The Politics of Debt in the Era of Rising Rates

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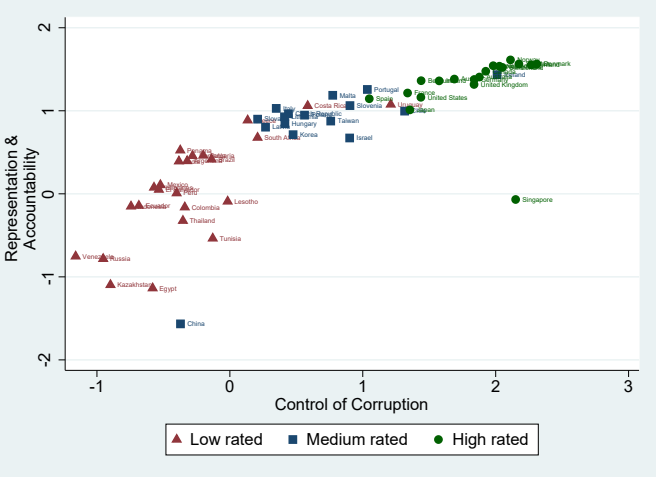
[a]Views expressed are those of the authors and do not reflect views of the FRB Richmond or CAFRAL.

This paper

Understand how **time-varying risk-free rates** r impact near-term sovereign debt management and default decisions in EMs.

- Political landscape affects the response to rising rates and associated default risk.
- We address two questions:
  1. How do rising rates affect EM when there is scope for corruption in countries with weak institutions?
  2. How do International Financial Institutions (IFIs) short-term lending programs affect these dynamics?

The Politics of Debt

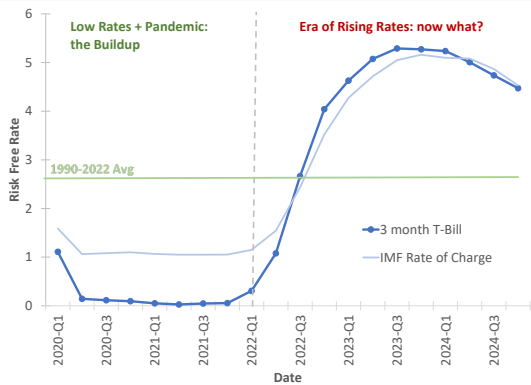


- Countries with stronger institutions default less (better Fitch ratings).

Risk free rates

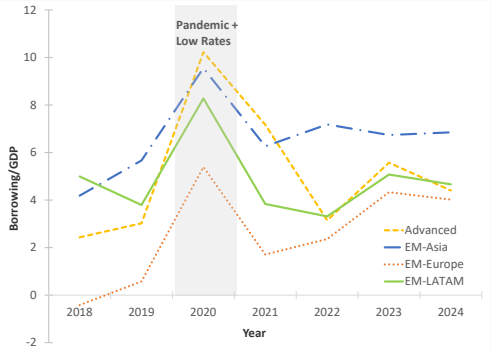
Back

- EMs' borrowing rates depend on risk free rate r.



- Unusually low during Pandemic $\Rightarrow$ cheap access to credit.

Borrowing



- Pandemic + Low rates => large borrowing/GDP in EM.

Debt pre and post Pandemic

Country	2022 Debt/GDP	Long Run (90-22)
Argentina	86	57
Brazil	73	61
Chile	32	16
Colombia	57	37
Costa Rica	70	50
Ecuador	51	44
El Salvador	75	58
Greece	172	151
India	87	75
Korea	55	36
Mexico	50	32
Portugal	119	100
Thailand	55	32
Uruguay	71	68

- By 2022, when $r \uparrow$, EMs were highly indebted $\Rightarrow$ sustainable?

Environment I

- Quantitative, infinite horizon model (Azzimonti-Mitra, 2023).
- **Het. Agents** in n symmetric groups (regions, industries, castes, ethnic/religious/interest groups)

$$u(c, l, g) + \pi_i$$

  - Public good g, private consumption c, leisure $1 - l$.
  - Piece of 'the pie'

    π_i: political favors,targeted public goods (bridges to nowhere), pork, exemptions, nepotism, bribes $\rightsquigarrow$ corruption.

- No access to international capital mkts $c_t = (1 - \tau_t) w_t l_t$.

Environment II

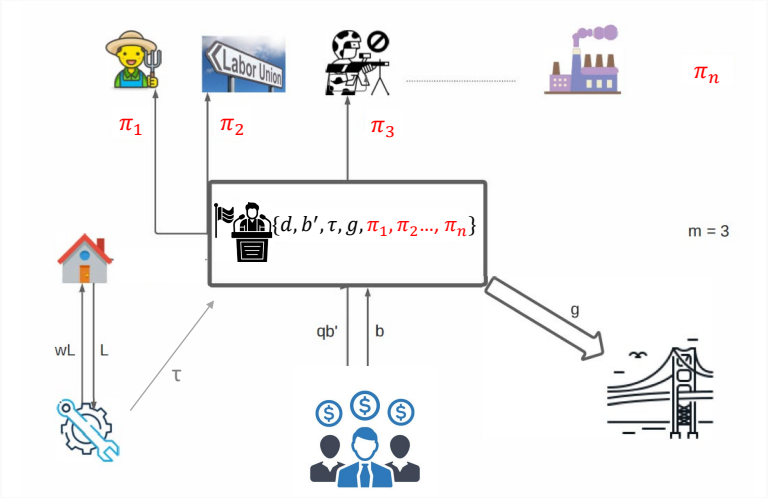
- **Firms**: competitive $f(z_t, l_t)$
- **Government**: can default, $d_t = 1$

$$Rev(\tau_t) + (1 - d_t)\Big[q_t b_{t+1} - b_t\Big] \geq g_t + \underbrace{\sum_i \pi_{i,t}}_{\text{the pie}},$$

- **International lenders**: as in Arellano (2008). Details
- **Risk-free rates** $R_t = \{r_t, r_{t+1}, ...\}$ are time-varying and deterministic
  $=>$ affect bond prices.

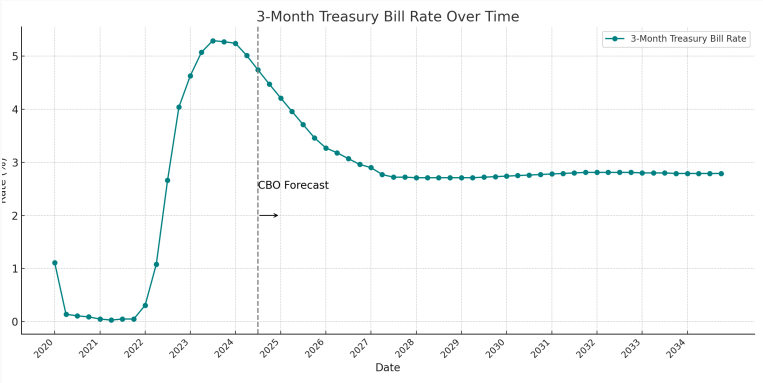
Model - Big picture

Bargaining protocol | Optimization



Interest Rate Path

- Most of the sovereign default literature assumes a constant risk free rate.
- We consider this trajectory instead:



Risk-free rate (3-month T-Bill, CBO forecast).

Long run

Policy Functions

- Long run $\bar{r}$ constant.
- Calibrated to Argentina. Calibration Details

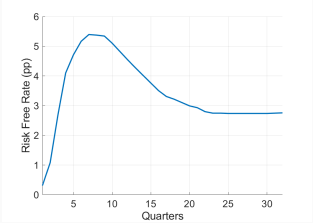
Moment	Benchmark $m < n$	Planner $m = n$
$\mu\left(\frac{\text{Debt}}{\text{y}}\right)$	53%	18.3%
$\rho(\frac{\text{TB}}{\text{y}}, \text{y})$	-0.57	0.55
μ(Favors/y)	4.5%	$= 0$
Spreads	6.7%	$\simeq 0$
Rate of Default	3.6 %	$\simeq 0$
Periods in Default	24 %	$\simeq 0$

- Politics ($m < n$) => over-borrowing, pro-cyclical debt, frequent defaults, and high spreads.

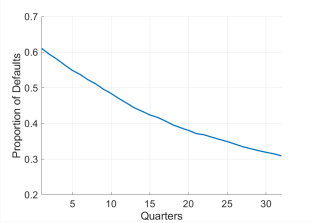
Medium term simulation (40 quarters)

- Assumptions:
  - Start in 2022:Q1.
  - High initial debt/GDP=64%.
  - r_t follows CBO, converges to $\bar{r}$.
- Caution: z_t persistent, one simulation over medium term can be misleading.
- Monte Carlo Simulation: draw 1,000 different paths for z_t, keep last 40 quarters.
- Report per-period avgs for those 1000 plausible cases.

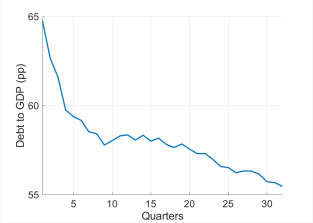
Medium term debt management



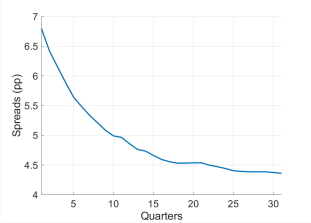
(a) Risk free interest rate



(b) Frequency of Default



(c) Debt to output ratio



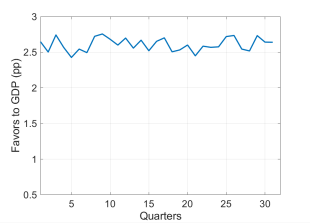
(d) Spreads

Medium term debt management, cont

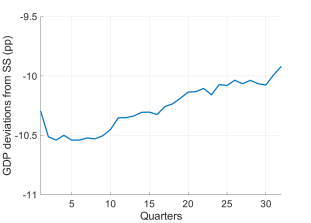
- Pandemic + low-rate period built up debt/GDP to unsustainable levels.
- Facing rising rates
  - 60% of EMs default in 2022:Q1 (bad and medium TFP shocks).
  - 40% of EMs implement steep austerity measures (really good TFP shocks).
- Spreads go down because of 'survivor bias'.

The party goes on

- Politicians adjust by either: (i) defaulting or (ii) imposing stiff austerity measures (high taxes).



(a) The Pie



(b) GDP Deviations from SS

- But the pie doesn't shrink...non-defaulters cut down everything but corruption. Plots
- Painful GDP losses.

International Financial Institutions (IFIs)

IMF programs

THE EXTENDED FUND FACILITY (EFF)

ENGLISH

The Extended Fund Facility (EFF) provides financial assistance to countries facing serious medium-term balance of payments problems because of structural weakn time to address. To help countries implement medium-term structural reforms, the EFF offers longer program engagement and a longer repayment period.

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Purpose	Provide assistance to countries experiencing serious payment imbalances because of structural impediments or slow growth and an inherently weak balance-of-payments position.
	Support comprehensive programs with a focus on policies needed to correct structural imbalances over an extended period.
Eligibility	All member countries facing actual or potential external financing needs. Most often used by advanced and emerging market countries, but low-income countries sometimes use the EFF together with the Extended Credit Facility (ECF).
Conditionality	Countries' policy commitments expected to focus on structural reforms to address institutional or economic weaknesses, in addition to policies to maintain macroeconomic stability.
	Disbursements conditional on the observance of quantitative performance criteria. Progress in

IMF lending

- 5 year IMF program (20 quarters).
- GBC becomes

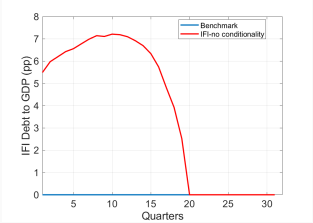
$$Rev(\tau_t) + (1 - d_t)\Big[q_t b_{t+1} - b_t\Big] + q_{I,t} b_{I,t+1} - b_{I,t} \geq g_t + \sum_i \pi_{i,t}.$$

- Cost of borrowing from IMF: Details
  - A base lending rate, similar to the risk-free rate.
  - Plus a *surcharge* that depends on the size of the loan. Plot
  - Following Boz (2011),

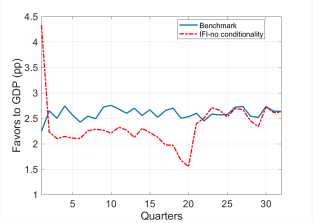
$$q_{I,t}(b_{I,t+1}) = \frac{1}{1 + r_t + \phi(b_{I,t+1})}$$

Note: No commitment in repaying $q_{I,t}$ b/c IMF's preferag-red cag-reditor status + major EMs almost always repaid (Boz, 2011).

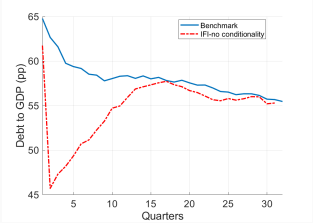
Debt Management w/ IFI program (no conditionality) Plots



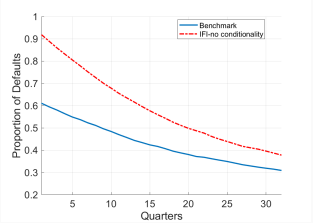
(a) IFI debt



(b) The Pie



(c) Private Debt



(d) Frequency of Default

Moral Hazard under No Conditionality

- IFI debt cheaper if country is near-default (high spreads) => should prevent default.
- **No conditionality**: politicians borrow up to 6% of GDP and throw a party...Corruption ↑
- Moral hazard: IFI debt available in default.
  - Default in 90% scenarios.
  - Lucky EMs don't implement austerity programs.

Conditionality

How does the IMF assess conditionality?

Most IMF financing is paid out in installments and linked to demonstrable policy actions. Policy commitments can take different forms. They include:

Prior actions

These are steps a country agrees to take before the IMF approves financing or completes a review. They ensure that a program will have the necessary foundation for success.

Examples
Fiscal revenue measures
Clearance of external arrears
Governance reform

Indicative targets

Indicative targets, which are flexible numerical trackers, may be set for quantitative indicators to help monitor progress in meeting a program's objectives. Heightened uncertainty and limited capacity may justify greater use of indicative targets under certain circumstances. As uncertainty is reduced, these targets may become QPCs, with appropriate modifications.

Examples
Ceiling on the general government wage bill
Ceiling on domestic arrears
Ceiling on government borrowing from the central bank

Structural benchmarks

These are reform measures that often cannot be quantified but are critical for achieving program goals and used as markers to assess program implementation.

Examples
Strengthen tax administration
Improve fiscal transparency
Improve anti-corruption and rule of law
Reform State-Owned Enterprises (SOEs) and their governance

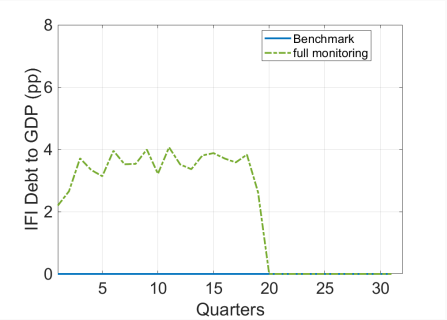
The IMF Executive Board conducts periodic program reviews to assess whether the program is on track or needs to be adjusted in light of new developments. If a country misses a QPC condition, the IMF Executive Board may approve a waiver if

IFI program with conditionality

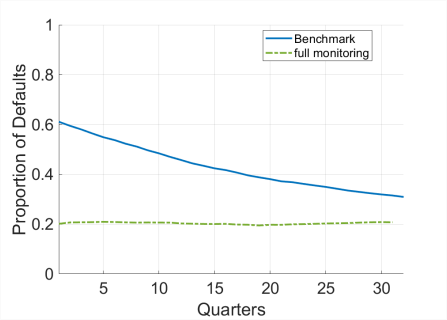
- Several papers studied IMF lending with conditionality rules.
  - debt ceilings, upper bounds on government spending, borrowing limits, etc.
- This paper: the root of the problem is corruption.
- Focus on the effect of *governance reforms* or anti-corruption efforts.
  - Could be implemented via monitoring.
- If country wants to borrow from IMF, its politicians cannot eat 'the pie'
  - Perfect monitoring: $b_{I,t+1} > 0 \Rightarrow \Pi = 0$.
  - Imperfect monitoring: $b_{I,t+1} > 0 \Rightarrow (1-\kappa)\Pi$, with κ prob of being caught.

IFI program with full monitoring

Two Shocks



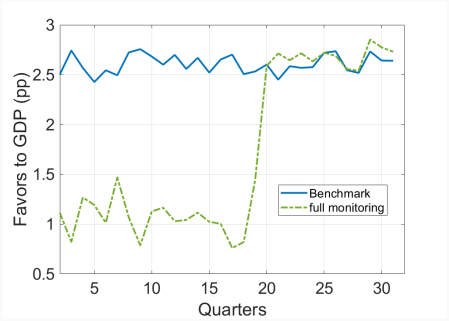
(a) IMF Debt



(b) Defaults

- VERY effective in reducing defaults: w/ small IFI loans (<4% of GDP).
- Monitoring prices out lucky EMs (separating equilibrium).

IFI program with full monitoring



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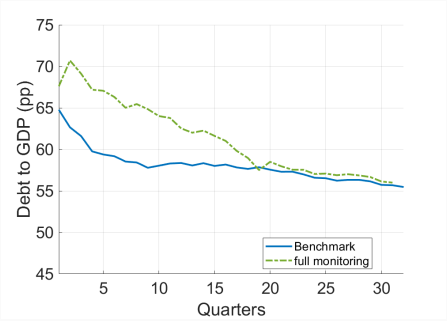
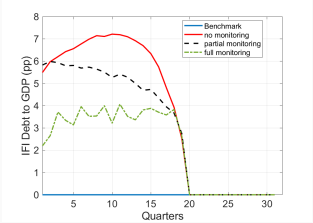


(b) Private Debt

- Moral hazard remains:
  - Program $\downarrow$ spreads, private debt is cheaper $\Rightarrow$ higher borrowing capacity.
  - Seeding the seeds for recurrent users of the program!

IMF program with imperfect monitoring



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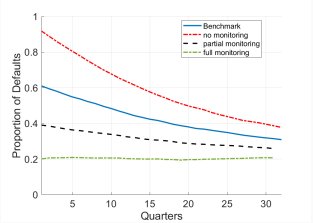
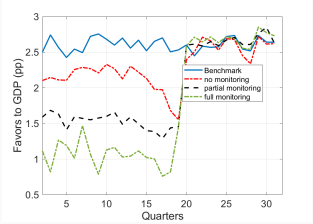
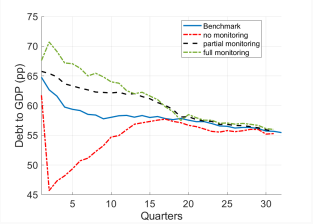


(b) Frequency of Default



(c) The Pie



(d) Private Debt

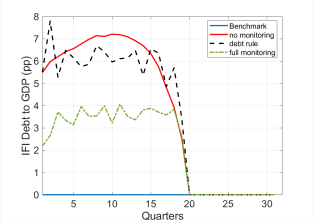
Quantitative Performance Criteria: Debt Ceiling Rule

$$\text{IFI Conditionality:} \quad \frac{b_{t+1}}{y_t} \leq \max\left\{0.95\frac{b_t}{y_t}, \frac{\bar{b}}{\bar{y}}\right\} \quad \text{if} \quad b_{I,t+1} > 0,$$

- Austerity condition: $\downarrow$ debt/GDP by 5% until reaching long-run debt/GDP.
- Politician can't increase debt if borrowing from IFI

  $=>$ indirectly limits corruption spending.

Debt Ceiling Rule



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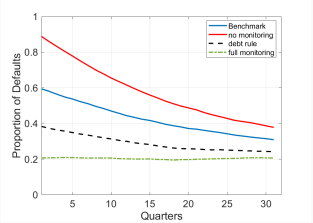
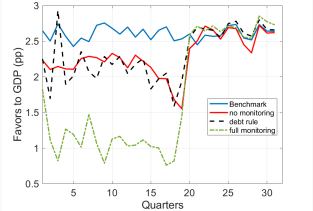
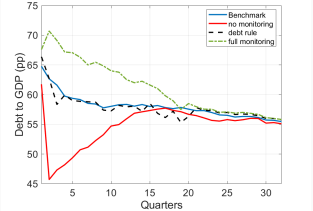


(b) Frequency of Default

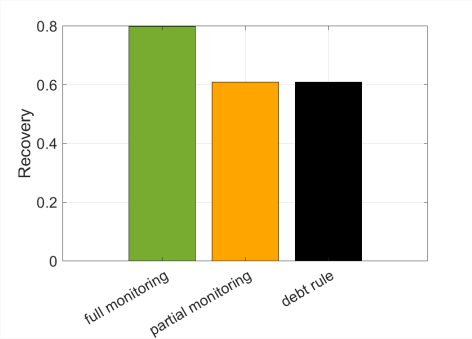


(c) The Pie

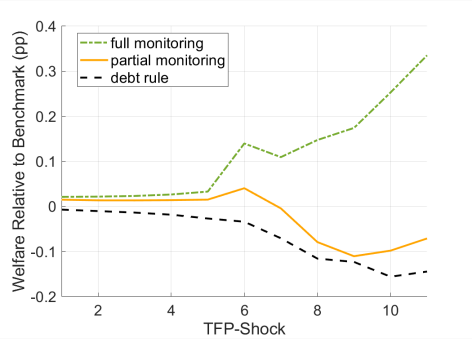


(d) Private Debt

Which conditionality rule is better? Full monitoring!



(a) International Investors: Recovery



(b) EM Citizens: Welfare Gains

- International investors indifferent between partial monitoring and debt ceiling.
- EM citizens prefer curbing corruption!

Conclusion

- The politics of debt: EMs w/ weak institutions engage in corruption, over-borrow, default too often.
- The era of rising rates, doomed to default or face stiff austerity programs, but no fundamental decrease in corruption spending.
- IFI lending programs provide short-term relief, but can exacerbate this problem by offering an attractive outside option.
- **Conditionality**: full monitoring is best. If unavailable,
  - International investors indifferent ($\sim\downarrow$ default).
  - Citizens prefer imperfect monitoring. Debt ceilings impacts average citizen, monitoring the average political elites (*mwc*).

Moving forward

- Calibrate to other EMs.
- Consider other rules: public spending limits, deficit ceilings, cyclical bounds.
- Uncertainty about r_t path.
- Long run effects of IFI lending with conditionality rules.
- Long-term debt.

Proposer's Problem in Round k

Continuation Values Back

- Proposer's problem

$$\max_{\Phi_t} V_t^P(\mathbf{s}_t, \Phi_t) \equiv U\Big(c_t^*, l_t^*, g_t\Big) + \pi_{p,t} + \beta\, \mathbb{E}_{\mathbf{s}_{t+1}} J_{t+1}(\mathbf{s}_{t+1}, \Phi_{t+1} | \Phi_t)$$

s.t.

$$V_t^I(\mathbf{s}_t, \Phi_t) \geq J_t^{k+1}(\mathbf{s}_t, \Phi_t^{k+1})$$

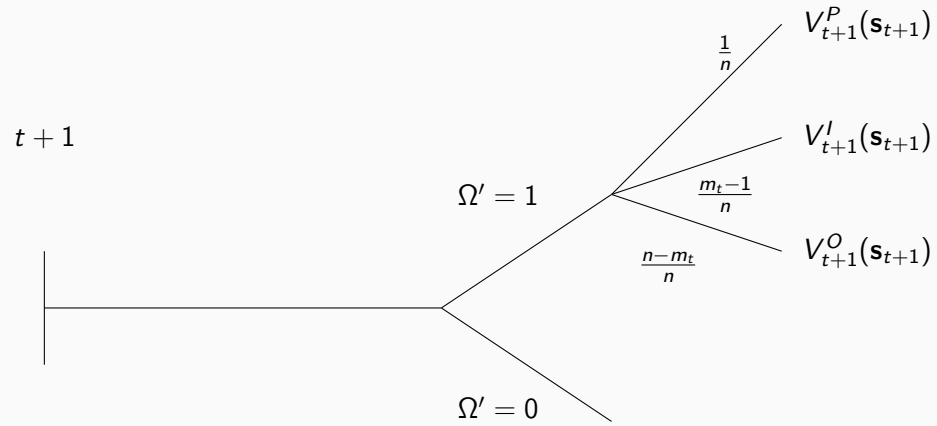
$$\pi_{p,t} = \Pi_t - (m_t - 1)\pi_t \geq 0$$

$$\tau_t, g_t, \pi_t \geq 0.$$

- In the *mwc*

$$V_t^I(\mathbf{s}_t, \Phi_t) = U\Big(c_t^*, l_t^*, g_t\Big) + \pi_t + \beta\, \mathbb{E}_{\mathbf{s}_{t+1}} J_{t+1}(\mathbf{s}_{t+1}, \Phi_{t+1} | \Phi_t)$$

Determination of $J_{t+1}(\mathbf{s}_{t+1})$ Back



$$J_{t+1} = \frac{1}{n}\, V^P_{t+1} + \frac{m_t - 1}{n}\, V^I_{t+1} + \frac{m_t - n}{n}\, V^O_{t+1}.$$

Functional Forms

Back

- The utility function specification is GHH

$$U(c, l, g) = \frac{1}{1-\sigma}\left(c - \frac{l^{1+\gamma}}{1+\gamma}\right)^{1-\sigma} + \frac{\eta}{1-\sigma} g^{1-\sigma}.$$

- Default involves a productivity cost of the following form

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

  with $\alpha_1 \geq 0$.

- z and m follows an AR(1) process

$$j_{t+1} = (1 - \zeta_j)\psi_j + \rho j_t + \epsilon^j_{t+1}$$

Model Fit

Back

Moment	Data: Argentina	Benchmark	
$\mu\left(\frac{\text{Debt}}{\text{y}}\right)$	53%	53%	Matched by Construction
$\mu\left(\frac{\text{g}}{\text{y}}\right)$	14%	13%	
$\mu(\text{r} - \text{r}^*)$	7%	6.7%	

IMF Rates Construction

Back

Cost of Borrowing (in Annual Percentage Rates as of March 2024)

Components	Rate of Charge	First Year	Fourth Year
Cost of funding	SDR Rate	4.104%	4.104%
Lending margin	100 basis points	5.104%	5.104%
Burden adjustment	0 basis points, but variable if arrears	5.104%	5.104%
Commitment fee	15–60 basis points, refundable when disbursed	Assuming full disbursement on year 1	
Service fee	50 basis points per disbursement	5.604%	Disbursed in year 1
Size-levied surcharge	200 basis points if >187.5% of quota	7.604%	7.104%
Time-levied surcharge	100 basis points if >3 years (51 months for EFF)	8.604%	8.104%

Source: IMF (2016) and IMF (2024). Based on CEPR (2021).

CEPR

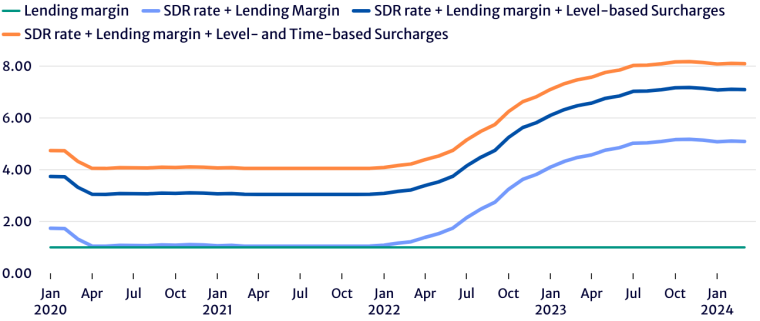
IMF Rates Over Time

Back

Figure 1

IMF Headline Annual Percentage Rate, Monthly Average

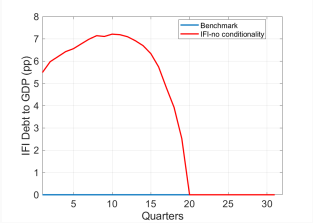
The headline rate is the main component of the regular charges and interest, and it consists of the SDR rate plus the lending margin, fixed at 100 basis points.



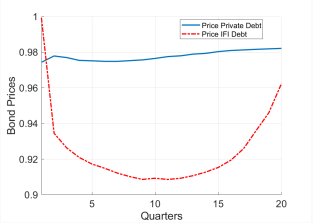
Source: Analysis by the authors based on IMF Finances data.

CEPR

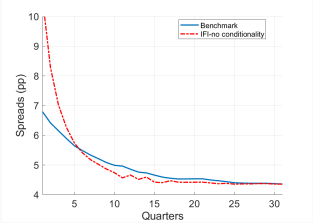
Debt Management w/ IFI program (no conditionality) Back



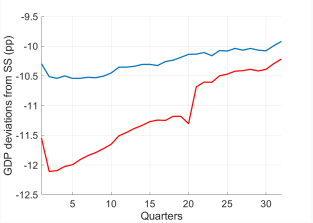
(a) IFI debt



(b) Price of Private and IFI Debt



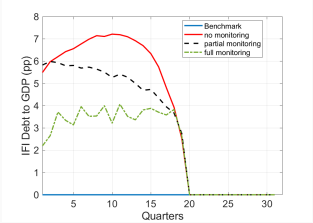
(c) Spreads



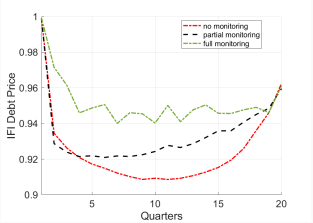
(d) GDP

Debt Management w/ IFI program with conditionality

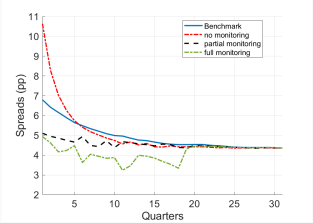
Back



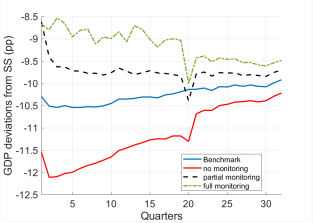
(a) IFI debt



(b) Price of Private and IFI Debt



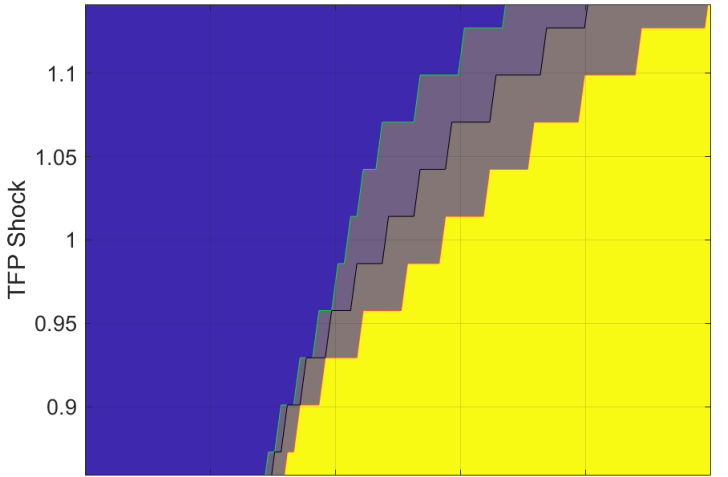
(c) Spreads



(d) GDP

Default Regions

Back



Some facts

Back

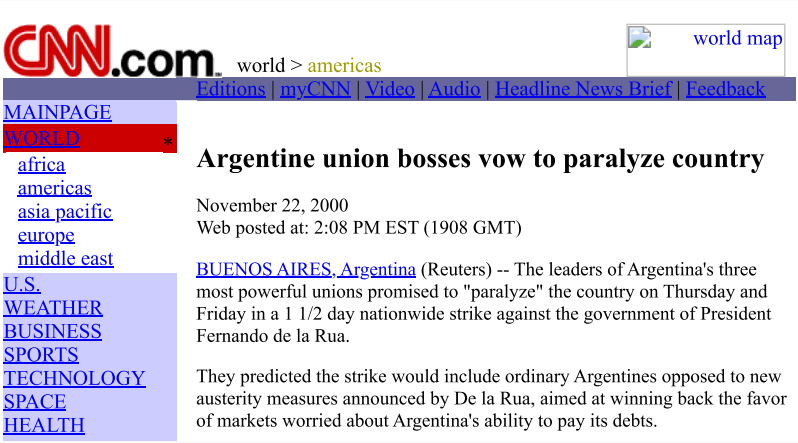
Business Cycle Moments

Moments	Developed (n=30)	Emerging (n=28)
$\rho(PS, y)$	0.3	0.0
$\rho(NX, y)$	0.0	-0.1
$\sigma(y)$	5.0	7.3
$\sigma(c)/\sigma(y)$	1.1	1.2
$\sigma(g)/\sigma(y)$	0.9	1.3
Fitch Ratings	3.8	2.9

- Fiscal policy responses to shocks $\neq$.
  - Emerging economies: don't smooth...

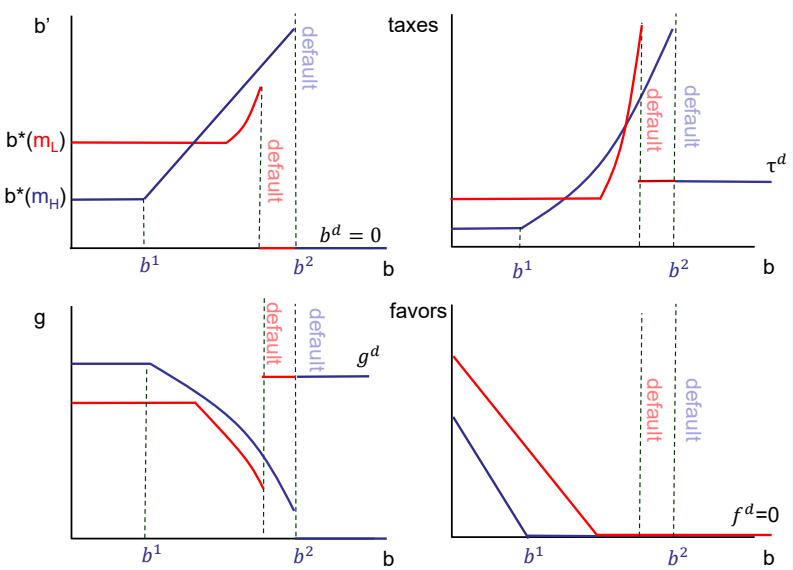
    Pro-cyclical debt $=>$ amplifies the cycle!

Example: Union Leader with Political Influence



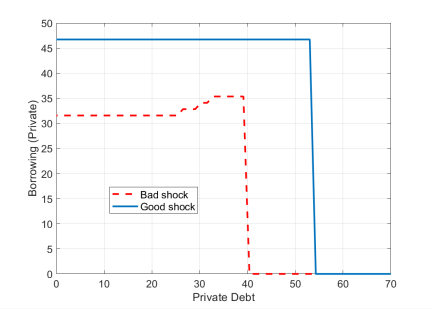
Policy Functions: institutions

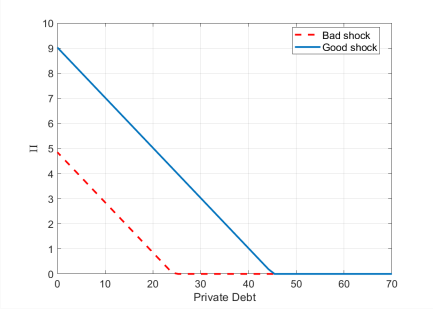
Back



Policy Functions: shocks

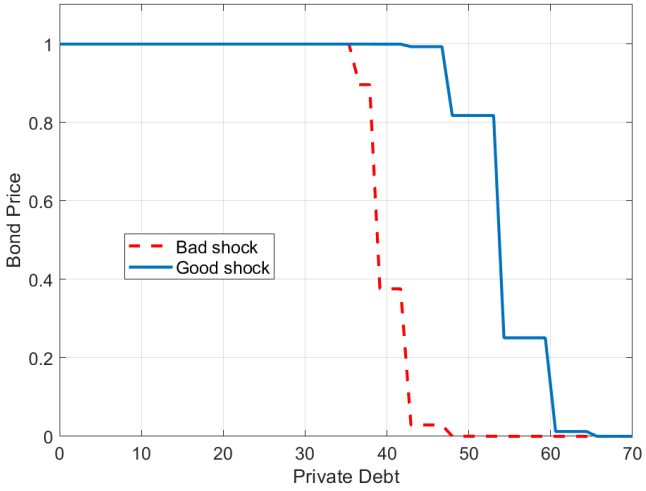
Prices Back





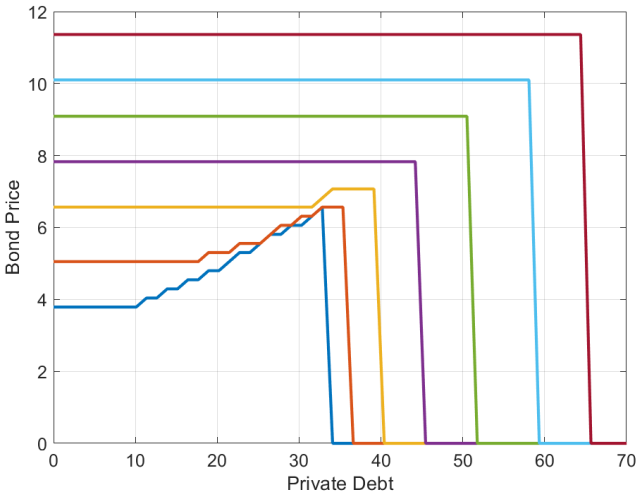
Policy Function - Bond Prices

Back



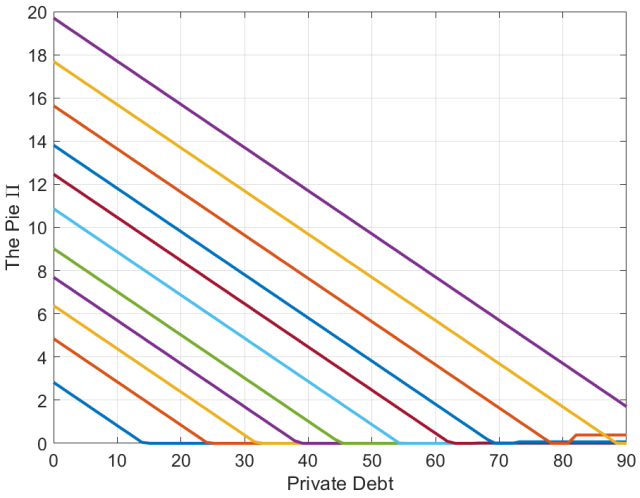
Borrowing Policy Function and TFP

Back



The Pie and TFP

Back



Why does r_t matter? Back

- Risk-free interest rates $R_t = \{r_t, r_{t+1}, ...\}$ are time-varying and deterministic (assume perfect forecast).
- **International lenders**: as in Arellano (2008).

$$q_t^* = \int_{z_{t+1} \in \Psi_{t+1}} \left[\frac{1 - d_{t+1}}{1 + r_{t+1}} \right] \partial z_{t+1} | z_t,$$

- Sequence R_t affects bond prices.

$\Rightarrow$ This matters for government policy, in particular debt management and default decisions.

Proposer's Problem

Lots of Details back

- Diverts Π_t from budget, offers $\pi_{i,t} = \pi$ to *mwc*.
- Keeps $\pi_{p,t} = \Pi_t - (m_t - 1)\pi_t$.
- Can write the problem as max welfare of average *mwc* member (linearity)

$$\max_{\{\tau_t, g_t, d_t, b_{t+1}\}} U(\tau_t, g_t) + \frac{\Pi_t}{m_t} + \beta \mathbb{E}_{\mathbf{s}_{t+1}} J(\mathbf{s}_{t+1})$$

$$\text{s.t.} \quad \Pi_t = Rev(\tau_t) - g_t + (1 - d_t)\Big[q_t b_{t+1} - b_t\Big] \geq 0.$$

The politics back

- Each group has a *leader* with seat in bargaining table (governor, legislator, lobbyist, union leader, religious leader, oligarch, etc.).
  - One leader chosen at random to make a policy proposal

$$\Psi_t = \{\tau_t, g_t, b_{t+1}, d_t, \underbrace{\pi_{1,t}, \pi_{2,t}, ..., \pi_{n,t}}_{\textit{corruption}}\}$$

  - Proposals need support of $m_t \leq n$ leaders to be implemented (*mwc*).
  - m_t is stochastic (political shocks).
- Bargaining process opens door to corruption / wasteful spending.
- Solve symmetric Markov Perfect Equilibrium (MPE).

Calibration Targets: Argentina

back Functional Forms Model Fit Policy Functions

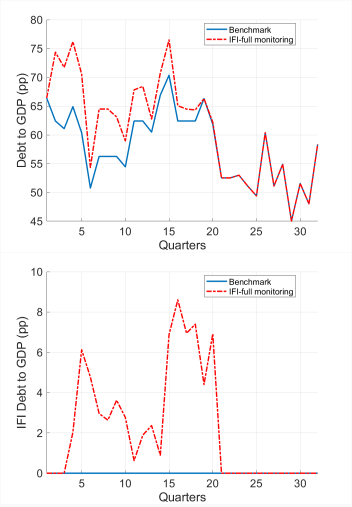
Parameter	Value	Target	Description
σ	2		CRRA
γ	2		Frisch Elasticity
β	0.9932	$\frac{1}{1+r}$	FOC
$\bar{r}$ (annualized)	2.8%		3 mont T-Bill
θ	0.0385	6.5 Years of Exclusion	
ζ_z	0.925	Persistence Real GDP	AR(1)
σ_z	0.018	Volatility of Real GDP	
ζ_m	0.954	Persistence of R&A	AR(1)
σ_m	0.234	Volatility of R&A	
α_0	-0.36	$\mathbb{E}(\text{Spreads}) = 7\%$	Jointly Calibrated
α_1	0.40	$\frac{\text{Debt}}{\text{GDP}} = 53\%$	
η	1.2	$\frac{\text{Spend}}{\text{Y}} = 0.14$	
$\bar{m}$	5		

(Quarterly model)

IMF program with full monitoring: two TFP sequences

back

(a) Non-defaulter



(b) Defaulter