Sovereign Spreads and the Political Leaning of Nations*

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Abstract

Using data from 56 nations over 45 years, we find that nations that are more likely to elect left wing governments face higher (and more volatile) sovereign spreads. To explain these facts, we build a sovereign default model in which two policymakers (left and right) alternate in power. The probability of an incumbent staying in power is increasing in the share of government spending. We parametrize the left policymaker as having a higher marginal political gain from increasing government spending than the right does, a feature found in our data. Model economies in which the left is more frequently in power face worse borrowing terms due to higher default risk, a greater reluctance for fiscal austerity in bad times, and a higher share of government spending on average. These features imply large welfare losses for households.

JEL classification: F34, F41.
Keywords: Sovereign default, Interest rate spread, Political turnover, Left-wing, Right-wing, Cyclicality of fiscal policy.

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1 Introduction

Nations vary widely in how often they are governed by left-wing governments – for example, the ruling party in Ecuador is classified as left, 87 percent of the time between 1975 and 2020 by the Database of Political Institutions (DPI) while this occurs only 20 percent of the time in Turkey over the same period. This paper explores the impact of these international differences in the propensity of a nation to elect left (or right) leaning central governments on their sovereign debt yields. We begin by showing that the level and volatility of the sovereign spread of a nation is increasing in the fraction of time spent under a left-wing government.

To shed light on this finding, we build a quantitative model of a small open economy in which elections determine which of two policymakers will be in power. Neither of the potential incumbents can commit to repay the nation's long-term international debt and this default risk causes international lenders to charge a premium over the risk free world interest rate (the spread). The reelection probability of either incumbent policymaker is increasing in popular support, which is itself increasing in the fraction of aggregate output devoted to government consumption. Consistent with the political data, left and right governments are modeled as differing in the amount of political support generated by this fiscal choice. Our data indicates that left-wing governments obtain more electoral benefits from increasing public spending than right-wing governments do, and we parametrize the model accordingly.

We show that in times when aggregate output is unusually low, left governments display greater reluctance to lower government spending than right governments, and are more likely to default on their debt obligations. This occurs because the left government suffers greater losses of popular support and faces a sharper fall in its reelection prospects, from the same potential reduction in spending relative to the right government, other things constant. Aware of this political dynamic, international lenders assign a higher default risk to a left government than to a right government, which translates in to worse borrowing terms. This benchmark model is consistent with the stylized facts typically discussed in the quantitative sovereign default literature: private and public consumption are both more volatile than output and positively correlated with it; the trade balance is negatively correlated with GDP; spreads rise with debt levels and fall with output increases, ceteris paribus.

To address the empirical regularity described above, we build two variants of the benchmark

economy which we will call the 'Left leaning' and the 'Right leaning' economies. The Left leaning economy builds in a small equilibrium advantage for left governments in that they win elections slightly more than 50 percent of the time. Conversely, the Right leaning economy has the left winning elections slightly less than 50 percent of the time. These two economies differ only in the value of one parameter governing the effectiveness with which popular support for an incumbent translates into their reelection probability. This parameter is intended to capture the combined influence on reelection probabilities of the myriad institutional differences that exist in the political arena of different nations, and can be uncovered using international political data. The values used to parametrize the two economies are drawn from either side of the mean.

We show that the Left leaning economy displays a sovereign spread that is 200 basis points higher than the Right leaning economy, holding debt at its mean. This result emerges because the election effectiveness parameter not only governs the reelection probability of a government directly, it also indirectly influences its aversion to incur fiscal austerity measures in bad times. International lenders understand this political calculus and assign higher default risk to the Left leaning economy. We show that the two economies display differing fiscal behaviour – the Left leaning economy displays more procyclicality in fiscal policy than the Right leaning economy and this difference is consistent with the data. The differences in the propensity towards electing left governments comes with substantial welfare consequences: if the representative household could switch from the Left leaning economy to the Right leaning one, the average welfare gain is over 10 percent of permanent consumption.

Related literature. This paper considers a dynamic stochastic small open economy with incomplete markets, endogenous political turnover, and default risk. It builds on the seminal study on international lending and sovereign default by Eaton and Gersovitz (1981), and on the more recent quantitative models by Aguiar and Gopinath (2006) and Arellano (2008), among others. Like our paper, Cuadra, Sanchez and Sapriza (2010) are interested in the relationship between endogenous fiscal policy and sovereign debt markets but do not make the connection to reelection probabilities that we highlight in this paper.[1]

[1] Cuadra et al. (2010) show that their model generates pro-cyclical fiscal policy, i.e., government spending increases with output while taxes fall. Our model also generates procyclical fiscal policy.

Our paper is naturally related to the works that merge sovereign default risk with political considerations. Cuadra and Sapriza (2008) introduce exogenous political turnover into sovereign default models and study the role of exogenously varying the reelection probability (which they call political instability) on fiscal policy and default risk. Hatchondo, Martinez and Sapriza (2009) study how the exogenous turnover of politicians with different discount factors (patient vs. impatient) can create default crises (which they call political defaults). D'Erasmo (2011) uses a similar framework but introduces asymmetric information: this gives an incentive to the patient politician to try to separate itself from the impatient one. We build on these three papers and endogenize the reelection probability, making it explicitly dependent on equilibrium fiscal choices. Furthermore, we use our model to explain a novel empirical regularity, the relationship between the propensity of an economy to choose a left government and the average level of its sovereign spread.

Like our paper, Scholl (2017) studies the interplay between fiscal policy and endogenous electoral outcomes in a model of sovereign default.[2] Society is polarized between two types of agents who prefer more or less government spending and two parties who only govern to maximize the welfare of their supporters. Scholl (2017) focuses on the effects of political instability on debt accumulation and default policies in a country. In contrast, our model does not rely on differences in preferences towards public consumption to generate political heterogeneity between left and right. Instead, we estimate a simple reelection process and our estimates imply that the left has a higher marginal political gain from increasing government spending than the right. As a robustness exercise (see section 5.5), we also show that preference differences toward public consumption cannot account for the motivating empirical regularities that our paper focuses on.[3]

[2]Endogenous electoral outcomes can also be found in the sovereign default model of Chatterjee and Eyigungor (2019). Governments in office have the ability to obtain private benefits in the process of providing public goods. The threat of lower private benefits from losing power makes the incumbent behave myopically in bad times relative to good times. This endogenously time-varying level of patience leads to increased volatility in the sovereign spread. In contrast to our model, the two policymakers in Chatterjee and Eyigungor (2019) are not heterogeneous. Other related work includes Andreasen, Sandleris and Van der Ghote (2019) who study default incentives in a model of sovereign debt with income inequality and political constraints; Herrera, Ordoñez and Trebesch (2020) who focus on the interaction between political booms (i.e., increases in popularity) and financial crises; and Chang (2007) who studies the interaction of political frictions and debt repayment in a stylized model of information asymmetry and conflict between the government and the public.

[3]In Scholl (2017), the party that prefers higher government spending has an inbuilt economic disadvantage due to the presence of distortionary taxation and this plays a role in reducing their ability to repay debt. We eschew this feature in order to focus on a purely political source of difference between the two policymakers.

Finally, we also relate to the vast literature on the political economy of government debt. The work of Alesina and Tabellini (1990), Persson and Svensson (1989), and Battaglini and Coate (2008) are key references from this branch of the literature.[4] A closely related paper is the one by Müller, Storesletten and Zilibotti (2016) who study a political-equilibrium model with switches between left and right-wing governments. The main difference with our work is that Müller et al. (2016) abstract from sovereign default.

Layout. Section 2 presents our empirical findings. Section 3 introduces a quantitative model of sovereign borrowing, default and political elections. Section 4 discusses the calibration of the model. Section 5 explains the main results and quantitative implications of the theory. Section 6 concludes and an empirical appendix can be found at the end of the manuscript.

2 Motivating evidence

Data description. We combine information on macroeconomic, financial, and fiscal variables from standard sources (various International Monetary Fund and World Bank databases), information on country sovereign spreads (JP Morgan's EMBI Global and country specific bond yield data), and information on the political affiliation of national governments from the IDB's Database of Political Institutions (DPI, Cruz, Keefer and Scartascini, 2021). The first two sets of data sources are frequently used and well understood, but the last one deserves further description. The IDB's DPI provides us with a harmonized classification of political parties into either Left-wing or Right-wing. The DPI assigns a party's orientation as right (R) if the party is defined as conservative, Christian democratic, or simply 'right-wing.' On the other hand, a party's orientation is assigned as left (L) if the party is defined as communist, socialist, social democratic, or simply 'left-wing.' We also use DPI's data on election dates to infer, from changes in the incumbent, the results of the electoral process.

We start with a large number countries and restrict our sample to keep only countries for which we have data on the political stance (L vs. R), the sovereign spread, the debt level, government spending, private consumption, and the trade balance. This process leaves us with a dataset of 56 countries over the period 1975–2020. We are interested in uncovering the long

[4] Yared (2010) and Ilzetzki (2011) are more recent contributions showing how political distortions can lead to inefficient debt accumulation. See Alesina and Passalacqua (2016) for a recent literature review.

run impact of the propensity of a nation to elect a left government (left-propensity henceforth) on its sovereign spread. As a result we average the data over the sample period for each country. We define left-propensity as the fraction of time (over the sample period) that a given country spent under a left wing central government. The empirical appendix provides further details about all our data sources.

Sovereign spreads and left-propensity. We use the aforementioned dataset to document two primary motivating stylized facts: the higher the left-propensity of a nation the higher the *(i)* level and *(ii)* volatility of its sovereign spreads.

We measure the effect of left-propensity by estimating cross-country regressions of the following form:

$$\text{DV}_i = \alpha + \beta \, \text{Left.Prop}_i + \phi_1' \, \mathbf{X}_i + \phi_2' \, \mathbf{M}_i + \epsilon_i, \tag{1}$$

where DV_i is either the average level or volatility (in standard deviations) of the sovereign spread for country i (measured in basis points) and Left.Prop_i is the left-propensity measure discussed above. $\mathbf{X}_i$ is a vector of the most theoretically relevant control variables in this context of studying average spreads: the average debt-to-GDP ratio and the volatility of real GDP as measured by its standard deviation over the sample period. Vector $\mathbf{M}_i$ includes additional controls such as the level of the fiscal surplus, and the fraction of time the country spent in a fixed exchange rate regime. In addition, we create a variable that captures the number of default crises events occurring in a country, based on information from Catão and Mano (2017), and also include this in the vector $\mathbf{M}_i$. Finally, ϵ_i is a random error term.[5]

The left panel of Table 1 displays the results for the spread level and the right panel for the spread volatility regressions, each considering three different specifications. We begin with the spread level regressions. The coefficient of 'Left.Prop' is between 235 and 159 basis point and significant in all specifications. Consistent with economic theory and previous studies, the spread level also increases when a nation carries a higher average ratio of debt-to-GDP and displays a more volatile GDP (the former is significant while the later is not significant at conventional levels). Inclusion of additional controls in specification (3) lowers the rela-

[5]Naturally, there exist a vast and well-known empirical literature that explores the cyclical determinants of sovereign spreads. Instead, our focus is on long-term differences in spread levels and volatilities among nations, in which the time variation is averaged out. As such many variables capturing short-term domestic and global conditions (whose effect on the spread is well understood) are absent from our specifications.

Table 1: Spread regressions

Dep. variable:	Spread level			Spread volatility		
	(1)	(2)	(3)	(4)	(5)	(6)
Left.Prop	235.64**	207.88**	159.58*	288.08**	286.61**	256.34*
	(100.52)	(94.15)	(89.91)	(127.06)	(135.80)	(152.72)
Debt/GDP		9.09***	5.53*		7.33	4.33
		(2.57)	(2.94)		(4.76)	(5.70)
GDP volatility		48.06	44.03		96.20	88.10
		(32.30)	(29.10)		(64.94)	(60.55)
(Intercept)	142.72***	-85.72	-120.00	98.96*	-238.20	-293.30
	(45.98)	(92.39)	(108.42)	(50.49)	(181.13)	(227.52)
Num.Obs.	56	56	56	56	56	56
R2	0.044	0.299	0.379	0.019	0.115	0.137
Other controls?	No	No	Yes	No	No	Yes

Note: Robust standard errors are reported in parentheses. The volatilities of spreads and GDP are their respective standard deviations. The other covariates included in columns (3) and (6) control for the fiscal surplus, the exchange rate regime, and the history of default crises. *p<0.1; **p<0.05; ***p<0.01.

tionship between the spread level and left-propensity below 200 basis points. Turning to the spread volatility regressions, the left-propensity coefficient is also positive and significant in all specifications (4)–(6).[6]

Having established that nations with higher left-propensity pay higher and more volatile sovereign spreads, in the coming sections we propose a quantitative theory of political turnover, fiscal policy and default incentives that is able to rationalize these empirical findings.

3 The Model

We consider a small open economy populated by a continuum of households. There are also two policymakers (L and R) which alternate in power.[7] The economy trades long-duration non-state-contingent bonds with a mass of competitive foreign lenders and has no commitment

[6]In related and contemporaneous work, Brooks, Cunha and Mosley (2019) find that elections won by left wing parties are associated with higher spread volatility.

[7]These policymakers are office-motivated (i.e. they prefer to be in power than not) and when in power they have per-period utility functions that are identical to the households' preferences. Past work has modelled political differences through variation in the preference for public consumption over private consumption. We eschew this approach in the main model in order to focus on one source of political difference between left and right that obtains from the impact of fiscal choices on reelection probabilities as discussed earlier. In the robustness section, we show that differences in preferences on their own cannot explain our empirical regularities.

to repaying its debts. We use recursive notation, where *un-primed* variables (e.g. x) represent current values, while *primed* variables (e.g. x') represent next-period values. Time is discrete and goes on forever.

3.1 Households

The representative household derives utility from the consumption of both private (c) and public (g) goods according to the following per-period utility function:

$$U(c, g) = \alpha\, u(c) + (1 - \alpha)\, u(g), \tag{2}$$

where the function $u(\cdot)$ is of the CRRA type:

$$u(x) = \frac{x^{1-\gamma} - 1}{1 - \gamma}, \qquad \text{for } x = \{c, g\}, \tag{3}$$

where parameter γ controls the degree of relative risk aversion (common across goods).

Households receive a stochastic stream of tradable income y which is assumed to have compact support $\mathcal{Y} \subset \mathbb{R}_{++}$ and to follow a Markov process. They also face a proportional income tax (transfer) rate, τ, which is decided by the government and may be time-varying. As it is typical in the models following Eaton and Gersovitz (1981), the households are hand-to-mouth agents: the government does all the intertemporal smoothing for them and implements the desired allocation via changes in the tax rate. Therefore the budget constraint of the households is just given by

$$c = (1 - \tau)y\,.$$

In case of a government default the households suffer an income loss ($\phi(y) \geq 0$), and hence their budget constraint is

$$c = (1 - \tau)\,\left[y - \phi(y)\right]\,.$$

3.2 Political Turnover

An election may occur in any period with an exogenous probability π. If an election occurs, the incumbent policymaker may be replaced by the other policymaker. This is similar to the way elections are modeled in Chatterjee and Eyigungor (2019) and Scholl (2017).

We endogenize political turnover through a technology that governs the probability of winning elections. In this we are guided by evidence (discussed later) illustrating that the reelection probability of incumbents depends on fiscal choices (in particular, higher fiscal spending is associated with higher reelection probabilities). We model this reelection technology with an eye on the available political data and it consists of two functions. First, we let ps_i denote 'popular support' of a given policymaker and we model it as an increasing function of the government spending to income ratio:

$$ps_i = ps_i(g/y), \quad \text{with} \quad ps_i'(g/y) > 0 \quad \text{and} \quad i \in \{L, R\}.$$

Second, we assume a mapping between popular support and reelection probability, $P_i(ps)$, with $P_i'(ps) > 0$ for $i \in \{L, R\}$.

3.3 Government finances

The government borrows from a large pool of international investors by issuing long-duration bonds. As in Hatchondo and Martinez (2009), a bond issued in period t promises an infinite stream of coupons, which decrease at a constant rate δ.[8] In particular, a bond issued in period t promises to pay $\kappa(1-\delta)^{j-1}$ units of the tradable good in period $t+j$, for all $j \geq 1$. Hence, debt dynamics can be represented as follows:

$$b' = (1-\delta)b + \nu,$$

where b is the number of coupons due at the beginning of the current period, ν is the number of long-term bonds issued in the current period, and b' are the number of coupons due at the beginning of next period. The advantage of this payment structure is that it enables us to condense all future payment obligations derived from past debt issuances into a one-dimensional state variable: the payment obligations that mature in the current period.

If the government decides to repay its debt obligations it also needs to choose a combination of taxes and debt issuance in order to finance its expenditures (coupon payments plus public consumption). Therefore, the government budget constraint under repayment is

[8] Arellano and Ramanarayanan (2012) and Hatchondo, Martinez and Sosa-Padilla (2016) allow the government to issue both short-term and long-term debt, and study optimal maturity.

$$g + \kappa b = \tau y + [b' - (1-\delta)b]\, q(b', g, y)\,, \tag{4}$$

where $q(b', g, y)$ is the per-bond price of the long-duration non-state-contingent government debt and κ is a parameter that controls the size of the per-bond coupon payment. Given that there is lack of commitment to financial obligations, the government may choose to default on its debt. If so, it will face financial exclusion for a random number of periods, and its budget constraint while in autarky is

$$g = \tau\,[y - \phi(y)]\ . \tag{5}$$

3.4 Determination of government policies

Each period, conditional on being in good financial standing, incumbent $i \in \{L, R\}$ chooses whether to honor its outstanding foreign debt or default. Let d denote the current-period default decision. We assume that d is equal to 1 if the government defaulted in the current period and is equal to 0 if it did not. Let V_i denote the policymaker's value function at the beginning of a period, that is, before the default decision is made. Let V_i^0 denote the value function of a sovereign not in default. Let V_i^1 denote the value function of a sovereign in default.

For any bond price function q_i, the function V_i satisfies the following functional equation:

$$V_i(b, y) = \max_{d \in \{0,1\}} \Big\{ d\, V_i^1(y) + (1-d)\, V_i^0(b, y) \Big\}. \tag{6}$$

When incumbent i has access to financial markets it chooses public spending, the tax rate and foreign debt in order to solve the following problem:

$$V_i^0(b, y) = \max_{\tau, g, b'} \Big\{ U\big((1-\tau)y, g\big) + \beta \mathcal{P}_i\, \mathbb{E}_{y'|y} V_i(b', y') + \beta\,(1-\mathcal{P}_i)\ \mathbb{E}_{y'|y} \overline{V}_i(b', y') \Big\} \tag{7}$$

subject to

$$\begin{aligned} g + \kappa b &= \tau y + q_i(b', g, y)\,[b' - (1-\delta)b]\ , \\ \mathcal{P}_i &\equiv 1 - \pi + \pi P_i(ps)\,, \text{ and} \qquad (8) \\ ps &= ps_i(g/y) \qquad (9) \end{aligned}$$

where $\beta \in (0, 1)$ is a discount factor common across agents and $\mathcal{P}_i$ can be understood as the

probability that incumbent i will be in office in the next period (and it is a function of both exogenous and endogenous variables). The value function of policymaker i when it is not in power and the country is in good financial standing is $\overline{V}_i(b,y)$, and will be defined shortly (and similarly for when in autarky). When the government defaults the country gets excluded from international financial markets and the economy suffers an income loss. The problem is:

$$V_i^1(y) = \max_{\tau,g} \Big\{ U\big((1-\tau)\left(y-\phi(y)\right), g\big) + \beta \mathcal{P}_i \mathbb{E}_{y'|y} \Big[\theta V_i(0,y') + (1-\theta) V_i^1(y') \Big] + \beta\big(1-\mathcal{P}_i\big) \mathbb{E}_{y'|y} \Big[\theta \overline{V}_i(0,y') + (1-\theta) \overline{V}_i^1(y') \Big] \Big\} \quad (10)$$

subject to

$$g = \tau\left(y-\phi(y)\right), \text{ (8), and (9).}$$

The economy gets excluded from international credit markets in the default period, but it could regain access in any future period with probability θ. When the economy returns to credit markets, it does so without a debt burden (a feature captured by the zero in the value functions $V_i(0,y')$ and $\overline{V}_i(0,y')$). Alternatively, the economy remains in autarky with probability $1-\theta$.

Value while not in power. If policymaker i is not in power, then $\overline{V}_i(b,y)$ depends on the decisions of the opponent policymaker (which is now the incumbent). Let $\overline{V}_i^0(b,y)$ represent the value function of policymaker i when not in power and the country repays the debt, and $\overline{V}_i^1(y)$ when the country defaults. Optimal decisions of the opponent are denoted by $-i$. Hence, the value functions of policymaker i while not in office are given by

$$\overline{V}_i^0(b,y) = \chi\, U(c_{-i}, g_{-i}) + \beta \mathcal{P}_{-i} \mathbb{E}_{y'|y} \overline{V}_i(b'_{-i}, y') + \beta\left(1-\mathcal{P}_{-i}\right) \mathbb{E}_{y'|y} V_i(b'_{-i}, y') \quad (11)$$

$$\overline{V}_i^1(y) = \chi\, U(c_{-i}, g_{-i}) + \beta \mathcal{P}_{-i} \mathbb{E}_{y'|y} \Big[\theta \overline{V}_i(0,y') + (1-\theta) \overline{V}_i^1(y') \Big] + \beta\big(1-\mathcal{P}_{-i}\big) \mathbb{E}_{y'|y} \Big[\theta V_i(0,y') + (1-\theta) V_i^1(y') \Big] \quad (12)$$

where

$$\overline{V}_i(b_{-i}, y) \equiv \big(1 - d_{-i}(b_{-i}, y)\big) \overline{V}_i^0(b_{-i}, y) + d_{-i}(b_{-i}, y) \overline{V}_i^1(,y)\,, \quad (13)$$

with $\mathcal{P}_{-i}$ defined analogously to $\mathcal{P}_i$. Therefore, the value of being outside of office is the sum of (i) a reduced flow utility (with parameter $\chi \in (0,1)$ controlling the relative disutility of not being in power), and (ii) a continuation value that takes into account the possibility of winning future elections and coming back into office.[9]

3.5 Foreign Lenders

Foreign lenders are risk neutral and discount time at rate r, which is the international risk-free interest rate. Lenders have perfect information about the income process of the small open economy and each policymaker's reelection function. Bonds are priced in a competitive market inhabited by a large number of identical lenders, which implies that bond prices are pinned down by a zero expected profit condition. The risk of default (of both types of government) and the reelection probability of the current incumbent i are both taken into consideration by foreign lenders when pricing the sovereign bond:

$$\begin{aligned} q_i(b',g,y) \;=\; & \frac{\mathcal{P}_i}{1+r}\,\mathbb{E}_{y'|y}\left[1-\hat{d}_i\left(b',y'\right)\right]\left[\kappa+(1-\delta)\,q_i\left(\hat{b}_i(b',y'),\hat{g}_i(b',y'),y'\right)\right]+ \\ & \frac{1-\mathcal{P}_i}{1+r}\,\mathbb{E}_{y'|y}\left[1-\hat{d}_{-i}\left(b',y'\right)\right]\left[\kappa+(1-\delta)\,q_{-i}\left(\hat{b}_{-i}(b',y'),\hat{g}_{-i}(b',y'),y'\right)\right] \end{aligned} \tag{14}$$

with $\{\hat{d},\hat{b},\hat{g}\}$ denoting future policy rules that lenders expect the two governments will follow.

Equation (14) indicates that if the country defaults, the lenders get nothing. However, if the country repays the lenders get the coupon payment (κ) and the bond still has a residual market value $((1-\delta)q')$. Since there is uncertainty regarding who will be in office next period, the equilibrium price is a weighted average over the two possible future incumbents.

Our pricing function is a natural extension of the ones found in standard models of sovereign debt with long-duration debt (e.g., Hatchondo and Martinez, 2009). The main difference is that government spending choices matter for the bond price since they affect reelection probabilities.

[9] In Chatterjee and Eyigungor (2019) incumbents enjoy a private gain from being in office which is conceptually similar to the out-of-office loss in utility captured by χ. Note that in the quantitative implementation we scale mean income to guarantee that flow utility is always positive and therefore $\chi \in (0,1)$ actually implies a flow utility reduction while outside of power.

3.6 Recursive equilibrium definition

Definition 1 (Markov perfect equilibrium)**.** *A Markov perfect equilibrium is defined by value functions* $\left\{V_i(b,y), V_i^0(b,y), V_i^1(y), \overline{V}_i(b,y), \overline{V}_i^0(b,y), \overline{V}_i^1(y)\right\}_{i\in\{L,\,R\}}$ *, associated policy functions* $\left\{d_i(b,y), g_i^0(b,y), g_1^1(y), \tau_i^0(b,y), \tau_i^1(y)\right\}_{i\in\{L,\,R\}}$*, reelection probability functions* $\{P_i(ps), ps_i(g/y)\}_{i\in\{L,\,R\}}$*, and a set bond price schedules* $q_i(b',g,y)$ *for* $i \in \{L,\ R\}$ *such that*

1. *given policy functions, the bond price function* q_i *is given by equation* (14)*; and*
2. *the policy functions solve the dynamic programming problem defined by equations* (6) – (13)*, when the government can trade bonds at* q*.*

4 Quantitative Analysis

We solve the model using value function iteration and interpolation (Hatchondo, Martinez and Sapriza, 2010). In paramaterizing our model we are guided by our data on 56 countries. A period in the model refers to a year.

We split the parameters of the model into two groups. The first group of parameters (those in the top part of Table 4) can either be directly estimated from the data or follow the values that are typically used in the literature. The second group of parameter values (those in the bottom part of Table 4) are set by simultaneously matching key moments from the data.

We assume a coefficient of relative risk aversion of 2 and a discount factor of 0.96, which are both standard values. Regarding the financial market parameters, the risk-free rate is set to 4% annually, also a standard value in literature. The probability of reentry into international financial markets is chosen to be 15.4%, so that the government remains excluded for a period of six and a half years after a default episode, on average (Chatterjee and Eyigungor, 2012). We set $\delta = 0.142$. With this value and our target for the average spread, bonds have an average duration of 5 years in the simulations, which is roughly the average debt duration found in previous literature.[10]

[10]Using a sample of 27 countries, Cruces, Buscaglia and Alonso (2002) find an average duration of 4.77 years, with a standard deviation of 1.52 years. Bai, Kim and Mihalache (2017) report an average debt duration of 6.7 years in a panel of 11 economies. We use the Macaulay definition of duration which, with our coupon structure, is given by $D = (1+i^*)/(\delta+i^*)$, where i^* denotes the constant per-period yield delivered by the bond.

We assume that y follows a log-normal AR(1) process:

$$\log(y_t) = (1-\rho)\mu + \rho \log(y_{t-1}) + \epsilon_t,$$

with $|\rho| < 1$, and $\epsilon_t \sim N(0, \sigma^2)$. The persistence and volatility parameters are estimated for each country in our dataset. We then use the median of these values.[11] As in Chatterjee and Eyigungor (2012), we assume a quadratic loss function for income during a default episode $\phi(y) = \max\{y[\lambda_0 + \lambda_1[y - \mathbb{E}(y)]], 0\}$.

Estimation of the reelection technology. As explained in section 3, we postulate a reelection technology in two steps that takes advantage of available political data. First, we propose a simple linear model for the relationship between popular support and government spending. Namely, we estimate

$$ps_{jt} = \psi_1 \text{ Gov.Spending-to-GDP}_{jt} + \psi_2 \text{ Left}_{jt} \times \text{Gov.Spending-to-GDP}_{jt} + \psi_{0,t} + \epsilon_{jt} \qquad (15)$$

where j indexes the countries, t the years, 'Left_{jt}' is an indicator variable taking a value of one if the country j is under a left wing government in year t (and zero otherwise), and ϵ_{jt} is an error term. It is important to include time effects in order to account for international 'waves' of support for incumbents. For example, a global recession could lower the level of support for all incumbent governments, holding other things constant. To estimate (15) we use the 'Popular support' sub-index from the International Country Risk Guide (ICRG) database (ICRG Researchers, 2013).[12] Table 2 presents the estimates. We then use the estimated ψ_1, ψ_2 and the (mean of the) ψ_0's as parameters for our model.[13]

Second, we use a decreasing returns to scale function to map popular support into reelection

[11] As in Arellano (2008), we scale income so that it has a mean value of 10. This guarantees that flow utility is always positive in our simulations, and hence $\chi < 1$ indeed captures a utility penalty of being out of office.

[12] The 'Popular support' sub-index from ICRG is normalized relative to its highest value of 4.

[13] That is to say, in solving our model we use the prediction coming out of (15):

$$\hat{ps} = \mathbb{E}(\hat{\psi}_0) + \hat{\psi}_1 \, g/y + \hat{\psi}_2 \text{ Left} \times g/y.$$

Table 2: Popular support estimation

Dep. variable:	Popular support
Gov.Spending-to-GDP	0.481***
	(0.149)
Left × Gov.Spending-to-GDP	0.243***
	(0.081)
Mean of Time Effects	0.48
Num.Obs.	492
Num.Countries	45
Num.Years	15
R2	0.084

Note: standard errors are clustered at the year level and are reported in parentheses. *p<0.1; **p<0.05; ***p<0.01.

probabilities. Specifically, we assume that

$$P_i(ps) = A\, ps^{\omega_i} \quad \text{for } i \in \{L, R\}\,, \tag{16}$$

where ω_i captures the elasticity of reelection probabilities with respect to popular support (which we allow to be different for L and R, following the data) and A is a common scalar parameter which we call 'election efficiency.' To obtain estimates of ω_i we run a simple linear probability model using elections results data (with ones representing electoral wins and zeros losses). The estimated model is

$$\text{Prob. of reelection}_\ell = \phi_0 + \phi_1\, \text{ps}_\ell + \phi_2\, \text{Left}_\ell \times \text{ps}_\ell + \mathbf{e}_\ell\,, \tag{17}$$

where ℓ indexes the election events in our dataset, 'ps' stands for popular support (as above), and $\mathbf{e}$ is an error term.[14] Table 3 presents the estimation results. We then use the estimated ϕ's and our raw data to compute policymaker specific elasticities: $\omega_L = 0.95$ and $\omega_R = 0.72$. This result that the left government gains more political support from increasing public spending is also consistent with the empirical political science literature.[15]

[14] Including year dummies produces almost identical results.

[15] Levitt and Snyder (1997) find evidence that federal spending benefits congressional incumbents in the US. Evidence of strategic government spending has also been found in Canada (Landon and Ryan, 1997), Chile (Cerda and Vergara, 2008), India (Arulampalam, Dasgupta, Dhillon and Dutta, 2009), Mexico (De La and Ana, 2013), and Sweden (Dahlberg and Johansson, 2002; Johansson, 2003). Shin (2016) finds that the effect of welfare spending on the incumbent's vote share is stronger for the left.

Table 3: Probability of reelection estimation

Dep. variable:	Prob. of reelection
Popular support	0.780***
	(0.293)
Left × Popular support	0.339**
	(0.152)
(Intercept)	0.077
	(0.163)
Num.Obs.	109
R2	0.145

Note: *p<0.1; **p<0.05; ***p<0.01.

Finally, we use equation (16), our data on popular support, and our estimated ω's to back out an A for each country in our dataset.[16] The mean of those values is used in our benchmark calibration, $A = 1.07$. Table 4 presents all parameter values.

Table 4: Parameter values.

Parameter	Description	Value
r	Risk-free rate	0.04
β	Discount factor	0.96
γ	Coefficient of relative risk aversion	2
δ	Coupon decay rate	0.142
κ	Bond coupon	$(r+\delta)/(1+r)$
θ	Probability of re-entry	0.154
π	Probability of elections	0.25
ρ	Autocorrelation of $\log(y)$	0.90
σ	Std. dev. of innovation to $\log(y)$	0.03
μ	Mean log income	$(-1/2)\sigma^2$
A	Election efficiency	1.07
ω_L	Elasticity of P for L	0.95
ω_R	Elasticity of P for R	0.72
$\hat{\psi}_1$	Popularity slope	0.481
$\hat{\psi}_2$	Popularity slope	0.243
$\mathbb{E}\left(\hat{\psi}_0\right)$	Popularity intercept	0.483
	Parameters set by simulation	
λ_0	Default cost parameter	0.11
λ_1	Default cost parameter	0.875
$1-\alpha$	Utility weight on g	0.01
χ	Out-of-office scale parameter	0.8475

[16] In following this approach we borrow from the business cycle literature's treatment of how TFP is backed out using a Cobb-Douglas production technology, data on capital and labor, and values for the labor share.

Targeted moments. The calibration strategy described so far leaves us with four parameters to assign values to: the parameters of the income cost of default (λ_0, λ_1), the utility weight on public consumption ($1-\alpha$), and the out-of-office scale parameter (χ). We target the following four moments from the data: (i) a mean external debt-to-GDP ratio of 41%, (ii) a mean sovereign spread of 3.2%, (iii) a mean government spending-to-GDP ratio of 15%, and (iv) an ex-ante probability of incumbents winning elections of 67%.

Table 5: Data and model statistics.

	Data	Model
Targeted moments		
Mean s (in %)	3.2	3.2
Mean Debt/GDP	.41	.41
Mean G/GDP	.15	.15
Mean prob. winning elec.	.67	.68
Non-targeted moments		
$\sigma(s)$ (in %)	2.6	1.8
$\sigma(C)/\sigma(GDP)$	1.1	1.4
$\rho(GDP, s)$	-.32	-.72
$\rho(GDP, C)$	.79	.83
$\rho(GDP, G)$	.47	.70
$\rho(GDP, TB/GDP)$	-.22	-.78

Note: $\sigma(x)$ and $\rho(x, z)$ denote the standard deviation of variable x and the correlation coefficient between variables x and z, respectively. C is private consumption, G is government spending, TB is the trade balance, and s is the sovereign spread. For GDP, private consumption, and government spending we report statistics for the deviations from a log-quadratic trend; for the trade balance we use a quadratic trend, and for the spread we use its level.

Model fit. Table 5 shows statistics from the data and the model. As is clear from the top panel of this table, our calibration gives a very close fit to the targeted moments.

Table 5 also shows that our benchmark calibration produces business cycle statistics that are consistent with the data for non-targeted moments. In particular, our model delivers (i) excess consumption volatility, (ii) countercyclical spreads, (iii) a countercyclical trade balance, (iv) procyclical consumption, and (v) procyclical government spending. All of these are empirical regularities typically accounted for in the open economy business cycle literature.

Having established that the model does a reasonable job accounting for the usual empirical features discussed in the literature, we now use it to help shed light on the relationship between Left-propensity of a nation and its sovereign spread.

5 Left-propensity, fiscal policy and spreads

We begin this section with an explanation of how we use the model to generate economies that display different levels of Left propensity. We then use these model economies to generate data that can shed light on the economic forces that underlie the main empirical regularities documented earlier – countries with a higher Left-propensity tend to pay higher and more volatile spreads. Next, we explore two testable implications of our theory: (i) that a higher election efficiency (A) is associated with higher spreads, and (ii) that economies with higher Left-propensity run more procyclical fiscal policies. We find both to be consistent with out international data. We then study the welfare implications of different levels of Left propensity and find substantial gains of moving to an economy with a lower Left propensity. Finally, we present results for some alternative ways to model left and right wing policymakers such as exogenous differences in their preferences towards public consumption and show that the implications of these alternative *models* are at odds with the data.

5.1 Generating variation in 'Left-propensity'.

Since our empirical regularities come from average cross-country regressions (i.e. they are between estimators), we need to simulate data from economies featuring different levels of 'Left-propensity.' To do this, we vary the election efficiency parameter A in equation (16) and allow it to take two values around the mean ($A = 1.07$) of our calculated country values.[17] We take a value above the mean ($A = 1.18$) in order to generate an economy that has a small tendency to elect the left more than half of the time (left is in power 54% of the time). We will cal this economy the 'Left leaning' economy. Similarly, we take a value below the mean ($A = 0.88$) and use it to define an economy that has a slightly higher probability of electing the right policy maker (left is in power 48% of the time). We refer to this economy as the 'Right leaning' economy. As election efficiency A varies from economy to economy, the same level of popular support can lead to higher or lower reelection probabilities. As such, A succinctly captures the combined influence on reelection probabilities of the myriad institutional differences that exist in the political arena of different nations.

As election efficiency increases, policymakers realize that a unit increase in popular support

[17] Recall section 4 (page 16) where we describe how we compute country-specific values for A.

translates into larger gains in reelection prospects. This, in turn, incentivizes them to increase the share of government spending which is the only way they can influence popular support. In other words, a higher A translates into more political bang for their fiscal buck. As a result, changing the election efficiency of an economy has a direct effect on reelection probabilities, but also, an indirect effect through the endogenous impact on fiscal choices of the government. We also note that the two policymakers differ in the overall transmission of government spending to popular support and onto reelection probabilities. As a result, there is a differential impact of changing A on the right as compared to the left.

5.2 Politics and spreads

In this section we will use the Left leaning and Right leaning economies to shed light on the economics underlying the main empirical regularities documented earlier, namely that countries with a higher Left-propensity tend to pay higher and more volatile spreads.

Figure 1 shows that indeed our theory produces spread-debt menus that are higher (i.e. less favorable borrowing terms) the higher is the Left propensity of the economy. In particular, from this figure we can see that at the mean debt level (41%), the Left leaning economy pays roughly 200bps more than the Right leaning economy.

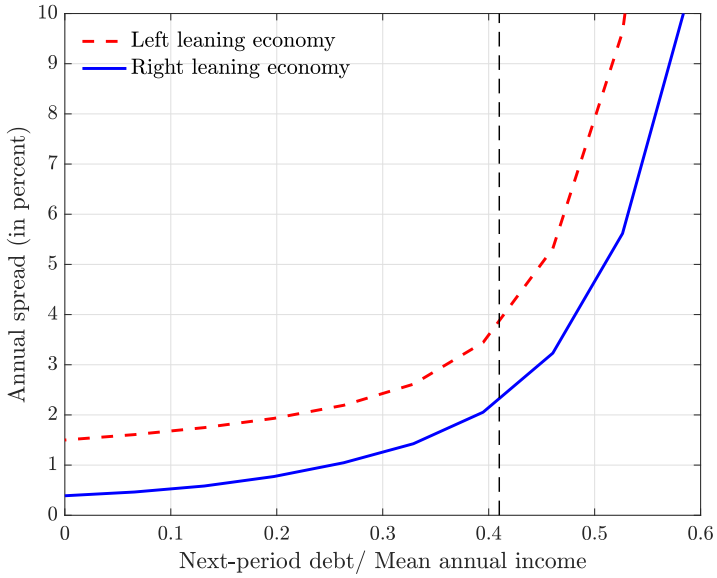

Figure 1: Spread-debt menus. The dashed red line is for the Left leaning economy and the solid blue line is for the Right leaning economy. The vertical line marks the mean debt level (41%). The plot assumes the income level is at its mean.

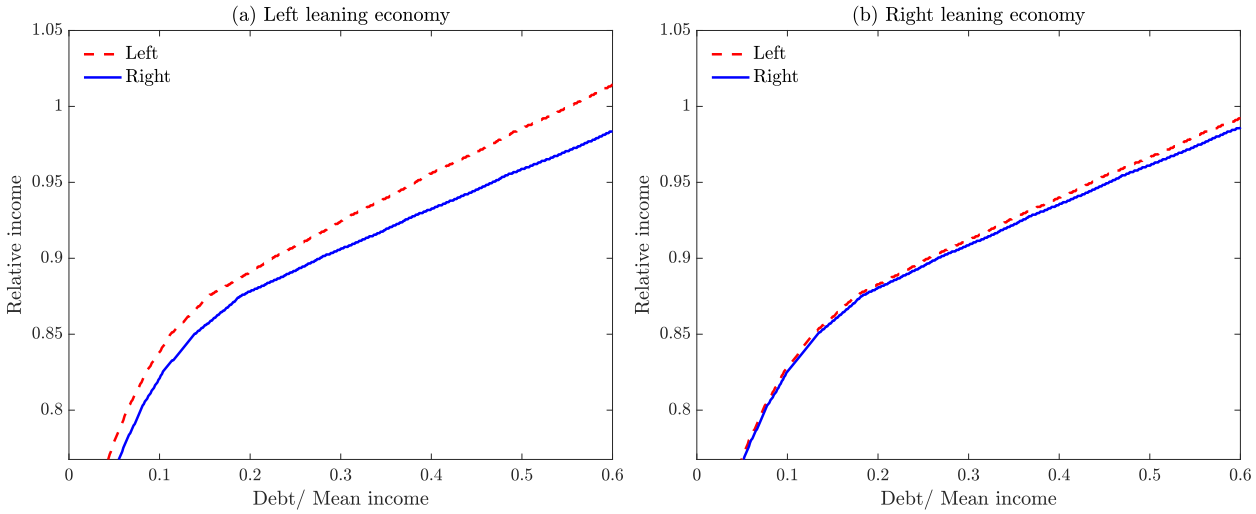

Figure 2: Default sets. The red dashed line corresponds to the Left wing policymaker and the solid blue line corresponds to the Right wing one. Each line is the respective default set contour: the government defaults south of the line. "Relative income" refers to the income level as a fraction of mean income. We trim the region of the state space where relative income is above 1.05, as no government ever defaults in those states. Panels (a) and (b) are Left and Right leaning economies, respectively.

The differences in the spread-debt menus offered to the two economies by international lenders reflect different expected default policies across economies (recall the bond price equation (14), which basically prices the repayment probability in all future periods adjusting for the likelihood of changes in the policymaker in power). Figure 2 shows the equilibrium default regions for both policymakers in the Left and Right leaning economies. Here we can see that for both policymakers it is true that default incentives increase with the debt level and decrease with the income level (exactly as in the Eaton and Gersovitz, 1981 tradition). We can also notice that the Left policymaker defaults "before" the right policymaker does, by which we mean the following: fix a debt level (say 30% of mean income) then as income decreases we hit the boundary of L's default set before we hit the corresponding boundary for R. This means that default incentives are stronger for L, which translates into higher spreads. The Left leaning economy has the left in power more often, which explains its higher spreads (as already seen in Figure 1).[18]

Since our model only introduces political differences through the reelection technology, then

[18]Even though the differences in the default regions in Figure 2 seem small, recall that our model has long-term debt and therefore lenders price in not only the one-period-ahead default probability, but all future default probabilities. Since the default region of L is *everywhere* larger than the one for R, this translates into significant differences in equilibrium spreads.

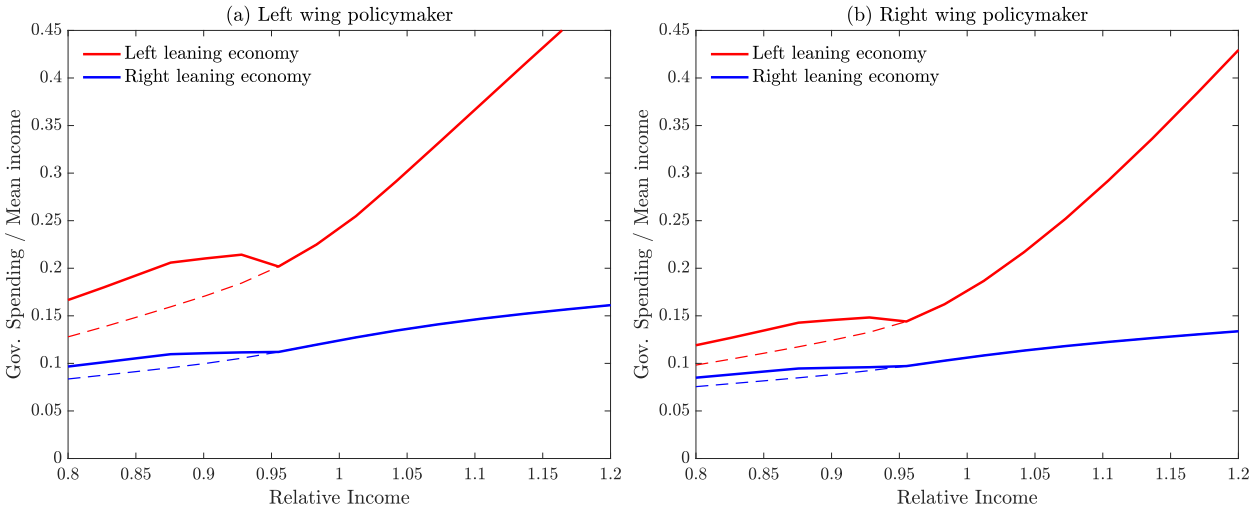

Figure 3: Government spending as a function of income. The red and blue lines are for the Left and Right leaning economies, respectively. The solid lines are the equilibrium functions and the dashed lines are assuming repayment. Panels (a) and (b) are for the Left and Right wing policymakers, respectively.

it must be the case that differences in the default policies between the two policymakers in one economy (and across the two economies) come from the differences in the political process parameters. To confirm this intuition, and to understand why default incentives are stronger for L, we plot the equilibrium level of government spending in Figure 3. In this figure we plot not only the equilibrium government spending of each policymaker in the two economies, but we also plot (in dashed lines) the level of government spending chosen *under repayment*. If the two lines coincide, then the incumbent is choosing to repay the debt for that particular state; if they differ, then the solid line is the choice under default and the dashed line shows what the incumbent would have chosen had it repaid instead. When the lines diverge, the policymaker in power sees a political benefit from defaulting due to the fiscal space that opens up. Recall that popular support is increasing in the share of government spending, so there is a political cost to be paid if the policy maker chooses to repay the debt rather than defaulting and keeping government spending at a higher level (avoiding fiscal austerity). The vertical distance between the dashed and solid lines captures the additional spending made possible by default.

Focusing for a moment on the left panel of Figure 3, we see that the left policymaker has a greater political gain from defaulting in the Left leaning economy (red lines) than in the Right leaning economy (blue lines). This is captured by the larger vertical distance between the solid and dashed lines for the Left leaning economy. A similar, but more muted pattern

can be discerned in the right panel of the figure which displays the fiscal behaviour of the right policymaker as income varies. This fiscal/political difference between the two policymakers is primarily responsible for the left being assigned a higher default probability. As the Left Propensity increases, this divergence between left and right becomes more pronounced.

In order to understand why the Left leaning economy involves higher default risk, we need to understand the role that a higher A plays in creating a stronger distaste for fiscal austerity. Recall that a higher A creates a stronger "political bang for the fiscal buck." This effect works to reduce reelection prospects when income is very low, causing the government to tighten its belt and reduce spending if it wants to meet its outstanding obligations. This choice of fiscal austerity reduces popular support, which in turn, reduces the probability of winning elections. The higher the A, the higher the political cost of austerity, the higher the default incentives. These dynamics are more exacerbated for the left-wing policymaker because of the estimated political parameters, as discussed above.

Effects on the volatility of the spread. The dynamics described above also affect the volatility of the spread. Our Right leaning economy features a mean standard deviation of the sovereign spread that is 88 bps, while in the Left leaning economy this statistic is 135 bps (roughly 50 bps higher). We corroborate the statistical significance of this difference by simulating 200 samples of 30 periods each for both economies and then performing a test for the equality of means of the respective volatility distributions. This hypothesis is strongly rejected (p-value of $7.00E^{-13}$).[19]

5.3 Testable Implications

In this section we explore two testable implications of our theory. Namely, that a higher election efficiency (A) is associated with higher spreads, and that economies that are more left leaning display government spending that is more procyclical.

[19] A Kolmogorov-Smirnov test also rejects the hypothesis that the two samples (of spread volatilities) are coming from the same continuous distribution (p-value of $1.48E^{-9}$).

5.3.1 Election efficiency and spreads

We show above that variation in election efficiency leads to variation in default risk and spreads. We used estimates of (16) to generate a distribution of election efficiency parameters for the nations in our dataset. We now test the theory by checking to see if our uncovered election efficiency data is indeed positively correlated with sovereign spreads. To do this, we regress the average spread of country i on the calculated A's and the usual controls, and we find that the coefficient of interest is indeed positive and significant. Table 6 shows the estimation results.

Table 6: Election efficiency and spreads

Dep. variable:	Spread level
Election efficiency	118.059*
	(57.624)
Debt/GDP	3.791
	(4.777)
GDP volatility	52.068
	(51.277)
(Intercept)	-1.193
	(209.632)
Num.Obs.	23
R2	0.180
Other controls?	Yes

Note: Robust standard errors are reported in parentheses. Other controls include the fiscal surplus and the exchange rate regime. *p<0.1; **p<0.05; ***p<0.01.

5.3.2 Left-propensity and the cyclicality of government spending

Another feature of our model is that government spending is procyclical. This property, which is found in the data (see Table 5 for our dataset, and Kaminsky, Reinhart and Végh, 2004 and Frankel, Vegh and Vuletin, 2013 more generally), is shared by other papers in this literature (e.g. Cuadra et al., 2010). The typical intuition for this result hinges on the tension between a consumption-smoothing desire and the risk of default. The government wants to deliver a smooth path of public consumption but market incompleteness comes in the way.[20] In good

[20]See Riascos and Vegh (2003) and Fernández, Guzman, Lama and Vegh (2021).

times, borrowing is cheap and the government can afford more public spending (and lower taxes); in bad times the reverse is true. So, the countercyclicality of borrowing costs drives the procyclicality of fiscal policies.

A more novel testable implication of our model is that government spending is more pro-cyclical for economies with higher left-propensity. This is clear from inspecting the slopes of the equilibrium functions for $g(b, y)$ in Figure 3. Once again, the underlying intuition follows from the previously discussed impact of a higher A. When the election efficiency A is high, default risk rises more sharply as income drops. As a result, borrowing costs are more counter-cyclical, leading to more pro-cyclical government spending.

We then use our international dataset to test if this is found in the data and confirm it is. Table 7 shows that a higher left-propensity is associated with more procyclical government spending and that this is true, as well, after controlling for other variables. In particular, consistent with the workings of the model, a higher countercylicality of the spread (i.e. a more negative value for 'Cyclicality of spread') comes with higher procyclicality of government spending but it does not undo the significance of 'Left.Prop.'

Table 7: Cyclicality of government spending and left propensity

Dep. variable:	Cyclicality of gov. spending		
Left.Prop	0.293***	0.261***	0.259***
	(0.090)	(0.090)	(0.086)
Cyclicality of spread		-0.253**	-0.240*
		(0.124)	(0.125)
(Intercept)	0.310***	0.246***	0.146
	(0.058)	(0.070)	(0.137)
Num.Obs.	56	56	56
R2	0.106	0.165	0.174
Add. controls?	No	No	Yes

Note: *p<0.1; **p<0.05; ***p<0.01. Additional controls include the debt-to-GDP ratio and the level of government spending. The cyclicality of government spending is computed as the correlation between the cyclical components of government spending and GDP after removing the log-quadratic trend. The cyclicality of the spread is computed using its level and the cyclical component of GDP.

5.4 Implications for Welfare

We showed above that economies with a higher propensity to elect left governments face more stringent borrowing terms as captured by the spread-debt menus in Figure 1. This leads to both higher spread levels and more volatility in spreads relative to an economy that is less likely to elect left governments. As such, we would expect the Left leaning economy to be less able to smooth both private consumption and public spending when compared to the Right leaning economy. In addition, the higher level of A in the Left leaning economy implies that policymakers will choose more public consumption in order to bolster their chances of wining reelection than in the Right leaning economy. Since the utility weight on public spending (a calibrated parameter) is much lower than on private consumption, this reallocation of resources towards government spending comes with a cost to households in the economy. Essentially we see a divergence in the interests of households and policy makers due to the presence of political considerations in fiscal policy.

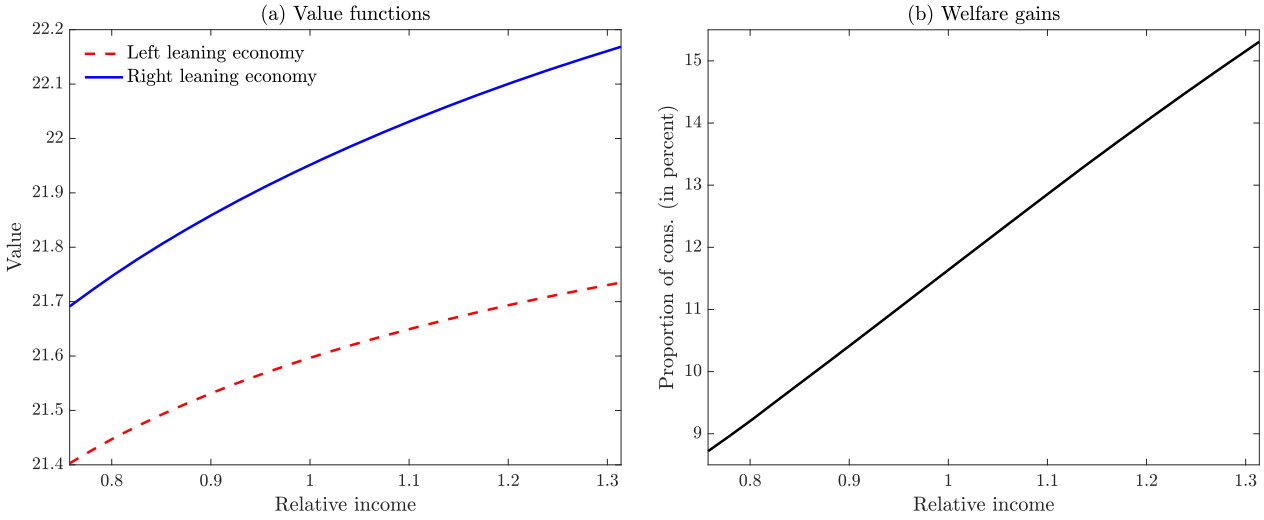

Figure 4: Value functions and welfare gains. Panel (a) shows the value functions for the representative household in the Left and Right leaning economies. Panel (b) shows the welfare gain of moving from the Left leaning economy to the Right leaning one, expressed in proportional (public and private) consumption increases.

In Figure 4 we display the consequences in terms of welfare for the households of the Left leaning economy. The left panel in this figure shows that the representative household's welfare is uniformly higher (as income varies) in the Right leaning economy. This is due to three interrelated reasons: (i) lower default incentives, which translate in less frequent defaults (with

their associated income losses), (ii) better borrowing terms allowing for better consumption smoothing, and (iii) the lower government spending (for strategic political reasons), which has a lower welfare weight than private consumption.

The right panel of Figure 4 plots the welfare gains (for the representative household) of moving from the Left leaning economy to the Right leaning one. These gains are uniformly positive and increasing in the level of income. They average 11.7% of permanent (private and public) consumption and over 99% of these gains are coming from the different allocations chosen (a very small fraction is coming from the change in the frequency of left and right wing incumbents).

5.5 Robustness

In this section we explore alternative ways to model political differences between left and right wing policymakers. It has been suggested that the Left has a preference for higher government spending. This difference in preferences is absent in our benchmark model. Instead, our model relies on two key elements to generate our main results. The first element is that reelection probabilities are increasing in the share of government spending. The second element is that left wing policymakers gain more electorally from government spending than their right wing counterparts.[21] Finally we use variation in election efficiency to generate variation in Left-Propensity. We show that removing these elements makes the model inconsistent with the facts even when allowing for differences in preferences.

An alternative to our political structure is that left and right policy makers have different reelection probabilities that arise from exogenous sources and are independent of their fiscal choices.[22] To operationalize this alternative model and test whether it can account for the empirical regularities, we assume that the reelection probability is fixed at the party specific means observed in the benchmark calibration ($P_L = 0.67$ and $P_R = 0.69$). Then, in order to generate variation in the left-propensity we increase P_L to take the same value it takes in the Left leaning economy from section 5.2, which is 0.81. While doing this exercise we keep all other parameters unchanged.

[21] Recall we provide empirical support for both these elements in section 4.

[22] This difference in exogenous reelection probabilities is equivalent to assuming different time-invariant discount factors.

Table 8: Exogenous differences in P

	Preferences for g:	
	Benchmark	High $(1-\alpha_L)$
Δ in Left.Prop (in pp)	13.7	13.7
Δ in Spread (in %)	-14.1	-25.4
Δ in Vol. of Spread (in %)	-13.5	-31.1

Note: each entry is a comparison between the Left leaning economy and the (appropriately modified) benchmark economy.

The first column in Table 8 shows that this alternative model of political differences delivers the opposite result. The economy with the higher P_L has a higher Left-propensity but a lower spread level (and a lower spread volatility). The reason for this is that when reelection probabilities become independent from the fiscal choices then the model boils down to one of policymakers that only differ in their impatience: making the P higher for the left wing policymaker is equivalent to making them more patient, and a more patient government defaults less frequently and pays lower and less volatile spreads.[23] Since the left is more often in power in this economy, the average spread falls.

The second column in Table 8 makes it transparent that the result does not hinge on policymaker differences in the preference for government spending. In this column we keep $(1-\alpha)$ at the baseline value for R (1%) and increase it to 10% for L. We then repeat the exercise of increasing the exogenous probability of reelection of the left in order to generate an economy with more Left-propensity. Once again, we find that this differential preference for public spending of the left does not contribute to generating higher nor more volatile spreads for the economy with higher Left-propensity. While the greater desire for government spending on the part of the left translates into a higher share of government spending on average, it does not generate additional default risk.[24]

Overall, the results in this subsection highlight that making reelection probabilities responsive to fiscal choices is a key element of our theory. It allows the strategic use of government

[23]This is the same result found in Hatchondo et al. (2009).

[24]Yet another variant of the models discussed above allows for differences in preferences while keeping endogenous reelection probabilities. We solve this model allowing for reelection probabilities to depend on fiscal policies, but in an identical manner for both parties: in this way we only impose differences across policy makers in the utility weight they assign to government spending, $1-\alpha$. Being consistent with the data (i.e., calibrating to the observed levels of g/y), this modelling approach does not generate variation in left-propensity and therefore it cannot account for our motivating facts. For brevity, we omit a fuller presentation of these results.

spending in order to improve the chance of retaining office. This leads governments to avoid fiscal austerity measures through default. Variation in election efficiency across economies causes variation in austerity reluctance (and therefore default risk) while also changing the reelection probabilities of both policy makers. As a result both left frequency and average spread levels increase in A.

6 Conclusions

We combine international data on sovereign bond yields with macroeconomic indicators and political variables to show that nations that have a higher propensity to elect left wing governments pay higher spreads on their government debt when averaged over more than four decades. These nations also face more volatile sovereign spreads.

We build a quantitative sovereign default model with long term debt and elections that lead to political turnover between two policymakers. These two policymakers differ in the political support gained from public expenditure: consistent with the data, the left policymaker gains more from public spending than the right. We calibrate this model to our international data and then use it to generate simulated economies that differ in their propensity to elect the left policymaker. The model delivers the key regularities found in the data - the economy with a higher propensity to elect the left faces higher and more volatile spreads. In line with the data, the economy with a higher left-propensity also displays a more procyclical fiscal policy. A higher left-propensity occurs when the probability of winning reelection is more responsive to changes in the share of public spending. This increased responsiveness imposes a large political cost on governments that wish to repay debt in bad times by engaging in fiscal austerity measures. In turn, this cost encourages default and discourages fiscal austerity while increasing the likelihood of electing left policy makers. We show that the high level and volatility of sovereign spreads faced by the economy with a higher left-propensity lead to substantial welfare losses.

References

Aguiar, Mark and Gita Gopinath, "Defaultable debt, interest rates and the current account," *Journal of International Economics*, 2006, *69* (1), 64–83.

Alesina, Alberto and Andrea Passalacqua, "The political economy of government debt," in "Handbook of macroeconomics," Vol. 2, Elsevier, 2016, pp. 2599–2651.

_ **and Guido Tabellini**, "A positive theory of fiscal deficits and government debt," *The Review of Economic Studies*, 1990, *57* (3), 403–414.

Andreasen, Eugenia, Guido Sandleris, and Alejandro Van der Ghote, "The political economy of sovereign defaults," *Journal of Monetary Economics*, 2019, *104*, 23–36.

Arellano, Cristina, "Default risk and income fluctuations in emerging economies," *The American Economic Review*, 2008, *98* (3), 690–712.

_ **and Ananth Ramanarayanan**, "Default and the maturity structure in sovereign bonds," *Journal of Political Economy*, 2012, *120* (2), 187–232.

Arulampalam, Wiji, Sugato Dasgupta, Amrita Dhillon, and Bhaskar Dutta, "Electoral goals and center-state transfers: A theoretical model and empirical evidence from India," *Journal of Development Economics*, 2009, *88* (1), 103–119.

Bai, Yan, Seon Tae Kim, and Gabriel Mihalache, "The payment schedule of sovereign debt," *Economics Letters*, 2017, *161*, 19 – 23.

Battaglini, Marco and Stephen Coate, "A dynamic theory of public spending, taxation, and debt," *American Economic Review*, 2008, *98* (1), 201–36.

Beck, Thorsten, George Clarke, Alberto Groff, Philip Keefer, and Patrick Walsh, "New tools in comparative political economy: The database of political institutions," *The World Bank Economic Review*, 2001, *15* (1), 165–176.

Brooks, Sarah M, Raphael Cunha, and Layna Mosley, "Elections, Ideology and Experience? Sovereign Bond Investors and Government Change," *Mimeo, University of North Carolina, Chapel Hill*, 2019.

Catão, Luis AV and Rui C Mano, "Default premium," *Journal of International Economics*, 2017, *107*, 91–110.

Cerda, Rodrigo and Rodrigo Vergara, "Government subsidies and presidential election outcomes: evidence for a developing country," *World Development*, 2008, *36* (11), 2470–2488.

Chang, Roberto, "Financial crises and political crises," *Journal of monetary Economics*, 2007, *54* (8), 2409–2420.

Chatterjee, Satyajit and Burcu Eyigungor, "Maturity, indebtedness, and default risk," *American Economic Review*, 2012, *102* (6), 2674–99.

_ **and** _ , "Endogenous political turnover and fluctuations in sovereign default risk," *Journal of International Economics*, 2019, *117*, 37–50.

Cruces, Juan José, Marcos Buscaglia, and Joaquín Alonso, "The Term Structure of Country Risk and Valuation in Emerging Markets," 2002. manuscript, Universidad Nacional de La Plata.

Cruz, Cesi, Philip Keefer, and Carlos Scartascini, "Database of Political Institutions 2020," *Inter-American Development Bank Research Department.*, 2021.

Cuadra, Gabriel and Horacio Sapriza, "Sovereign default, interest rates and political uncertainty in emerging markets," *Journal of International Economics*, 2008, *76* (1), 78–88.

_ , Juan M Sanchez, and Horacio Sapriza, "Fiscal policy and default risk in emerging markets," *Review of Economic Dynamics*, 2010, *13* (1), 452–469.

Dahlberg, Matz and Eva Johansson, "On the vote-purchasing behavior of incumbent governments," *American Political Science Review*, 2002, *96* (1), 27–40.

D'Erasmo, Pablo, "Government Reputation and Debt Repayment," *Manuscript, University of Maryland*, 2011.

Eaton, Jonathan and Mark Gersovitz, "Debt with potential repudiation: Theoretical and empirical analysis," *The Review of Economic Studies*, 1981, *48* (2), 289–309.

Fernández, Andrés, Daniel Guzman, Ruy E Lama, and Carlos A Vegh, "Procyclical Fiscal Policy and Asset Market Incompleteness," Working Paper 29149, National Bureau of Economic Research August 2021.

Frankel, Jeffrey A, Carlos A Vegh, and Guillermo Vuletin, "On graduation from fiscal procyclicality," *Journal of Development Economics*, 2013, *100* (1), 32–47.

Hatchondo, Juan Carlos and Leonardo Martinez, "Long-duration bonds and sovereign defaults," *Journal of international Economics*, 2009, *79* (1), 117–125.

_ , _ , and Cesar Sosa-Padilla, "Debt dilution and sovereign default risk," *Journal of Political Economy*, 2016, *124* (5), 1383–1422.

_ , _ , and Horacio Sapriza, "Heterogeneous borrowers in quantitative models of sovereign default," *International Economic Review*, 2009, *50* (3), 1129–1151.

_ , _ , and _ , "Quantitative properties of sovereign default models: solution methods matter," *Review of Economic dynamics*, 2010, *13* (4), 919–933.

Herrera, Helios, Guillermo Ordoñez, and Christoph Trebesch, "Political booms, financial crises," *Journal of Political Economy*, 2020, *128* (2), 000–000.

ICRG Researchers, "International Country Risk Guide (ICRG) Researchers Dataset," 2013.

Ilzetzki, Ethan, "Rent-seeking distortions and fiscal procyclicality," *Journal of Development Economics*, 2011, *96* (1), 30–46.

Johansson, Eva, "Intergovernmental grants as a tactical instrument: empirical evidence from Swedish municipalities," *Journal of Public Economics*, 2003, *87* (5), 883–915.

Kaminsky, Graciela L, Carmen M Reinhart, and Carlos A Végh, "When it rains, it pours: procyclical capital flows and macroeconomic policies," *NBER macroeconomics annual*, 2004, *19*, 11–53.

La, O De and L Ana, "Do conditional cash transfers affect electoral behavior? Evidence from a randomized experiment in Mexico," *American Journal of Political Science*, 2013, *57* (1), 1–14.

Landon, Stuart and David L Ryan, "The political costs of taxes and government spending," *Canadian Journal of Economics*, 1997, pp. 85–111.

Levitt, Steven D and James M Snyder, "The impact of federal spending on House election outcomes," *Journal of Political Economy*, 1997, *105* (1), 30–53.

Müller, Andreas, Kjetil Storesletten, and Fabrizio Zilibotti, "The political color of fiscal responsibility," *Journal of the European Economic Association*, 2016, *14* (1), 252–302.

Persson, Torsten and Lars EO Svensson, "Why a stubborn conservative would run a deficit: Policy with time-inconsistent preferences," *The Quarterly Journal of Economics*, 1989, *104* (2), 325–345.

Riascos, Alvaro and Carlos A Vegh, "Procyclical government spending in developing countries: The role of capital market imperfections," *unpublished (Washington: International Monetary Fund)*, 2003.

Scholl, Almuth, "The dynamics of sovereign default risk and political turnover," *Journal of International Economics*, 2017, *108*, 37–53.

Shin, Jungsub, "The Consequences of Government Ideology and Taxation on Welfare Voting," *Political Research Quarterly*, 2016, *69* (3), 430–443.

Yared, Pierre, "Politicians, taxes and debt," *The Review of Economic Studies*, 2010, *77* (2), 806–840.

A Empirical appendix

A.1 Data Sources and Variable definitions

1. **Political data – DPI**

   (a) Source: Cruz, Cesi, Philip Keefer, and Carlos Scartascini. 2021. "Database of Political Institutions 2020." Washington, DC: Inter-American Development Bank Research Department. Download link: https://publications.iadb.org/en/database-political-institutions-2020-dpi2020

   (b) Variables used:

      i. `EXECRLC`. It codes as "Right" parties which are defined as conservative, Christian democratic, or simply 'right-wing,' and as "Left" those parties defined as communist, socialist, social democratic, or simply 'left-wing.' There are some instances in which the government is coded as 'centrist" – we pool these observations together with "Left."

      ii. `DATELEG` and `DATEEXEC`. These code elections dates (month/year). We use them to identify elections and then we check if there was a change in the political leaning of the incumbent. If there was, we code that election as a loss for the previous incumbent; otherwise it is coded as a victory. Electoral victories and losses are assigned ones and zeros (respectively) and used in the estimation of the reelection probability.

2. **Political data - ICRG**

   (a) Source: International Country Risk Guide (ICRG) Researchers, 2013, "International Country Risk Guide (ICRG) Researchers Dataset." DOI: 10.7910/DVN/4YHTPU

   (b) Variable used: `POLITICAL SUPPORT` sub-index. This index ranges from 0 to 4, with higher values indicating a higher level of support for the government. We take the monthly observations and compute year medians. We then divide all observations by the highest possible value, 4. Therefore our normalized annual variable ranges from 0 to 1.

3. **Macroeconomic, financial and fiscal data**

   As is common in studies of emerging economies, we exclude crisis years. Whenever possible, we take the data from the online appendix of Catão and Mano (2017). We also follow them in terms of variable definitions for debt, spreads, crisis years, fiscal surplus and exchange rate regime classification. Here, we provide a brief description of these variables:[25]

   (a) Gross Domestic Product (GDP): as reported by the World Bank's World Development Indicators database.

   (b) Debt: we focus on external debt. The source is the World Bank's Global Development Finance database.

   (c) Spreads: the main source for emerging market spreads is JP Morgan's EMBI spreads. For countries not included in the EMBI, the spread is computed as the difference between the country 10-year bond yield and a reference rate (typically the US 10-year yield or, for Euro area countries, the German 10-year Bund yield).

[25] See Catão and Mano (2017)'s data appendix for further details.

(d) Exchange rate regime: this is a dummy variable taking a value of 1 for countries deemed to be under a "Fix" regime and 0 otherwise. This dummy was constructed based on the IMF classification (categories "1" and "2").

(e) Crisis years: these are defined as years in which a given country experienced a "credit event." These events are defined as all the years in between the initial default and full (or near full) settlement of arrears as per the Standard and Poor's definition.

(f) Fiscal surplus: General government balance, as reported in Catão and Mano (2017). Their sources include IMF's International Financial Statistics, World Economic Outlook, and the World Bank's Global Development Finance databases.

(g) Government spending/GDP: as reported by the World Bank's World Development Indicators database.

A.2 Country coverage

Table A1: Countries in the dataset

Argentina	Dominican Republic	Latvia	Russia
Australia	Ecuador	Lebanon	Slovakia
Austria	El Salvador	Lithuania	Slovenia
Belgium	Estonia	Mexico	South Africa
Brazil	Finland	Netherlands	South Korea
Bulgaria	France	New Zealand	Spain
Canada	Greece	Norway	Sweden
Chile	Guatemala	Pakistan	Thailand
Colombia	Hungary	Panama	Tunisia
Costa Rica	Iceland	Peru	Turk Cyprus
Croatia	India	Philippines	Turkey
Cyprus	Israel	Poland	Ukraine
Czech Rep.	Italy	Portugal	Uruguay
Denmark	Jamaica	Romania	Venezuela

These are all the countries for which we have data on, at least, GDP per capita, debt, consumption, spread, government spending, and political orientation. Exercises in section 2 use data from these countries.