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 (face-value reductions)
- 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 write-offs) 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 imminent 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)

Write-offs $\implies$ sovereign and creditors' **gains**

Simple intuition for our result (1)

- In this class of models the optimal maturity is very short
- Aguiar et al. (2019): optimal to shorten debt maturity in debt restructurings.
- Debt relief $\approx$ debt restructuring
- Standstill $\approx$ maturity extension

$\Longrightarrow$ Standstills are not a good idea

Simple intuition for our result (2)

▸ bond price ▸ VDE

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

- Standstills and Write-offs move the debt in **opposite** directions:

  Standstill: future debt $\uparrow$ (postponed debt payments earn interest)
  $$\implies q \downarrow\downarrow \implies MV \approx bq \downarrow$$
  Write-offs: 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 **write-offs**

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

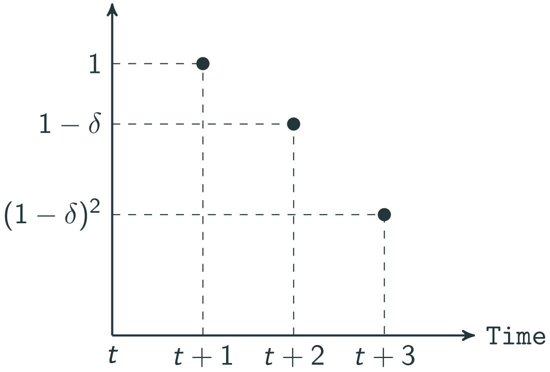
$$\log(y_t) = (1-\rho)\,\mu + \rho\log(y_{t-1}) + \varepsilon_t$$

- 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

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

$$V\left(b,y\right)=\max_{d\epsilon\{0,1\}}\{dV_1(y)+(1-d)V_0(b,y)\}, \tag{1}$$

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

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

The bond price is given by the following functional equation:

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

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.

Write-off

- Reduction in debt's face value.

Creditor's capital losses

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

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

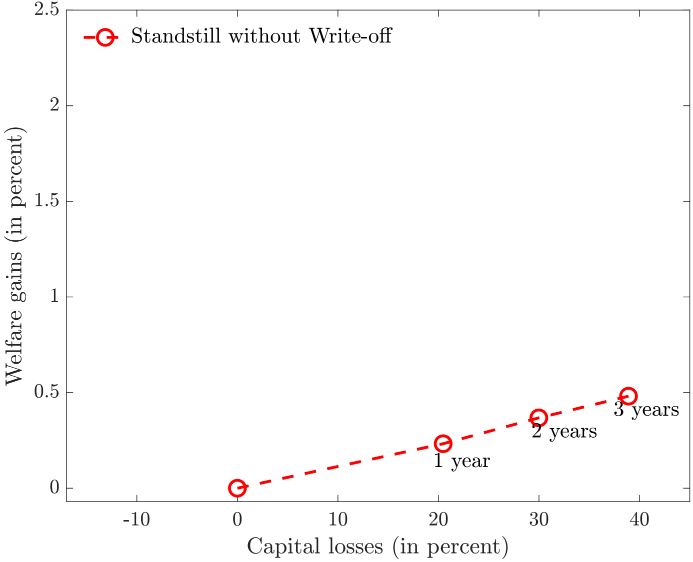
$$MV^{DS_j}(b, y) = b\left[1 - \hat{d}^{DS_j}(b, y)\right](1 + r^{DS})\, q^{DS_j}\left(\hat{b}^{DS_j}(b, y), y\right)$$

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

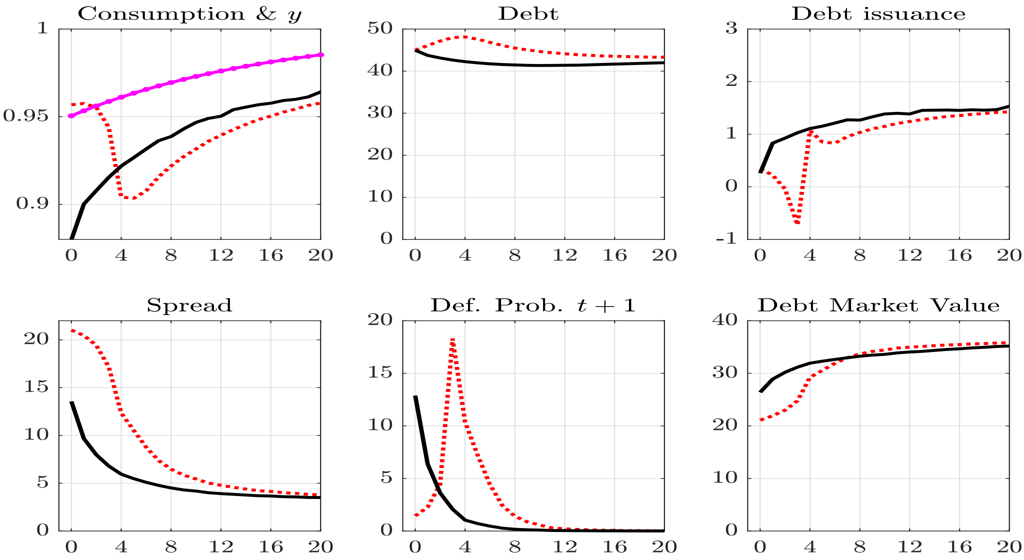
Q: What is the best debt relief 'strategy' for a given capital loss?

Standstills: welfare gains and creditors' losses

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

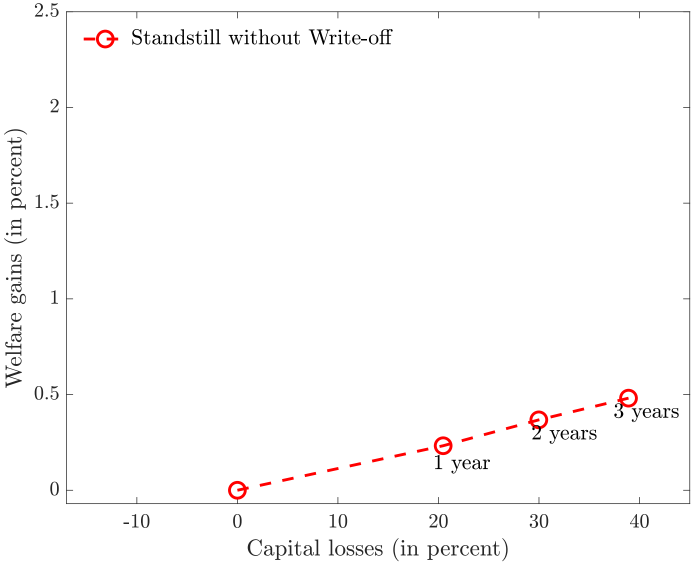


IRFs: Standstills increase indebtedness

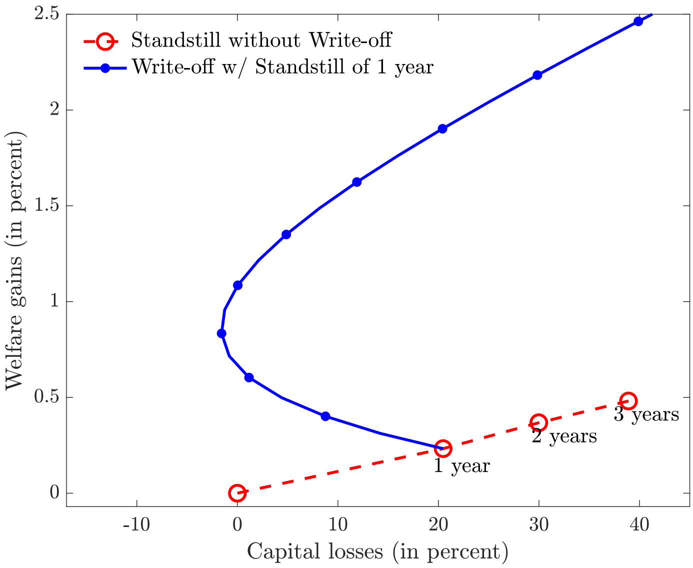


Black: No debt relief **Red:** 1yr Standstill

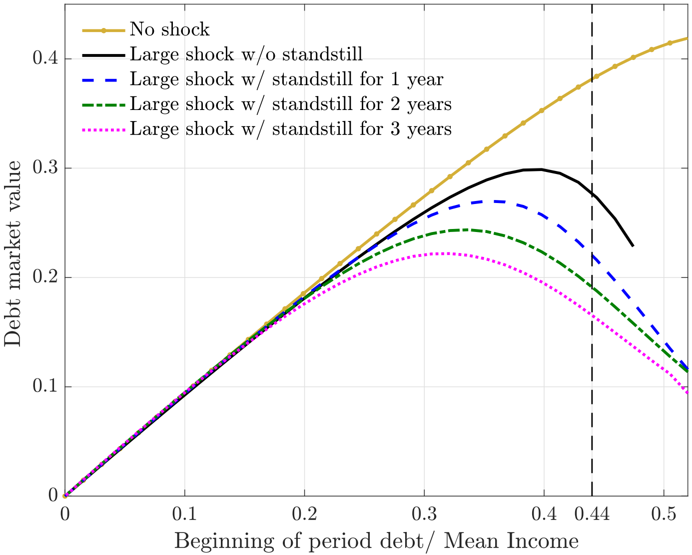
Write-offs: larger welfare gains and smaller creditors' losses



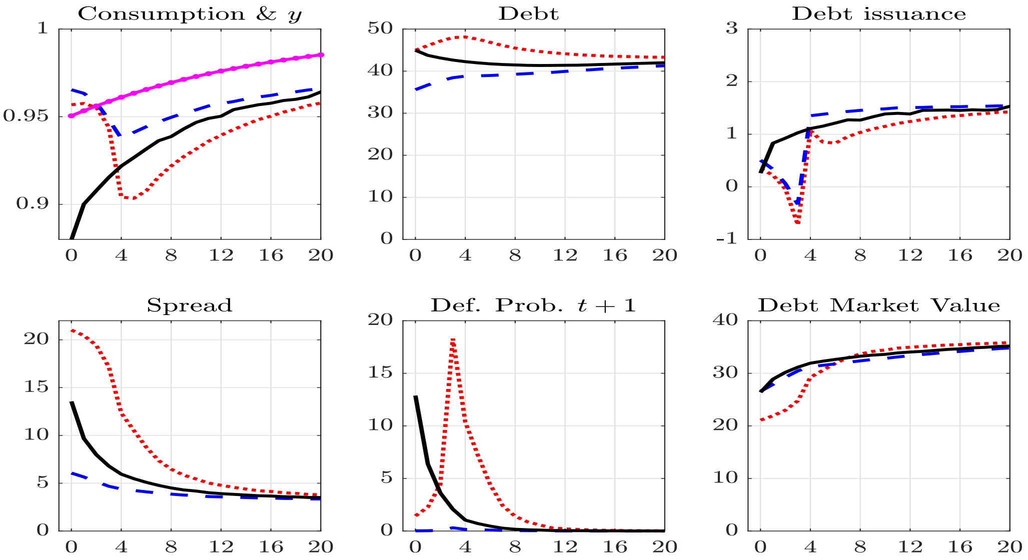
Write-offs: larger welfare gains and smaller creditors' losses



Standstills lower the market value of debt and increase debt overhang

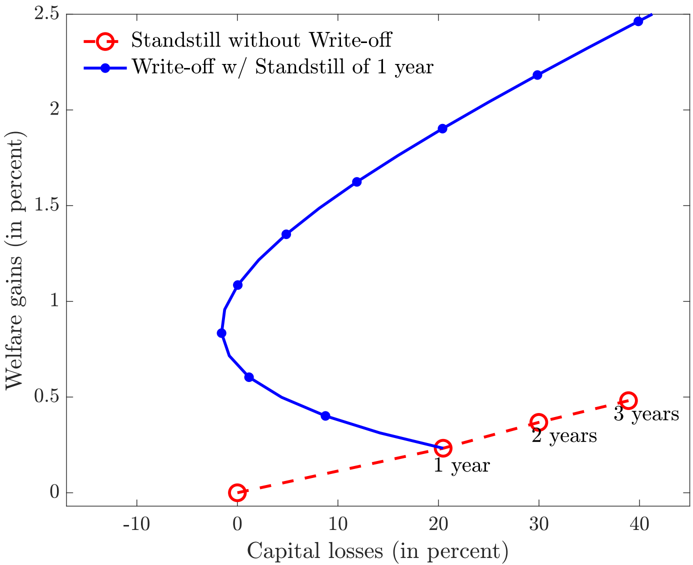


IRFs: No debt relief vs. Standstill vs. Standstill + 21% Write-off

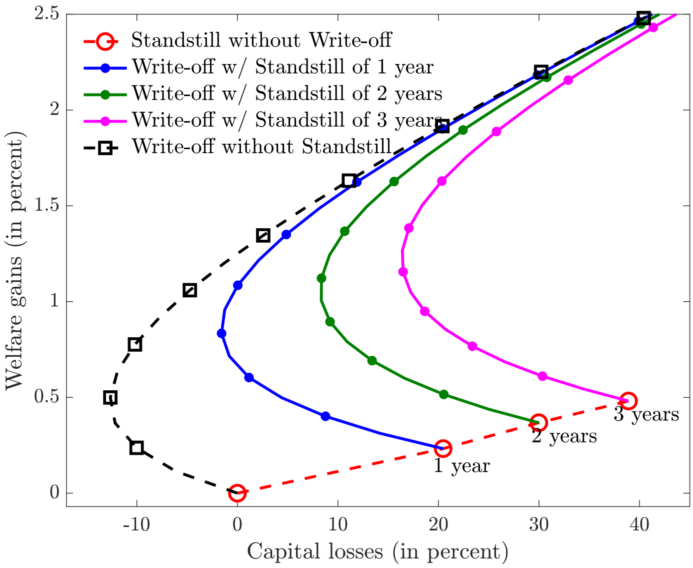


Black: No debt relief **Red:** 1yr Standstill **Blue:** 1yr Standstill + 21% Write-off

‘Only write-offs’ is the best option

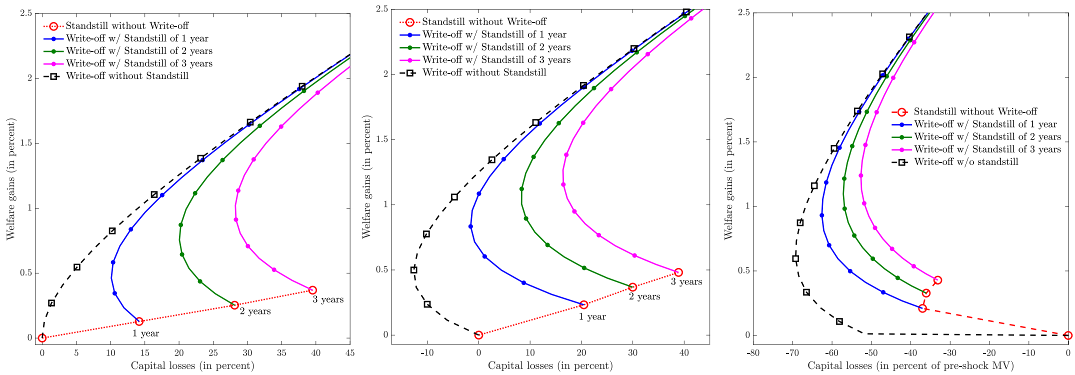


‘Only write-offs’ is the best option



But losses from standstill are negligible for large enough write-offs

‘Only write-offs’ is the best option – holds for other shock sizes

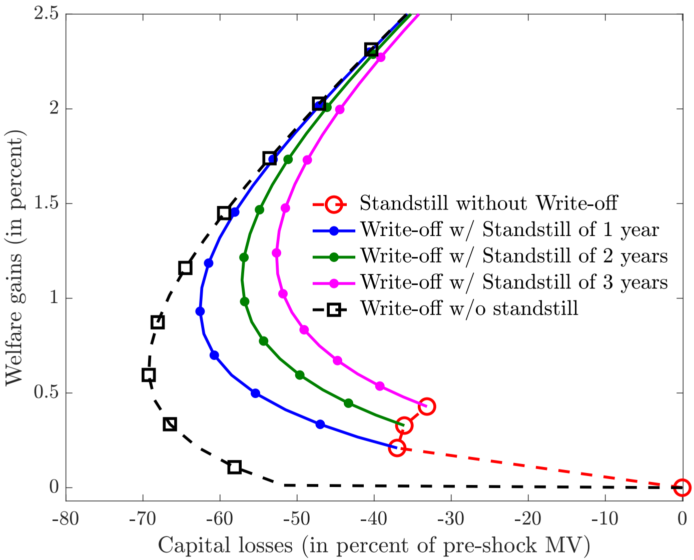


Small ($\downarrow y \approx 3\%$) Large ($\downarrow y \approx 5\%$) Triggers default ($\downarrow y \approx 7\%$)

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

▸ MV plots

Zooming into the "Trigger default" shock



Standstills can generate capital gains (but write-offs are still superior)

Robustness

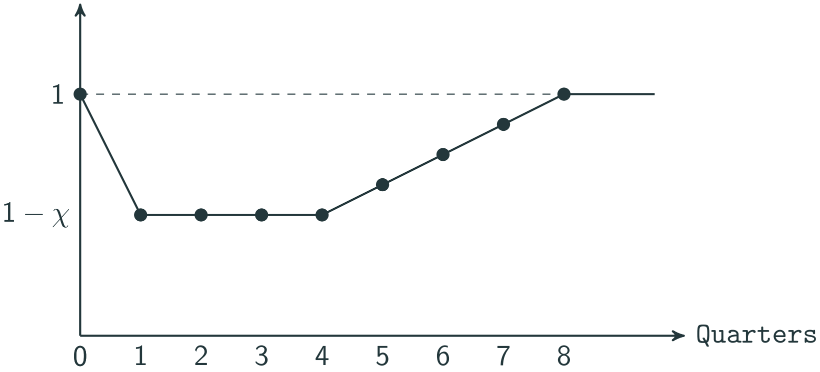
▸ go to conclusions

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)
5. Low initial debt level (not in the slides, nor the paper... but in my laptop 😎)

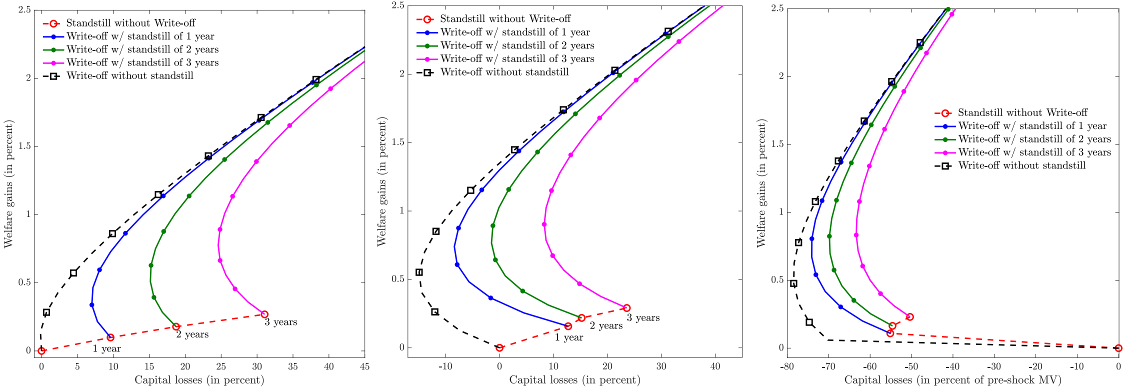
Robustness 1: different nature of the shock

- 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, write-offs 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)

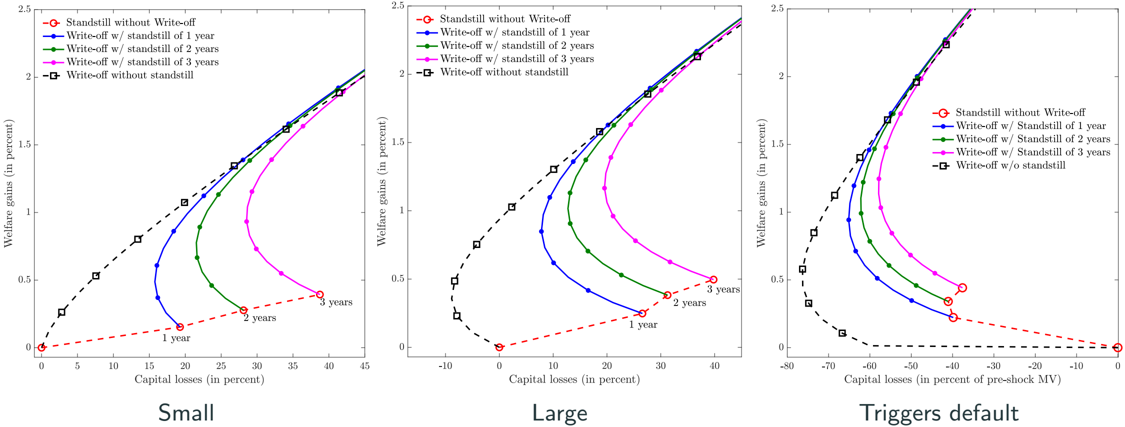
- Equivalent to imposing the following restriction for 4 quarters:

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

- Same definition of the different shock sizes

Robustness 2: adding a sudden stop

MV curves



Robust punchline: Debt reliefs are inefficient without write-offs.

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 write-offs
  3. Write-offs only still the best policy

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

Conclusions

- Standstills may produce welfare gains for the sovereign and capital losses for creditors
- In contrast, write-offs may produce welfare and capital **gains**
- Standstills help generate debt overhang and thus a role for write-offs that produce Pareto gains.
- If standstills without write-offs are favored because of the regulatory cost of write-offs (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

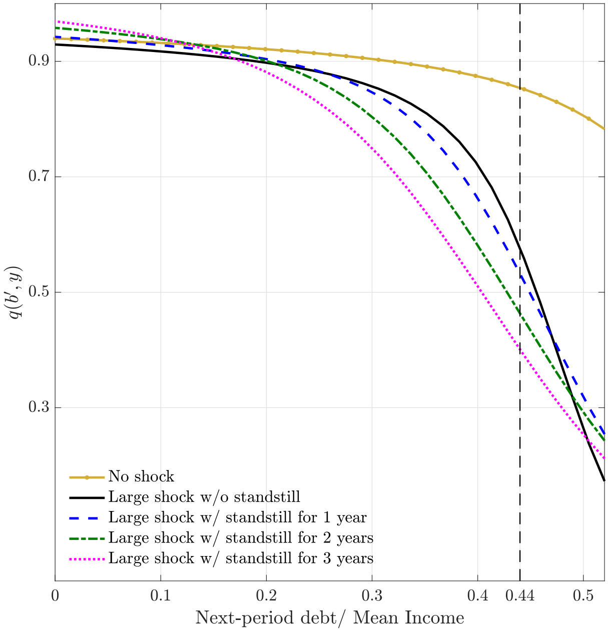
Related literature

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 **write-offs** (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 write-offs with standstills are **not significant for large write-offs.**

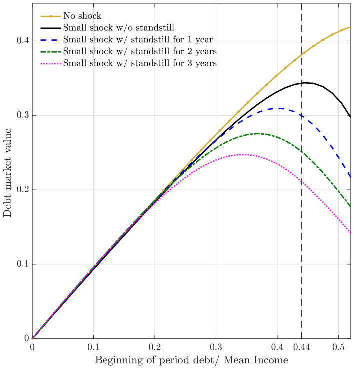
Debt price (large shock)

back

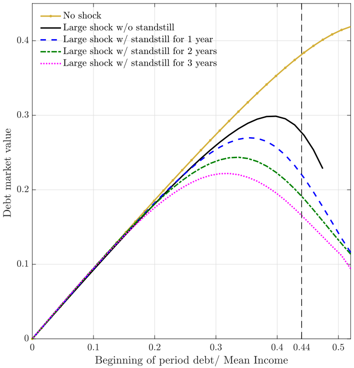


Debt market value curves

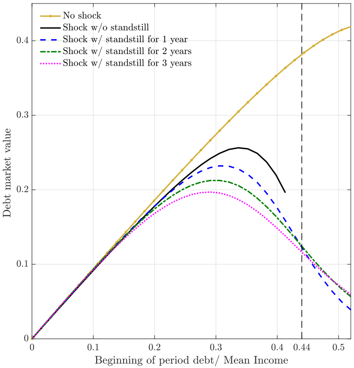
back



Small

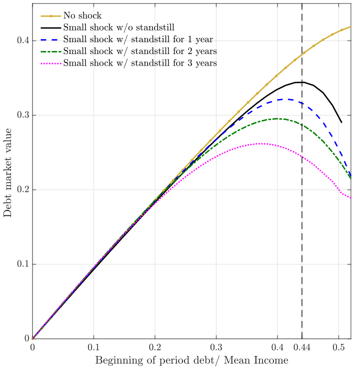


Large



Triggers default

Debt market value curves



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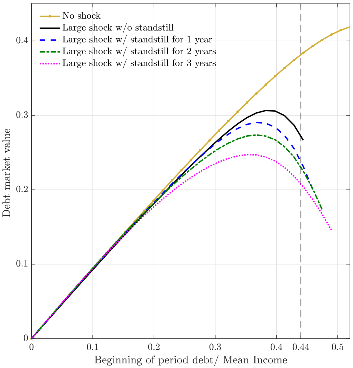

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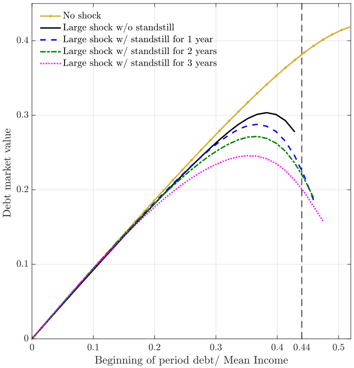
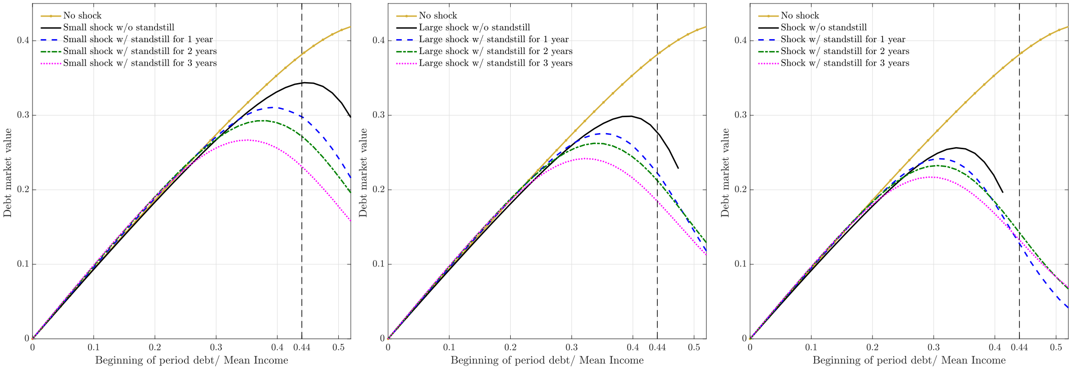


Triggers default

Debt market value curves

▸ back



Small

Large

Triggers default

Robustness 3: adding a positive recovery rate

back

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

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

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

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

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

Robustness 3: adding a positive recovery rate

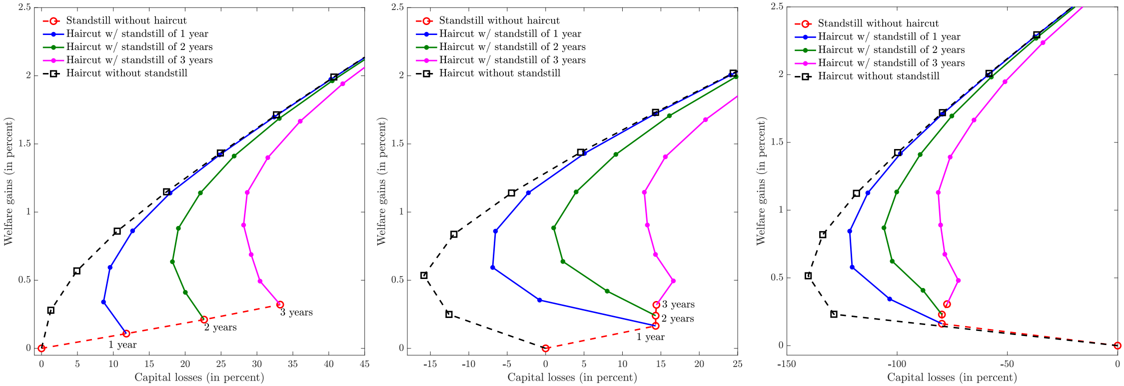
back

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

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

Robustness 3: adding a positive recovery rate

back



Small | Large | Triggers default

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