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# Sovereign Lending: Borrowing and Defaulting to China

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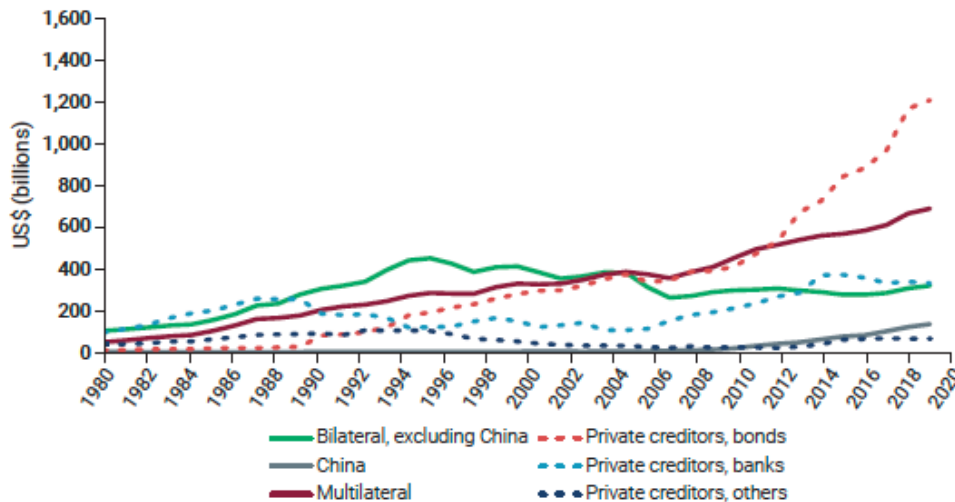
Laura Alfaro

Harvard Business School, CEPR & RPN

# Debt Strikes Back: New Kids On the Block

Sovereign Risk + Information, Incentives, and Coordination problems

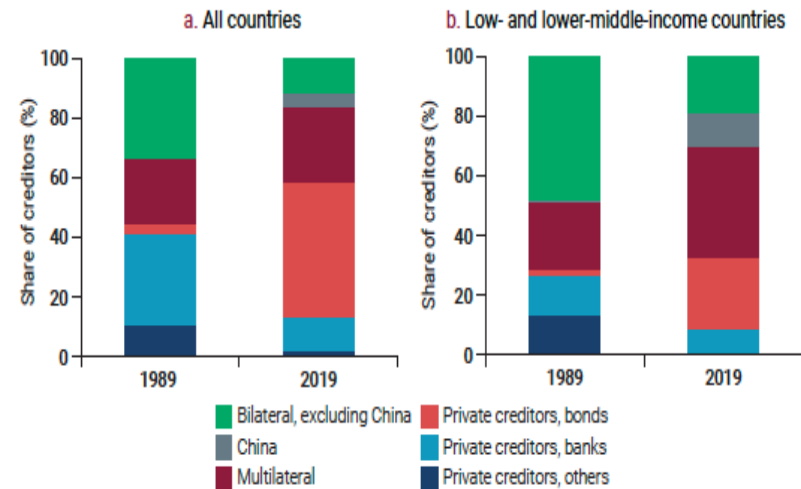
Figure 5.4 External debt in low- and middle-income countries, by creditor type, 1980–2019



Source: World Bank, International Debt Statistics (database), <https://databank.worldbank.org/source/international-debt-statistics#>.

Note: The figure shows total public and publicly guaranteed external debt by creditor type in low- and middle-income countries. The data are for 120 low- and middle-income countries, of which 73 are low- and lower-middle-income countries.

Figure 5.5 Composition of creditors in all countries and in low- and lower-middle-income countries, 1989 and 2019



Source: World Bank, International Debt Statistics (database), <https://databank.worldbank.org/source/international-debt-statistics#>.

Note: The figure shows the trends in creditor composition overall (panel a) and in low- and lower-middle-income countries (panel b). The data are for 120 low- and middle-income countries, of which 73 are low- and lower-middle-income countries.

Source: WB Development Report, 2022;  
See also Horn, Reinhart, Trebesch (2021, 2022, 2023)

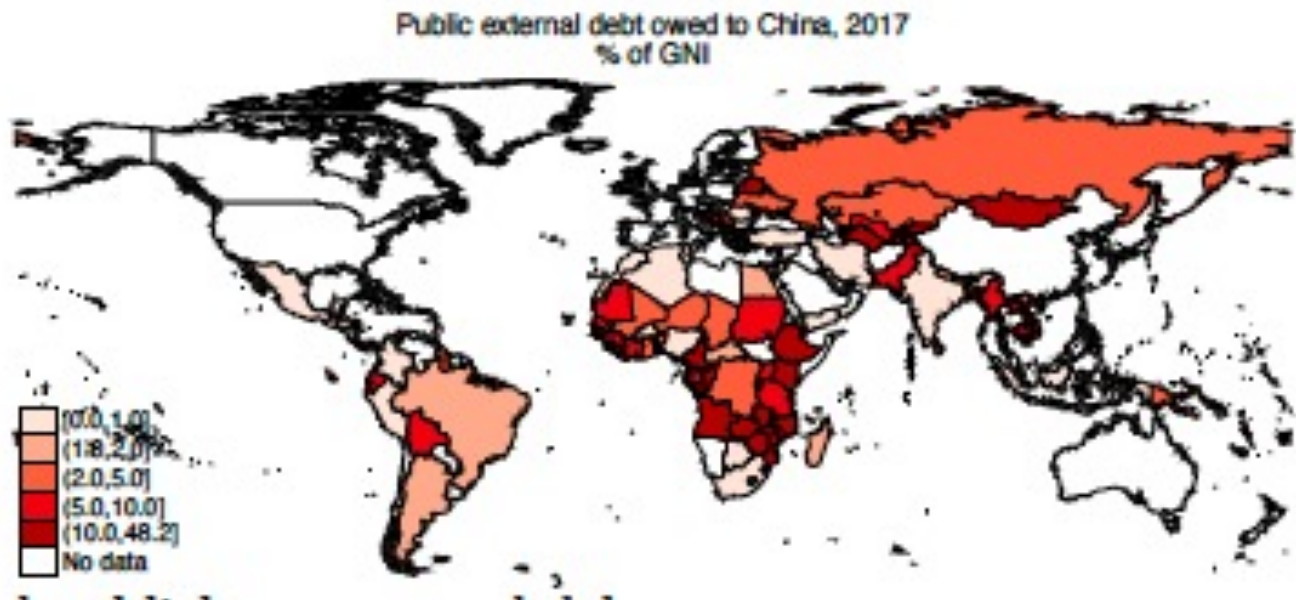
Bank Syndicates (70s-80s) → Bond Holders 90-00s → Sovereigns (10-20s)

# Borrowing from China: New Facts

Horn, Reinhart, Trebesch (2020, 21, 22)

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- To poor countries, more defaults, lower output levels, less output costs;

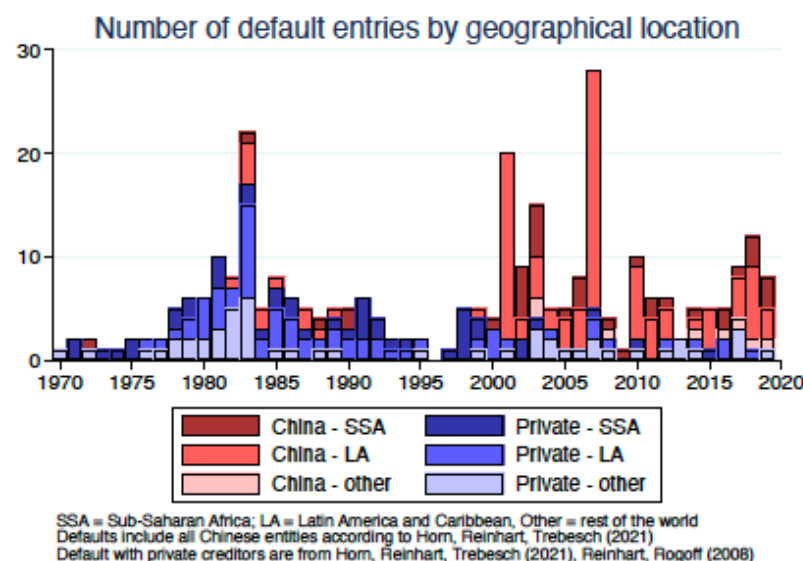


Source: Horn, Reinhart, Trebesch (2021, 2022, 2023)

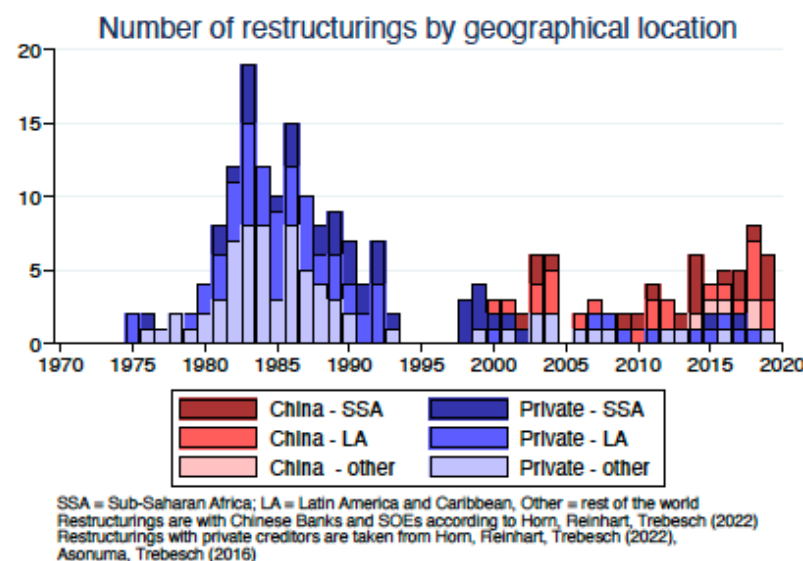
# Sovereign Lending: Borrowing from China

## Defaulting to China

*Default*

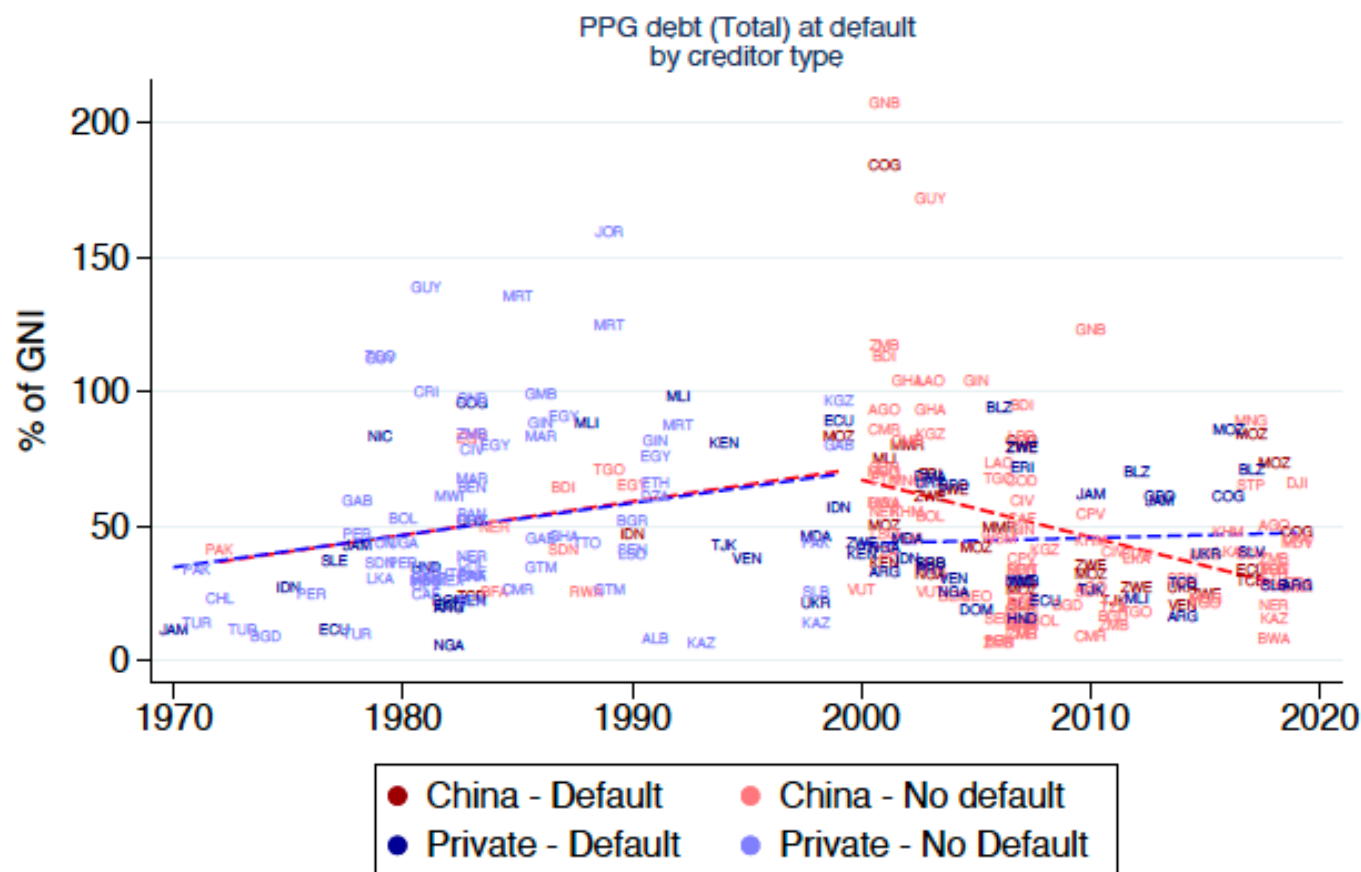


*Restructuring*



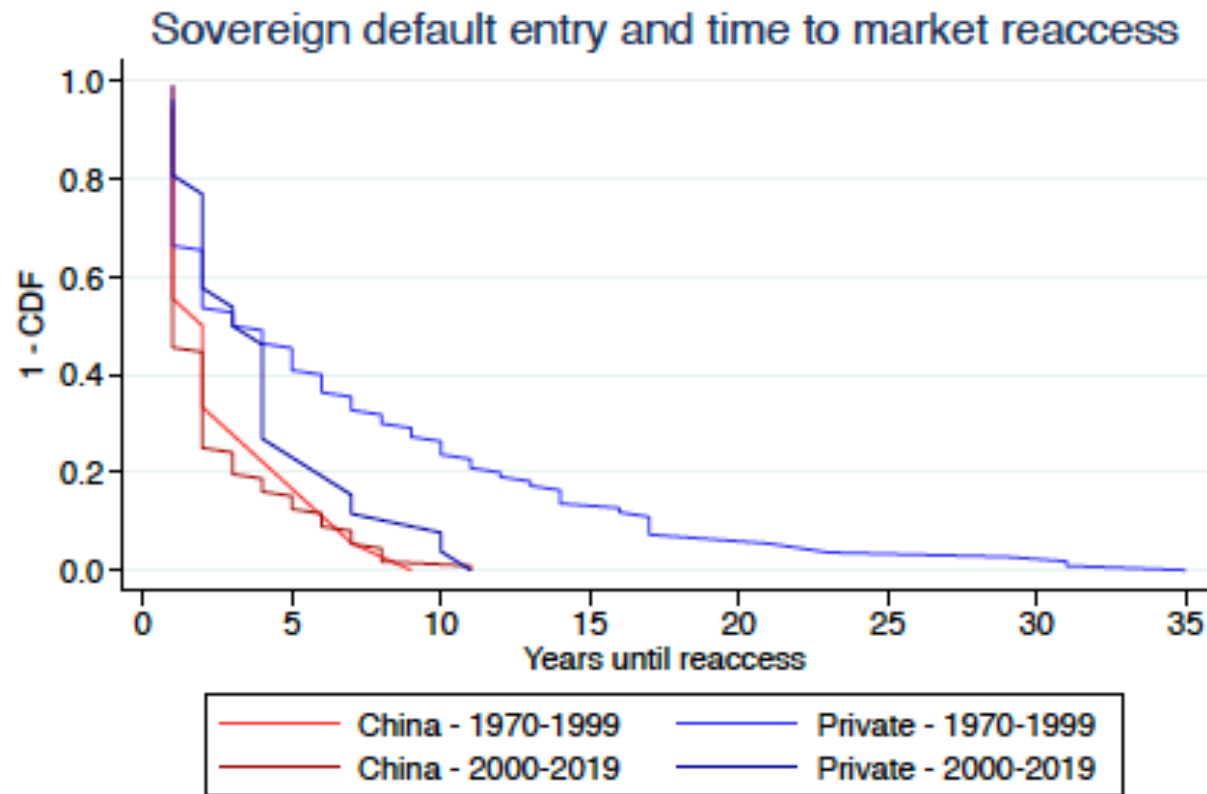
*Notes:* The figures display the number of defaults (Panel A) and debt restructurings (Panel B) by creditor type and geographical region. “Other” includes countries in Eastern Europe, Central Asia, South and South East Asia, as well as North Africa. Restructurings of “Other” entails the series of defaults in European countries in the 1970s and early 1990s with private creditors. We use the beginning of the restructuring episode with private creditors. The series starts in 1975. We only have the completion dates of debt restructurings with Chinese banks. The series starts in 2000 and the sources are [Horn et al. \(2021, 2022\)](#).

# Defaulting to China



Dotted lines represent averages over time for each creditor type.  
Derived from  $Y_i = B_0 + B_1 \cdot \text{year}_i$  for each default episode  $i$ .

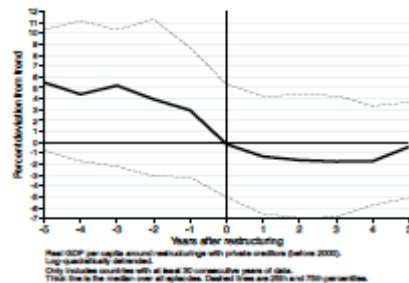
# Defaulting: More Frequent Rapid Re-Entry



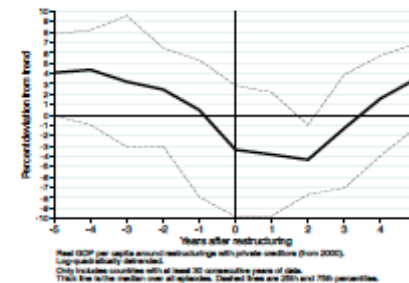
Reaccess defined as debt increase (China), new issuance and debt increase (private)  
Non-missing N: 18/19 (China 1970-1999), 112/137 (China 2000-2019), 110/124 (private 1970-1999), 25/43 (private 2000-2019)

# Defaulting to China: Lower Output Costs

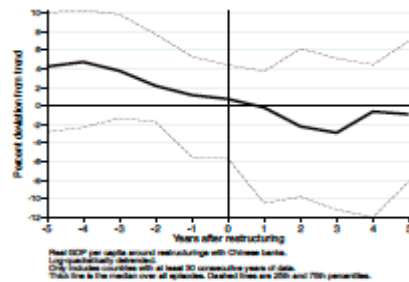
(a) *with private creditors, 1970 - 1999*



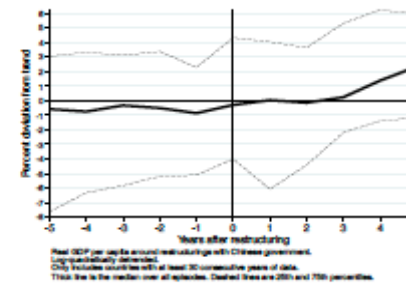
(b) *with private creditors, 2000 - 2019*



(c) *with Chinese banks, 2000 - 2019*



(d) *with the Chinese government, 2000 - 2019*



*Notes:* Figure 8 displays the evolution of real GDP per capita around the beginning of the restructuring episode with private creditors or the completion of restructurings with Chinese creditors. Real GDP per capita is log-quadratically detrended. The median is computed from countries with more than thirty years of GDP data. We use the indicator NY.GDP.PCAP.KN from the World Development Indicators database maintained by [World Bank \(2022b\)](#).



# Changing Landscape

- More defaults, less output costs; lower output levels, poor countries (more heterogeneity—small nations/Argentina), less transparent

Country	Default rate		$\sigma_y$	$\sigma_c$	$\sigma_{TB/y}$	$\sigma_c/\sigma_y$	$\rho_y$	$corr(c,y)$	$corr(TB/y,y)$	Debt to GDP			Interest rate		Maturity		EMBI Spread	$\Delta y_{t:D_t=1}$		$y_{t:D_{t+1}=1}^c$	
	Private	China								Private	China	Total	Private	China	Private	China		private	China	private	China
Major borrowers of private debt																					
Argentina	10.0	0.0	9.4	10.6	4.1	1.12	0.78	0.87	-0.42	21.9	0.4	29.6	6.5	3.5	12.6	13.7	6.9	-4.2		-4.2	
Brazil	0.0	0.0	5.9	4.5	1.8	0.76	0.78	0.91	-0.45	6.8	0.3	9.6	6.0	4.0	11.6	12.0	4.2				
Colombia	0.0	0.0	4.6	3.3	1.6	0.71	0.85	0.69	0.11	10.8		18.4	6.5		13.9		3.1				
Egypt, Arab Rep.	0.0	0.0	3.1	3.4	2.2	1.12	0.80	0.53	-0.26	2.9	0.3	22.9	4.0	4.1	10.7	7.6	3.2				
Mexico	0.0	0.0	2.4	3.2	0.7	1.31	0.72	0.82	-0.40	14.1		16.4	4.4		21.8		2.4				
Philippines	0.0	0.0	1.8	1.9	2.8	1.07	0.68	0.61	-0.21	10.6	0.1	23.4	5.5	2.3	14.2	17.9	2.7				
Turkey	0.0	0.0	4.6	4.4	2.9	0.96	0.60	0.94	-0.70	11.2	0.0	14.9	5.9	3.8	10.9	8.6	3.8				
Mean	1.429	0.000	0.045	0.045	2.303	1.008	0.745	0.768	-0.332	11.190	0.226	19.321	5.471	3.547	13.743	11.982					
Mean ex ARC	0.0	0.0	3.7	3.5	2.0	0.99	0.74	0.75	-0.32	9.4	0.2	17.6	5.4	3.6	13.9	11.5	3.2				
Major borrowers of China loans																					
Angola	0.0	5.0	14.9	12.2	10.9	0.82	0.97	0.30	0.46	23.6	7.1	39.5	5.1	3.9	8.6	13.9	6.4	-5.8		-4.5	
Cameroon	0.0	5.0	4.3	3.1	1.9	0.73	0.89	0.93	0.70	1.3	2.7	28.5	3.5	2.2	9.6	18.2		0.8		5.3	
Ecuador	5.0	5.0	5.4	4.8	2.4	0.89	0.80	0.81	-0.09	15.1	2.4	30.5	6.2	5.3	9.6	12.1	8.5	4.6	-0.5	-0.1	
Ethiopia	0.0	5.0	6.4	7.2	3.3	1.12	0.74	0.78	0.22	4.9	3.0	36.6	3.5	2.3	12.2	18.2		4.9		0.8	
Sri Lanka	0.0	10.0	4.0	3.2	2.4	0.78	0.87	0.54	-0.58	8.6	2.7	38.4	5.0	3.0	9.1	18.2	5.1	5.3		1.1	
Mozambique	15.0	5.0	1.7	5.5	11.0	3.24	0.27	0.66	-0.25	4.9	4.5	48.6	2.2	1.8	16.1	19.4		3.0	0.5	2.0	
Senegal	0.0	5.0	2.8	2.4	2.4	0.87	0.65	0.37	-0.11	4.0	2.1	35.6	5.4	1.8	11.5	19.7	4.7	-1.4		-0.4	
Mean	3.750	5.625	0.070	0.062	6.530	1.140	0.821	0.604	0.163	8.310	3.222	35.976	4.341	2.738	11.448	17.271					

**Notes:** Debt levels, interest rates, and maturities were computed based on the sample 2000-2019 for all countries in the group. The sum of private and China debt may differ from total debt since the total includes other debt components such as official bilateral and multilateral loans. Interest rates and maturities of country-year pairs in which no borrowing from the respective creditor took place were excluded. Interest rates and maturities refer to newly disbursed debt.  $y$ ,  $c$  are log-quadratically detrended GDP and consumption, and  $TB/y$  is the trade balance.  $\sigma$  denotes standard deviation and  $corr()$  the correlation. Default rates are computed as the share of years in which countries sought to restructure their outstanding debt. We use JPMorgan's EMBI+ Index to compute the spreads during non-restructuring years, that is, all years in which a country does not negotiate a debt restructuring. Columns  $\Delta y_{t:D_t=1}$  displays the contraction in real per capita GDP in the year a country seeks a restructuring. Columns  $y_{t:D_t+1=1}^c$  display the percent deviation from the trend in a country in the year before it sought to restructure its debt. It reflects the position in the business cycle. All indicators that refer to restructuring episodes specifically are averaged over all episodes for which data is available if a country restructured its debt multiple times during the sample period.



# International Financial Transactions

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- **Financial assets:** inherently involve a commitment to pay at a later date;
  - Payments are always contingent and hence, fundamentally affected by
    - i. **Asymmetric information** (such as moral hazard and adverse selection)
    - ii. **Non-enforcement risk** (contract uncertainty, incentives to use productively)
    - iii. **Coordination problems** (different types/number assets, creditors)
- **Exacerbated at international level + additional risks (currencies)**
- **Sovereignty** → involvement of governments/sovereigns as explicit or implicit parties
  - ✓ Lack of supranational authority to enforce contracts: Governments can choose to default on international obligations: **willingness versus capacity to pay**
  - ✓ **Poor** substitutes for effective property rights at the international level (direct and indirect default punishment costs) and risky debt structures as an **inefficient** market response to information, uncertainty, and coordination risks.
  - ✓ Adds many **more players: quasi-sovereign entities, government-owned firms; supranational; bilateral, MFIs ..**
    - ✓ Now more evident but always there

# Sovereign Lending from China

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- More defaults, less output costs; lower output levels, to poor countries, less transparent
- Borrower Side
  - Interaction with other lenders (private, sovereigns)
    - Competition to Private Lenders (Alfaro & Kanczuk, 2021)
      - Role of Clauses: Collateral—so far
    - Competition to Multilateral (Alfaro Guler, Kürsat, Taskin, 2022)
      - Role of Clauses: Concessional – So Far
        - Strategic Default
- Lender Side: Motivation

# Debt Transparency Heat Map

	Data accessibility	Instrument coverage	Sectorial coverage	Information on recent contracted loans	Periodicity	Time range	Debt Management Strategy	Annual borrowing plan	Other debt statistics / contingent liabilities (CLs)
Afghanistan									
Bangladesh									
Benin									
Bhutan									
Burkina Faso									
Burundi									
Cabo Verde									
Cambodia									
Cameroon									
Central African Republic									
Chad									
Comoros									
Congo, Dem. Rep.									
Congo, Rep.									
Côte d'Ivoire									
Djibouti									
Dominica									
Eritrea									

# Sovereign Debt: New Players, New Clauses

Sovereign Risk + Information, Incentives, and Coordination problems

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- Non-members of the Paris Club do not report official lending
  - **Non-disclosure clauses; renegotiation and arbitration unclear** (see Gelpern et al. 2021).
  - “These hidden overseas debts pose serious challenges for country risk analysis and bond pricing. Debt sustainability metrics are poorer than generally perceived, especially so in about two dozen developing countries that borrowed heavily from China during the boom decade of 2003–2013. Moreover, private investors may not appreciate the extent to which they are junior to the Chinese government.” Horn, Reinhart, Trebesch (2021).
- How does NPC debt affect traditional debt sustainability?
  - What are welfare consequences for recipient country?
  - What would be the outcome of increased transparency?

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- Alfaro and Kanczuk (2021): **Undisclosed NPC debt** compared against traditional debt
  - 1) **Reduces traditional debt sustainability; more defaults**
    - Collateralized debt: increase NPC debt/ reduces traditional debt.
  - 2) **Disclosure of NPC debt:** increases traditional debt sustainability; **increases recipient country welfare** even more; but **decreases sustainability of NPC debt**

# The Model

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- Endowment economy populated by a benevolent government (the sovereign) that borrows funds from two types of investors:
  - “**International investors**”: a continuum of risk-neutral investors (the traditional international credit market)
  - **Non-Paris Club** (NPC) investor, also assumed to be risk-neutral
    - In contrast with the “international investors,” the NPC investor does not release information about the amount loaned.
- Preferences are concave: households prefer a smooth consumption profile.
  - To smooth consumption, the benevolent government may choose optimally to default on its commitments
- A government that defaults on its debts is assumed to be temporarily excluded from borrowing in the market in which it defaulted + output cost.

# The Model

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➤  $B_t$  denotes debt owed to international investors,  $D_t$  debt owed to the NPC

- If chooses to repay its debt to both international and NPC investors:

$$c_t + q_t^B B_{t+1} + q_t^D D_{t+1} = y_t + B_t + D_t,$$

- If defaults on international investors:

$$c_t + q_t^D D_{t+1} = y_t(1 - \tau^B) + D_t,$$

- If defaults on NPC investor:

$$c_t + q_t^B B_{t+1} = y_t(1 - \tau^D) + B_t,$$

- If defaults on both:

$$c_t = y_t(1 - \tau^B)(1 - \tau^D).$$



# Scenarios

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- i. a case without the NPC investor (to reflect the environment before China's recent economic growth and its Belt and Road strategy);
  - ii. the current equilibrium, with the presence of the NPC investor and incomplete information about its debt;
  - iii. a hypothetical case where there is disclosure of NPC debt and information is transparent.
- 
- Model calibrated Angolan economy: one of the African countries most indebted to China.



# Calibration: Angola

<i>Parameter</i>	<i>Calibration</i>	<i>Data matched</i>
Risk aversion	$\sigma = 2$	Real Business Cycle
International riskless interest rate	$\rho^B = 0.04$	Real Business Cycle
Technology shock autocorrelation	$\alpha = 0.75$	GDP AR(1) process
Technology shock standard deviation	$\sigma = 0.074$	GDP AR(1) process
Probability of international redemption	$\theta^B = 0.50$	Duration of each default
International Output costs	$\tau^B = 0.10$	Interest Rate Spread
Discount factor	$\beta = 0.50$	Debt over GDP
NPC investor interest cost	$\rho^D = 0.04$	Same as International
Probability of NPC redemption	$\theta^D = 0.50$	Duration of each default
NPC debt output cost	$\tau^D = 0.05$	China-Angola trade Furceri and Zdzienicka, 2021
Int. Inv. output cost	$\tau^B = 0.10$	

# Results: Version 1

## Only International Debt

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Economy	State (Investor Types)	Probability (%)	Debt Type	Debt (% GDP)	Welfare (% GDP)
Version 1: Without NPC Investors	Both	-	B	-	0 
			D	-	
	International	96.7	B	42.5	
	NPC	-	D	-	
	None	 3.2	-	-	

“Version 1”:

Calibration to Angola (suppose situation before NPC debt)

Choose output costs of default and intertemporal discount factor

Match average debt and spread over last 16 years: (43% and 3% respectively)

Welfare normalized to 0.

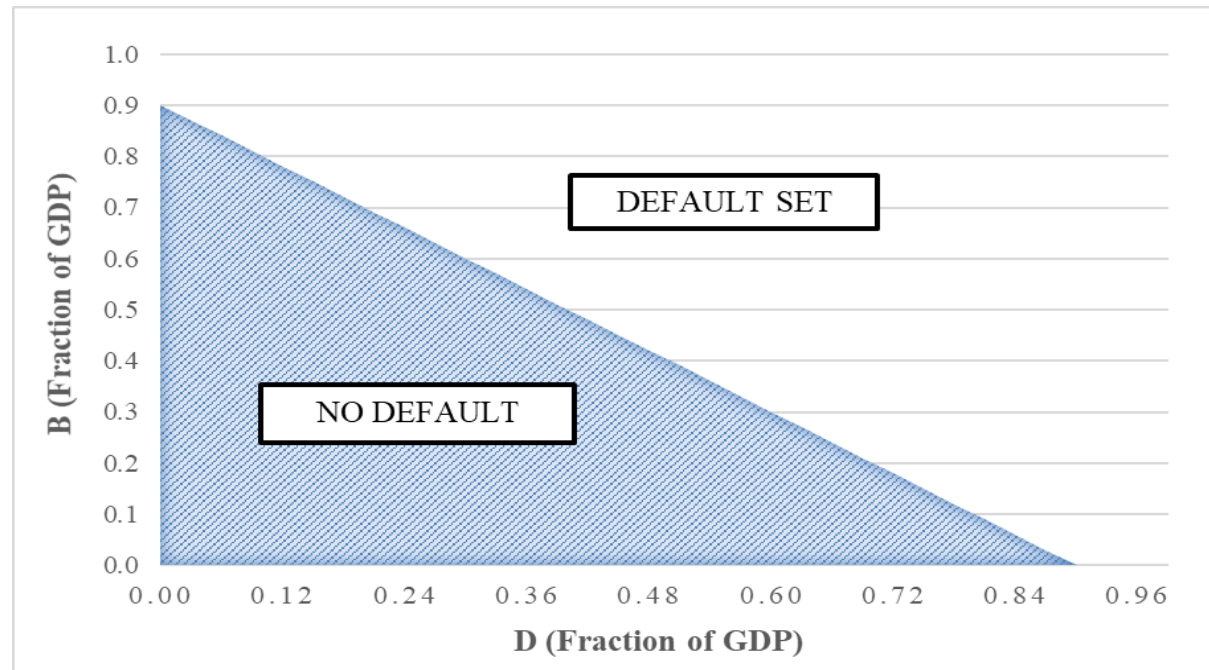
# Results: Version 2

## Both Types of Debt, Incomplete Information

Economy	State (Investor Types)	Probability (%)	Debt Type	Debt (% GDP)	Welfare (% GDP)
Version 1: Without NPC Investors	Both	-	B	-	0
			D	-	
	International	96.7	B	42.5	
	NPC	-	D	-	
Version 2: With NPC Investors, Incomplete Information	Both	24.7	B	20.3	7.2
			D	9.6	
	International	27.5	B	24.7	
	NPC	11.0	D	6.7	
Version 3: With NPC Investors, Complete Information	Both	32.5	B	16.5	9.0
			D	1.0	
	International	62.2	B	38.5	
	NPC	2.5	D	0.1	
	Both	2.8	B	-	
			D	-	
	International	62.2	B	38.5	
	NPC	2.5	D	0.1	

“Version 2”: Less sustainability for international debt (now only 24%; 27.% of time)  
 More defaults and often in state with no access to market  
 Higher welfare (for recipient country) than in version 1 (Can still **use NPC** to smooth consumption even after defaulting from international investors; lower default cost, less debt.).

# Results



Main intuition:

- NPC and traditional debts are “imperfect” substitutes
- After defaulted in one can use other to smooth consumption
- This reduces punishment for defaulting, and thus sustainability
- Defaulting on international investors is more likely with higher NPC debt (and the same applies to NPC debt default)

# Results

Economy	State (Investor Types)	Probability (%)	Debt Type	Debt (% GDP)	Welfare (% GDP)
Version 1: Without NPC Investors	Both	-	B	-	0
			D	-	
	International	96.7	B	42.5	
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			D	1.0	
	International	62.2	B	38.5	
	NPC	2.5	D	0.1	
	None	2.8	-	-	

“Version 3”: both types of debt and complete info

International debt a little less sustainability (from 42.5 to 38.5%) and less often (62%), sovereign has more options; prefers international  
Less NPC debt; Asymmetry caused by different costs from defaulting (by assumption)

Market is fully closed with less probability than in version 1 (3.2% to 2.8%)

# Sensitivity: Cost of Default Sovereign's Impatience

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- Cost of Default: changes in output costs of default ( $\tau^B$  and  $\tau^D$ ) and the probability of redemption ( $\theta^B$  and  $\theta^D$ ).
  - Higher costs of default imply more debt sustainability
- Different  $\beta$  values (sovereigns' impatience): most critical parameter in determining debt sustainability.
  - Debt sustainability decreases with beta and decreases if the NPC investor is present.
    - An interesting quantitative result is that the effect of the NPC presence on sustainability is much more severe when beta is low.
    - Regardless of the initial level of sustainability, the presence of the NPC investor will reduce debt sustainability to a fairly-low value.



# Collateralized Debt

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- China's lending tends to be collateralized, or not subject to “traditional” default (contracts allow for some form of recovery and service).
  - This would increase NPC debt
    - There is also evidence that deferments, refinancing, and new terms are much more common than asset seizures.
- For international investors debt is smaller if China's debt is collateralized NPC
  - Suppose the sovereign borrowed  $D$  from the NPC investor and has already consumed this amount in previous periods and pays has pay the debt services,  $\rho D$ , to the NPC investor.
  - For international investors is as if GDP is smaller ( $y_t' = y_t - \rho D$ ).

# Implications

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- 1) Undisclosed NPC debt (when compared with case with only traditional debt...)
    - **Reduces traditional debt sustainability**
    - **Causes more defaults**
  - 2) Disclosure of NPC debt would (when compared with case with undisclosed NPC debt...)
    - Increase traditional debt sustainability
    - Increase recipient country welfare even more
    - But decrease sustainability of NPC debt
- ➔ Lack of transparency: incentives to borrow from China? Additional ones?

# China Loans: Not Transparent But Grace Periods

2000-2019	Grace Period, years	Maturity, years	Interest Rate, %
China loans			
Commercial	3.72	11.50	5.21
Concessional	5.95	19.30	2.10
Zero-Interest	9.19	16.77	0.00
Total	4.32	13.37	4.07
Private debt	3.84	12.30	4.76
Official debt	5.89	24.12	2.18
US 3-year rate			2.34
EMBI Global			4.13
1970-1999			
Private debt	2.16	9.43	8.01
Official debt	6.44	25.89	4.2
US 3-year rate			7.83

*Notes:* Table 3 documents summary statistics of the Chinese loans based on the Chinese loan database by [Horn et al. \(2021\)](#). Summary statistics are computed based on all available data points for the respective variable. Private and official loan terms are calculated using simple averages across debtor countries in the International Debt Statistics of the World Bank. Interest rates are in annual percent. Maturity and grace periods are expressed in years. US 3-year rate refers to the average Treasury rate for the given maturity during the corresponding period. See Appendix for a detailed description of the data sources.

# Non-Paris The Lender

## Risk-Neutral + Loans with Grace Periods

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- Similar to previous model (output costs, exclusion) + grace periods:
  - Grace periods: the sovereign does not make any coupon payments but the interest applies to the loan principle.
  - Non-grace periods, the sovereign makes the standard coupon payments.
    - Do not stipulate risk aversion premium on lenders.
- Markov process, where  $g \in \{0, 1\}$  captures the state of grace period with  $g = 1$  denoting the grace periods and  $g = 0$  denoting the other periods.
- Evolution of Chinese debt becomes

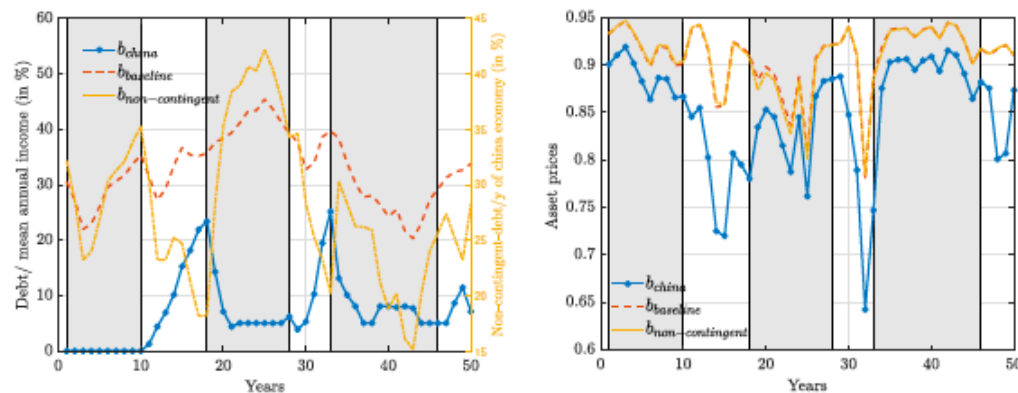
$$\begin{aligned} b_{t+1}^c &= (1 - \delta_c)b_t^c + i_t^c & \text{if } g &= 0 \\ b_{t+1}^c &= b_t^c(1 + r) & \text{if } g &= 1 \end{aligned}$$

# Additional Results

Simulated moments for economies with and without China loans (same parameters)

	With China debt	Without China debt
Mean debt/y (%)	28.1	24.4
Mean China debt/y (%)	7.5	<i>n.a.</i>
Mean spread for private bonds (%)	3.1	1.6
Default rate	4.3	1.9

- In the presence of China loans, the sovereign becomes more indebted during grace periods, which then increases the debt burden overall to rollover the high debt levels.



Portfolio and price dynamics. Shaded regions denote periods with no grace period.

# Borrowing from China

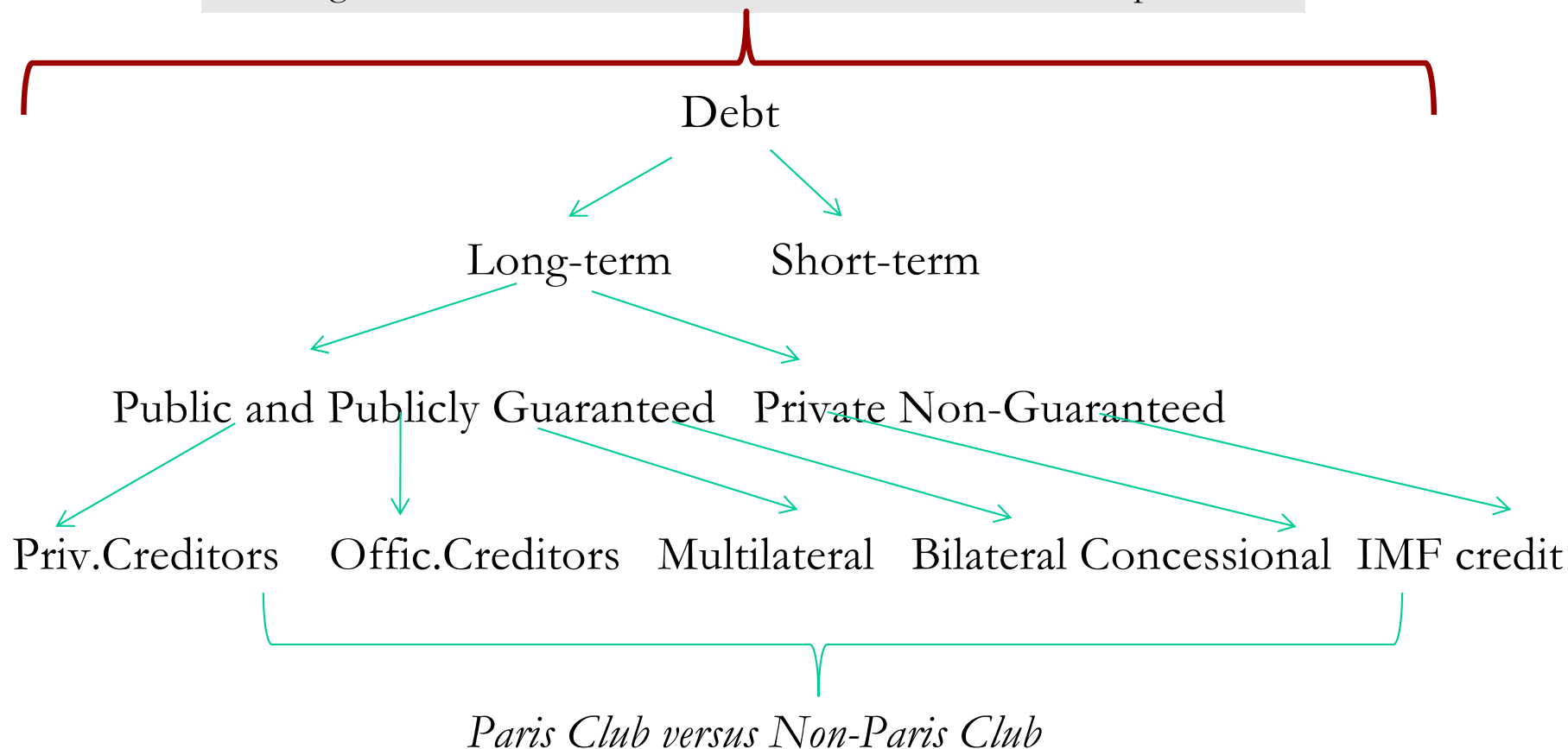
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- Recent default episodes are typically to China with no clear identification of adverse income shocks, recovery episodes are quicker than traditional lending standards.
- Undisclosed NPC debt: reduces traditional debt sustainability; Causes more defaults (default costs; collateral clauses)
- Grace periods: We find that governments default more and pay higher interest rates: **this is because governments start borrowing more which also exacerbates the debt dilution problem**
- Next Steps
  - Additional clauses; Strategic defaults
  - **Motivation of Lender**

# Debt Distress and Restructuring

## Components of External Debt (WB)

Sovereign Risk + Information, Incentive, and Coordination problems



Bank Syndicates (70s-80s) → Bond Holders 90-00s → Sovereigns (10-20s)