = 0.25$.

Finally, borrowing above the post-negotiation debt ceiling incurs quadratic penalties: $\varsigma_1 = 5 \times 10^{-5}$ and $\varsigma_2 = 100$, reflecting the political and institutional costs of overriding agreed-upon borrowing limits. These later costs are set high enough that the party in power will never choose to incur them.

We map model inputs to Argentine data along two dimensions: tax progressivity and political dynamics.

Tax progressivity. Following Heathcote et al. (2017), we estimate progressivity parameters using macro data on labor income, hours worked, and educational attainment. To compute all these moments, we use data from CEDLA and the World Bank. We use employment-to-population ratios and education-level population shares to partition households into skilled

Table 3: Calibrated Parameters

Parameter	Value
Discount factor	$\beta = 0.92$
Volatility taste shock	$\sigma^{\varepsilon^G} = 7.5 \times 10^{-3}$
Correlation tast shock	$\rho^{\varepsilon^G} = 0.37$
Issuance costs:	$\iota_1 = 5 \times 10^{-5}$
$\iota_1 \exp(\iota_2 \lvert B' - B \rvert) - \iota_1$	$\iota_2 = 28$
Ideology weights	$\omega_R^R = 0.69$=1-ω_R^L
Default costs:	$\phi_0^D = -0.19$
$A - \max(\phi_0^D A + \phi_1^D A^2, 0)$	$\phi_1^D = 0.25$
Ceiling break costs:	$\varsigma_1 = 5 \times 10^{-5}$
$\varsigma_1 \exp(\varsigma_2 \lvert B' - \bar{B} \rvert) - \varsigma_1$	$\varsigma_2 = 50$

Note: This table reports the internally calibrated parameters.

and unskilled types. We then compute pre-tax labor income using wage and hours data by skill group and, finally, we use disposable income to infer average tax rates across types.

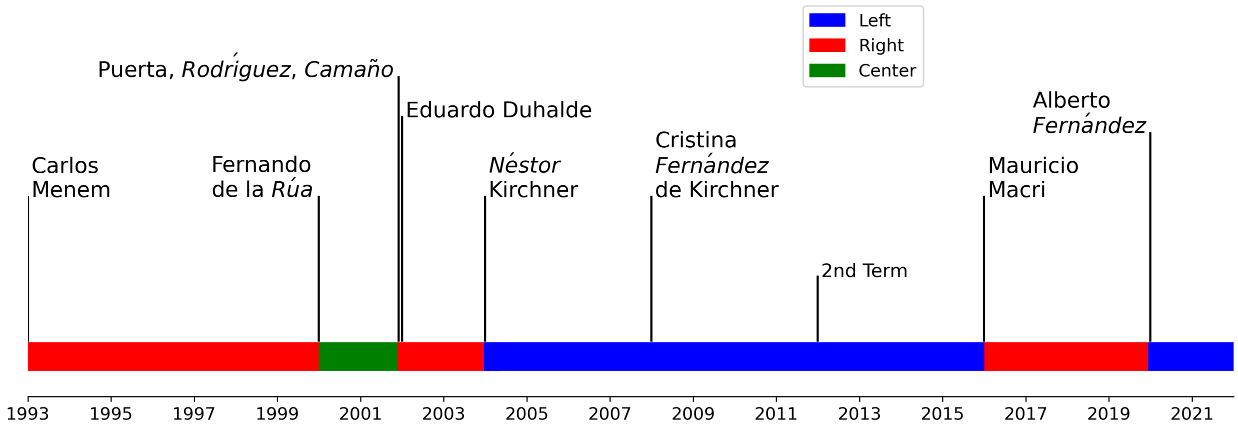
Political turnover. We assign party identity (Left, Right, Center) using the Database of Political Institutions 2020 (Scartascini et al., 2021). Figure 6 shows the political orientation of Argentina's executive from 1993 to 2021, which we use to calibrate reelection probabilities and ideological preference parameters.

4.2 Quantitative Results

We now present four quantitative exercises to evaluate the role of endogenous debt ceiling renegotiation in shaping default behavior, fiscal flexibility, and welfare. Our comparisons are across three versions of the model: (i) no debt ceiling, (ii) a debt ceiling with ex-post negotiation (our baseline model), and (iii) a debt ceiling without ex-post negotiation ($\bar{B}'_{\text{pre}} = \bar{B}'_{\text{post}}$).

Welfare gains. We begin by computing the lifetime utility of a patient-utilitarian planner who averages across household types and political states. Specifically, we compute the welfare

Figure 6: Political Leanings of Argentina's Executive



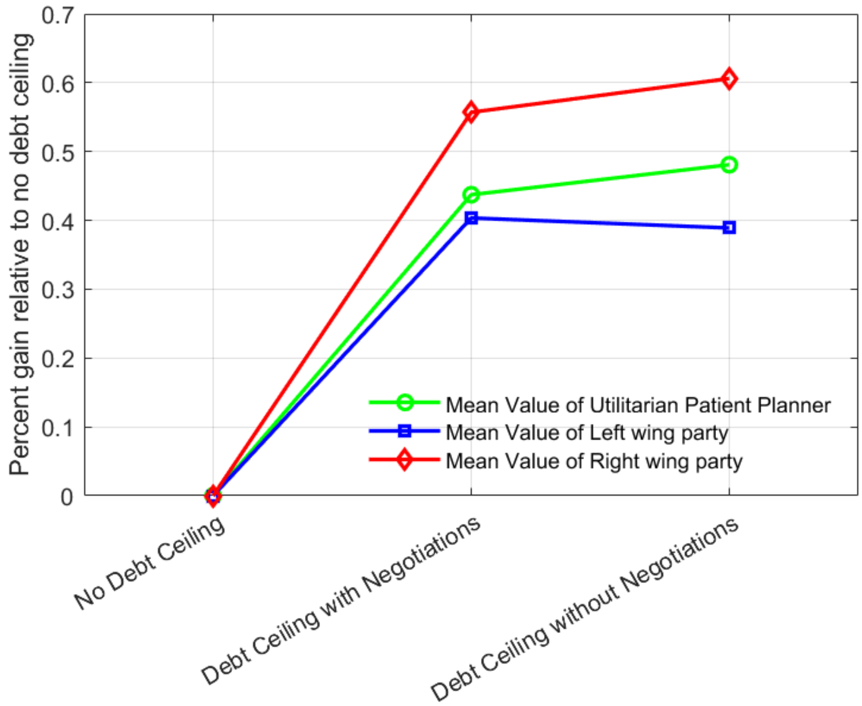
Note: This figure plots the timeline of the political affiliation of the party in power in Argentina from 1993 to 2021.

of the patient-utilitarian planner:

$$V^{SP}_{\beta=\frac{1}{R}}(s_0|\mathcal{D}^{L|L},\mathcal{B}^{L|L'},\boldsymbol{\tau}^{L|L},\bar{\mathcal{B}}^{L|L'}_{pre},\bar{\mathcal{B}}^{R|L\prime}{}_{post};\mathcal{D}^{R|R},\mathcal{B}^{R|R'},\bar{\mathcal{B}}^{R|R'},\boldsymbol{\tau}^{R|R},\bar{\mathcal{B}}^{L|R\prime}{}_{post}).$$

In addition, we report the average continuation values of each political party. Figure 7 shows percent gains in welfare relative to the baseline without a debt ceiling. We find that both political parties and the utilitarian planner strictly prefer a model with ceilings, with additional (albeit heterogeneous) gains from endogenizing negotiation.

Figure 7: Welfare Gains Relative to No Debt Ceiling



Note: This figure plots the welfare gains—relative to the no debt ceiling case—and decomposes them for the left-wing and right-wing parties.

Ergodic moments. Table 4 reports long-run averages of key macroeconomic outcomes across model variants. Debt ceilings reduce default probabilities, debt levels, and spreads. Relative to a model without negotiation, the negotiated ceilings generate slightly more default and borrowing, reflecting the greater flexibility afforded by political compromise.

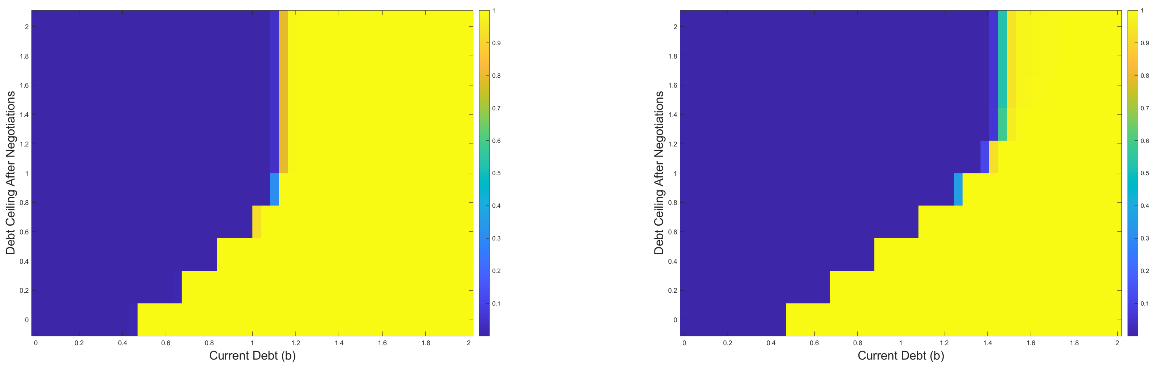
Table 4: Main Moments at the Ergodic Distribution

	Default Probabilities	Mean Debt	Mean Spread	Mean Ceiling	Mean Ceiling Announced
No Debt Ceiling	6.5	108	16.7	–	–
Debt Ceiling with Negotiation	5.4	104	11.3	149	126
Debt Ceiling without Negotiation	5.1	103	11.1	154	154

Note: This table reports salient moments of the ergodic distribution.

Default sets by party. We next analyze the set of states in which each party opts to default. As shown in Figure 8, the left-wing party exhibits a larger default region, consistent with its stronger redistributive motives and lower valuation of debt service. The default sets are plotted over current debt and the post-negotiation debt ceiling.

Figure 8: The Left-wing Party has Larger Default Sets



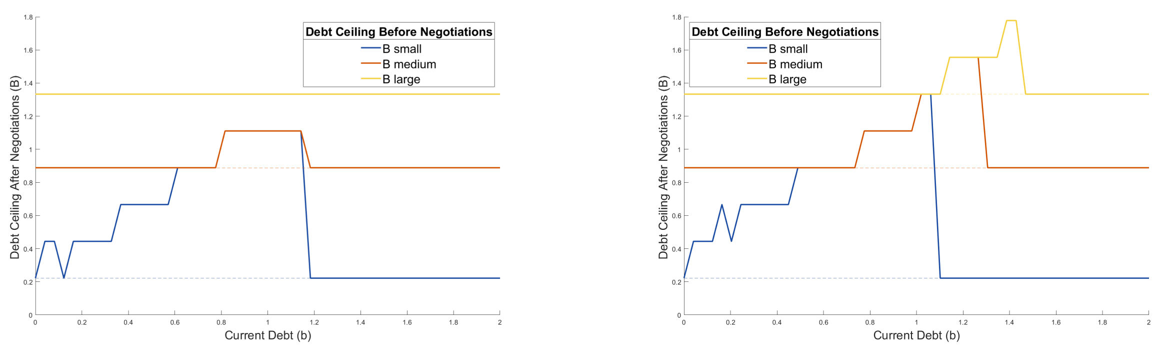
Default set of L party

Default set of R party

Note: This figure reports the default regions across parties as a function of current debt and renegotiated debt ceiling.

Ceiling renegotiation behavior. Finally, we explore how the opposition adjusts the debt ceiling in equilibrium. Figure 9 plots the mapping from pre-negotiation debt ceilings to post-negotiation ceilings, for different levels of outstanding debt. We find that opposition parties adjust ceilings gradually and nonlinearly, allowing more borrowing when debt is low but capping flexibility when debt is already elevated. This mechanism reflects a dynamic political tradeoff between discipline and accommodation.

Figure 9: Opposition Lifts the Debt Ceiling Gradually



Negotiation with L party in power

Negotiation with R party in power

Note: This figure reports the opposition's post-negotiation ceilings as a function of pre-negotiation ceilings and debt levels.

5 Conclusion

This paper develops a quantitative framework to assess the desirability and enforceability of fiscal rules—specifically, debt ceilings—in environments with limited commitment. We combine two complementary approaches. The first is a tractable sovereign default model with long-term debt, in which the government endogenously announces a self-imposed borrowing ceiling that can be exceeded in the future only at a cost. The second is a richer political economy model in which these ceilings emerge endogenously from strategic renegotiations between alternating partisan governments. Together, the two models shed light on the role of fiscal rules as imperfect but valuable commitment devices.

The simple model highlights a core economic trade-off: a debt ceiling can improve borrowing terms by mitigating debt dilution, but may also constrain fiscal flexibility and increase default risk. We show that a moderate penalty for exceeding the ceiling leads governments to make credible promises about future borrowing without overly constraining their ability to respond to shocks. This partial commitment improves credit conditions and raises welfare. However, excessively tight or fully rigid ceilings backfire—raising default risk, lowering welfare, and reducing the value of the rule itself.

The political economy model builds on this insight and shows how fiscal rules can be sustained in equilibrium even when future governments are not bound by their predecessors' promises. In our framework, the incoming administration can renegotiate the inherited ceiling with the opposition before it binds. These negotiations generate an endogenous form of fiscal discipline: opposition parties are willing to accommodate debt increases in response to shocks, but resist excessive borrowing, especially when the incumbent is of the opposing ideology. This strategic interaction leads to intermediate and history-dependent fiscal rules that improve welfare, reduce spreads, and align incentives across political transitions.

Quantitatively, both models deliver consistent results. In simulations calibrated to Argentina, we find that moderate debt ceilings lower average spreads and improve welfare, with the gains driven by improved commitment rather than hard constraints. In the political model, the presence of alternating parties with asymmetric preferences creates additional political incentives to restrain debt accumulation over time. We show that these frictions—often viewed as obstacles to policy—can in fact sustain rules that discipline government behavior and improve macroeconomic outcomes.

Taken together, our results suggest that fiscal rules need not be externally enforced to be effective. Credible rules can emerge endogenously from the political process, particularly when institutional frictions, opposition incentives, or ideological asymmetries support them.

From a policy perspective, our framework highlights the value of intermediate forms of commitment—fiscal arrangements that discourage overborrowing but preserve enough flexibility to respond to economic shocks. Future work can explore how different political institutions, rule designs, or international enforcement mechanisms affect the trade-off between credibility and adaptability in fiscal policy.

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