Sovereign Debt Standstills

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Motivation

Response to COVID-19

- G20 agreed on a 'sovereign debt standstill' to poorest countries:
  - Debt service suspension
  - Without haircuts
- Proposals to include private creditors and middle-income countries (Bolton et al., 2020)

Before COVID-19

- "Reprofiling" before IMF programs
- Liquidity shock triggered standstills (bond covenants)
- Guiding principle in recent sovereign debt restructurings

Overview of the paper

▸ Lit Review

What we do

- Quantify effects of **one-time debt relief** (standstills and/or haircuts) after a large negative shock
- Simplest **quantitative sovereign default** model with **long-term debt**

What we find

Standstills

- Create sovereign welfare **gains** but creditors' capital **losses** (except when the standstill avoids an immediate default)
- Consistent with creditors' reluctance to participate (even w/o free-riding problem).
- Help generate **"debt overhang"** and thus opportunities for **"voluntary debt exchange"** (Hatchondo, Martinez and Sosa-Padilla, JME 2014)

Haircuts $\Longrightarrow$ sovereign and creditors' **gains**

Simple intuition for our result

- For **low income** or for **high debt** levels: bond price becomes very sensitive to changes in the debt level

- Standstills and haircuts move the debt in **opposite** directions:

  Standstill: future debt $\uparrow$ (postponed debt payments earn interest)
  $$\implies q \downarrow\downarrow \implies MV \approx bq \downarrow$$
  Haircut: debt $\downarrow$ $\implies$ $q \uparrow\uparrow \implies MV \approx bq \uparrow$

- **Standstills** increase future debt $\implies$ increased sensitivity of bond prices to debt levels $\implies$ increased debt **overhang** and gains from **haircuts**

Model: simplest framework with default and long-term debt

- Equilibrium default model à la Eaton-Gersovitz (Aguiar-Gopinath; Arellano) with long-term debt (Chatterjee-Eyigungor; Hatchondo-Martinez).

- Stochastic exchange economy

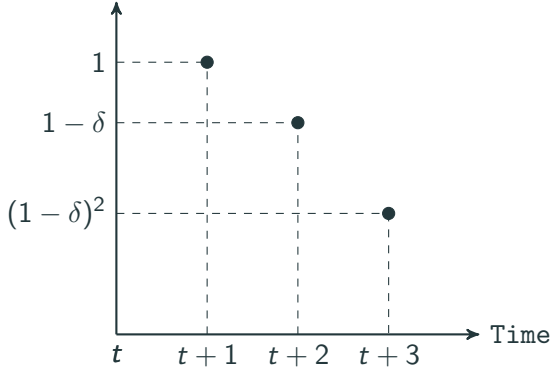
$$\log(y_t) = (1-\rho)\,\mu + \rho \log(y_{t-1}) + \varepsilon_t$$

- Objective of the government: $\mathbb{E}_t \sum_{j=t}^{\infty} \beta^{j-t} u(c_j)$

$$u(c) = \frac{c^{1-\gamma} - 1}{1-\gamma}, \text{ with } \gamma \neq 1.$$

Model: borrowing opportunities

- Competitive risk-neutral lenders
- Non-contingent long-term bonds. Perpetuities with geometrically decreasing coupon obligations.



Model: defaults

- **Total defaults:** if the government defaults, it will not pay any current or future coupon obligations contracted in the past (robust to adding positive recovery rates)

- **Stochastic default duration:** a default event starts with the gov's default decision and may end each period after the default period with probability ψ

- **Exclusion cost:** a government in default cannot borrow

- **Income cost:** each period the gov is in default current income is reduced by

$$\phi(y) = \max\{y\,[\lambda_0 + \lambda_1[y - \mathbb{E}(y)]]\,, 0\}$$

Model: recursive formulation

$$V(b,y) = \max_{d \epsilon \{0,1\}} \{ d V_1(y) + (1-d) V_0(b,y) \}, \tag{1}$$

$$V_1(y) = u(y - \phi(y)) + \beta \, \mathbb{E}_{y'|y} \left\{ \psi V(0,y') + (1-\psi) V_1(y') \right\} \tag{2}$$

$$V_0(b,y) = \max_{b' \geq 0} \left\{ u(\underbrace{y - b + q(b',y)\overbrace{[b' - (1-\delta)b]}^{\text{issuance}}}_{\text{consumption}}) + \beta \, \mathbb{E}_{y'|y} V(b',y') \right\} \tag{3}$$

The bond price is given by the following functional equation:

$$q(b',y) = \mathbb{E}_{y'|y} \left\{ e^{-r} \left(1 - \hat{d}(b',y') \right) \left[1 + (1-\delta) \, q\left(\hat{b}(b',y'), y' \right) \right] \right\} \tag{4}$$

Calibration

Nothing new. Mexican data, quarterly frequency

We follow Hatchondo, Martinez and Sosa-Padilla (2014) and Hatchondo and Martinez (2017).

Risk aversion	γ	2
Risk-free rate	r	1%
Discount factor	β	0.9745
Probability default ends	ψ	0.083
Debt duration	δ	0.03
Income autocorrelation coefficient	ρ	0.94
Standard deviation of innovations	σ_ϵ	1.5%
Mean log income	μ	$(-1/2)\sigma_\epsilon^2$
Income cost of defaulting	λ_0	0.183
Income cost of defaulting	λ_1	1.10

No problem fitting data

Targeted moments		
	Model	Data
Mean Debt-to-GDP	44	44
Mean r_s	3.4	3.4
Non-Targeted moments		
$\sigma(c)/\sigma(y)$	1.4	1.2
$\sigma(tb)$	0.8	1.4
$\sigma(r_s)$	1.5	1.5
$\rho(tb, y)$	-0.8	-0.7
$\rho(c, y)$	0.99	0.93
$\rho(r_s, y)$	-0.7	-0.5
$\rho(r_s, tb)$	0.9	0.6

Main exercise: the shock and the standstill

Three shock sizes

- Endowment shock (only shock), mean debt (44%)
- Worsens access to debt markets (and thus the need for standstill)
  1. Small shock: spread increases by 250 bps (preserved market access; Mexico)
  2. Large shock: 1000 bps (sub-investment grade; 1000 bps in Sub- Saharan Africa)
  3. Default-triggering shock: country defaults w/o debt relief **but** repays with standstill

Standstills

- No debt payments for T^{DS} periods
- The government can borrow (or buy back debt)
- Creditors' holdings grow at the rate $r^{DS} = 1.85\%$ (risk-free rate + avg quarterly spread)
- Gov can declare a default. If so, standstill ends.

Creditor's capital losses

Creditor's capital loss: percent decline in the market value of debt (at the beginning of a period)

$$MV(b,y) = b\left[1-\hat{d}(b,y)\right]\left[1+(1-\delta)q(\hat{b}(b,y),y)\right]$$

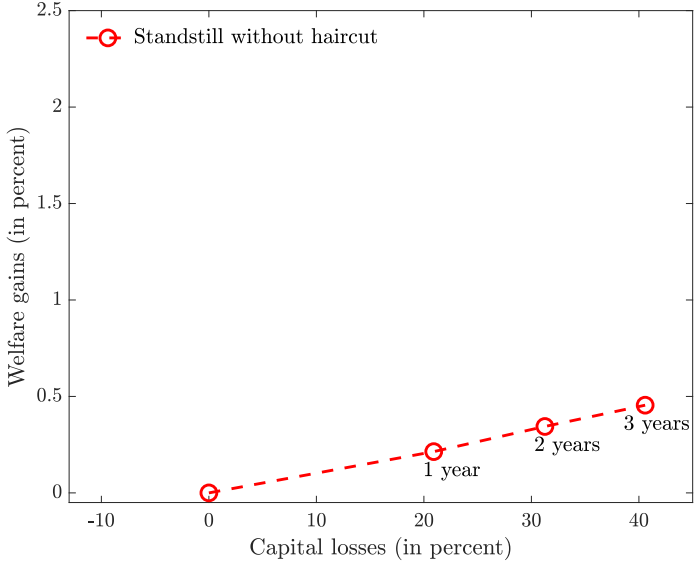
$$MV^{DS_j}(b,y) = b\left[1-\hat{d}^{DS_j}(b,y)\right](1+r^{DS})\,q^{DS_j}\left(\hat{b}^{DS_j}(b,y),y\right)$$

We have nothing to say about **how or if** capital losses could be imposed (e.g., "doctrine of necessity")

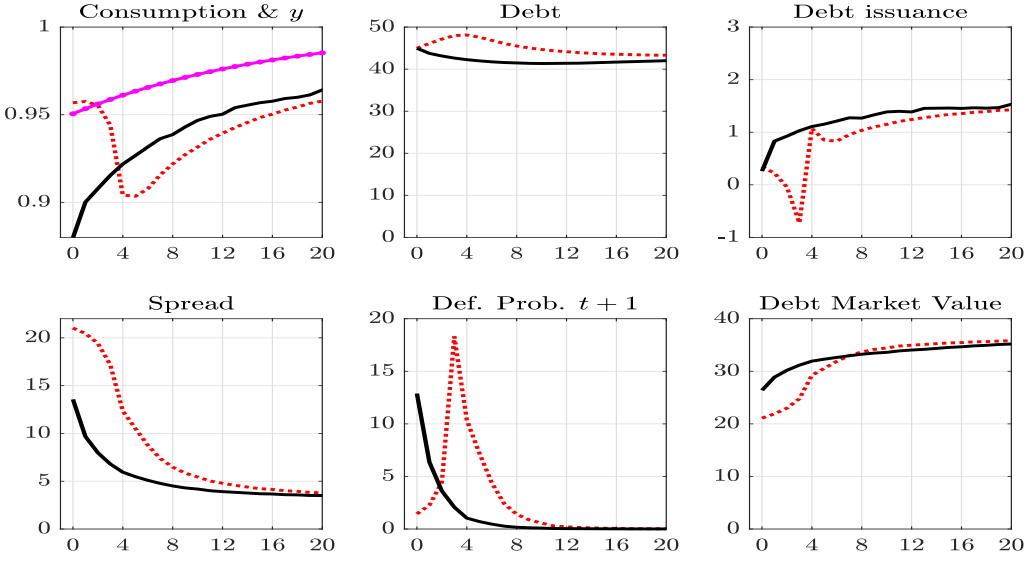
Q: What is the best debt relief 'strategy' for a given capital loss?

Standstills: welfare gains and creditors' losses

Focus on the "Large" shock (↑ spread: 1000 bps, ↓ $y \approx 5\%$)

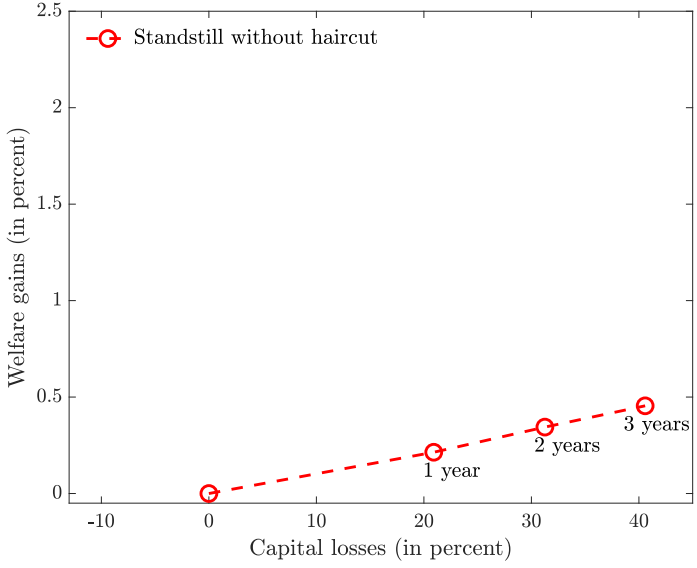


IRFs: Standstills increase indebtedness

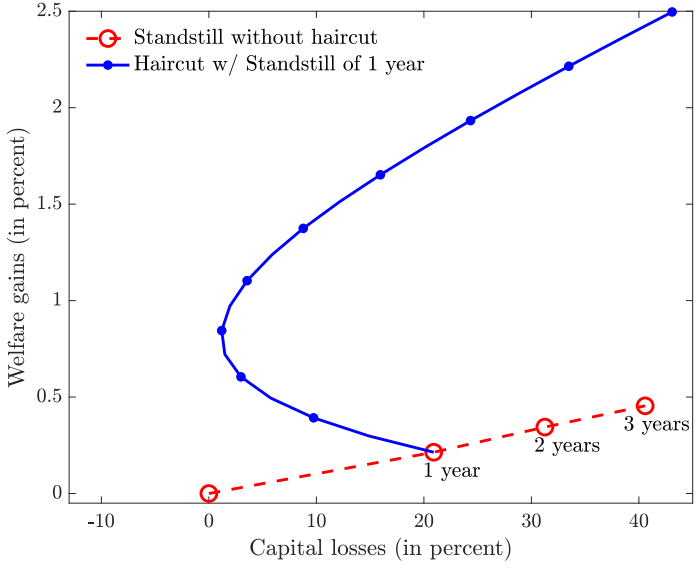


Black: No debt relief **Red:** 1yr Standstill

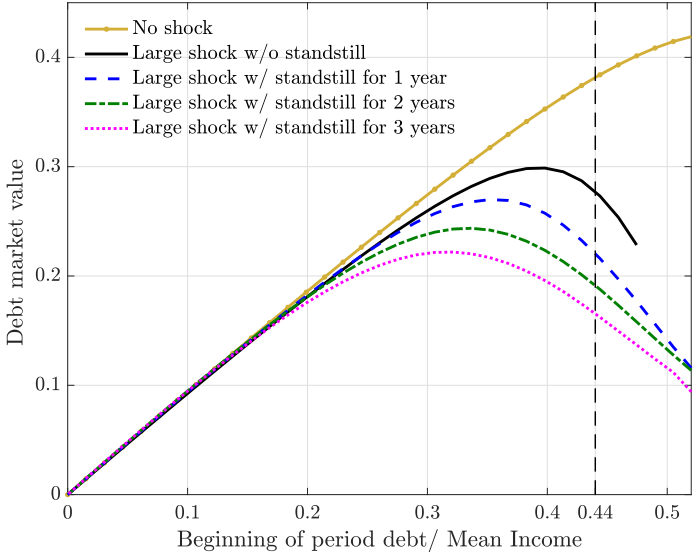
Haircuts: larger welfare gains and smaller creditors' losses



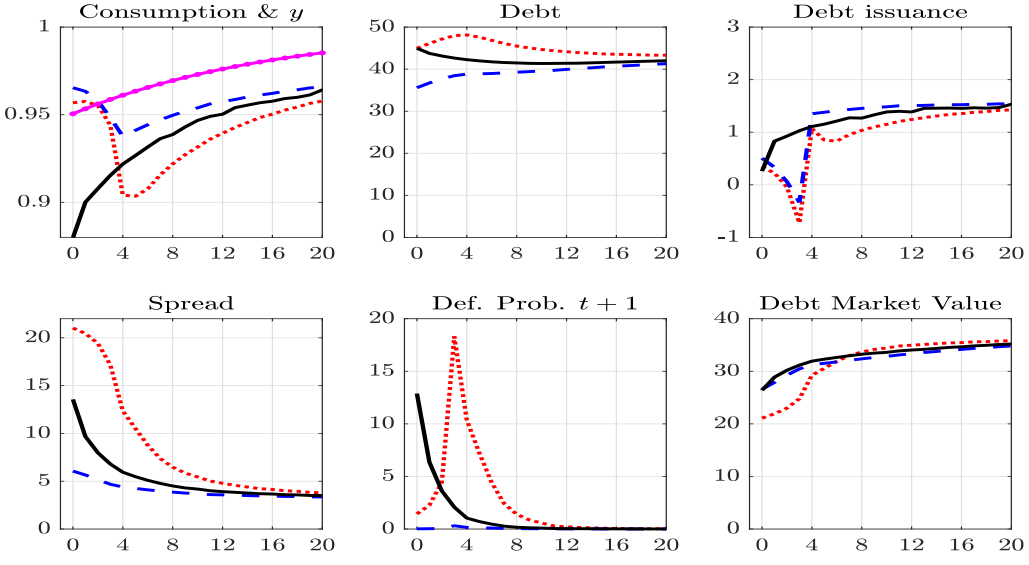
Haircuts: larger welfare gains and smaller creditors' losses



Standstills lower the market value of debt and increase debt overhang

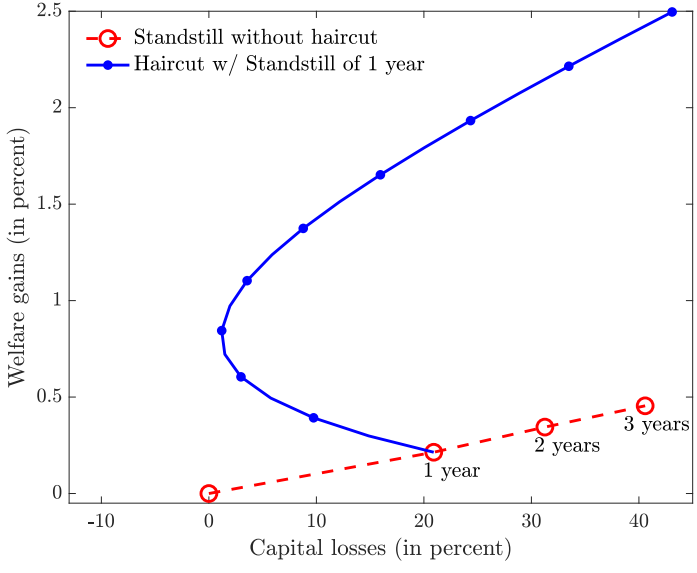


IRFs: No debt relief vs. Standstill vs. Standstill + 21% haircut

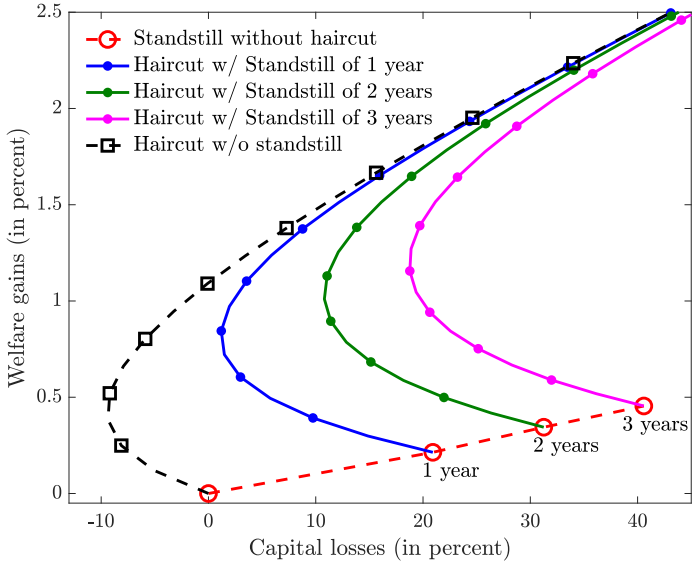


Black: No debt relief **Red:** 1yr Standstill **Blue:** 1yr Standstill + 21% Haircut

‘Only haircuts’ is the best option

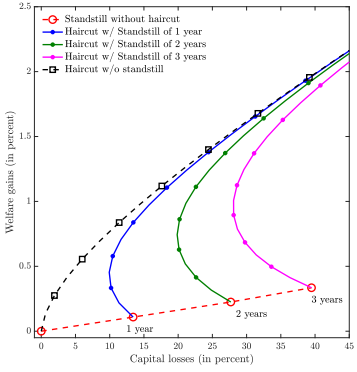


‘Only haircuts’ is the best option

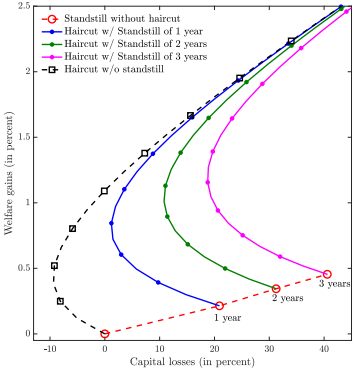


But losses from standstill are negligible for large enough haircuts

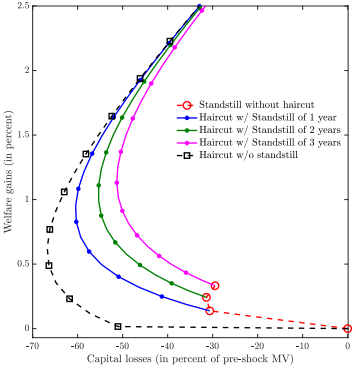
‘Only haircuts’ is the best option – holds for other shock sizes



Small ($\downarrow y \approx 3\%$)



Large ($\downarrow y \approx 5\%$)



Triggers default ($\downarrow y \approx 7\%$)

Note: for “Triggers default’ case standstills can generate capital gains (but haircuts are still superior)

▸ MV plots

Robustness

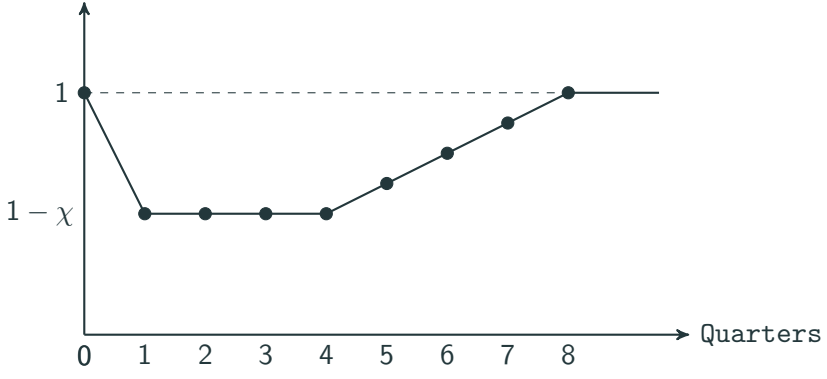
go to conclusions

Our results are robust to

1. Different *nature* of the shock: temporary drop in y, slow recovery ($\approx$ Covid-19)
2. Adding a sudden stop
3. Allowing for a positive recovery rate
4. Modeling the crisis as a 'debt shock' (not in these slides)

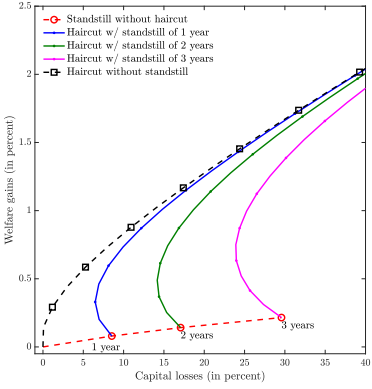
Robustness 1: different nature of the shock

- Income drops for 4 quarters: $y^{\text{effective}} = (1 - \chi)\, y$
- After that, it recovers in another 4 quarters
- 'U-shaped' recovery $\approx$ Covid-19 shock

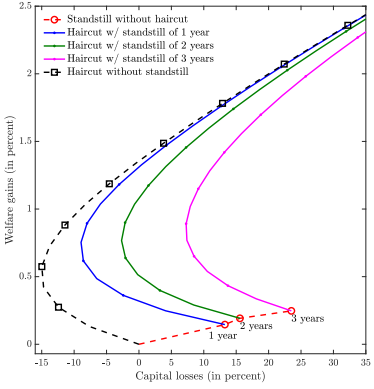


Robustness 1: different nature of the shock

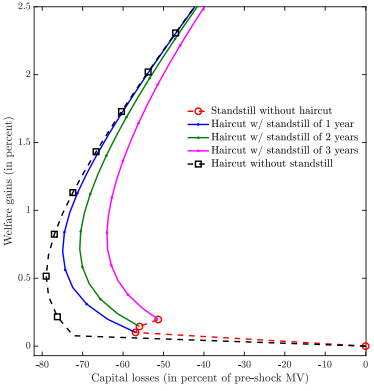
▸ MV curves



Small ($\chi = 7\%$)



Large ($\chi = 10.7\%$)



Triggers default ($\chi = 11\%$)

- Large shock + HC ($\approx 20\%$): welfare **and** capital gains
- 'Triggers default' shock: standstills mutually beneficial, haircuts superior

Robustness 2: adding a sudden stop

- **Motivation:** liquidity concerns during the crisis $\rightarrow$ standstill may be particularly helpful in this case

- Country cannot issue new debt for 1 year (but can buyback if it wants)

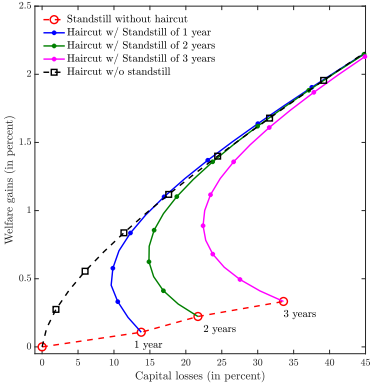
- Equivalent to imposing the following restriction for 4 quarters:

$$\text{Debt issuance} = \begin{cases} b' - (1-\delta)b \ \leq 0 & \text{for the No-DS case} \\ b' - (1-\delta)\,(1+r^{DS})b \ \leq 0 & \text{for the DS case} \end{cases}$$

- Same definition of the different shock sizes

Robustness 2: adding a sudden stop

▸ MV curves



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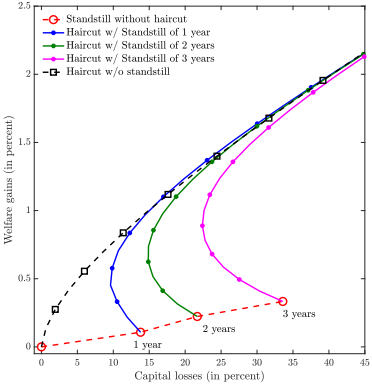

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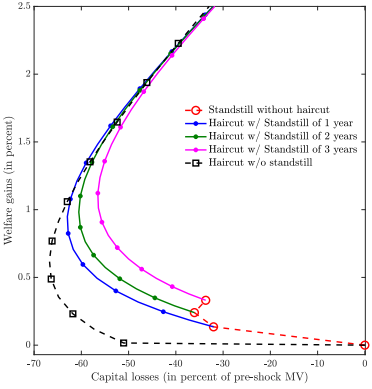

Triggers default

Robust punchline: Debt reliefs are inefficient without haircuts.

Robustness 3: adding a positive recovery rate

▸ Recovery details

- After a default, recovered debt isn't zero but a % of mean debt in simulations:
  $\Longrightarrow$ recovery rate decreases with debt (as docum. by Sunder-Plassmann, 2018)

- Follow a similar calibration (now using data on recovery rates from Cruces and Trebesch 2013).

- As before:
  1. Standstills produce welfare gains but capital losses (exc. when avoiding imminent default)
  2. Capital losses triggered by standstills can be mitigated using haircuts
  3. Haircut-only still the best policy

Punchline: main result (*debt reliefs are inefficient without haircuts*) is robust to including debt recovery

Conclusions

- Standstills may produce welfare gains for the sovereign and capital losses for creditors
- In contrast, haircuts may produce welfare **and** capital gains
- Standstills help generate debt overhang and thus a role for haircuts that produce Pareto gains.
- If standstills without haircuts are favored because of the regulatory cost of haircuts (Dvorkin et al., 2020) or the "Doctrine of necessity" (Bolton et al., 2020), inefficiencies triggered by these frameworks appear to be significant.

Thanks !

Some data about the Standstill Initiative

back

- **DSSI**: Debt Service Suspension Initiative
- Official debt. Offered to 73 of the poorest countries.
- 48/73 took it (as of Feb 28, 2022).
- Mean potential relief = 1.5% of GDP. 'Usage' rate = 27%

- *From May 2020 to December 2021, the initiative suspended $12.9 billion in debt-service payments owed by participating countries to their creditors.*

- *The G20 has also called on private creditors to participate in the initiative on comparable terms. Regrettably, only one private creditor participated.*

Data from Voluntary Debt Exchanges

back

	Capital gains	Haircut
Ukraine (2000)	.48	.18
Dom. Rep. (04-05)	.24	.05
Uruguay (2003)	.22	.10
Pakistan (1999)	.07	.15
Belize (06-07)	-.11	.24
Greece (11-12)	-.59	.65

Data from Hatchondo, Martinez and Sosa-Padilla, JME 2014

Related literature

back

- **Quantitative** equilibrium default model à la Eaton-Gersovitz (RESTUD 1981) (Aguiar and Gopinath JIE 2006; Arellano, AER 2008) with **long-term debt** (Chatterjee and Eyigungor AER 2012; Hatchondo and Martinez JIE 2009).

- Aguiar et al. (Econometrica 2019), Dvorkin et al. (AEJ Macro 2020), Mihalache (JIE 2020):

  - In debt **restructuring** (similar to debt relief), extensions of **maturity** (similar to standstills) are dominated by **haircuts** (except for the reasons in Dvorkin et al.)

  - **Time inconsistency (debt dilution):** the government **issues too much debt** and this problem is worse with longer maturities.

- Not with **standstills:** The government **buys back debt.** But standstills generate **debt overhang.**
- **Inefficiencies** of combining haircuts with standstills are **not significant for large haircuts.**

Debt price (large shock)

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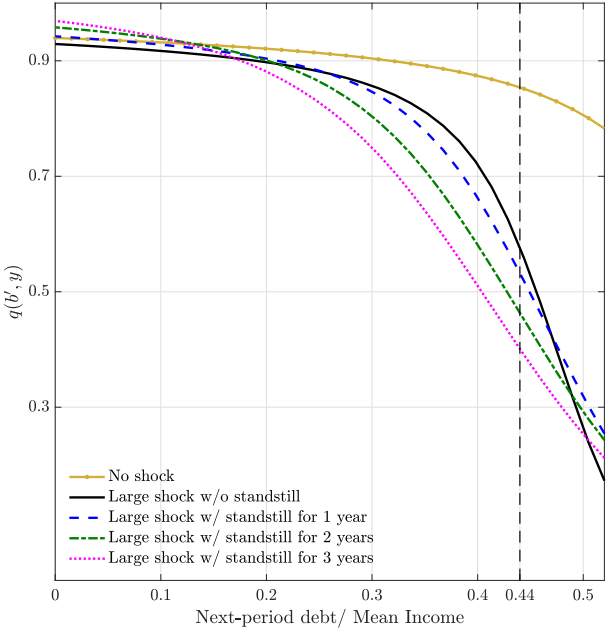

Debt market value curves

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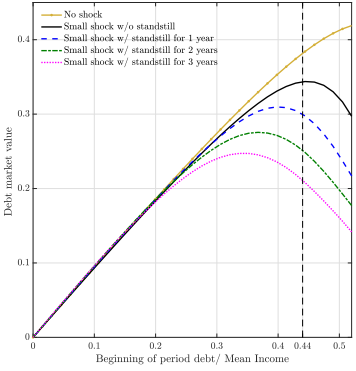

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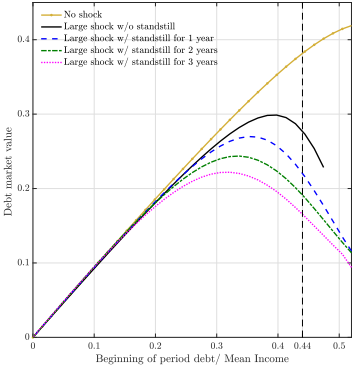

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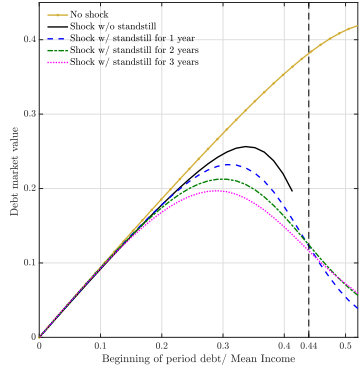

Triggers default

Debt market value curves

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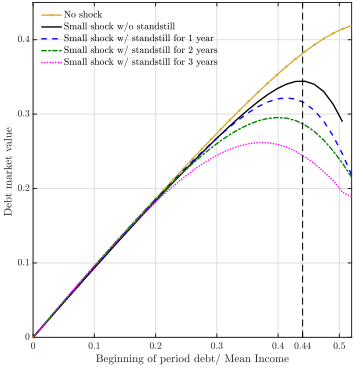

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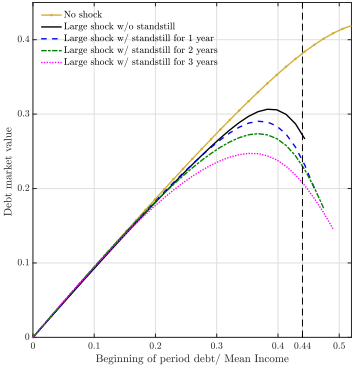

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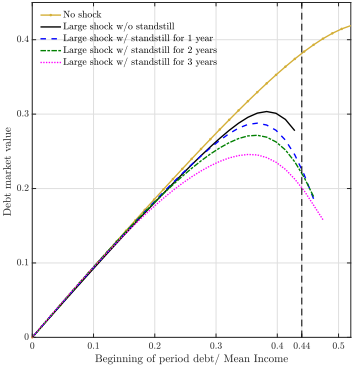

Triggers default

Debt market value curves

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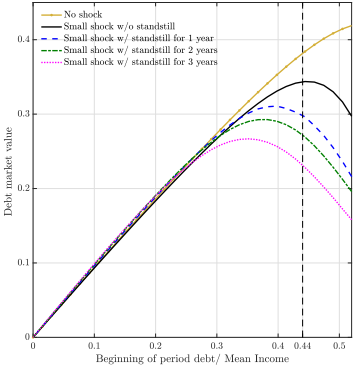

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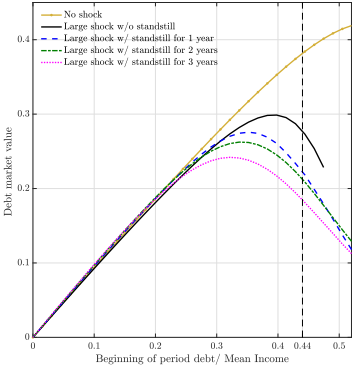

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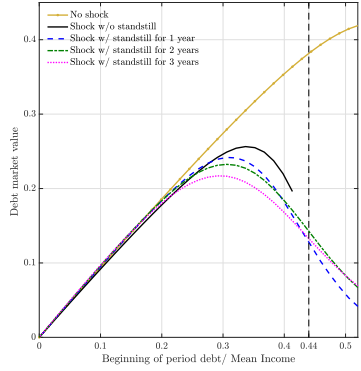


Triggers default

Robustness 3: adding a positive recovery rate

back

$$V(b,y) = \max_{d \in \{0,1\}} \{dV_1(b,y) + (1-d)V_0(b,y)\},$$

$$V_1(b,y) = u(y - \phi(y)) + \beta \mathbb{E}_{y'|y} \left[\psi V(b_D, y') + (1-\psi) V_1(b_D, y')\right]$$

and $b_D = \min\{\alpha, b\}$ is the 'recovered' debt level.

$$V_0(b,y) = \max_{b' \geq 0} \left\{u\left(y - b + q(b',y)\left[b' - (1-\delta)b\right]\right) + \beta \mathbb{E}_{y'|y} V(b',y')\right\}.$$

$$\text{subject to:} \quad b' > \quad (1-\delta)b \quad \text{only if} \quad q(b',y) > \underline{q},$$

Robustness 3: adding a positive recovery rate

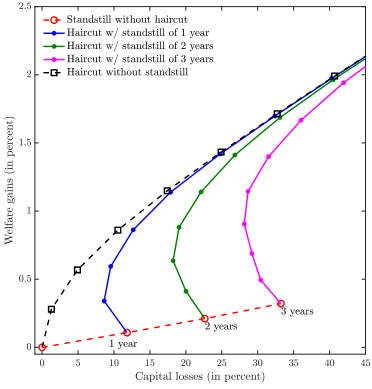
back

$$
\begin{aligned}
q(b',y) &= \frac{1}{1+r}\mathbb{E}_{y'|y}\left\{\left[1-\hat{d}\left(b',y'\right)\right]\left[1+(1-\delta)\,q(\hat{b}(b',y'),y')\right]\right\} \\
&\quad +\frac{1}{1+r}\mathbb{E}_{y'|y}\left\{\hat{d}\left(b',y'\right)q^{D}(b',y')\right\}
\end{aligned}
$$

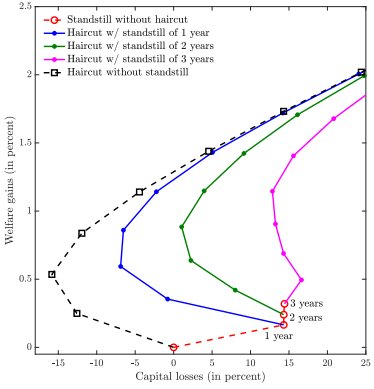
$$
\begin{aligned}
q^{D}(b,y) &= \frac{1-\psi}{1+r}\mathbb{E}_{y'|y}\left\{\frac{b_D}{b}q^{D}(b_D,y')\right\} \\
&\quad +\frac{\psi}{1+r}\mathbb{E}_{y'|y}\left\{\left[1-\hat{d}\left(b_D,y'\right)\right]\ \frac{b_D}{b}\ \left[1+(1-\delta)\,q\left(\hat{b}(b_D,y'),y'\right)\right]\right\} \\
&\quad +\frac{\psi}{1+r}\mathbb{E}_{y'|y}\left\{\hat{d}\left(b_D,y'\right)\ \frac{b_D}{b}\ q^{D}(b_D,y')\right\}
\end{aligned}
$$

Robustness 3: adding a positive recovery rate

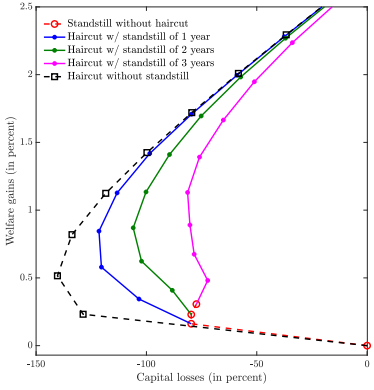
back



Small



Large



Triggers default

Punchline: main result (*debt reliefs are inefficient without haircuts*) is robust to including debt recovery