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SOVEREIGN DEFAULT AND TAX-SMOOTHING IN THE SHADOW OF CORRUPTION AND INSTITUTIONAL WEAKNESS

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Working Paper 31943
http://www.nber.org/papers/w31943

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
December 2023

We thank participants of the 2022 Kuznets Mini-Conference: Political Distortions and Economic Development (Yale), the 2023 AEA Winter Meetings, 2023 SED Meetings, 2023 Spring Midwest Macro Meetings, and seminar participants at the FRB of Philadelphia and Richmond and the International Monetary Fund. The views expressed herein are those of the authors and do not necessarily reflect the views of the Federal Reserve Bank of Richmond or CAFRAL. The views expressed herein are those of the author and do not necessarily reflect the views of the National Bureau of Economic Research.

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NBER Working Paper No. 31943
December 2023
JEL No. D72,E43,E62,F34,F40,F41,H20,H4,H6,P33

ABSTRACT

Emerging countries exhibit volatile fiscal policies and frequent sovereign debt crises, that significantly diminish the well-being of their citizens. International advisors typically suggest developed-world solutions as a remedy. We argue that the root of the problem lies in the institutional environment, which does not incentivize responsible policymaking, particularly tax-smoothing practices. Focusing on democratic representation and control of corruption, our dynamic political-economy bargaining model shows that nations with weaker institutions experience frequent default episodes and greater economic volatility. Our results are in line with stylized facts from a panel of 58 countries between 1990 and 2022. Through counterfactual experiments, we find that while emerging economy policymakers might favor moderate reforms to improve democratic representation, achieving the institutional depth seen in developed countries is politically unfeasible, despite its clear advantages for citizens.

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A data appendix is available at http://www.nber.org/data-appendix/w31943

1 Introduction

Fiscal policy responses to shocks are widely different across countries. Developed economies smooth taxes, borrowing in recessions, and paying back during booms[1]. This is illustrated in Table 1 (in blue), where a positive correlation is observed between the primary balance and output.[2] This behavior, which dampens economic cycles, is consistent with optimal debt determination (see Barro (1979)).

Table 1: Business Cycle Moments and Institutions

Moments	Developed	Emerging
Economic and Fiscal Variables		
σ(y)	5.0	7.3
σ(c)/σ(y)	1.1	1.2
σ(g)/σ(y)	0.9	1.3
Fitch Ratings	3.8	2.9
ρ(NX,y)	0.0	-0.1
ρ(PB,y)	0.3	0.0
Representation and Accountability (R&A)		
Average	1.2	0.1
Volatility (st dev)	0.1	0.2
Control of Corruption (CC)		
Average	1.4	-0.2
Number Countries	30	28

Notes: Yearly sample, 1990-2022, where y =GDP, c =private consumption, and g = public consumption. All real and log-linearly de-trended. PB is the primary balance (Rev-Exp+rb), and NX are net exports (X-I), both as % of GDP. Correlations represent regression coefficients. R&A and CC in the range [-2.5,2.5]. See Appendix A.3 for sources and further computation details.

In emerging economies, borrowing is acyclical on average, and pro-cyclical for certain countries (see Figure 1). The latter means that borrowing rises during expansions, facilitated by easy access to international capital markets, and decreases during recessions, often as a result of a sovereign default.[3] Evidence of emerging countries' reduced capacity to mitigate shocks can be seen in the more pronounced fluctuation in

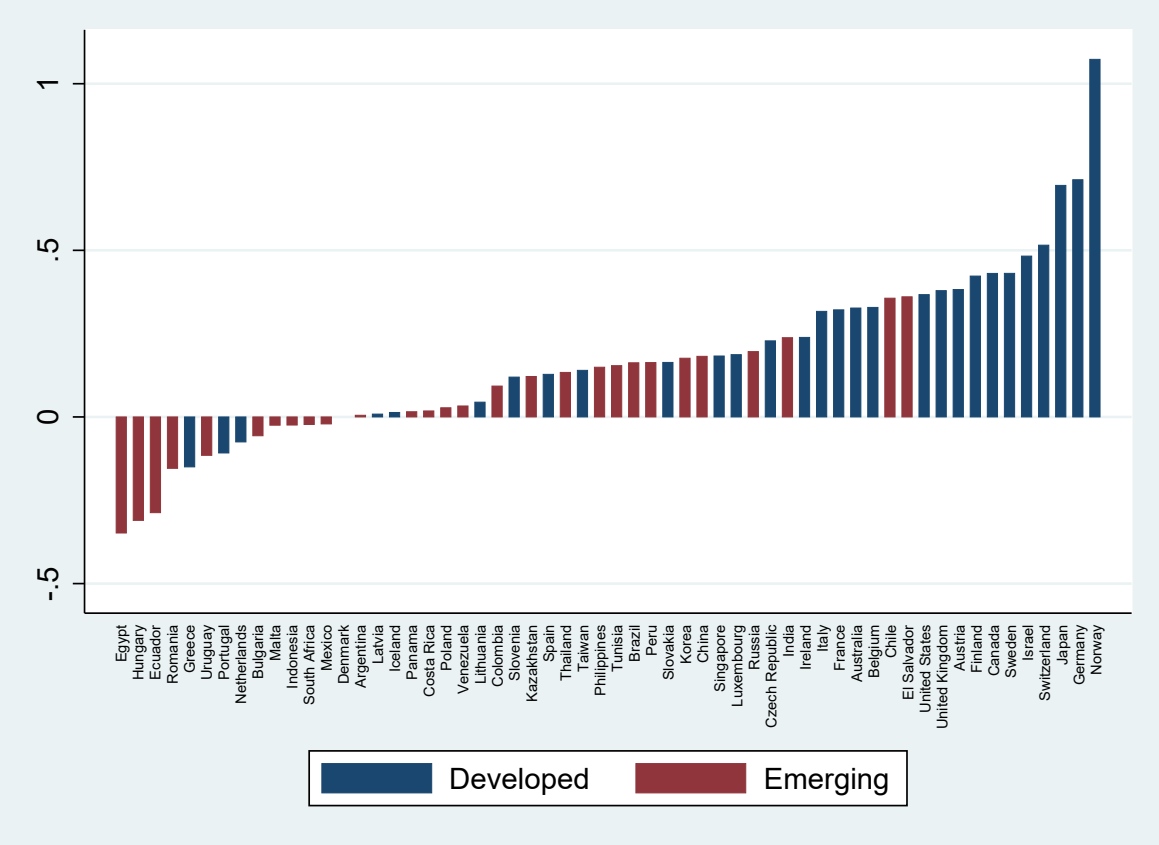
[1] See the studies by Sargent and Velde (1995) or Hall and Sargent (2020)).

[2] The negative relationship between net exports and GDP is consistent with this as well, indicating that countries tend to import goods (e.g. borrow) in recessions.

[3] This phenomenon, especially prevalent in Latin America during the 80s and 90s, has been noted by studies including Kaminsky et al. (2004), Talvi and Végh (2005), Ilzetzki and Vegh (2008), and more recently Kaas et al. (2020) and Bianchi et al. (2023). However, our sample period from 1990 to 2022 reveals a significant decrease in the number of countries showing procyclicality.

private and public consumption relative to output, a higher volatility of output itself, as shown in Table 1 and the higher frequency of sovereign debt crises (see Mitchener and Trebesch (2023)). Even within emerging economies, some countries are 'serial defaulters' (like Argentina), while others (like Chile) have been less prone to default.

Figure 1: Correlation between Primary Balance and GDP - benchmark sample



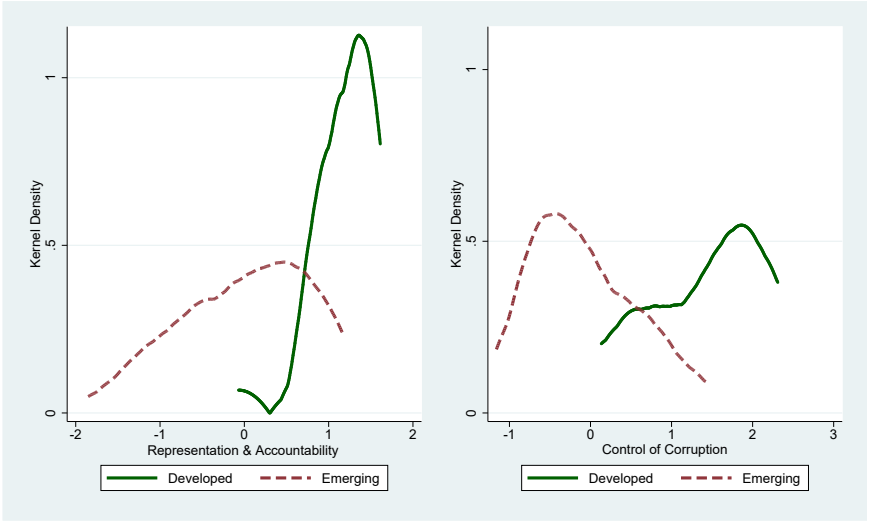
Notes: See Appendix A.3 for sources and computation details.

Observing such diverging outcomes, international organizations typically prescribe policies to serial defaulters that proved successful in developed countries, such as reducing deficits and the size of the public sector. For example, IMF loans include conditions emphasizing fiscal austerity and budgetary reforms, including structural reforms at times [4]. However, policymakers quickly deviate from such prescriptions or do not implement them at all, as they become politically unfeasible. Unfortunately, it is not enough that policymakers understand what good policies are; they need to find it optimal to implement them. In this paper, we argue that the institutional framework in which policies are decided is as important as, if not more than, the policy prescriptions themselves. We concentrate on two key institutional characteristics, namely the degree of democratic *representation and accountability* and the *control of corruption*. We propose that these elements play a significant role in guiding fiscal policy and debt management strategies. Once we summarize how these two factors are measured in the data, we proceed to describe their role in our quantitative model.

[4] See https://www.imf.org/en/About/Factsheets/Sheets/2023/IMF-Conditionality

Our empirical proxies are obtained from the World Bank's Worldwide Governance Indicators. The degree of representation and accountability (R&A) captures public perceptions about (i) the extent to which citizens can participate in selecting their government through free elections, freedom of expression, freedom of association, and a free media (also known as 'vertical accountability') and (ii) de-facto checks and balances (or 'horizontal accountability')[5]. Positive scores indicate stronger democratic institutions (see additional details in Appendix A). The second indicator we use is 'control of corruption' (CC), capturing the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as the capture of the state by elites and private interests. Smaller values indicate that excessive patronage, nepotism, and 'favors-for-favors' are widespread. Table 1 presents summary statistics for these series.

Figure 2: Distribution of R&A (left) and CC (right) across countries



Notes: World Bank's WGI, 58 countries, 1990-2022 (country list in Online Appendix).

Figure 2 shows the distributions of R&A (left) and CC (right) across 58 countries between 1990 and 2022. On average, developed economies (solid green line) are more representative and exhibit less corruption than emerging ones (dashed maroon line).[6] However, there is some overlap between the CC series, indicating that some developed economies have levels of corruption closer to those in emerging countries, and vice-versa.[7]

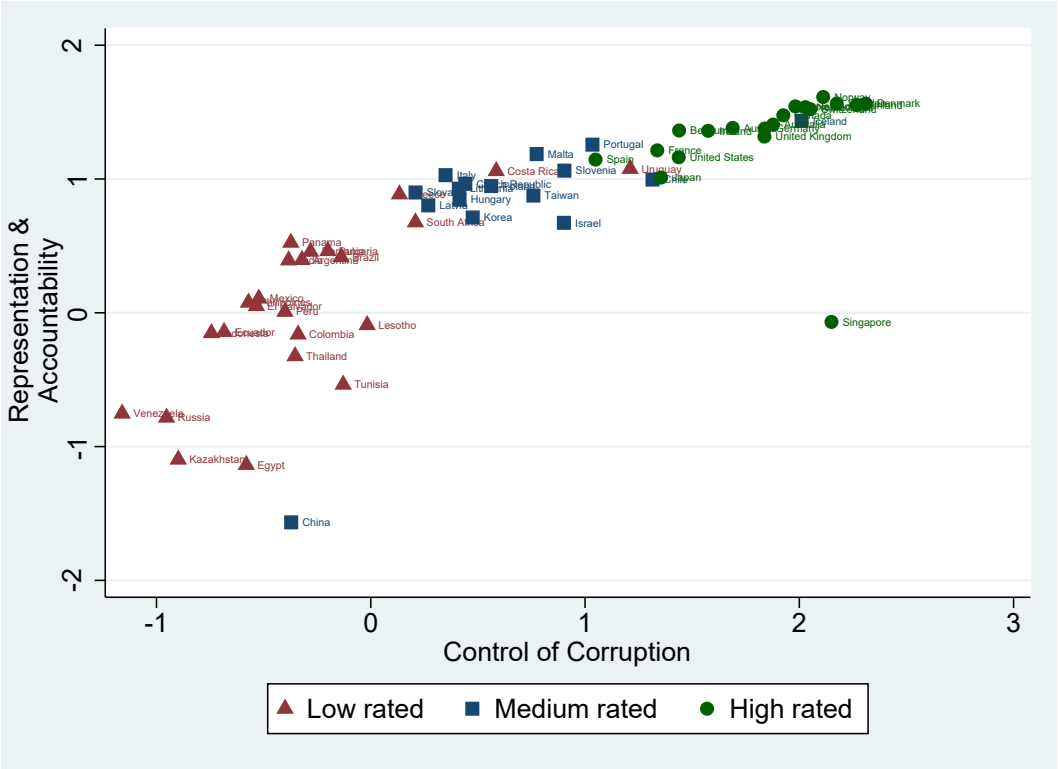
Figure 3 depicts the average values of R&A plotted against CC for each country, revealing a positive correlation. In other words, governments with stronger democratic institutions typically exhibit less corruption (with Singapore being an exception). Different colors are used to emphasize the country's default risk,

[5]The concepts of vertical and horizontal accountability were first introduced by O'Donell (1998). While 'representation and accountability' is a *subjective* or de-facto measure combining both vertical and horizontal accountability, there exist *de-jure* measures that independently capture each dimension. Because they are based on enacted legislation and power structure (see Lührmann et al. (2020)), they change less frequently and more abruptly than R&A. Our benchmark measure captures partial changes, as perceived by the population. On average, these measures are highly correlated with those constructed by the WGI.

[6]The sample only includes countries for which we also had economic and fiscal variable observations, as well as Fitch sovereign debt ratings, as described later. The unrestricted distributions of CC and R&A are shown in the Online Appendix, Figure 1. Clearly, our sample misses countries with the weakest institutions.

[7]The only developed country with negative R&A scores is Singapore. See Tables 1 and 2 in the Online Appendix.

Figure 3: Default risk, representation and accountability and corruption



Sources: World Bank's "Worldwide Governance Indicators (WGI)" and Fitch Ratings, 58 countries, 1990-2022. See Appendix A.3 for details.

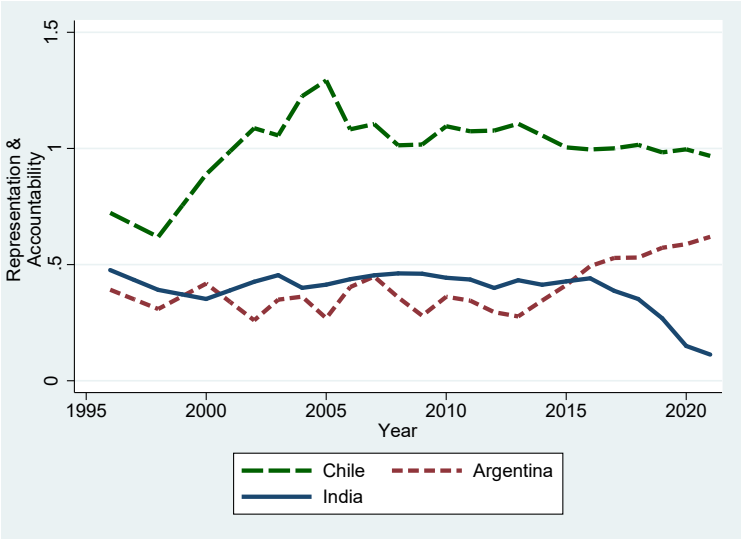
which is calculated using the long-term average of Fitch ratings (see Appendix A.2 for details). Countries are categorized into three groups: those with high ratings (marked by green circles), medium ratings (marked by blue squares), and low ratings (marked by red triangles). Lower ratings indicate a higher probability of default. Countries with higher representation that keep corruption under control generally have good sovereign credit ratings, which is predominantly seen in developed economies. It is worth noting that our sample does not include countries with very low R&A and CC scores, due to either their lack of participation in international financial markets or insufficient economic data.[8]

Table 1 presents the standard deviation of representation and accountability for the two groups of countries, underscoring the volatile nature of R&A in emerging markets. There is also notable disparity within this group, as illustrated by Figure 4. The government of Chile scores significantly higher than Argentina's and India's, reaching a R&A mean that is much closer to that of developed countries in recent years. Despite having similar paths until 2015, Argentina and India's R&A scores diverged soon after, highlighting the dynamic nature of institutional development.

Taken together, the evidence above indicates that: (i) fiscal policy and macroeconomic outcomes are more volatile in emerging countries (there is less tax smoothing), (ii) default risk is lower in countries with

[8]In the figure, we are only including countries for which we have institutional and economic data, as well as Fitch ratings' observations. The scatter plot including all countries with existing R&A and CC scores for this period can be found in Figure 2 of the Online Appendix.

Figure 4: Representation & Accountability over time (Argentina, Chile, and India)



strong representation and accountability and low levels of corruption, and (iii) institutional strength evolves over time. While developed economies look similar both in terms of their institutional setting and risk of default, emerging economies are more heterogeneous. In this paper, we build a theory consistent with these observations, where institutional strength and the pervasive effects of corruption take center stage.

Our study builds on the dynamic political economy bargaining model developed in Azzimonti and Mitra (2023), to explore how democratic representation and corruption impact policymakers' behavior towards tax smoothing and preventing sovereign debt crises.[9] The population is composed of symmetric groups representing diverse regions, industries, castes, and ethnic or religious groups, each with a leader that has political influence. Group leaders bargain periodically over public goods spending, financing through distortionary taxes and/or external borrowing, and over whether to repay or default. One group leader is randomly selected to make a policy proposal, but needs the support of a 'minimum winning coalition' (mwc)—formed by a subset of these groups— to implement policy. In order to secure support, the proposer can promise 'political favors.' These can take the form of targeted public goods, permits for resource exploitation, bribes, subsidies, nepotism, pork spending, favorable exchange rates, or policies affecting non-economic dimensions such as ethnic or religious in-group favoritism, same-sex marriage and abortion laws, or transgender rights. A key characteristic is that these favors are costly to provide and can be targeted to benefit a specific group. The 'control of corruption' is an institutional characteristic determining how easy it is to transform public revenues into favors.

The size of the minimum winning coalition (mwc) in the model plays a crucial role in determining the number of groups whose preferences are considered when making policy decisions, capturing the notion of 'representation and accountability.' A small mwc allows the proposer to pass policies with the support of

[9] In Azzimonti and Mitra (2023), we augmented the bargaining model proposed by Battaglini and Coate (2008) by integrating sovereign default, akin to Arellano (2008) and Cuadra et al. (2010).

only a few groups, ignoring the effects of their actions on other groups. Because political favors are financed with government resources, a common pool problem arises (where all groups contribute, but only a few enjoy the proceeds of taxation). As a result, the use of favors can be widespread, generating deadweight losses[10]. When the mwc equals the total population, the model collapses to that of a benevolent planner without commitment. This captures a society where the preferences of all groups are considered, and favors are never used. International risk-neutral lenders provide loans to the government, and in turn, price sovereign bonds based on the government's default risk. This pricing mechanism ensures that the lenders discipline government borrowing, offering lower prices when the likelihood of default is high. To accurately assess the risk, lenders must consider, in addition to the state of the economy and the current stock of debt, the current and future institutional environment as well as the level of corruption[11]. Because of this, regime changes have important implications for debt sustainability.

The latter is illustrated with a quantitative counterfactual experiment in which we evaluate the macroeconomic consequences of a permanent regime change that strengthens institutions in two countries (e.g. increases the size of the mwc), but asymmetrically, using Argentina and Chile as case studies. Both countries were under the rule of military juntas in the 1970s, but transitioned to democracies in 1983 and 1989, respectively. While Argentina and Chile share similar geographic, cultural, and historical characteristics, Chile was more successful in ensuring well-functioning checks and balances– or horizontal accountability— after democracy was reinstated. In our model, this is captured by a higher mwc size. We show that our model can help rationalize the different trajectories in Argentina's and Chile's economies in subsequent years. In particular, we find that Argentina suffers recurrent sovereign debt crises and significant volatility in private and public consumption, whereas Chile does not, consistently with the data (see Mitchener and Trebesch (2023)). A key insight is that while both countries can default at any time, institutional strength makes this option less desirable for Chilean policymakers than for Argentinean ones.

More generally, our analysis reveals that policymakers tend to smooth taxes when R&A is high, as in developed countries, but less so when R&A is low, as in emerging countries, *even when strategic default is permitted in both cases and policymakers are equally patient*. Specifically, we find that policymakers in countries with strong institutions behave responsibly, reducing debt in good times and avoiding the default region. In contrast, when the government is less representative (but still democratic), government officials borrow excessively in good times to give out favors and find it beneficial to default when recessions hit, as commonly observed in emerging markets. In other words, our model generates 'political defaults,' namely that a politician chooses to default when a benevolent planner would not. As a result, low R&A countries

[10] Choi et al. (2021) provides micro evidence of how excess ARRA stimulus grants extended to politically connected firms in the U.S. lead to fewer jobs.

[11] In a model with nominal debt—denominated in domestic currency—policy risk, emanating from less developed and volatile domestic institutions, would lead to excess returns due to currency risk and a positive violation of UIP, as documented in Kalemli-Özcan and Varela (2021).

exhibit worse tax smoothing (and sometimes even procyclical debt), recurrent sovereign debt crises, and frequent default events[12].

Addressing corruption can mitigate some impacts of inadequate checks and balances. Yet, our analysis reveals that reforms enhancing representation and accountability are significantly more effective in stabilizing economic shocks than similar efforts to curb corruption. While anti-corruption measures could theoretically improve resource allocation by lowering default risks and economic volatility, our findings suggest that politicians in environments with extremely weak democratic structures initially prioritize strengthening these structures. This preference stems from the fact that, although both strategies might lead to comparable outcomes in terms of taxation, public expenditure, and debt repayment in a political equilibrium, anti-corruption efforts limit the use of political favors by those in power. However, extensive reforms in representation and accountability to match those in developed countries are politically unattainable. Politicians are more inclined to implement incremental reforms, just large enough to receive favorable treatment from lenders, but allowing them to maintain their capacity to distribute political favors.

The rest of the paper is organized as follows. Section 2 summarizes how our work fits in the literature. In Section 3, we describe the economic environment and define the politico-economic equilibrium. Section 4 describes the calibration strategy. We compare the transition to democracy in Argentina and Chile by simulating a once-and-for-all institutional reform in Section 5 and describe tax smoothing in emerging and developed economies through the lens of our model in Section 6. In Section 7, we analyze a 'crackdown on corruption' and show how it can be different from a reform that increases representation. Section 8 concludes.

2 Related Literature

The literature on fiscal policy cyclicality has bifurcated into two distinct branches: (i) the *traditional public finance* literature and (ii) the more quantitative *sovereign default* literature. Our paper aims to connect them by providing a unifying theory of fiscal policy cyclicality and sovereign default decisions.

The traditional public finance literature has predominantly focused on studying developed economies, assuming the existence of a 'commitment technology' for debt repayment. The seminal work of Barro (1979)[13], followed by the studies of Aiyagari et al. (2002) and Barseghyan et al. (2013), have highlighted tax smoothing and counter-cyclical debt as key implications of their models (these are summarized in Yared (2019)). While consistent with the cyclical properties of fiscal policy in developed countries like the US, their predictions are inconsistent with the empirical behavior observed in emerging economies (as documented by Gavin and Perotti (1997), Talvi and Végh (2005), and Ilzetzki and Vegh (2008)). An exception is Ilzetzki

[12] While autocratic regimes are not the main focus of interest in our applications, we show how the model can be expanded to analyze them. An important difference between democratic regimes with low R&A and autocratic regimes is that the latter exhibit less political turnover. We develop this further in Appendix C.2.

[13] Also see Lucas and Stokey (1983) and recent work by Hall and Sargent (2020) for a discussion of its empirical validity.

(2011), who generates procyclical fiscal policies in a model subject to political distortions, but assuming commitment to repay debt (and abstracting from default risk, inconsistent with Figure 3).

At the other extreme, the sovereign default literature—with the pioneering work of Arellano (2008)—has centered on explaining the behavior of emerging economies, with particular emphasis on Latin America. An important innovation in these models is allowing the government to strategically default. Within this environment, Cuadra et al. (2010) shows that debt increases in booms rather than recessions and taxes are pro-cyclical (see more recent work by Kaas et al. (2020) and Martinez et al. (2022)). The latter is a direct consequence of counter-cyclical sovereign default risk: When default risk rises the government needs to raise tax rates to finance public goods[14] (see Vegh and Vuletin (2015) for empirical evidence on this channel). At the end of the day, then, what makes emerging economies different from developed ones in these papers boils down to one important assumption: whether countries have a commitment technology to repay debt obligations or not[15]. The European sovereign debt crisis, however, demonstrated that even developed nations, such as Greece, may occasionally opt for strategic default. In this paper, we provide a unifying theory that can encompass the behavior of countries across different stages of development[16].

We build on the dynamic bargaining political economy model developed in Azzimonti and Mitra (2023) to study how different degrees of representation and accountability along with poor control of corruption affect fiscal policy decisions. We relate to the dynamic bargaining literature in political economy, which typically abstracts from default (see Baron and Ferejohn (1989), Battaglini and Coate (2008), Azzimonti et al. (2016), or Drazen and Ilzetzki (2023)).[17] A recent paper by Cusato Novelli (2020) incorporates default in a bargaining model, allowing the author to simultaneously match the observed default frequencies and debt-to-output ratios, something that traditional sovereign default models typically fail to achieve [18]. Our model can also match these moments. The main difference between our papers is that we consider a production economy (rather than an endowment one) where taxes are distortionary[19]. This generates a tax-smoothing motive—as in the traditional public finance literature— a key ingredient to our analysis of the effects of institutional strength on fiscal policy cyclicality and the impact of politics on business cycle fluctuations. Another important difference between our models is that we allow for democratic represen-

[14]Espino et al. (2020) shows, in a model with nominal debt, how governments can use a combination of both inflation and distortionary taxes to finance debt. The interplay between default risk and inflation is also shown in Mihalache (2020) in an environment with long-term debt.

[15]In addition, it is typically assumed that policymakers in emerging markets are 'more impatient' than those in developed markets, incorporated through differences in their discount factors.

[16]While there is heterogeneity across countries on institutional development, we abstract from inequality within the country. See D'Erasmo and Mendoza (2016) or D'Erasmo and Mendoza (2021) for studies where default has redistributive effects.

[17]Andreasen et al. (2019) considers default but in a voting model and abstracting from productive inefficiencies associated with the tax system.

[18]See a discussion of the difficulties in obtaining this in default models with a benevolent government in the literature reviews by Tomz and Wright (2007) and Aguiar and Amador (2014).

[19]In Mendoza and Yue (2012a), a default amplifies economic fluctuations through a production channel. A default reduces the ability of producers to obtain the working capital needed to import intermediate goods. An inefficiency arises after a default since domestic intermediate goods are poor substitutes for imported ones. Taxes are lump-sum in their environment, so a tax-smoothing motive is not considered.

tation to fluctuate over time as seen in the data. This feature of our model can explain why countries with low democratic representation display more volatile fundamentals than their developed counterparts. Both democratic representation and corruption, as well as their volatility, *amplify* the business cycle and increase the likelihood of sovereign debt crises.

It is important to note that while we incorporate dynamic bargaining, ours is not a model of debt restructuring, where the government renegotiates repayment with foreign creditors (see Yue (2010)). Our study focuses instead on internal political bargaining, where the key actors are domestic politicians, who often must agree on tax increases to avoid a default. This internal bargaining process is influenced by the institutional context, specifically the levels of democratic representation and corruption within the government.

We offer three novel quantitative contributions relative to previous work. First, we explain the tax-smoothing behavior of both developed and emerging countries assuming the same discount factor, which has not been done in previous quantitative studies (e.g. they need to assume a significantly smaller value for the discount factor of emerging economies' government to generate default in equilibrium). There is a body of work analyzing the role of political distortions on default decisions within the sovereign default literature (see Hatchondo and Martinez (2010) and Chang (2007)[20]). Hatchondo et al. (2009) study how differences in re-election probabilities that affect the effective discount factor of a government, can impact default incentives. Chatterjee and Eyigungor (2019) and Cotoc et al. (2022) study default incentives under endogenous re-election probabilities, but again assume relatively low discount factors. In our bargaining model, the discount factor equals the inverse of the risk-free rate as in standard macroeconomic models, allowing us to replicate the tax-smoothing behavior of developed economies when either institutions are strong (e.g. the mwc equals the whole population) or corruption levels are low, or both. By weakening institutions (e.g. lowering the size of the mwc), we can approximate the cyclicality behavior of emerging economies without the need to change the degree of impatience of policymakers. In the appendix, we illustrate how democratic representation and political turnover are not equivalent by analyzing an autocracy. That is, a situation where the size of the mwc is low but the autocrat remains in power forever. We also show that the dynamic behavior of our model is not equivalent to one where the discount factor is low. Second, we investigate how institutional reform can improve tax smoothing in an emerging country using Chile and Argentina as case studies. Third, we conduct a policy experiment to highlight how an improvement in the technology to control corruption differs from an institutional reform strengthening democratic representation –an exercise that has implications for international policy-making.

3 The model

This is an infinite-horizon model where time is discrete. The economy has a domestic sector, with competitive firms and workers, a government that decides policy, and international investors that buy debt from the government.

[20]Relatedly, Herrera et al. (2020) models the relationship between popularity (e.g., political booms) and financial crises.

3.1 Economic Environment

The domestic economy is populated by a continuum of infinitely lived agents uniformly distributed across n groups, representing diverse regions, industries, castes, and ethnic or religious groups, each with a population normalized to 1. Agents in group i derive utility from private consumption c, labor l, a public good g, and political favors $\tilde{f}_i$. These can be thought of as pork spending (bridges to nowhere), nepotism, bribes, or targeted public goods. Generically, we think of these as 'corrupt public practices.' That is activities that benefit a subset of the population at the expense of all groups. The instantaneous utility of an agent in group i satisfies

$$U(c, l, g, f_i) = u(c, l) + \pi v(g) + \tilde{f}_i, \tag{1}$$

where π denotes the weight of pure public goods relative to the consumption-leisure aggregate. Agents discount the future at a rate β. In line with small open economy models of sovereign default, we consider imperfect capital markets that prevent individuals from using assets to smooth aggregate fluctuations. This is akin to assuming that agents are hand-to-mouth—as the model abstracts from idiosyncratic shocks—implying that $c = wl$, with w denoting the economy-wide wage rate.

Firms produce a single non-storable consumption good, y, using the linear technology $y = h(z, d)l$. The economy is subject to aggregate TFP shocks, where $z \in Z$ follows a first-order Markov process $\mu(z'|z)$. We denote the long-run value of TFP by $\bar{z}$. When $z > \bar{z}$, the economy is in *good times*, and when $z < \bar{z}$ the economy is in a *recession*. The function $h(z, d)$, increasing in z, takes different forms in states of repayment ($d = 0$) and default ($d = 1$).

Firms are competitive and maximize profits, subject to a distortionary policy τ,

$$\max (1 - \tau)y - wl.$$

Policy τ can be interpreted as labor income taxes, revenue taxes, or other costs proportional to the firm's output which are mandatory to operate the production technology and generate revenues for the government (permits, fees, etc.). The behavior of international lenders is modeled following Arellano (2008). Specifically, we assume that an infinite number of identical risk-neutral international lenders are present. These lenders can borrow and lend at a risk-free rate r from the international capital market and can also buy government debt at a price q. Because this is a perfectly competitive market, lenders earn no profits in equilibrium.

3.2 Government Sector

The government collects revenue $Rev(\tau) = \tau y$ and uses its proceeds to fund public goods and political favors. In addition, it can issue one-period non-contingent real bonds that can be bought and sold in international markets. The net resources raised by the government from capital markets are denoted by $qb' - b$, where a positive value of b' is the face value of the current debt of the government and q is the price of new bonds. The government can choose to strategically default on debt b, a decision we denote with $d = 1$. If

the government reneges on its current debt obligations, it is excluded from international credit markets for a stochastic number of periods determined by probability θ, with credit standing downgraded to $\Omega = 0$. Since $b' = 0$ in such case, it must finance expenditures solely with $Rev(\tau)$ until access to markets is re-gained. The government budget constraint is

$$Rev(\tau) - g + (1-d)\Big[qb' - b\Big] \geq \sum_i f_i, \tag{2}$$

with $f_i \geq 0$ and $\sum_i f_i$ corresponds to the total amount of resources devoted to political favors. We assume that engaging in corrupt practices is costly: For each dollar taken from the budget, only a fraction $1/\phi$ can be consumed. Hence, when a policymaker spends f_i dollars in favors, agents only receive $\tilde{f}_i = \frac{f_i}{\phi}$. The institutional variable ϕ is our model counterpart for 'control of corruption.' Higher values correspond to better technologies used to crack down on corruption in the public sector.

When the government borrows from abroad, additional resources (measured in consumption goods) are imported. When the government pays down debt, resources are exported. The aggregate resource constraint is

$$y = c + g + \sum_i f_i + nx,$$

where $nx = x - i$ denotes net exports (e.g. exports minus imports). Since there is a single production good in the world, the exchange rate is equal to 1 at all times. In our model, trade deficits have a one-to-one mapping with government deficits.

Bargaining process

Each group in society has a leader with political influence, who has a 'seat' in the bargaining table where policy is decided. Policy proposals need the support of enough leaders, $m \leq n$, to be implemented. This process gives each one of them some veto power and opens the possibility for corrupt public practices. We refer to m as the size of the 'minimum winning coalition' or mwc. We allow for m to change stochastically over time, capturing the evolution of representation and accountability illustrated by Figure 4. More specifically, we assume that m follows a first-order Markov process with transition probability $p(m'|m)$. We define permanent increases or decreases in its long-run average $\bar{m}$ as "regime changes," reflecting fundamental shifts in the political landscape or institutional structures. On the other hand, temporary shocks to m are interpreted as fluctuations in the balance of power that may arise due to electoral outcomes (where one group controls all branches of government) or the fluctuating relative importance of certain groups at different periods of time.

We use the bargaining protocol from Azzimonti and Mitra (2023), which extends the dynamic legislative bargaining model (with exogenous status quo) of Battaglini and Coate (2008) to incorporate strategic default. Group leaders meet at the beginning of a period and one of them is chosen (at random) to make a policy proposal. Since individuals are identical in all regions, the identity of the leader of each group is irrelevant.

A proposal is given by

$$\Phi(\Omega) = \begin{cases} \{\tau, g, b', d, f_1, f_2, ..., f_n\} & if\ \Omega = 1 \\ \{\tau, g, f_1, f_2, ..., f_n\} & if\ \Omega = 0 \end{cases} \tag{3}$$

When the country is excluded from credit markets, $\Omega = 0$, it is 'in default', indexed by $d = 1$ and unable to borrow $b' = 0$. Otherwise, when $\Omega = 1$, d and b' are free choices.

If the proposal succeeds in obtaining the support of m leaders, the policy is implemented. If the proposal fails to obtain enough support, leaders move to the next proposal round in which a new proposer is chosen at random. If no agreement can be reached in $T \geq 2$ proposal rounds, an outsider is appointed to choose a reference (symmetric) policy.

3.3 Politico-Economic Equilibrium

The aggregate state variables at the outset of any period are the stock of debt b, the TFP shock z, the size m of the mwc, and the credit standing $\Omega \in \{0, 1\}$. Let $\mathbf{s} = \{z, m, \Omega\}$, and the full state-space be denoted by $\Pi = \{\mathbf{s}, b\}$, We start by describing a competitive equilibrium given government policy $\Phi(\Omega)$. In equilibrium, variables depend on $\Phi(\Omega)$ and Π. Throughout the paper, we write Φ (omitting Ω) to simplify notation.

Firms maximize profits, implying that $w(\mathbf{s}, \Phi) = (1 - \tau)h(z, d)$. To characterize the agents' problem, we make further assumptions about the utility functional forms.

Assumption 1. *Suppose that $u(c, l)$ is of the GHH family (see Greenwood et al. (1988)),*

$$u(c, l) = \frac{1}{1-\sigma}\left(c - \frac{l^{1+\gamma}}{1+\gamma}\right)^{1-\sigma} \quad \textit{and} \quad v(g) = \frac{g^{1-\sigma}}{1-\sigma},$$

where $\sigma > 0$ captures the degree of risk aversion and $\gamma > 0$ represents the Frisch elasticity of labor supply.

Because agents are hand-to-mouth, it is easy to show that the individual labor supply $l(\mathbf{s}, \Phi)$ and optimal consumption $c(\mathbf{s}, \Phi)$ are independent of debt decisions,

$$l(\mathbf{s}, \Phi) = [h(z, d)(1 - \tau)]^{\frac{1}{\gamma}} \quad \text{and} \quad c(\mathbf{s}, \Phi) = (1 - \tau)h(z, d)l(\mathbf{s}, \Phi).$$

As a result, aggregate output is also independent of debt, $y(\mathbf{s}, \Phi) = nh(z, d)l(\mathbf{s}, \Phi)$.

International lenders make zero profits when $\Omega = 1$ (that is, when the country can actually borrow). Their break-even bond prices satisfy

$$q(\mathbf{s}, \Phi) = \int_{(z',m') \in \Psi(z',m')} \left[\frac{1 - d(z', m', b')}{1 + r}\right] \partial z' \partial m' | (z, m), \tag{4}$$

where $\Psi(z', m') = \{(z', m') : d(z', m', b') = 0\}$ is the repayment set for the government and $d(z', m', b')$ is tomorrow's equilibrium default choice (which only depends on tomorrow's exogenous states and today's borrowing in the political equilibrium, as will become clearer in the next section). Note that q depends on $\mathbf{s}$, since z and m are Markov processes.

It is useful to define the budget balance excluding favors

$$B(\Pi,\Phi)=\begin{cases} Rev(\mathbf{s},\Phi)-g+(1-d)\Big[q(\mathbf{s},\Phi)b'-b\Big] & if\ \Omega=1 \\ Rev(\mathbf{s},\Phi)-g & if\ \Omega=0 \end{cases} \tag{5}$$

with $Rev(\mathbf{s},\Phi)=\tau y(\mathbf{s},\Phi)$. The budget constraint of the government collapses to $B(\Pi,\Phi)\geq\sum_i f_i$.

We focus on a symmetric Markov-perfect equilibrium, implying that any proposer in round $k\in\{1,2,...,T\}$ selects identical policies. The full decision-making problem of the proposer, which is quite heavy in terms of notation, is relegated to Appendix B.1. Since the other $n-1$ legislators are ex-ante identical, the $m-1$ coalition members needed to pass the legislation are randomly selected from them. To secure their consent, the proposer offers favors $f_i=f$ to members of the selected mwc and $f_i=0$ to members outside of it. This, again, is a result of symmetry. The proposer keeps the remaining $f_p=B(\Pi,\Phi)-(m-1)f$, which may be higher than what is given to other mwc members, $f_p\geq f$.

Following Azzimonti and Mitra (2023), we show in Appendix B.2 that the proposal is accepted immediately, in $k=1$, and that the proposer's problem is equivalent to one where the welfare of the average member of the mwc is maximized[21]

$$\begin{aligned} &\max_{\Phi} U\Big(c(\mathbf{s},\Phi),l(\mathbf{s},\Phi),g\Big)+\frac{B(\Pi,\Phi)}{\phi m}+\beta\mathbb{E}_{\mathbf{s}'}\,J(\Pi') \\ \text{s.t.}\quad & B(\Pi,\Phi)\geq 0, \end{aligned} \tag{6}$$

with $J(\Pi')$ denote the expected value of continuation utility for the proposer given that the next period's Markov-perfect equilibrium policy is $\Phi'(\Pi')$,

$$J(\Pi')=U\Big(c(\mathbf{s}',\Phi'(\Pi')),l(\mathbf{s}',\Phi'(\Pi')),g'\Big)+\frac{B(\Pi',\Phi'(\Pi'))}{\phi n}+\beta\,\mathbb{E}_{\mathbf{s}''}\,J(\Pi''). \tag{7}$$

Note that the left-hand side of the objective function in eq. (6) is not equal to $J(\Pi)$, from eq. (7). This happens because the proposer can use the budget to keep f_p for certain in the current period. In the future, the proposer may not even be in the mwc, implying that he or she would receive less in expectation (see Appendix B.2 for a derivation of the objective function above). This force will create incentives for the proposer to over-spend and over-borrow relative to a benevolent planner, a feature already highlighted in Battaglini and Coate (2008). In this paper, we emphasize how this characteristic also affects incentives to default, and how these incentives become stronger in the shadow of corruption (low ϕ) and institutional weakness (low $\bar{m}$).

The size of the mwc, given by m, is a key parameter of our model: it captures how many votes the proposer needs in choosing a policy. As m grows closer to n, the policymaker must internalize the preferences of all members of society. When $m=n$, there is full representation and accountability, and institutions are strong. On the contrary, when $m=1$ there are no independent institutions and the proposer chooses an

[21] A key assumption for the proof to go through is the linearity in f. Most dynamic bargaining papers, including Battaglini and Coate (2008) and Barseghyan et al. (2013), need to make this assumption to make the problem tractable.

allocation that devotes significant resources towards her group. Due to the common pool problem, where all members of society contribute towards government revenues, but only one group can appropriate a large share of it, this situation corresponds to one with low $R\&A$ in the data. Similarly, a government can have varied degrees of control over corruption. A combination of low $R\&A$ and low CC implies maximum incentives to divert resources towards favors, as evident from eq. (6). As we will show later, institutional reform through a change in $\bar{m}$ or ϕ will have different implications for the continuation value, and hence different equilibrium outcomes.

3.4 Characterization and intuition

Suppose that $\gamma, \sigma \geq 1$ and $h(z,d) = z$ (this last assumption matters for calibration, but not at this point). It is easy to show that $Rev(\tau, z) = \tau n z^{1+\frac{1}{\gamma}}(1-\tau)^{\frac{1}{\gamma}}$. Recall that the budget devoted to corrupt public practices is $B = Rev(\tau, z) - g + (1-d)\Big[q(z,m,b')b' - b\Big] \geq 0$. There are two possibilities: either the proposer promises political favors in exchange for support, $B > 0$, or not $B = 0$ (so the constraint binds).

Case 1: When $B > 0$,

$$g^*(m) = (\pi\phi m)^{\frac{1}{\sigma}}.$$

Public good provision is independent of debt and default decisions and increases with the size of the mwc. This implies that societies with weak institutions, $m << n$, will tend to under-provide public goods. Taxes are chosen to equate the marginal cost of taxation in terms of consumption (net of the disutility of labor) to the marginal increase in the provision of political favors:

$$\left(\frac{\gamma}{1+\gamma}[(1-\tau)z]^{\frac{1+\gamma}{\gamma}}\right)^{-\sigma} = \frac{n}{m}\left[1 - \frac{\tau}{\gamma(1-\tau)}\right] \quad => \tau^*(m,z).$$

The resulting tax rate is also independent of debt decisions. When $m < n$, the marginal gain in political favors associated with an increase in τ is larger than that of a planner. As a result, societies with weak institutions will tend to over-tax and over-spend on political favors relative to the planner's preferred allocations. The expressions above illustrate that whether the country is in default or not does not affect g or τ in this case. Additional borrowing is used only to increase the budget devoted to corrupt public practices. This also implies that the incentives to repay debt are unaffected by public good provision and tax distortions.[22]

Case 2: When $B = 0$, that is no longer true. Here, borrowing and default decisions affect the provision of g:

$$g = Rev(\tau, z) + (1-d)\Big[q(z,m,b')b' - b\Big],$$

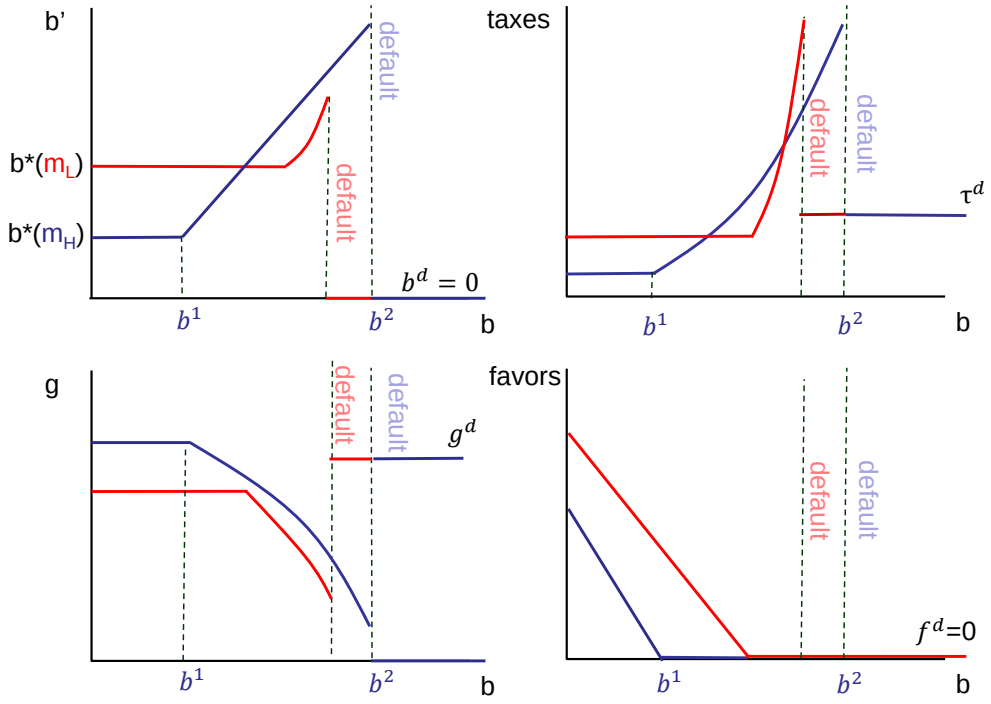
[22] These results are a direct consequence of the linearity in f_i. Relaxing this assumption would make policy functions smoother, and the results less stark. However, the bargaining model's level of complexity grows significantly with non-linearity.

and taxes (through g),

$$\left(\frac{\gamma}{1+\gamma}[(1-\tau)z]^{\frac{1+\gamma}{\gamma}}\right)^{-\sigma} = \pi g^{-\sigma} n \left[1 - \frac{\tau}{\gamma(1-\tau)}\right].$$

The LHS of the equation above is the same as before, but the RHS is now the marginal gain in additional public good provision financed by an additional tax dollar. The only effect of m in this case comes through the endogenous price of debt $q(z, m, b')$. When the country is in default ($d = 1$), however, g and τ are independent of institutional strength.

Figure 5: Policy functions for borrowing, taxes, government spending, and political favors



To better understand how the strength of institutions affects fiscal policy in the political equilibrium, we display two sets of policy functions, for $m_L < m_H$, in Figure 5. The figure is constructed assuming that governments have access to financial markets, $\Omega = 1$. We cannot derive all the theoretical properties of the model (as the decisions to borrow and default are quite involved analytically), so these functions are stylized representations of those obtained through numerical simulations.

First, let us focus on the functions in blue, corresponding to a government with a high value of m_H. When b is low, the proposer chooses $B > 0$, constant taxes $\tau^*(m_H, z)$ and public good provision $g^*(m_H)$, as derived in Case 1. From any $b < b^1$, debt jumps immediately to $b^*(m_H)$, reflecting the proposer's eagerness to spend fiscal capacity on political favors, even if that means financing them via borrowing. At b^1, the constraint on B starts to bind and $B = 0$ thereafter. As the stock of debt rises and, if more debt is to be used to extend political favors without changing g or taxes, the price of bonds declines steeply (not

shown). This makes it more costly to finance expenditures via public debt. As a result, the government is forced to increase taxes along with higher borrowing, and lower public good provision in order to pay back debt. At b^2, rolling over the level of debt becomes too costly, so the country defaults (setting $d = 1$). At this point, $b = b' = 0$, freeing fiscal capacity to reduce taxes to τ^d and increase public spending to g^d. Note that the proposer does not waste resources on political favors when in default. This is because policymakers agree on policy when in autarky in this example[23].

Now compare the blue policy functions (for m_H) with the red ones (for m_L). When debt is low, policymakers in countries with low mwc requirements spend more on political favors and less on g, as derived above (see Case 1). In addition, $b^*(m)$ is larger, implying that countries where institutions are weaker, borrow much more when it is cheap to do so. This implies that debt accumulates faster. The price schedule for debt is also steeper as the same debt implies higher chances for default for m_L. Repayment implies cutting back on favors that are valued more. This can be seen by the fact that the default point moves to the left (e.g. $b^2(m_L) < b^2(m_H)$). In other words, countries with weaker institutions are unable to sustain as much debt as those with higher m. This is consistent with the data in Figure 3, where we found that countries with larger R&A scores had lower default risk. In Appendix 5, we also show that they also have higher levels of debt/GDP in our sample. Finally, note that these differences arise only when corrupt practices give private gains to the proposer and other members of the mwc. As ϕ grows, the gains from providing $B > 0$ dissipate and policies converge to those of a benevolent planner. Hence, weak institutions only distort policies and allocations in the shadow of corruption in this environment.

4 Quantitative Model

This section summarizes the calibration strategy and model fit. In addition, we illustrate how governments with different mwc sizes respond to a recession. Counterfactual experiments are presented in subsequent sections.

4.1 Calibration

We calibrate the model to Argentina during the period 1993-2022. A list of the economic and fiscal variables used, together with data sources, can be found in Appendix A.3. We start by describing the exogenously determined parameters and then move to the calibrated ones.

A period in the model is one quarter[24]. The risk aversion parameter in the utility function is set to $\sigma = 2$, following the literature. The inverse of the Frisch elasticity of labor supply is $\gamma = 2$. The risk-free interest rate, $r = 0.55\%$, equals the value of the real 3-month U.S. T-bill interest rate for the period

[23] This also implies that the values of g and τ obtained in our model right after default are identical to the ones that would arise in a standard default model without politics (e.g. one where choices are made by a benevolent planner). This is developed further in Appendix C.1, where we contrast our bargaining model to the standard case, but assuming a lower discount factor as in Arellano (2008).

[24] We convert annual data to quarterly series by repeating the annual value for each quarter when quarterly data is unavailable.

under consideration. The discount factor, β, is set to match the inverse of the gross risk-free rate in the model $\beta = \frac{1}{1+r} = 0.9945$. It is worth noting that the discount factor takes the same value as in standard macroeconomic models. We do not need to assume an extremely low value for β—as most sovereign default models do[25]—, because the effective degree of impatience in our model depends on m/n. This will be explained in more detail below. We fix the corruption parameter $\phi = 1$ in the benchmark model, but later relax this to study the effects of corruption.

The exogenous productivity shock is assumed to follow an $AR(1)$ process of the form:

$$z_{t+1} = (1 - \zeta_z)\bar{z} + \zeta_z z_t + \epsilon^z_{t+1} \tag{8}$$

where $\mathbb{E}\epsilon^z_{t+1} = 0$ and $\mathbb{E}(\epsilon^z_{t+1})^2 = \sigma^2_z$. The income process parameters ζ_z and σ_z are chosen by fitting the above AR(1) process to real GDP per employed person, per year (HP-filtered using a parameter of 100). The average value of the process $\bar{z}$ is normalized to 1. The fitted AR(1) process is discretized to 21 possible realizations of the productivity shock using Tauchen and Hussey (1991). Table 2 reports the resulting values of ζ_z and σ_z used in the simulations.

In terms of the political process, we assume that there are $n = 20$ groups in the population. This is a normalization trading off computational accuracy and time[26]. The size of the mwc, represented with m, is also assumed to follow an AR(1) process of the form:

$$m_{t+1} = (1 - \zeta_m)\bar{m} + \zeta_m m_t + \epsilon^m_{t+1}. \tag{9}$$

Similar to the productivity shock, we assume $\mathbb{E}\epsilon^m_{t+1} = 0$ and $\mathbb{E}(\epsilon^m_{t+1})^2 = \sigma^2_m$. The values for ζ_m and σ_m are chosen by estimating an AR(1) process on the normalized series of R&A for Argentina for the period under consideration, displayed in Figure 4. Inspection of this figure suggests that R&A follows a mean reverting process for most of the samples. We first normalize the data to take values between 1 and 20, and discretize the fitted AR(1) process to take integer values in the same range. This maps the data to the model, where a higher value of m would imply more representation and accountability in the fiscal policy decision process.

Following Chatterjee and Eyigungor (2012), the probability of re-entry into the market following default, θ, is set to 0.0385. This is approximately equal to $\frac{1}{\theta} \cong 26$ quarters (6.5 years) of exclusion from financial markets after a default event. This value is consistent with the estimates by Gelos et al. (2011) and Richmond and Dias (2009). We also assume that default entails a loss in productivity (see Rose (2005), Bocola (2016)). While we do not formally model these, we take a reduced-form approach following Chatterjee and Eyigungor

[25]For example, Arellano (2008) sets β to 0.8.

[26]It is without loss of generality since what matters for computational results is the ratio m/n.

Table 2: Calibration Targets

Parameter	Value	Target	Description
σ	2		CRRA
γ	2		Frisch Elasticity
β	0.9945	$\frac{1}{1+r}$	FOC
r	0.0055		90 day U.S. Treasury
θ	0.0385	6.5 Years of Exclusion	
$\bar{z}$	1		Normalized
n	20		Normalized
ϕ	1		Normalized
ζ_z	0.925	Persistence Real GDP	AR(1)
σ_z	0.017	Volatility of Real GDP	
ζ_m	0.954	Persistence of R&A	AR(1)
σ_m	0.234	Volatility of R&A	
α_0	-0.364	$\mathbb{E}$(Spreads) = 7.05%	Jointly Calibrated
α_1	0.403	$\frac{\text{Debt}}{\text{GDP}} = 50\%$	
π	1.2	$\frac{\text{Spend}}{\text{Y}} = 0.14$	
$\bar{m}$	4.77		

(2012). In particular, we assume that labor productivity takes the following form[27]:

$$h(z,d) = \begin{cases} z & \text{if } d = 0 \\ z - \max\{0, \alpha_0 z + \alpha_1 z^2\}, \ \alpha_1 \geq 0 & \text{if } d = 1 \end{cases} \tag{10}$$

We calibrate α_0, α_1, $\bar{m}$ and π jointly by minimizing a quadratic loss function to match: average spreads, average of external debt to GDP, and the average value of government spending to GDP in the data. We use 150 equally spaced grid points for the borrowing level ranging from 0 to 100 percent of average GDP. The model is simulated for one million model periods. The values of the initial and final five thousand periods are discarded before using the series to compute the relevant moments. The bottom of Table 2 reports the parameters resulting from the calibration procedure.

4.2 Model Fit

We compute long-run moments from the simulation, and report their values in the second column of Table 3 along with their data counterparts. The numerical algorithm is described in the Section 2 of the Online Appendix. The moments reported below the horizontal line are the ones targeted in the calibration, and the ones above the line were not matched by design.

[27]The curvature of the default cost function is disciplined by the parameters α_0 and α_1. If $\alpha_0 > 0$, and $\alpha_1 = 0$, then the cost of default is proportional. If $\alpha_1 > 0$, and $\alpha_0 = 0$, then the cost rises more than proportionally to the rise in productivity. If $\alpha_0 < 0$, and $\alpha_1 > 0$, then for $z < -\frac{\alpha_0}{\alpha_1}$, the default cost is 0, but the cost rises more than proportionally for higher realizations of z.

The model performs fairly well in matching the data. An important feature of our model is that we can match the *pro-cyclicality* of fiscal policies earlier documented by Talvi and Végh (2005). These are reflected by the strong positive correlation between government spending and GDP, as well as the negative correlation between net exports and GDP. A $\rho\left(\frac{NX}{y}, y\right) < 0$ means that in recessions (e,g, a decline in y), $NX = x - i$ increases. Because in our model next exports are just external borrowing, this implies that the country borrows in booms, not in recessions (which is the opposite of what optimal tax-smoothing behavior would prescribe). The relative volatility of consumption to output is greater than 1 (as in most emerging economies) and close to that observed in Argentina. Tax rates in the model are almost acyclical, as in the data, for the period under consideration[28].

Table 3: Model Fit

Moment	**Data: Argentina**	**Benchmark**	
$\frac{\sigma(c)}{\sigma(y)}$	1.26	1.29	
$\rho(y,c)$	0.97	0.81	Pro-cyclical
$\rho(y,g)$	0.79	0.70	
$\rho(\frac{NX}{y}, y)$	-0.57	-0.37	
$\rho(y,tax)$	0.03	-0.004	
$\rho(r - r^*, y)$	-0.30	0.08	
$\sigma(y)$	5.0%	3.4%	
$\sigma(Spreads)$	2.9%	4.7%	
$\mu\left(\frac{Debt}{y}\right)$	50%	50%	Matched by Construction
$\mu\left(\frac{g}{y}\right)$	14%	13%	
$\mu(r - r^*)$	7.05%	7.11%	

There are two dimensions where our model does not perform as well. First, the volatility of output is a bit lower in the model than it is in the data. Second, the correlation of spreads to GDP is smaller and of the opposite sign to that in the data. The latter might be a consequence of using short-term debt, which results in a steep bond price schedule. In a recession, debt reduction dominates the effects of increasing spreads to avoid a default. Another reason could be that the series for m and z are uncorrelated in the model, but could be correlated in the data. See Mendoza and Yue (2012b) for a theory that can deliver counter-cyclical spreads.

4.3 Tax smoothing in the shadow of corruption

The canonical models determining *optimal* fiscal policy state that the government should increase debt rather than increase taxes in response to a temporary shock (that lowers revenues or increases spending needs). This results from the assumption that raising tax revenue generates distortions in the economy, whereas selling

[28] This calculation also includes periods of default.

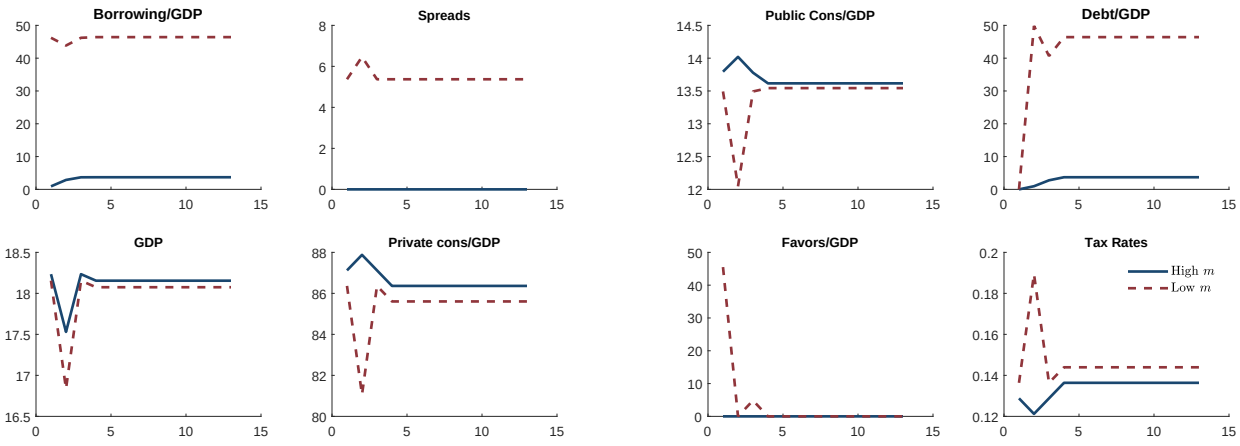
bonds does not (see Barro (1979), Lucas and Stokey (1983)). The "tax smoothing" hypothesis implies that government debt should be counter-cyclical (borrow in recessions) and taxes should exhibit low volatility. Taxes should eventually rise to repay the debt, but should not track the shock process.

In this model, the correlation between the fiscal balance (revenues minus expenditures) and output is -0.39 instead: the government borrows in booms rather than in recessions, a pro-cyclical policy response. To understand intuitively why this happens, we simulate the response to a negative TFP shock in period 2, assuming that aggregate productivity recovers immediately in period 3. In this experiment, we keep the size of the mwc constant at its long-run average for the calibrated economy, $m_t = \bar{m} = 4.77$. We analyze the response for two different initial levels of debt: a low one $b_0 < b^1$ and a high one $b_0 > b^1$.

Low Initial Debt

Suppose that the economy starts with no initial debt, $b_0 = 0$. This corresponds to the case where $b_0 < b^1$ in Section 3.4. The evolution of the endogenous variables for our benchmark economy is displayed in Figure 6, with a dashed-red line. In period 0, before the recession hits, borrowing (defined as qb') jumps immediately and corrupt public practices skyrocket (favors/GDP go up). The economy enters the recession (period 2) with high debt, so spreads rises to more than 6 percent. Unable to borrow cheaply, policymakers sharply decrease the provision of public goods and hike taxes. This reduces the labor supply, since $l = [h(z,d)(1-\tau)]^{\frac{1}{\gamma}}$ in equilibrium, exacerbating the effects of the negative shock: GDP not only falls because z goes down but also because higher taxes reduce the labor supply l. Rather than stabilizing the economy, the government *amplifies* the effects of a recession.

Figure 6: Response to a recession, low b_0



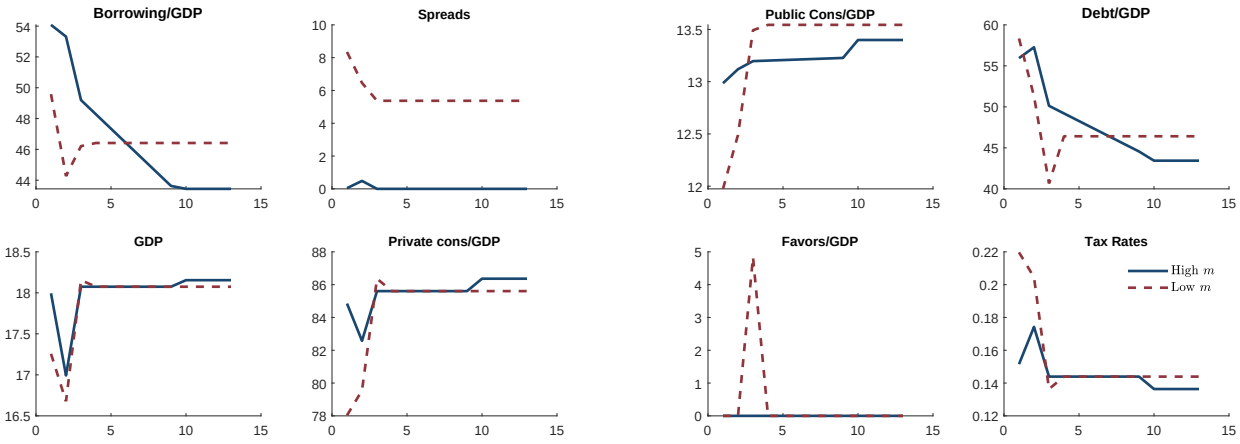
It is useful to contrast this to the response of a government with stronger institutions. To that end, we re-compute the model assuming $\bar{m}_H = 20$ and repeat the experiment (time series displayed in blue). As described in Section 3.4, a government with higher m behaves more responsibly. First, fewer resources are devoted to corrupt public practices (favors are zero in this case). Second, borrowing doesn't increase

as much initially. When the recession hits, the government can raise debt levels at a lower cost than in the benchmark case (i.e., spreads do not jump), so it can afford to lower τ, as tax-smoothing would prescribe. The decline in GDP is smaller, indicating the government's role in stabilizing the economy.

High Initial Debt

We conduct the same exercise assuming initial debt to be about 70 percent of GDP, corresponding to $b_0 \in (b^1, b^2)$ in Section 3.4. Figure 7 shows that both economies start reducing debt in the first period, but the benchmark economy (in red) does this at a much faster rate because of the higher spreads it faces. The benchmark economy imposes higher taxes and has lower GDP and private and public consumption. When the recession hits in period 2, taxes increase considerably more than in the $\bar{m}_H$ economy, even though its legacy debt in the current period is lower. This happens because markets price a higher default probability in the economy with weak institutions, despite its lower debt levels.

Figure 7: Response to a recession, high b_0

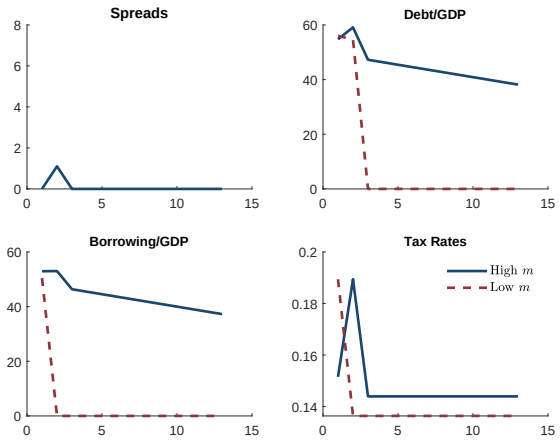


Once the benchmark economy recovers, taxes drop as the cost of borrowing becomes lower, and debt stabilizes at a constant level of around 45 percent of GDP. Instead of further reducing the stock of debt, the government chooses to spend the additional resources on political favors, which increase sharply after the recession ends. In the case of high debt, there is imperfect tax smoothing in both economies. This shows up in the decline in both private and public consumption to GDP ratios and increases in taxes during the recession. However, the negative effect of the shock is stronger in the economy with weak institutions. For initial debt levels above b^2, the benchmark economy responds to a negative TFP shock by outright defaulting. The impulse responses are omitted, but available upon request.

Political Defaults

We now consider a large recession, where TFP goes down significantly in $t = 2$ (for only one period). As in the previous case, countries start the simulation with a high level of debt (of around 70 percent). Figure 8 shows that the country with strong institutions m_H (solid blue) faces a large recession with an austerity measure (e.g. a tax hike), and chooses not to default. Spreads increase marginally.

Figure 8: Response to a "Great Recession," high b_0



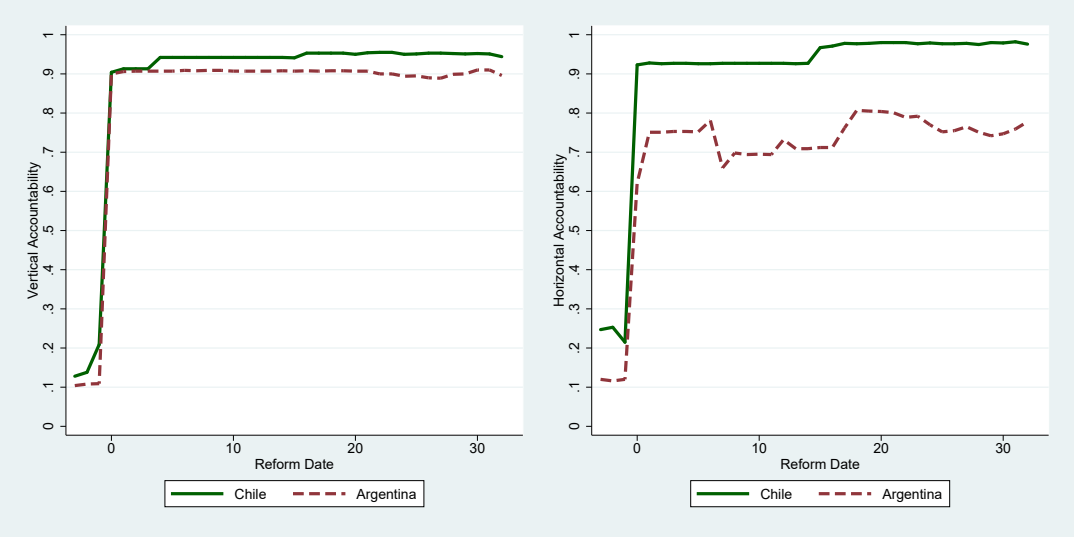
The country with weak institutions m_L (dashed maroon), instead, prefers to default in the second period rather than adopt an austerity measure. This illustrates the heterogeneous response of countries with different political environments, shedding light on the behavior of European nations following the global financial crisis. Greece (a country with a R&A of 0.89, close to that of an emerging economy) defaulted in March 2012, whereas Germany (a country with a R&A of 1.38, m_H in our example) did not. Our finding is related to Arellano and Bai (2016), which shows that a country subject to fiscal restrictions, in particular the inability to increase taxes, will be forced to default when facing a large recession. They refer to those as 'fiscal defaults.' In their paper, taxes are exogenously fixed through a budget rule. In our model, taxes are flexible but the politician prefers not to increase them when institutions are weak, giving rise to a 'political default.' A planner, in this case, would choose an austerity measure instead.

5 Transition to Democracy: Chile vs Argentina

Chile and Argentina were under the rule of military juntas in the late 1970s. Democratic governance was reinstated in both nations in the 1980s, with Argentina holding its inaugural democratic election in 1983 and Chile following suit in 1989. Free speech, free association, free press, and free elections were fully restored in both countries soon after. Yet, intriguingly, the trajectories of fiscal and economic indicators diverged significantly in the post-transition period. Argentina experienced a series of sovereign debt crises

and high volatility in output, whereas Chile experienced economic stability and low sovereign debt spreads. Economists attribute this divergence to economic reforms, particularly market liberalization. However, both nations embarked on similar economic liberalization journeys. Political scientists, on the other hand, emphasize the nuances in institutional reforms following the transition to a free democracy as the main differentiating factor. In this section, we evaluate whether heterogeneity in institutional reform can help explain the different trajectories of these two countries. More specifically, we evaluate the macroeconomic consequences of a permanent regime change that strengthens institutions in both countries, but asymmetrically. In particular, we assume that Chile's $\bar{m}$ is higher than Argentina's.

Figure 9: Vertical and Horizontal Accountability



Notes: VA and HA obtained from the V-Dem dataset.

This choice is informed by reading accounts of how the institutional reform was implemented in these countries (see O'Donell (1998) and Wigell (2017)), as well as data on the evolution of sub-components of representation and accountability. In his seminal work, O'Donell (1998) distinguishes between 'vertical' and 'horizontal' accountability. Vertical accountability (VA) refers to the citizens' capacity to hold the government accountable, evidenced by their freedom to establish political parties and engage in open elections. He argues that both countries were successful in ensuring VA. Horizontal accountability (HA), instead, refers to an effective system of separation of powers and checks and balances that impose constraints on how policy can be used to further politicians' private and political goals. According to the author, Chile was more successful than Argentina in securing strong HA, because key veto players could block the incumbent from governing by decree through legislative and judiciary independence. Figure 9 provides evidence of this claim, by displaying the evolution of of HA and VA from the V-Dem (Varieties of Democracy) dataset[29].

[29]Note that our measure of R&A, voice and accountability, includes both dimensions. Another difference is that R&A is based on public perceptions (a de facto measure), whereas VA and HA are constructed from practices that are legally recognized (a de jure measure).

Period 0 indicates the year in which the first democratic election was held. While VA is similar after free elections took place, Argentina's HA is significantly lower than Chile's following the transition.

Simulating the transition

In terms of our model, stronger HA is captured by a larger number of groups with veto power, $\bar{m}$. We computed our model for two different values of $\bar{m}$: Argentina's corresponds to the benchmark of $\bar{m}_A = 4.77$, whereas Chile's is higher at $\bar{m}_C = 8.8$ (with $n = 20$ in both cases). We keep the volatility of m to that of the benchmark[30]. We assume that both countries move from a dictatorship (with $\bar{m}_i = 1$) to a democracy in period 0, and simulate the two economies for 100 quarters assuming that they face the same sequence of TFP shocks. We discipline the initial debt-to-output ratios of the two countries using IMF data for the years in which the institutional reform happened. Argentina's debt/GDP in the initial period is 55.8 percent (e.g. the observed value in 1983) and in Chile is 77.1 percent (e.g. the observed value in 1989).

Figure 10: Evolution of policies and allocations to institutional reform

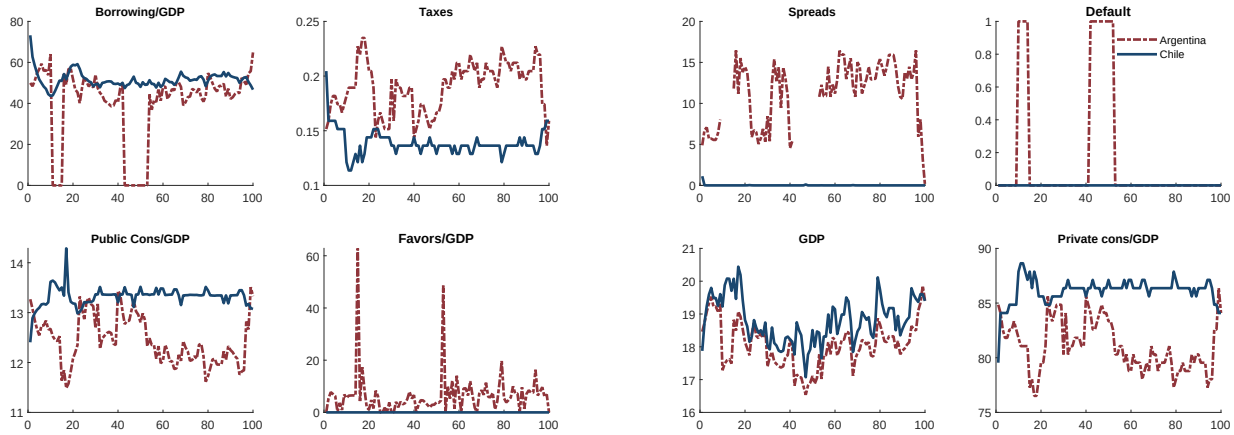


Figure 10 plots the evolution of fiscal and economic variables. Chile (displayed with a solid blue), has a higher stock of debt when the reform happens, but starts reducing debt/GDP soon after. Its borrowing, $q'B'$, reaches a smaller value than Argentina's (red dashed line) in less than 20 quarters. The decrease in debt obligations is achieved not by increasing taxes in the first period—which are actually smaller than Argentina's— or by initially reducing public spending, but instead by choosing not to waste tax dollars on political favors. Faced with a higher number of veto players and a large stock of debt, the Chilean government behaves more *responsibly*: the distortions associated with engaging in corrupt public practices are not worth the benefit to the proposer, as they need to be distributed among a larger mwc. Note that in this experiment we did not change ϕ: the reform did not make it more difficult to engage in corruption, it just made it less appealing. The elimination of f_i is an endogenous choice. Knowing that future policymakers will also not

[30]This is also lower for Chile. Lowering the volatility for m will only strengthen our results.

engage in corruption, further increases the incentives to reduce indebtedness today (because of better prices on debt), implying that the proposer is also more *patient* when $\bar{m}$ is higher. As a result of this, the Chilean government can better smooth taxes and consumption when recessions happen (and consistent with Figure 7). Spreads are low for Chile throughout and experiences no default episodes.

Argentina's post-transition experience is completely different. Rather than reducing borrowing, the government quickly engages in corrupt practices: we see positive values of f_i through the simulation. This is consistent with Wigell (2017), who documents that in the beginning of the 1990s, President Menem (Argentina) started manipulating targeted benefits as a lynchpin for mobilizing political support[31]. Intuitively, a lower $\bar{m}$ worsens the common pool problem associated with government expenditures. Fewer members of the mwc benefit from "priority" projects of the government at the cost of taxes and debt repayment obligations on the entire population. Favors are financed with higher taxes, and the government under-spends on public good provision. Markets attribute a higher probability of default to the Argentinean government, so spreads are much higher. When shocks hit, the economy experiences sovereign debt crises (e.g. jumps in spreads) and even two default episodes soon after. In other words, Argentina becomes a country where 'to default is the default.' The experiment points to the reason for significantly higher volatility in policy and allocations, as well as lower private and public consumption than in Chile.

6 Tax-smoothing: Emerging vs. Developed countries

The experiment in the previous section suggests that the ability to smooth policy and avert sovereign debt crises is strongly linked to institutional strength in our model. Is this insight more general or was it simply an artifact of arbitrary initial conditions or TFP shock realizations? To study this, we simulate the model for a large number of periods and eliminate the first 5000 quarters before computing statistics. The resulting long-run business cycle moments for the two countries are shown in Table 4. Argentina's is displayed in the first column and Chile's in the second. These aim to capture generic emerging economies with varying mwc sizes. In addition, we include a simulation for a hypothetical developed economy with strong institutions by setting $\bar{m} = n$ (this also corresponds to the solution of a benevolent planner without commitment to repay).[32]

The model predicts monotonicity in fiscal policies and macroeconomic outcomes. Spreads are highest in Argentina, where institutional quality is the lowest. Government spending relative to GDP and tax rates are more volatile in Argentina than in Chile, illustrating differences in their ability to smooth taxes. As expected, Chile exhibits higher volatility of taxes and government spending compared to the developed economy. Our results explain the heterogeneity observed in the data across the spectrum of emerging economies with vary-

[31] In Chile, by contrast, targeted programs remained under firm technocratic control. We can interpret f_i as the use of targeted programs for political support, as we do not have heterogeneity among agents (e.g. there are no other redistributive programs).

[32] To make things comparable, we are only changing $\bar{m}$ across the three simulations. The TFP shock process and realizations, as well as other parameters in the model are constant. In other words, we are not re-calibrating these economies in each column to match spreads. Because Argentina has the worst outcomes of the three, using it as a benchmark is a lower bound on the ability of economies with stronger institutions to smooth taxes.

Table 4: Business Cycle Moments in the Long Run

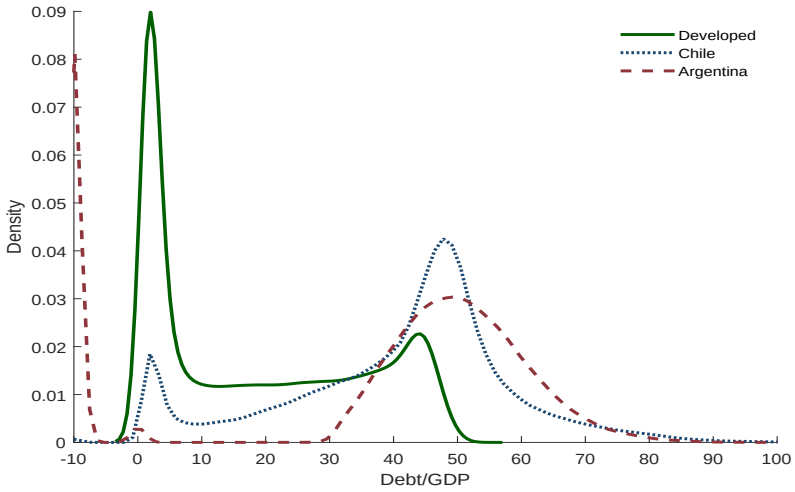
Moment	Argentina $\bar{m} = 4.77$	Chile $\bar{m} = 8.8$	Developed $\bar{m} = 20$
Institutions			
R&A (mean)	4.77	8.80	20.0
Instability (St Dev)	0.78	0.78	0
Favors/GDP (mean)	4.52%	0.10%	0
Fiscal Policy			
Spreads	7.08%	0.06%	0.001%
σ(tax)	0.04	0.01	0.01
σ(g)/σ(y)	1.49	1.25	0.83
μ(b/Y)	50.4%	41.1%	18.3%
ρ(TB,y)	-0.37	-0.20	0.55
ρ(FB,y)	-0.31	-0.21	0.65
μ(tax)	17.69	13.77	13.63
Macro Outcomes			
Sp. Crisis	9.85%	4.12%	2.82%
σ(c)/σ(y)	1.29	1.14	0.84

ing levels of institutional strength. Some of them are serial defaulters, or prone to a spread crisis[33] like Argentina, while others are significantly less prone to such crises like Chile. In our simulations, Argentina has a 9.85 percent chance of falling into a spread crisis, while Chile is much closer to a developed country with a 4 percent possibility of the same. Favors as a percentage of GDP are higher on average in Argentina, implying a significantly higher targeted use of public resources for political gains. This number is negligible in the other two cases with higher $\bar{m}$. The developed economy exhibits a strong positive correlation between trade balance and GDP, but this statistic is negative for both Chile and Argentina. This implies that the developed country can borrow in bad times without having to resort to abrupt tax increases to finance spending. This is also reflected in the sign and magnitude of the fiscal balance (FB) in all the columns, and in the magnitude of the ratio of the volatility of consumption to that of GDP. Highly volatile taxes spill over into private consumption expenditures, making them more volatile than output. That is, policy amplifies the cycle in countries with weak institutions like Argentina.

Why are spreads so much higher in Argentina? Figure 11 displays the long-run distribution of debt to GDP in the three economies. The average value of debt to GDP is highest for Argentina (red dashed line), at around 50 percent. The other two economies have significantly lower values of debt to GDP. Moreover, the developed economy has a significant mass at zero, indicating a desire to save in good times and use debt

[33]Following Trebesch and Zabel (2017), we code a spread crisis when we observe: (i) an increase in spreads compared to the previous period above the 99^{th} percentile of the spread distribution or (ii) an annualized spread of 10 percentage points or higher.

Figure 11: Ergodic debt distribution.



only in recessions[34]. Argentina defaults very frequently, as seen at the large mass in -10 (the arbitrary coded value for debt under default, for this plot's readability). Chile and the developed economy have no mass at that point, indicating that they rarely default. After gaining market access (post-default, indicated by the small mass at 0), Argentina jumps to a higher value of debt-to-GDP (of around 30 percent). This is not the case for Chile, whose average debt-to-GDP ratio is lower (blue dotted line). A mass at 0 implies that in some parts of the state space Chile would even like to save. The developed economy with strong institutions has a distribution of debt/GDP similar to Chile's, the only difference is that the mass at zero is larger[35].

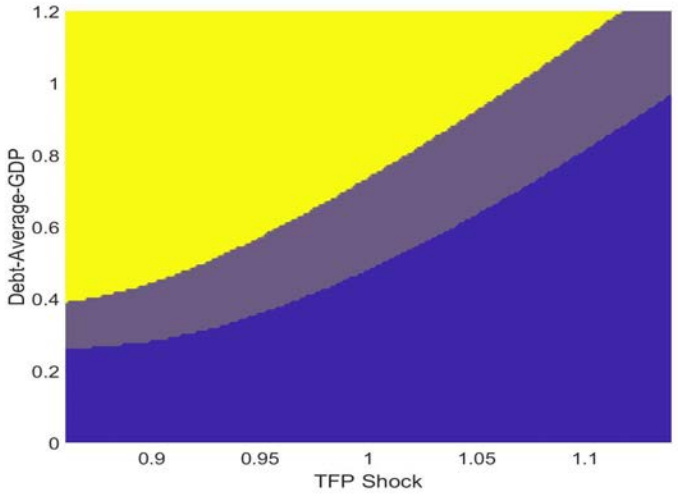
Figure 12 shows repayment and default regions in the state space for the three economies. The darker-shaded regions represent combinations of TFP shocks and legacy debt-to-GDP ratios where the government would optimally repay. The darkest region in the bottom right corner represents the repayment region for Argentina, while the combination of the two darker regions represents the repayment set for the other two countries. If the country finds itself in the light yellow region, it defaults. In addition to having higher debt on average (shown in the previous figure), Argentina defaults at a larger region of the state space, making it more likely to end up in the default region. The default region for the other two economies is the same. However, since Chile still borrows more than the developed economy, it is more likely to default.

This result is driven by two forces that change when $\bar{m}$ increases. On the one hand, stronger institutions reduce the gains of engaging in corrupt public practices (as political favors must be shared with a larger number of groups in society). On the other hand, it also increases the likelihood that the proposer is in the

[34]See Bianchi and Sosa-Padilla (2023) for an alternative environment where accumulating reserves could help smooth business cycle fluctuations.

[35]Following the tradition in the sovereign default literature, we computed the model restricting debt to be positive (e.g. ruling out savings). This is not binding in the calibrated benchmark economy (Argentina), but it can become binding in some states of the word for economies with higher values of $\bar{m}$ (such as the two examples we presented above). However, even if we allowed for such behavior, it is unlikely that borrowing will stop completely as in Aiyagari et al. (2002). With imperfect political institutions (lower representation and corruption), the asset floor is endogenously determined, which would make borrowing optimal at most points of the state space.

Figure 12: Default regions.



mwc in the future (e.g. receives political favors). This makes the proposer endogenously more patient. In Appendix C.2, we split these two forces by comparing our benchmark to an autocracy where the proposer is in power forever. That is a situation in which $m = 1$, but the autocrat knows it will be in the mwc with probability 1 (which we interpret as the case of China). We invite an interested reader to visit this extension.

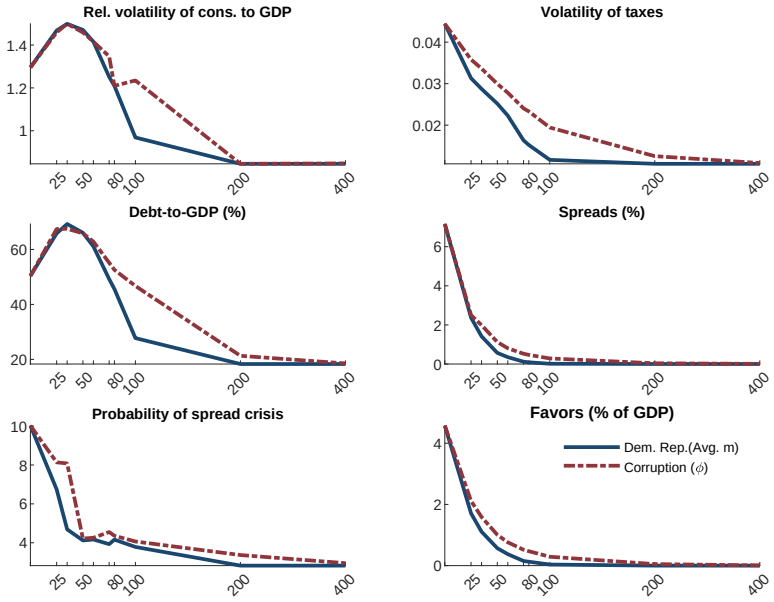
7 Implementing a 'crackdown on corruption'

In the previous counterfactual experiments, we kept the control of corruption fixed at the normalized value of $\phi = 1$. In this section, we want to study whether a 'crackdown of corruption' (e.g. an increase in ϕ) is as effective as a reform that strengthens representation and accountability (e.g. an increase in $\bar{m}$). An increase in ϕ reduces the benefits from engaging in corrupt public practices, since for each dollar taken from the budget, the proposer and each of the coalition members only get $1/\phi$ of their respective shares. An increase in $\bar{m}$ reduces the per-member amount received through corrupt public policies, but also affects the probability of being part of the mwc in the future. We evaluate which of the two reforms is more palatable to the proposer at different stages of institutional development, and compare this to the welfare gains of an average citizen in the population.

We simulate the economy where alternative values of ϕ or $\bar{m}$ are increased by {10, 25, 35, 50, 60, 75, 80, 100, 200, 400} percentage points. When ϕ is increased $\bar{m}$ is kept constant, and vice-versa. The long-run response of endogenous variables and their volatilities are shown in Figure 13. The dashed maroon line depicts crackdowns on corruption (e.g. increases in ϕ) whereas the blue solid line depicts strengthening the representation and accountability (e.g. increases in $\bar{m}$).

When the percentage increase in $\bar{m}$ is relatively small, debt issuance goes up because the fiscal space increases as a result of a reduction in spreads. A further increase, however, reduces debt and also the relative

Figure 13: Effect of Increasing m and ϕ by the Same Magnitude on the Endogenous Variables



Notes: Numbers on the x axis indicate percentage increase in $\bar{m}$ from 4.77 or ϕ from 1. When ϕ is increased $\bar{m}$ is kept constant and vice-versa.

volatility of consumption to GDP. The volatility of taxes is always decreasing, regardless of whether ϕ or $\bar{m}$ are increased, indicating that either reform improves tax smoothing. Corrupt public practices, spreads and the probability of spread crises also decrease monotonically for all degrees of such reform[36]. An increase in ϕ leads to qualitatively similar implications, but are much smaller in magnitude compared to that of $\bar{m}$ when it comes to reducing the volatility of consumption and taxes. In general, the performance of the economy is more responsive to increases in $\bar{m}$ than to increases in ϕ. Intuitively, volatility in m is equivalent to policy uncertainty as in Azzimonti (2018). In a case with lower $\bar{m}$, each member in the coalition carries more weight, and hence fluctuations in the coalition size lead to larger swings in fiscal policy variables.

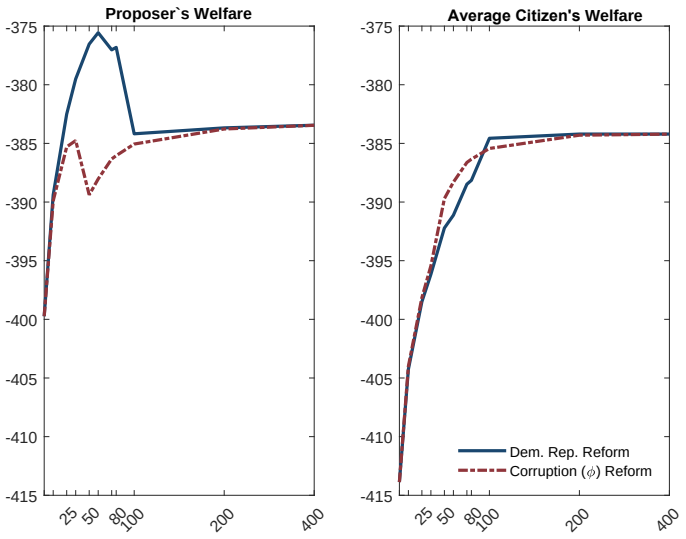
7.1 Reform when institutions are weak

The analysis above relates to long-run outcomes under alternative institutional environments. Apart from affecting these, the $\bar{m}$ reform also impacts the intertemporal price of f_i, and hence the desirability of the proposer to implement such reform. Figure 14 shows the welfare of the proposer (left panel) and that of an average citizen (right panel) assuming that either a crackdown on corruption or an $\bar{m}$ reform is implemented in the current period. The value at the origin represents welfare if no reform is undertaken. While the average citizen is always better off when there is less corruption or stronger representation (e.g. welfare is increasing

[36]For spreads, debt-to-GDP and favors average values of a one-million-period long simulation are reported.

in ϕ as well as $\bar{m}$ reforms), the proposer's welfare is non-monotonic. This happens because the group with greater political power benefits most from institutional weakness in the short run.

Figure 14: Effect of Increasing m or ϕ on Welfare



Notes: Numbers on the x axis indicate percentage increase in $\bar{m}$ from 4.77 (solid-blue) or ϕ from 1 (dashed-maroon). When ϕ is increased $\bar{m}$ is kept constant and vice-versa.

To understand the intuition, it is useful to look at eq.(6): a higher m reduces the weight on favors in the current period. But it also increases the chances of being chosen as a member of the mwc in the following period, thereby increasing the chances of receiving political favors in the future[37]. Therefore, the relative price of favors in the current period with respect to the future increases which makes the proposer optimally reduce favors in the current period and back-load it for the future. This price effect is relevant only because favors are positive at a lower level of development– when both the parameters are low. Increasing ϕ however, increases the price of favors both in the current and the future periods keeping the relative price unchanged. At lower values of $\bar{m}$, the effect of a reduction in volatility dominates the relative price effect, and hence the proposer is better off if $\bar{m}$ goes up. Increasing $\bar{m}$ by more than 60 percent leads to a drop in the proposer's welfare. Although there is higher fiscal space, borrowing starts to decline as the utility from favors for each coalition member is lower. Here the relative price effect dominates the volatility effect[38].

Both the rise and the corresponding fall, due to lower favors, in the proposer's welfare are modest when a corruption reform is undertaken. Since favors are directly targeted, such a reform never encourages borrowing as much as in the $\bar{m}$ reform to pay for favors. Consequently this results in lower taxes to finance favors in the ϕ-reform regime. An increase in $\bar{m}$ of 400 percent or more has the same effect on welfare as an increase in ϕ of the same magnitude. At that point, moments look similar to a developed country. They are

[37]The unconditional probability of being a member of the mwc in the following period is given by $\frac{m-1}{n}$.

[38]After an 80 percent reform, welfare starts to marginally improve again because taxes drop, and consumption and GDP rise. At this point, f_i drops to zero.

characterized by relative volatility of consumption to GDP of less than 1, less volatile taxes, lower spreads, and no spending in political favors, as shown in Figure 13.

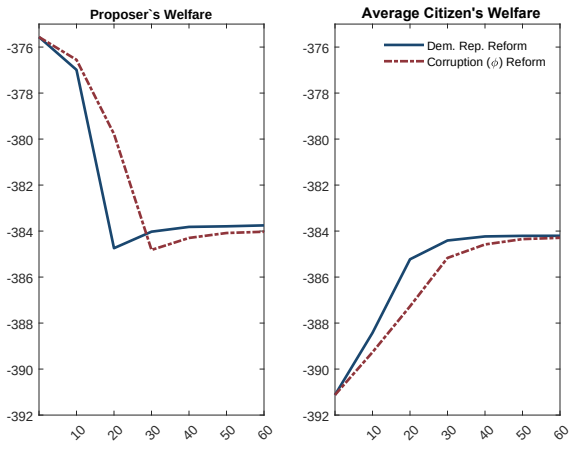
From the viewpoint of the average citizen, a ϕ reform is associated with higher welfare than a $\bar{m}$ reform in the initial bursts of reform (up to 70 percent). Lower taxes and lower debt allow for higher consumption and welfare. However, given a choice, the proposer would rather implement an $\bar{m}$ reform to attain favorable treatment from the lenders, move to the peak of the proposer's welfare (when $\bar{m}$ is increased by about 60 percent), and stay put. The average citizen would rather have a 60 percent crackdown on corruption, than a 60 percent increase in representation. This shows that political economy frictions may come in the way of an emerging/developing economy transitioning into a developed country. It is important to emphasize that foreign lenders price debt by taking into account only the risk of repayment, without any concern about the use or abuse of the lent resources.

7.2 Reform when institutions are stronger

In this paper, we have reported long-term averages of $R\&A$ and CC for all the countries in our sample. However, over time many of them came out of dictatorships and there had been significant gains in terms of institutional development.

Argentina, for example, shows a current $R\&A$ measure that is 60 percent higher than its long-term average. Given higher accountability, these countries need to make promises of reform to the electorate and carry them out to stay in power and get re-elected. The new president-elect of Argentina, Javier Milei, promises to put an end to corruption during his tenure, along with many other lofty reform promises. In Figure 15 we plot the welfare implications for such promises and evaluate their credibility. More specifically, we evaluate if a corruption reform is a promise that can be fulfilled.

Figure 15: Effect of Increasing m and ϕ from peak $\bar{m}$



Notes: Numbers on the x axis indicate percentage increase in $\bar{m}$ from 7.63 or ϕ from 1. When ϕ is increased $\bar{m}$ is kept constant and vice-versa.

We start from $\bar{m}$ that is already 60 percent higher and also corresponds to the peak for the proposer in Figure 14. Evidently, the proposer would not want to make any reforms at this point, as they would result in lower welfare. Increasing ϕ, however, has an associated welfare loss that is smaller for the proposer. The average citizen, however, would be better off improving democratic institutions. Intuitively, with already favorable treatment from the lenders, a ϕ-reform does not have the price effect that back-loads favors. This results in higher borrowing and higher taxes than a similar $\bar{m}$ reform that results in lower aggregate welfare.

8 Conclusion

We introduce a fiscal policy model that explains how countries with different levels of institutional development respond to macroeconomic shocks, considering the option of strategic default. The model focuses on two key institutional factors: representation and accountability (R&A) and control of corruption (CC). Empirically, we find that countries with strong R&A and CC have higher sovereign bond ratings, less tax volatility, and more counter-cyclical fiscal policies. In contrast, countries with weaker R&A and CC face higher economic volatility and more frequent sovereign debt crises.

Our theory highlights the significant impact of political favoritism in shaping these economic outcomes. When R&A,—represented by $\bar{m}$ (the size of the mwc) in our model—is low, governments tend to allocate excessive resources for political favors, exacerbating the common pool problem. A low CC environment facilitates the misuse of tax revenues for corrupt public practices. Lenders, recognizing these risks, adjust their lending terms accordingly, often leading to higher borrowing costs and fiscal instability in countries with weak institutions. We can explain economic patterns in countries with varying institutional strengths without assuming a lower subjective discount factor, as often done in sovereign default literature. We also generate 'prudent,' counter-cyclical fiscal responses in stronger institutional settings without assuming a debt repayment commitment. Using the quantitative model, we can explain the divergent economic paths of Argentina and Chile following the end of the dictatorship rules in the 1980s. A critical observation from our model is that while both could default at any time, Chile's stronger institutions make default less appealing for its policymakers.

We compare the effects of permanent reforms in representation and accountability (R&A) against sustained anti-corruption efforts. We find that in countries with very low institutional development, small improvements in R&A can lead to increased political favoritism, at the cost of lower welfare to the average citizen. This happens as international lenders, encouraged by perceived improvements, offer better loan terms, but the funds are often used for political gains. Such countries typically cease R&A improvements once they reach a level that benefits the ruling proposer, with no incentive for further reform. We find that in emerging countries, the incentives of the average citizen and those of the politicians never align perfectly. From the perspective of public policy, it is important to keep these considerations in mind. A one-size-fits-all policy may not be the best solution for economies at every stage of development.

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A Data Appendix

We collect data on (1) economic and policy variables, (2) institutional quality, and (3) sovereign credit ratings. Economic and policy data series are annual, ranging from 1990 to 2022, institutional data starts in 1996 and Fitch ratings in 1995. The three sets of variables, their sources, and detrending methods are described below. There are 58 countries for which we have data on all three variables which will be referred to as "benchmark" data, a subset of our full database.

A.1 Institutional Quality

We use two indicators for institutional quality: the strength of Representation and Accountability (R&A) and the control of corruption (CC). These are part of the World Bank's "World Governance Indicators" (obtained from the WGI Website).

- $R\&A$ is the degree of **Representation and Accountability**, proxied by the WGI variable "Voice and accountability," which captures perceptions of the extent to which a country's citizens can participate in selecting their government, as well as freedom of expression, freedom of association, and a free media. The variable ranges between [-2.5,2.5], with lower values indicating weaker R&A.
- CC is **Control of Corruption** (CC), obtained from the WGI variable with the same name, and captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as capture of the state by elites and private interests. The variable ranges between [-2.5,2.5], with lower values indicating poorer CC.

Alternative measures: The WGI provides alternative measures of institutional quality. These are 'Government Effectiveness (GE),' 'Regulatory Quality (RQ),' and ' Rule of Law (RL)'. Their long run values are highly correlated with CC: $Corr(CC, RL) = 0.96$, $Corr(CC, GE) = 0.97$ and $Corr(CC, RQ) = 0.93$. Because of this, we simply use CC in our analysis.

In terms of de-facto measures, there is an alternative measure called 'political constraints (PolCon)' developed by Henisz (2000), that we have used in previous work (see Azzimonti and Mitra (2023)). The series in only available until 2015, and this is why we use R&A instead. But the two are highly correlated: $Corr(CC, PolCon) = 0.85$.

A.2 Fitch Ratings

Sovereign ratings are obtained from 'Fitch Ratings' (see website and Sovereign Rating Criteria). They are available since 1995. The Sovereign Issuer Default Ratings (IDs) are evaluations that anticipate the ability and willingness of a government to fulfill its debt obligations to both private-sector creditors and public debt securities, regardless of ownership, in a timely and complete manner. Fitch uses a combination of quantitative analysis and qualitative judgments to evaluate sovereign credit risk (e.g., their proprietary Sovereign

Rating Model and the Qualitative Overlay). In addition, Fitch considers the impact of the sovereign's policies and actions on the country's overall economic performance, which can have significant effects on the sovereign's creditworthiness and can, in turn, be influenced by it. Using a series of factors, Fitch summarizes the rating at each point in time on the scale AAA to CCC+. We transform these ratings to a 0-4 scale. We discard all the countries for which we have less than 22 observations and then compute the average for each country. The third column of Online Appendix Tables 1 and 2 summarizes these values for developed and emerging economies.

We want to emphasize that structural factors, including 'political risk', are incorporated into Fitch's ratings. The company develops its measure of political risk incorporating Governance Quality (Government effectiveness, Rule of law, Control of corruption, Voice and accountability, and Business environment) and Political Stability & capacity (Political stability and capacity, Legitimacy of regime, Conflict/war risk, Debt payment record, Risk to economic policy). They also include past default decisions and other economic indicators when rating a country's default risk.

Construction of Figure 3: For each year, we we give a value of 4 to the countries with AA or above ratings, 3.5 to A, 3 to BBB and BB, 2 to B, 1.5 to CCC, 1 to CC, 0.5 to C, and 0 to DDD or below. We then average these out for all years in which we have observations and eliminate countries with less than 22 observations.

A.3 Fiscal Variables and Economic Aggregates

Variables are obtained from FRED, Eurostat, the World Bank, the IMF, OECD, Fitch Solutions, Statistical Offices and Financial Ministries.

A.3.1 Variable Definitions

- c: is "Private final consumption, USD (2010 prices)." Computed as the sum of all household spending on goods and services within the economy. It also includes spending by non-profit institutions serving households (NPISHs). Adjusted to 2010 prices. Built from NIPA.
- GDP Deflator: Gross Domestic Product: Implicit Price Deflator, Index 2012=100, Annual, Seasonally Adjusted. Downloaded from FRED, the variable name is GDPDEF.
- FB: is "Budget balance, % of GDP". It is constructed as fiscal revenue less fiscal expenditure as a percentage of GDP, $FB = \frac{Rev-Exp}{y}$, showing the net position or fiscal balance.
- g: corresponds to "Government final consumption, USD (2010 prices)". The sum of all government spending on goods and services within the economy. Also includes spending on government community services. Adjusted to 2010 prices. Built from NIPA.

- PB: is "Primary balance, % of GDP." Primary balance refers to the budget balance excluding interest payments on government debt as a percentage of GDP, $PB = \frac{Rev-Exp+rb}{y}$.
- tax: "Total revenue, % of GDP. " Fiscal revenue is government revenue or income through taxation, non-tax revenue (including asset sales), financial resourcing, and capital receipts. This variable is obtained from the OECD website.
- $Totb/y$: "Total government debt, % of GDP." Total government debt refers to the sum of both internal debt and foreign external debt issued by the government. Series obtained from the IMF.
- TB: is 'Net exports of goods services, % of GDP." It is the value of goods and services exported or sold abroad minus those that are imported or bought abroad. Net exports = exports - imports and $TB = \frac{X-I}{y}$. Variable expressed as a percentage of GDP. Built from NIPA.
- y: is "Real GDP, USD (2010 prices)."

Average values of private and public consumption to GDP, total debt to GDP, and tax revenues to GDP are displayed in Table 5

Table 5: Auxiliary Moments by Economic Group

Moment	Developed	Emerging
Means		
c/Y (%)	53.6	61.5
g/Y (%)	19.7	14.2
b/Y (%)	65.9	60.0
tax (%)	38.7	24.8
Cyclicality		
ρ(g,y)	0.37	0.56
ρ(c,y)	0.86	0.94
ρ(PB/y,y)	0.28	0.04

A.3.2 Variable Manipulations

Series are available from 1990 to 2022, although this is an unbalanced panel. We discard all the countries for which we have less than 22 observations in all variables except taxes (the series tends to have few observations for this variable). The list of countries in our sample satisfying the criteria can be found in Tables 1 and 2 of the Online Appendix.

We log-linearize: real GDP y, real private consumption c, and real public consumption g. That is, for each country, we regress $\ln y$ on time t using $\ln y_{it} = \alpha + \beta t + \epsilon_{it}$. Using the estimated parameters $\hat{\alpha}$ and $\hat{\beta}$, we compute the residual $\hat{\epsilon}_{it} = \ln y_{it} - \hat{\alpha} - \hat{\beta} t$ and this is our de-tended measure for GDP. The same method

is used to de-trend private and public consumption. We use the resulting series to compute: (i) the standard deviations: $\sigma(g)$, $\sigma(c)$, $\sigma(y)$ and (ii) the cyclicalities $\rho(g, Y)$, $\rho(c, y)$. The fiscal balance FB, the primary balance PB, the debt-to-output ratio b/y, and the trade balance TB are neither logged nor de-trended, as they are expressed as ratios (of output). When calculating their cyclicalities, only the cyclical component of real GDP is used for consistency. The cyclicality $\rho(g, y)$ corresponds to the estimated coefficient $\hat{\beta}$ of the OLS regression: $g_{it} = \alpha + \beta y_{it} + \epsilon_{it}$ (where g and y are log-linearized). Cyclicalities for all other variables are computed analogously.

B Theoretical Details

The policy proposal $\Phi(\Omega)$ depends on whether the government has access to capital markets $\Omega = 1$ or it is excluded from them, $\Omega = 0$. More specifically, $\Phi(1) = \{\tau, g, b', d, f_1, f_2, ..., f_n\}$ and $\Phi(0) = \{\tau, g, f_1, f_2, ..., f_n\}$, with $b' = 0$ and $d = 1$ when $\Omega = 0$. As explained in the main text, the proposer delivers the same amount of political favors f to each member of the mwc and the remaining f_p to him or herself. Policy Φ yields welfare $V^P(\Pi, \Phi)$ to the proposer, $V^I(\Pi, \Phi)$ to members of the mwc and, $V^O(\Pi, \Phi)$ to those outside of it.

B.1 The proposer problem

In round k, the proposer chooses Φ^k to maximize

$$\begin{aligned} &\max_{\Phi^k} V^{Pk}(\Pi, \Phi^k) \equiv U\Big(c(\mathbf{s}, \Phi^k), l(\mathbf{s}, \Phi^k), g\Big) + \frac{f_p}{\phi} + \beta\, \mathbb{E}_{\mathbf{s}'}\, J(\Pi', \Phi'|\Phi^k) \\ \text{s.t.} \quad &V^{Ik}(\Pi, \Phi^k) \geq J^{k+1}(\Pi, \Phi^{k+1}) \\ &f_p = B(\Pi, \Phi^k) - (m-1)f \geq 0 \\ &\tau, g, f \geq 0. \end{aligned} \tag{B.1}$$

The first constraint is an incentive compatibility constraint (IC) stating that the value of accepting the proposal for members of the mwc, $V^{Ik}(\Pi, \Phi^k)$, must be at least as large as the value of rejecting it, $J^{k+1}(\Pi, \Phi^{k+1})$. The second condition ensures the feasibility of government policies, requiring that the budget balance excluding favors is sufficient to cover the cost of providing political favors to the coalition members. Favors must be non-negative. The expected future value in the following period is $J(\Pi', \Phi'|\Phi^k)$, conditional on the current proposal being accepted.

We define the objects in the IC constraint next. Since members of the mwc obtain f in political favors,

$$V^{Ik}(\Pi, \Phi^k) = U\Big(c(\mathbf{s}, \Phi^k), l(\mathbf{s}, \Phi^k), g\Big) + \frac{f}{\phi} + \beta\, \mathbb{E}_{\mathbf{s}'}\, J(\Pi', \Phi'|\Phi^k)$$

when a proposal is accepted. If the proposal is rejected, we move to round $k+1$ where a new proposer is elected with probability $\frac{1}{n}$. If the member of the current minimum winning coalition mwc_k becomes a proposer in $k+1$, he/she will receive $V^{Pk+1}(\Pi, \Phi^{k+1})$. Note that the states do not change, as all proposal

rounds happen within a period. With probability $\frac{m-1}{n}$, a member of mwc_k belongs to mwc_{k+1}, in which case they get $V^{Ik+1}(\Pi, \Phi^{k+1})$. With probability $\frac{n-m}{n}$ a member of mwc_k is not in mwc_{k+1}, which delivers $V^{Ok+1}(\Pi, \Phi^{k+1})$. Recall that anyone outside of the mwc obtains

$$V^{Ok}(\Pi, \Phi^k) = U\Big(c(\mathbf{s}, \Phi^k), l(\mathbf{s}, \Phi^k), g\Big) + \beta\, \mathbb{E}_{\mathbf{s}'}\, J(\Pi', \Phi'|\Phi^k),$$

as in that case $f_i = 0$. The continuation value of rejecting a proposal to any member of the current mwc, $J^{k+1}(\Pi, \Phi^{k+1})$, is computed by taking expectations over these three possibilities.

$$J^{k+1}(\Pi, \Phi^{k+1}) = \frac{1}{n}\, V^{P,k+1}(\Pi, \Phi^{k+1}) + \frac{m-1}{n}\, V^{I,k+1}(\Pi, \Phi^{k+1}) + \frac{m-n}{n}\, V^{O,k+1}(\Pi, \Phi^{k+1}). \quad \text{(B.2)}$$

Re-arranging the expression above,

$$J^{k+1}(\Pi, \Phi^{k+1}) = U\Big(c(\mathbf{s}, \Phi^{k+1}), l(\mathbf{s}, \Phi^{k+1}), g^{k+1}\Big) + \frac{B(\Pi, \Phi^{k+1})}{\phi n} + \beta\, \mathbb{E}_{\mathbf{s}'}\, J(\Pi'|\Phi^{k+1}). \quad \text{(B.3)}$$

where Φ^{k+1} is the optimal policy of the next round's proposer (given any continuation value).

B.2 Simplified problem

The proposer will choose Φ^k such that the IC constraint holds with equality, $V^{Ik}(\Pi, \Phi^k) = J^{k+1}(\Pi, \Phi^{k+1})$. This implies political favors f satisfy

$$\frac{f}{\phi} = J^{k+1}(\Pi, \Phi^{k+1}) - U\Big(c(\mathbf{s}, \Phi^k), l(\mathbf{s}, \Phi^k), g\Big) - \beta\, \mathbb{E}_{\mathbf{s}'}\, J(\Pi', \Phi'|\Phi^k).$$

Replacing this in the definition of f_p (see B.1), we obtain

$$f_p = B(\Pi, \Phi^k) - (m-1)\phi\left[J^{k+1}(\Pi, \Phi^{k+1}) - U\Big(c(\Pi, \Phi^k), l(\Pi, \Phi^k), g\Big) - \beta\, \mathbb{E}_{\mathbf{s}'}\, J(\Pi', \Phi'|\Phi^k)\right]$$

substituting f_p in $V^{Pk}(\Pi, \Phi^k)$, we can write the objective function as

$$\max_{\Phi^k}\, U\Big(c(\mathbf{s}, \Phi^k), l(\mathbf{s}, \Phi^k), g\Big) + \frac{B(\Pi, \Phi^k)}{\phi m} + \beta\, \mathbb{E}_{\mathbf{s}'}\, J(\Pi', \Phi'|\Phi^k).$$

Note that we dropped $J^{k+1}(\Pi, \Phi^{k+1})$ from the expression. This is possible because it is unaffected by Φ^k, so it can be considered a constant for the optimization problem above.

On the equilibrium path, proposal rounds $2, ..., T$ does not occur. This reflects the assumption that any coalition member accepts a policy mix that ensures that he/she is weakly better off than waiting for the next round. We can thus write the proposer's problem omitting k. Moreover, since $c(.)$, $l(.)$, and $B(.)$ are independent of f, the only policy variables to be determined in the problem above are—with a slight abuse

of notation—, $\Phi(1) = \{\tau, g, b', d\}$ when the government has access to credit markets and $\Phi(0) = \{\tau, g\}$ otherwise. The proposer problem becomes

$$\begin{aligned} \max_{\Phi} \; & U\Big(c(\mathbf{s}, \Phi), l(\mathbf{s}, \Phi), g\Big) + \frac{B(\Pi, \Phi)}{\phi m} + \beta \mathbb{E}_{\mathbf{s}'} J(\Pi') \\ \text{s.t.} \quad & B(\Pi, \Phi) \geq 0, \end{aligned} \tag{B.4}$$

with

$$J(\Pi') = U\Big(c(\mathbf{s}', \Phi'(\Pi')), l(\mathbf{s}', \Phi'(\Pi')), g'\Big) + \frac{B(\Pi', \Phi'(\Pi'))}{\phi n} + \beta \, \mathbb{E}_{\mathbf{s}''} \, J(\Pi''). \tag{B.5}$$

where $\Phi'(\Pi')$ denotes next period's political *Markov Perfect equilibrium* outcomes. Up to this point, we have not mentioned anything about the continuation values. The derivation of $J(\Pi')$ is similar to that of $J^{k+1}(\Pi, \Phi^{k+1})$. In the next period, the proposer retains proposal power with probability $\frac{1}{n}$, obtaining welfare $V^P(\Pi', \Phi'(\Pi'))$. With probability $\frac{m-1}{n}$, it will be a member of next period's mwc, receiving $V^I(\Pi', \Phi'(\Pi'))$. With probability $\frac{n-m}{n}$ the current proposer is not in tomorrow's mwc, which delivers $V^O(\Pi', \Phi'(\Pi'))$. The proposer calculates $J(\Pi')$ as the expected value of $V^P(\Pi', \Phi'(\Pi'))$, $V^I(\Pi', \Phi'(\Pi'))$, and $V^O(\Pi', \Phi'(\Pi'))$.

C Extensions

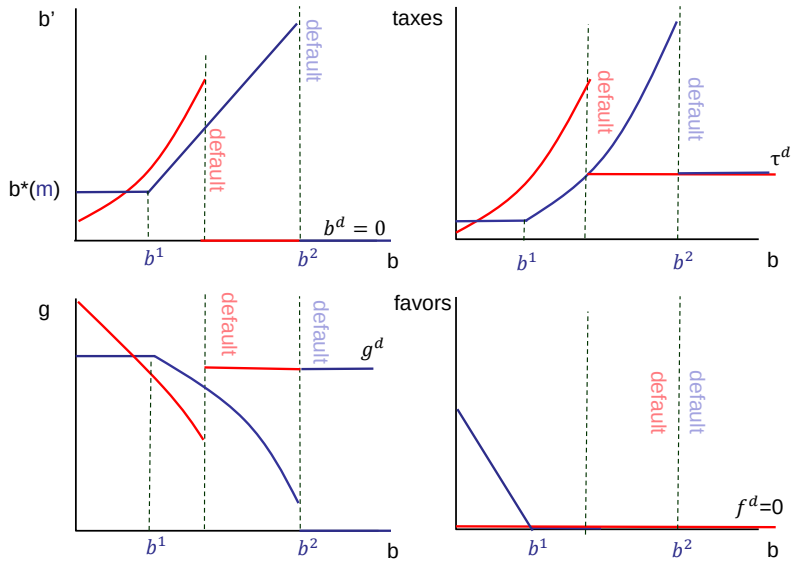
C.1 Low β case

The sovereign default literature typically assumes that the government is significantly more impatient than foreign lenders, imposing $\beta(1 + r) < 1$. Without this assumption, the government would not borrow in the long run and default would never happen in equilibrium. Since r is a fixed risk-free rate, this restrictive assumption often requires the value of β to be unusually low. In our model, institutional weakness and corruption make the government *endogenously* impatient. As a result, we do not need restrictions on β, which can take a standard value in macro (including $\beta(1+r) = 1$). In this section, we compare our baseline political-economy model against the standard sovereign default model with an impatient benevolent planner, which we will refer to as the 'low β' case, evaluating their similarities and differences.

The competitive equilibrium given policy is the same in both environments because the domestic private sector and international capital markets are identical. The government budget constraint is also the same, as we consider identical policy instruments in both cases. The only difference lies in the maximization problem of the policymaker. In our benchmark model, the proposer's problem is given by eq. (6). The maximization problem of the planner in the 'low β' case is, instead,

$$\begin{aligned} J(\Pi) = \quad & \max_{\Phi} U\Big(c(\mathbf{s}, \Phi), l(\mathbf{s}, \Phi), g\Big) + \frac{B(\Pi, \Phi)}{\phi n} + \beta_L \mathbb{E}_{\mathbf{s}'} \, J(\Pi') \\ \text{s.t.} \quad & B(\Pi, \Phi) \geq 0, \end{aligned} \tag{C.1}$$

Figure 16: Policy functions, benchmark (blue) vs 'low β' (red)



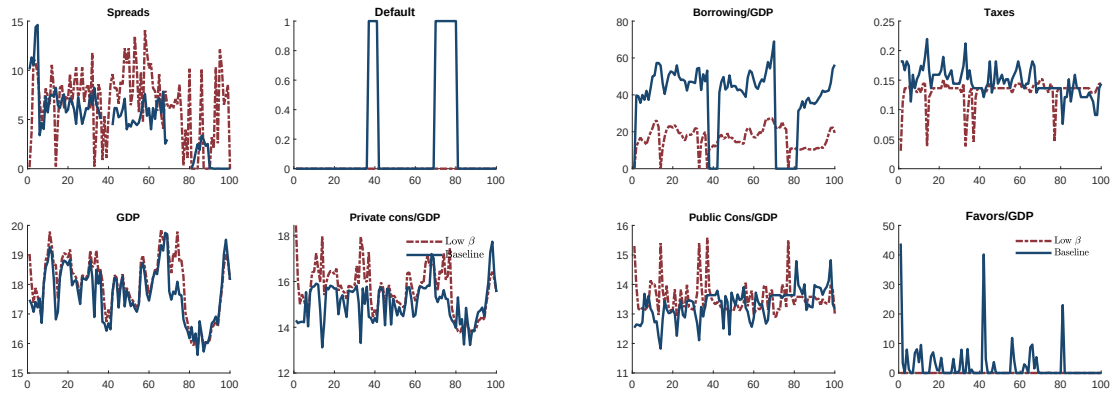
There are two main differences: First, if the planner chooses to give out political favors $B(\Pi, \Phi) > 0$, these need to be distributed among all groups (so there is an 'n' instead of an 'm' in the denominator). Second, the discount factor of the policymaker is β_L, lower than that of the lenders and domestic economic agents, β. Even though we have included the corruption parameter, this takes the value of $\phi = 1$ in the benchmark calibration in both cases.

Because in the 'low β' case $m = n$ (by construction), $f_i = 0$ for all states of the world: a benevolent planner does not find it optimal to distort the economy to engage in corrupt public practices, regardless of how impatient it may be. As a result, $B = 0$ and we are in Case 2 of Section 3.4. Additionally, when the country is in default, $b = b' = 0$, implying that the choices of τ and g are independent of β_L. The first-order conditions are also independent of m, implying that, in default, taxes and public good provision are the same regardless of whether we are in the benchmark economy or the 'low β' case. Figure 16 illustrates this point. In that figure, the benchmark case is depicted in blue whereas the 'low β' case is shown in red.

Things are different when the government has access to international capital markets. While it is still the case that there is no revenue devoted to political favors $B = 0$, the government is more impatient. This will yield a steeper debt accumulation profile and default at a value of debt smaller than b_2. In equilibrium, this will result in lower levels of sustainable debt as there is no additional incentive to defer default and enjoy favors; that is the reason behind the inability to match spreads and debt/GDP ratio in those models. In our benchmark economy, for low levels of debt, there is a jump in b' but then a flatter borrowing profile for intermediate levels of debt. This allows the government to borrow more before a default is triggered. As a result, our model delivers higher debt/GDP ratios for similar spreads, making it easier to match the data.

To understand this further, we simulated both economies for a finite number of periods. For the 'low-β' model (red dashed line) we set the value of β to 0.82 to match the average value of spreads in the benchmark.

Figure 17: Endogenous variables compared to a low-β economy



The initial debt for both economies is set to 0. We plot the time series of both economies for the same realizations of the TFP shocks in Figure 17. The one for the baseline model is the blue solid line.

There is a stark difference between the two economies. The baseline model borrowing immediately jumps to 60% of debt-GDP in period 1. The other one also rises, but at a much slower rate, and never reaches the level achieved by the benchmark economy. Since spreads are the same on average, higher debt in the benchmark economy requires higher taxes to repay the debt, as shown in Figure **??**. Higher taxes also imply lower GDP and lower private and public consumption. They are also lower in the benchmark as a share of GDP because of positive favors paid out. In the 'low-β' economy favors are zero by construction. Although default probabilities are the same in the two models by construction, our simulation generates two default events for the baseline economy. These are defaults due to political shocks that are absent in a 'low-β' economy.

Long-run moments associated with the low β case are displayed in the second column of Table 6 (the first column shows the results for the benchmark economy). The 'low-β' model sustains a lower level of debt than the baseline economy, even though the average spreads are the same. This implies that at higher levels of debt, the bond prices for the 'low-β' economy are lower, indicating a steeper bond price schedule. The subjective discount factor, therefore, has a sharper impact on spreads compared to m. This explains why in models of short-term debt and no possibility of political favors, it is difficult to match debt and spreads simultaneously to the data. This difference in the slope of the bond price schedule is because, in models with favors, curvature on the utility function makes favors easier to cut in a recession than increase taxes. If there are no favors, taxes need to be raised or there has to be a default to smooth consumption.

C.2 Autocracies: the case of China

In our model, the number of groups with veto power m (e.g. in the mwc) affects not only how tempting it is to engage in corrupt public practices but also the probability of being in the mwc in the future. As m declines, the proposer becomes naturally more impatient, as this reduces the likelihood of getting f_i next

Table 6: Long-run moments: Model Extensions

Moment	Benchmark	Low β	Autocracy
Institutions			
R&A (mean)	4.77	20	1
Instability (St Dev)	0.78	0	0
Favors/GDP (mean)	4.58%	0	35.58%
Impatience β	0.99	0.74	0.99
Fiscal Policy			
Spreads	7.11%	7.00%	0.004%
μ(tax)	17.69%	13.67%	43.2%
μ(g/Y)	13.1%	13.5%	7.2%
σ(tax)	0.044	0.023	0.018
σ(g)/σ(y)	1.48	1.67	0
μ(b/Y)	50.1%	21.7%	65.2%
ρ(TB,y)	-0.37	-0.65	-0.35
ρ(FB,y)	-0.31	-0.58	-0.34
Macro Outcomes			
Sp. Crisis	9.85%	40.1%	3.59%
σ(y)	3.34%	4.04%	2.70%
σ(c)/σ(y)	1.29	1.48	0.46

period. While we interpret the case of $m = 1$ as an autocracy, there are examples in which a group remains in power for long periods (e.g. China). In such a case, the proposer does not need to engage other groups to implement policies and also knows that it will likely be in power for a long period. To study such an environment, which is not covered in the main text, we simulated our economy assuming $m = 1$, but also that the one group in power will be in power forever. That is, there is full persistence. We understand this is unrealistic, but it could give us insights into how intermediate but highly persistent cases would work. This case also explains how the political frictions in this paper are different from turnovers.

The third column on Table 6 displays the results. The first thing to note is that a significant part of the budget is devoted to political favors, which reach a whooping 35% of GDP (versus 5% in the benchmark case). Because the autocrat is endogenously more patient (e.g. there is no risk of losing power), default risk is practically zero. This allows the government to better smooth taxes and public good provision, and sustain a higher level of debt to GDP. The volatility of output and consumption is also smaller. The autocrat can implement tax-smoothing policies but at the cost of frequently engaging in corrupt public practices.