Discussion on
Default and Interest Rate Shocks: Renegotiation Matters

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Summary: a great paper

- Question: How can we reconcile mild quantitative predictions from sovereign debt models with the narrative that the Volcker rate hikes caused the 1982 Mexican default?

- Solution: Introduce renegotiation that endogenously determines the haircut rate into an otherwise standard sovereign debt model

- Mechanisms: Lenders accept a larger haircut when rates are high because the opportunity cost of holding defaulted debt is higher. Thus, rate hikes are much more likely to lead to defaults.

Related strands of sovereign debt literature

- Debt renegotiation:
  - Nash bargaining vs games with endogenous delays
    - Benjamin-Wright (2009), Bai-Zhang (2012), Asonuma-Joo (2020)
  - Within Nash games, different outside options
    - Yue (2010), D'Erasmo (2008)
  - Debt exchange or preemptive renegotiation
    - Hatchondo-Martinez-Sosa-Padilla (2014), Asonuma-Trebesch (2016)

- Interest rate v.s. productivity shocks (growth or levels)
  - Aguiar-Gopinath (2006), Arellano (2008), Bai-Zhang (2010), ...
  - Guimaraes (2011), Johri-Khan-Sosa-Padilla (2022)

Debt renegotiation: Nash bargaining

- Nash bargaining: the outside option for both parties is to wait to negotiate in a later period:

$$b^R(y,r) = \arg\max_{\tilde{b}} \left\{ \left[S^{LEN}(y,r) \right]^\alpha \left[S^{GOV}(y,r) \right]^{1-\alpha} \right\}$$

where the surpluses are:

$$S^{GOV}(y,r) = V^P(\tilde{b},y,r) - V^D(y,r) \geq 0$$

$$S^{LEN}(y,r) = \left[\gamma + (1-\gamma)q^P(b^P(\tilde{b},y,r),y,r) \right] \tilde{b} - Q^D(y,r) \geq 0$$

Lenders' outside option: $Q^D(y, r)$

$$Q^D(y, r) = \frac{\theta}{1+r} \mathbb{E}\left[\left\{\gamma + (1-\gamma)q^P(b'', y', r')\right\} b^R(y', r')\right] + \frac{1-\theta}{1+r} \mathbb{E}\left[Q^D(y', r')\right]$$

- A higher r lowers lenders' outside option Q^D in the renegotiation
- b^R adjusts down to reallocate some of that surplus to government
- **Key idea:** lenders' opportunity cost of holding onto the debt has increased due to higher risk free rate

Two mechanisms in bond pricing

$$q^P(b', y, r) = \frac{1}{1+r}\mathbb{E}\left[\left\{1 - d(b', y', r')\right\}\left\{\gamma + (1-\gamma)q^P(b'', y', r')\right\}\right]$$
$$+ \frac{1}{1+r}\mathbb{E}\left[d(b', y', r')\frac{Q^D(y', r')}{b'}\right]$$

- "Standard" mechanism: a higher r lowers q^P (more discounting)
- Renegotiation mechanism: a higher r lowers Q^D and thus q^P
- Key idea: raising funds becomes more difficult for government
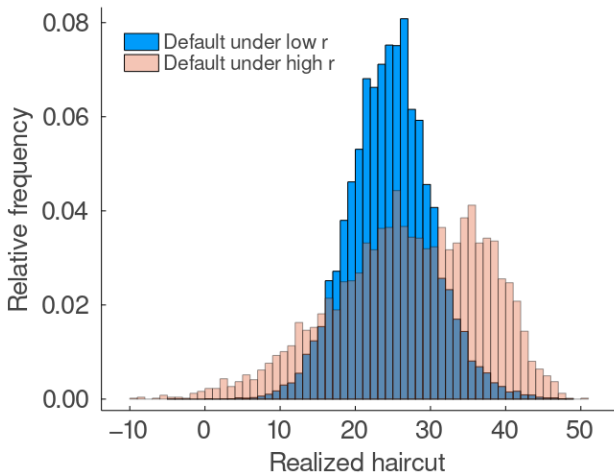
Key finding 1

- Renegotiation generates higher default risk after rate hike

$$\Pr(d_t = 1 \mid d_{t-1} = 0, r_t = r_H, r_{t-1} = r_L)$$

	No renegotiation, no recovery	Fixed exogenous haircut	Endogenous renegotiation
Pr (default event|interest-rate hike)	0.06	0.13	0.24

Key finding 2

- Quantitatively, rate hikes lead to bigger potential haircuts

Comment 1 on modeling and experiments

- Compare equilibrium outcomes for controlled scenarios
  - Default rates (unconditional and conditional), interest rates (cyclicality and volatility), debt ratios and dynamics
  - The impact of different outside options on Q^D

- Robustness analysis of renegotiation protocols
  - bargaining power α and expected delay θ
  - potential negative impact of high interest rates on sovereign countries (financial crisis, higher costs of borrowing for private sector)

Comment 2 on quantification of interest rate shocks

- Is $\Pr(d_t = 1 \mid d_{t-1} = 0, r_t = r_H, r_{t-1} = r_L)$ the right outcome measure? What if r changes from L to H, but there is also a bad output shock – did rate hikes "cause" the default?
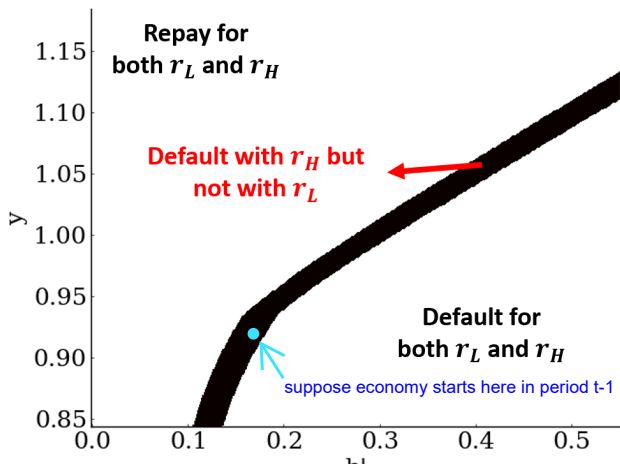
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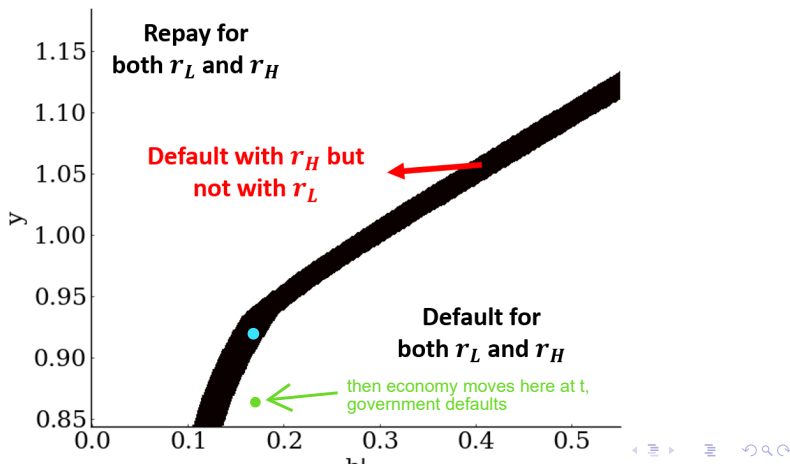
Comment 3 on haircut

- Highlight the power of renegotiation mechanism on this key finding

|	SZ-haircuts		Model haircuts	
	(1)	(2)	(3)	(4)
real risk-free rate	7.030**	6.329*	7.602**	6.807*
	(2.951)	(3.800)	(3.484)	(3.966)
maturity of instrument (years)		-0.225**		-0.222**
		(0.107)		(0.107)
coupon rate (fixed, percent)		1.091***		1.226***
		(0.377)		(0.410)
coupon rate (float, dummy)		1.914		3.292
		(4.254)		(4.554)
constant	37.06***	35.29***	35.48***	32.96***
	(5.196)	(6.965)	(6.051)	(7.468)
Observations	139	78	94	75
Number of episodes	17	14	14	13
Episode random effects	Yes	Yes	Yes	Yes

Data source: Asonuma, Niepelt, and Ranciere (2023)

Comment 4: recent U.S. interest rates hikes

- We have not observed a surge in sovereign defaults by emerging markets: Ghana, Sri Lanka, Suriname and Zambia

US federal funds target rate

The interest rate was left unchanged in May.
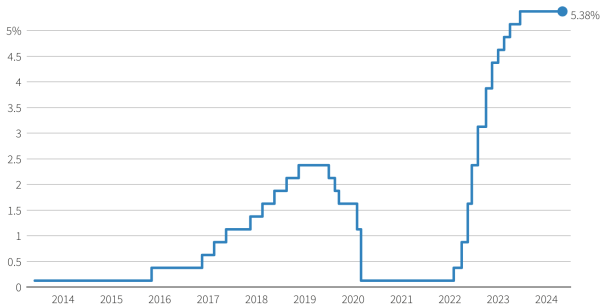
Data is the midpoint of the federal funds target range. Published May 1, 2024 at 8:12 PM GMT
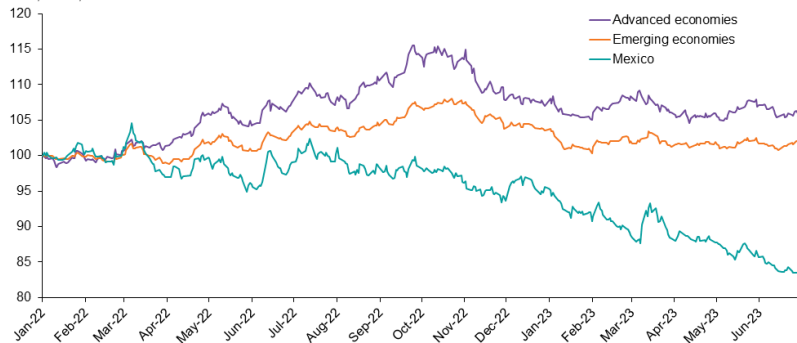Sources: Federal Reserve, LSEG

Comment 4: recent U.S. interest rates hikes

- Moreover, in other emerging economies, currencies are quite strong

Chart 1
Emerging-market currencies keep their value during Fed tightening cycle
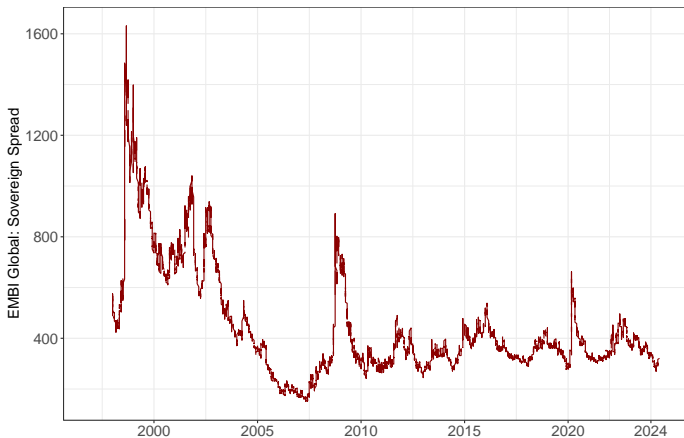Index, Jan 1, 2022=100*

*A positive index change indicates dollar appreciation against foreign currencies.
SOURCE: Federal Reserve Board.

Federal Reserve Bank of Dallas

Comment 4: recent U.S. interest rates hikes

- Does not seem to be much risk in the EMBI data

Conclusion

- This is a great paper.

- It highlights an interesting and important mechanism in sovereign debt renegotiation.

- I look forward to the next draft.