

Sovereign debt: 200 years of creditor losses

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24th Jacques Polak Annual Research Conference

Celebrating Ken Rogoff's Contributions to International Economics

IMF, November 9-10

Motivation and gaps in the empirical literature we aim to fill

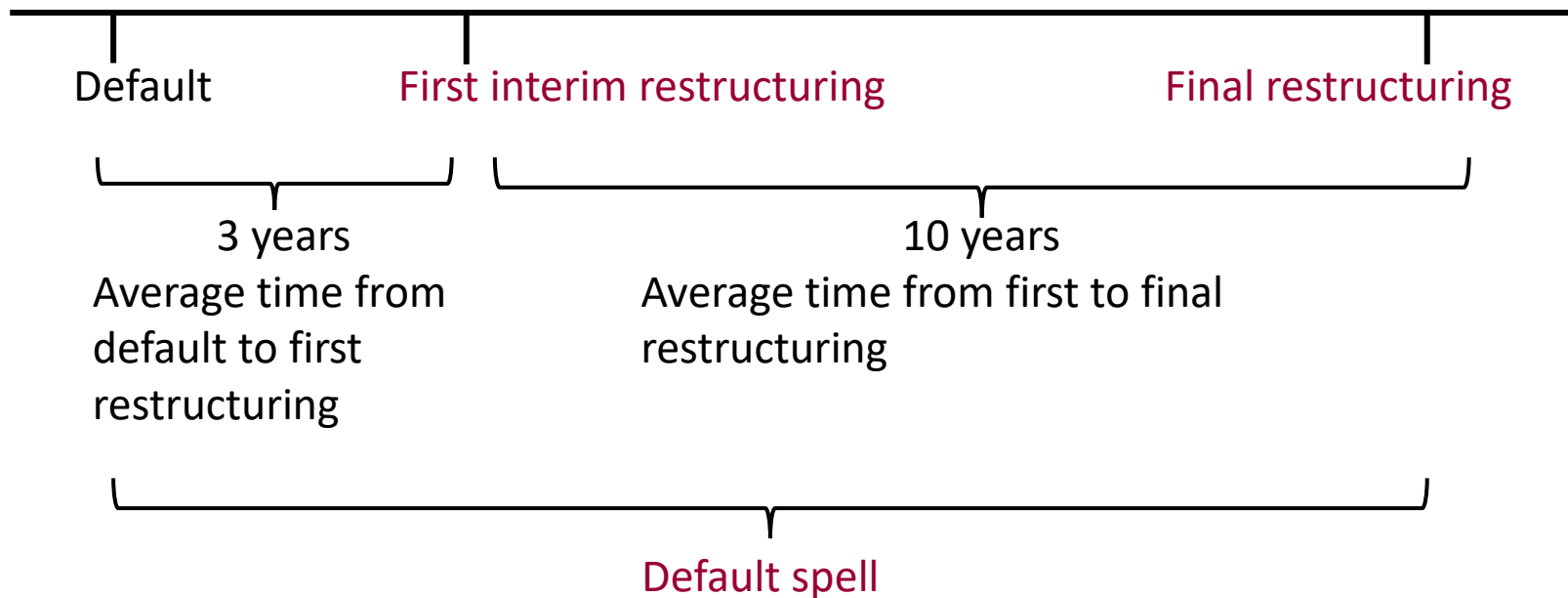
- Default (debt crises) are modelled as binary (0,1); the evidence suggests otherwise. They come in shades of grey (as is the case for banking crises—systemic vs. borderline, and currency and inflation crises of varying severity).
- The empirical literature tends to overlook the repeated-game aspect in sovereign debt negotiations that Bulow-Rogoff (1989, henceforth, B-R) highlight. Yet, it often takes multiple debt restructurings to end a debt crisis.
- Related to the previous point, haircuts are calculated for a **single** debt exchange. We account for serial restructurings and introduce the **B-R cumulative** haircut, which measures creditor losses when there is more than one restructuring during a default spell.
- A systematic comparison of the main historical drivers of haircut size can provide some rules-of-thumb as to what can be expected for future (or ongoing) defaults. Our list here is by no means exhaustive.

Preamble: Key definitions

Serial restructuring distinct from serial default, entails multiple debt restructurings within a single default episode.

Final restructuring deals end the default spell. These are not followed by another default vis à vis private creditors In, at least, the subsequent two years.

Default spells as in Reinhart and Rogoff (2009) begin with a default and end with a final restructuring, irrespective of how many years that may take or how many interim restructurings take place before the final one cures the default The maximum number of restructurings in a single default in our sample is seven.



Individual haircuts: Net-Present-Value (NPV), Sturzenegger and Zettelmeyer (2006, 2007)

$$H_t^i = 1 - \frac{\text{Present Value of } \textit{New Debt} (r_t^i)}{\text{Present Value of } \textit{Old Debt} (r_t^i)}$$

The discount rate, r , varies over time (t) and country (.).

It is usually proxied by the “exit yield” in secondary market prices

Introducing cumulative Bulow-Rogoff haircuts

$$H_{BR}^i = 1 - \prod_{j=1}^{J^i} WCR_{NPV}^{i,j}$$

WCR is the “wealth conversation ratio” (recovery rate) in the j^{th} restructuring event,

$$WCR_{NPV}^{i,j} = \frac{Debt\ affected^{i,j}}{Total\ Debt_{t-1}^i} (1 - H_{NPV}^{i,j}) + \left(1 - \frac{Debt\ affected^{i,j}}{Total\ Debt_{t-1}^i} \right)$$

The B-R measure allows us to answer questions like “What were creditor losses for Brazil’s 1983-1994 crisis (which involved 6 individual restructurings)?”

Summary of stylized facts: There are striking parallels in crisis resolution patterns across 200 years

We cover 321 final restructurings over 200 default spells, 1815-2020

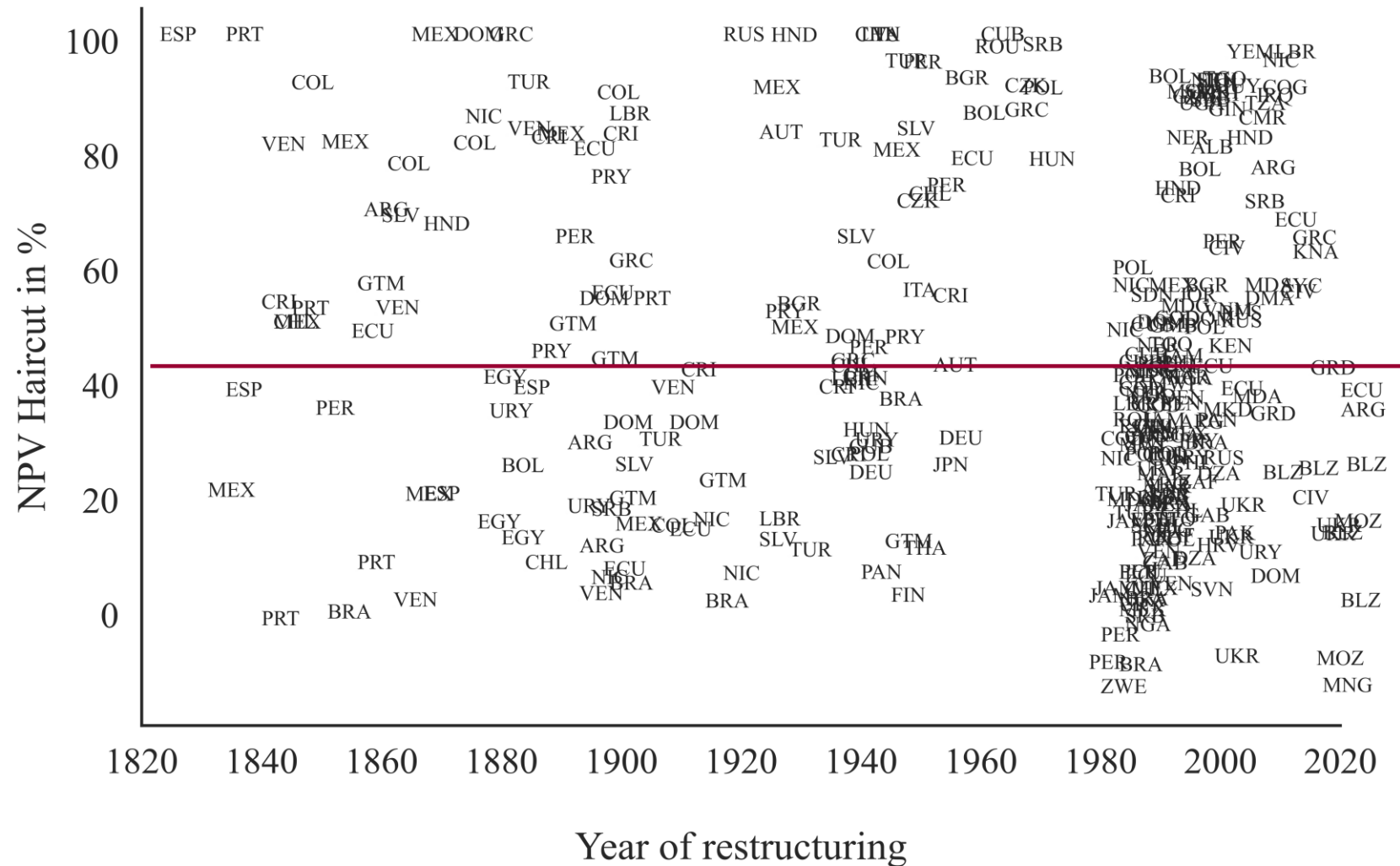
Features of Haircuts

1. Large heterogeneity in haircut size; this is evident throughout the full sample
2. Defaults are partial, as in B-R (median $\approx 38\%$); repudiations rare
3. Serial interim restructurings (within a default spell) are common and on the rise in the modern era (as stressed by B-R)
4. Interim restructurings have smaller haircuts than final ones (with a median of $\approx 30\%$ vs $\approx 50\%$)

Drivers of Size and Rules-of-Thumb: Haircuts are higher...

5. In the aftermath of external debt surges
6. For low-income debtors (larger haircuts do not necessarily imply greater debt relief)
7. For first-time sovereign issuers (borrowers)
8. During geopolitical disasters (wars, revolutions, country break-ups). These produce some of the most extreme outcomes
9. For longer debt crises
10. For deeper (post-default) output contractions

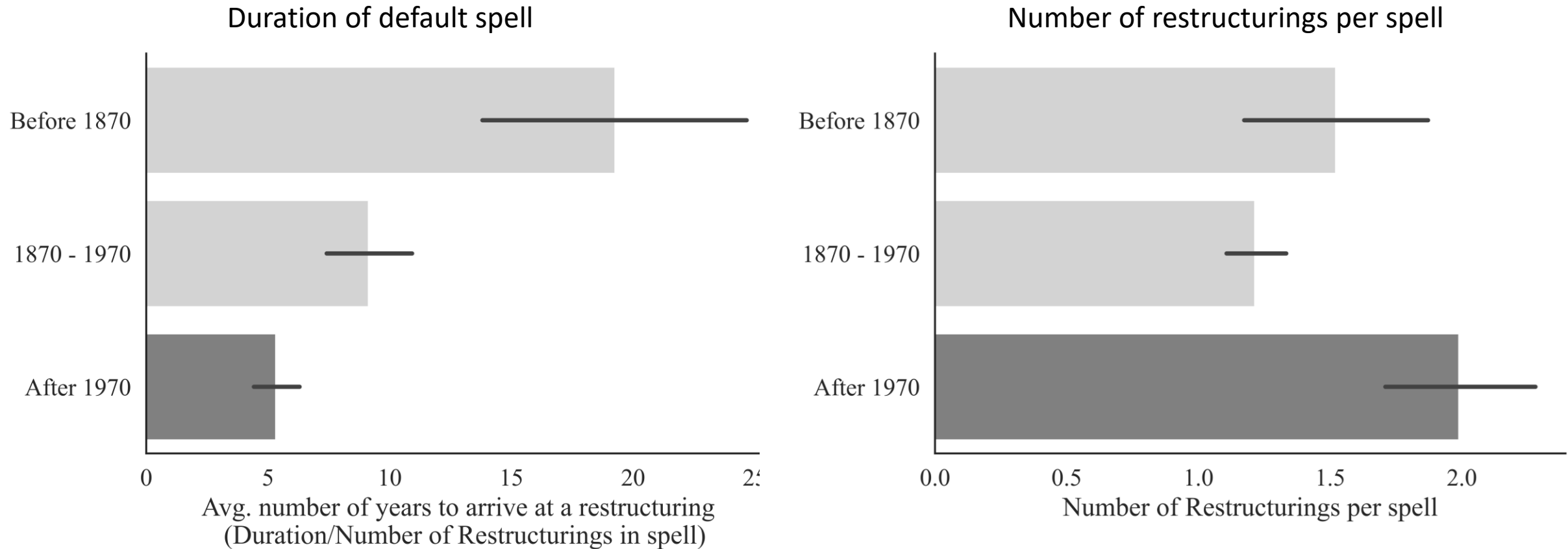
Stylized facts, 1815-2020: (1) There is a large variation in haircut size; (2) defaults are partial



Individual haircuts, H
 Average haircut = 42% (red line)
 Median haircut = 38%
 Definitions:
 Low H: below median
 High H: above median

(3) Serial interim restructurings (within a default spell) are on the rise in the modern era.

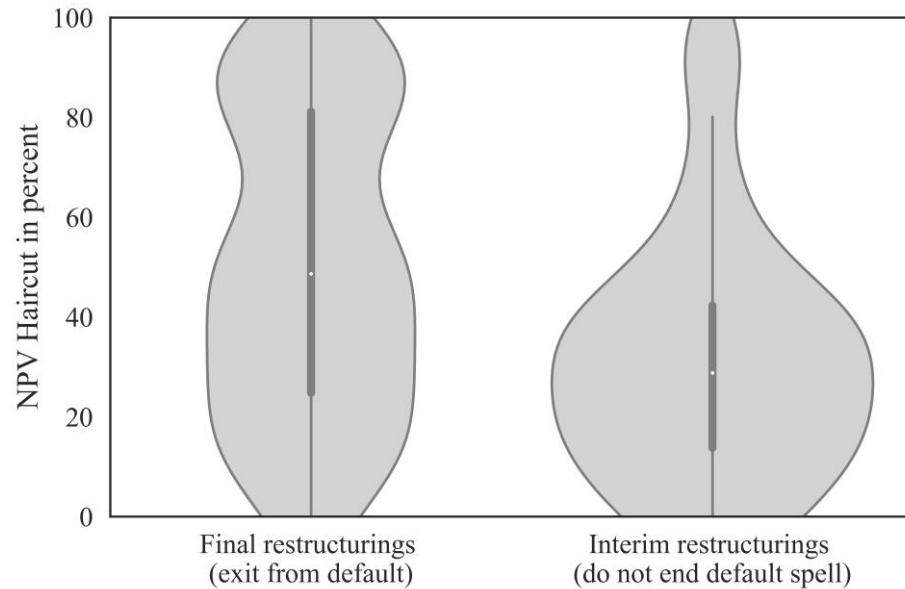
While default spells have become markedly shorter, the number of restructurings per spell has increased



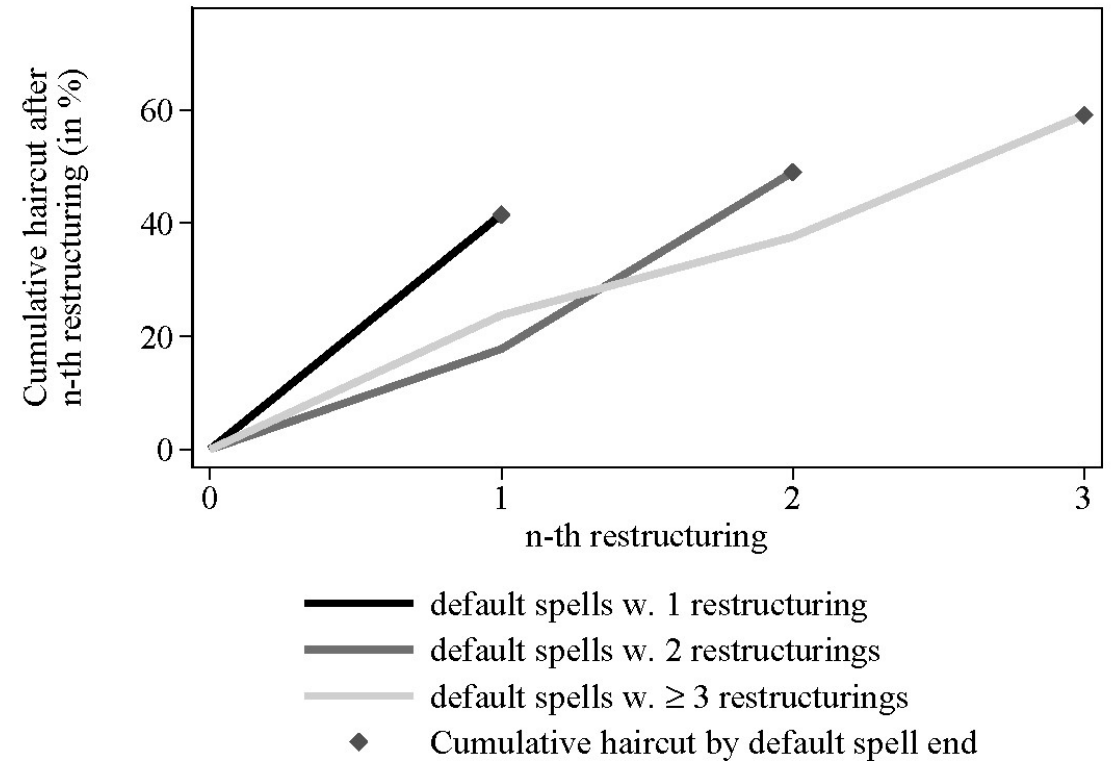
(4) Interim restructurings have smaller haircuts than final ones (median of $\approx 30\%$ vs $\approx 50\%$)

As interim restructurings fail, haircuts get bigger

Final vs. interim restructuring haircuts



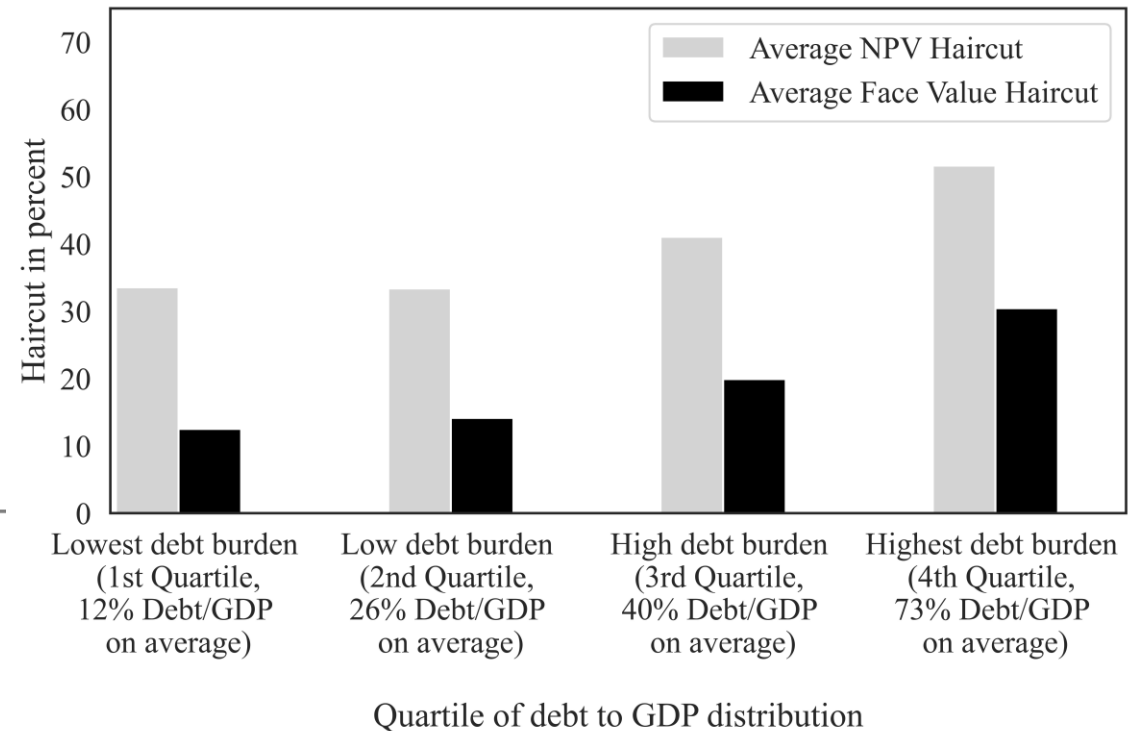
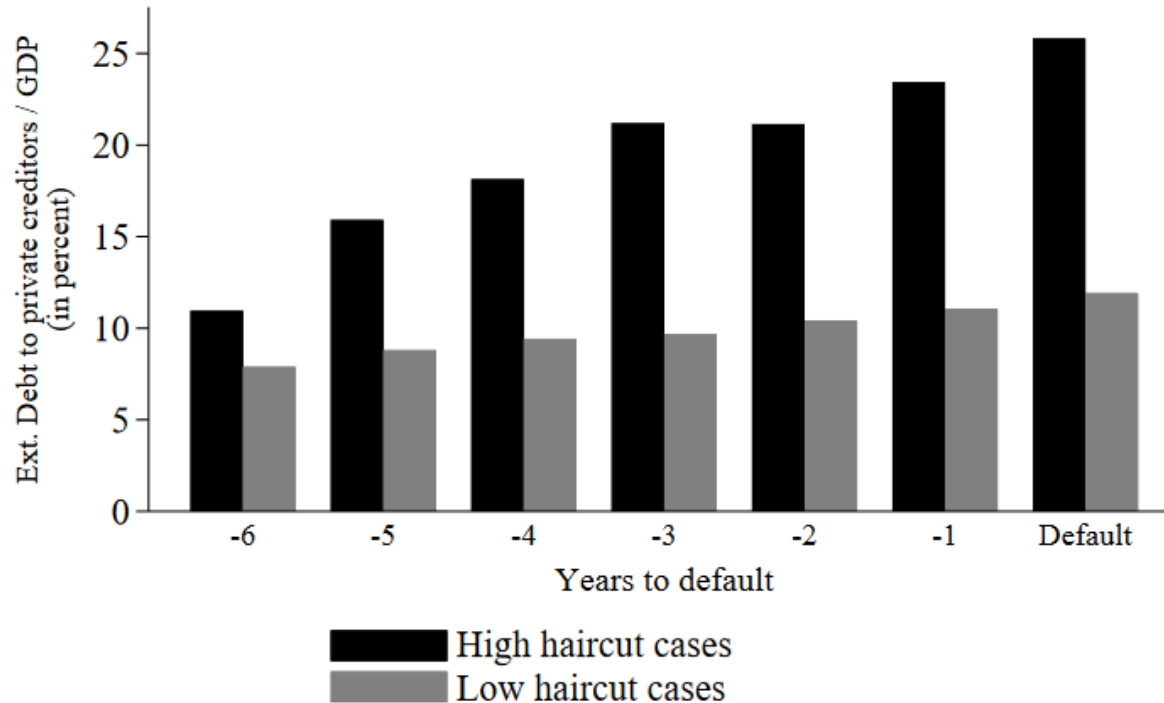
Serial restructuring and haircut size



(5) Haircuts are higher in the aftermath of external debt surges

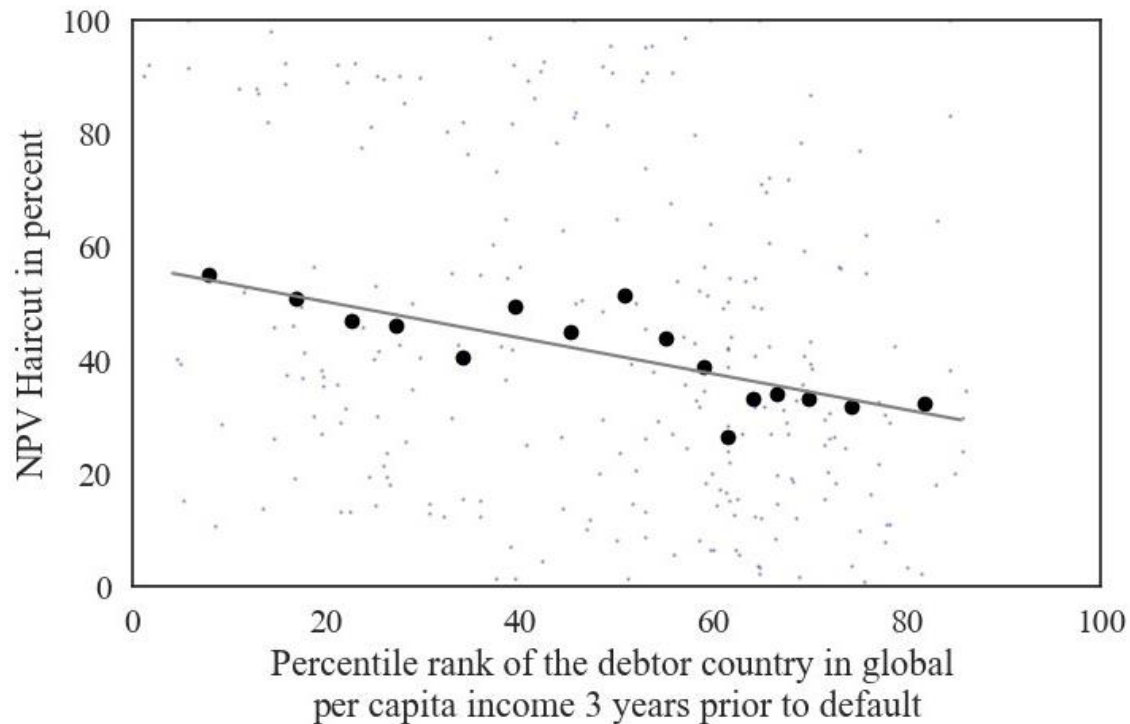
Pre-default build-up in debt to private creditors:
High and low haircut cases, 1815 - 2020

The pre-default build-up in debt to private creditors also
Translated to higher face value haircuts

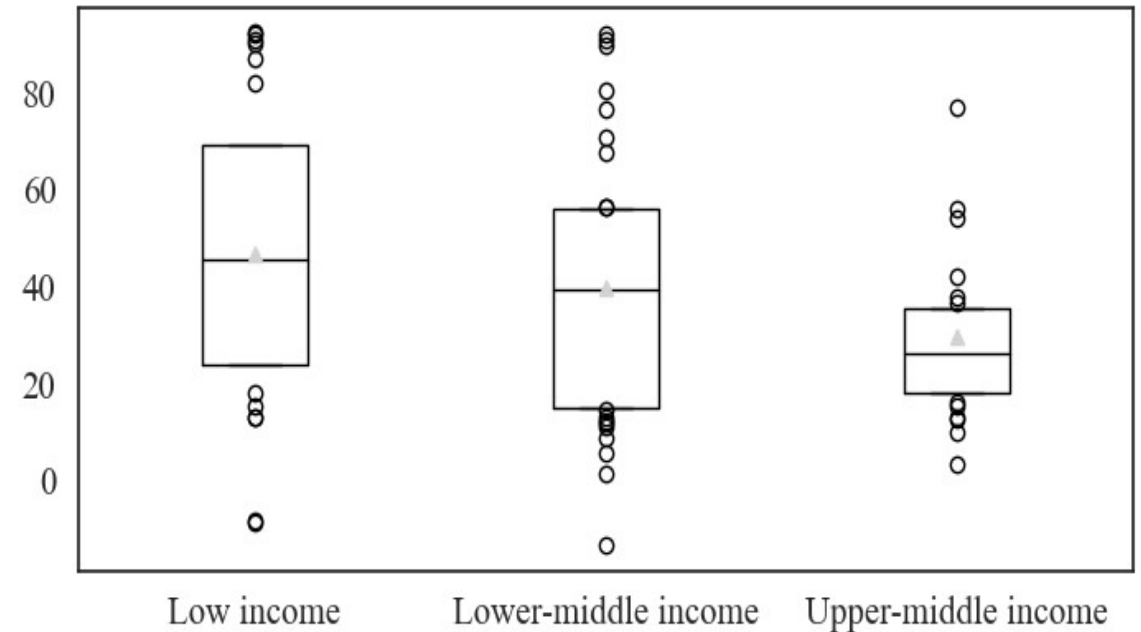


(6) Haircuts are higher for low-income sovereigns

Sovereign debtor's income relative to "world income" and haircut size



World Bank Income "group" as a predictor of haircut size: 1987-2020

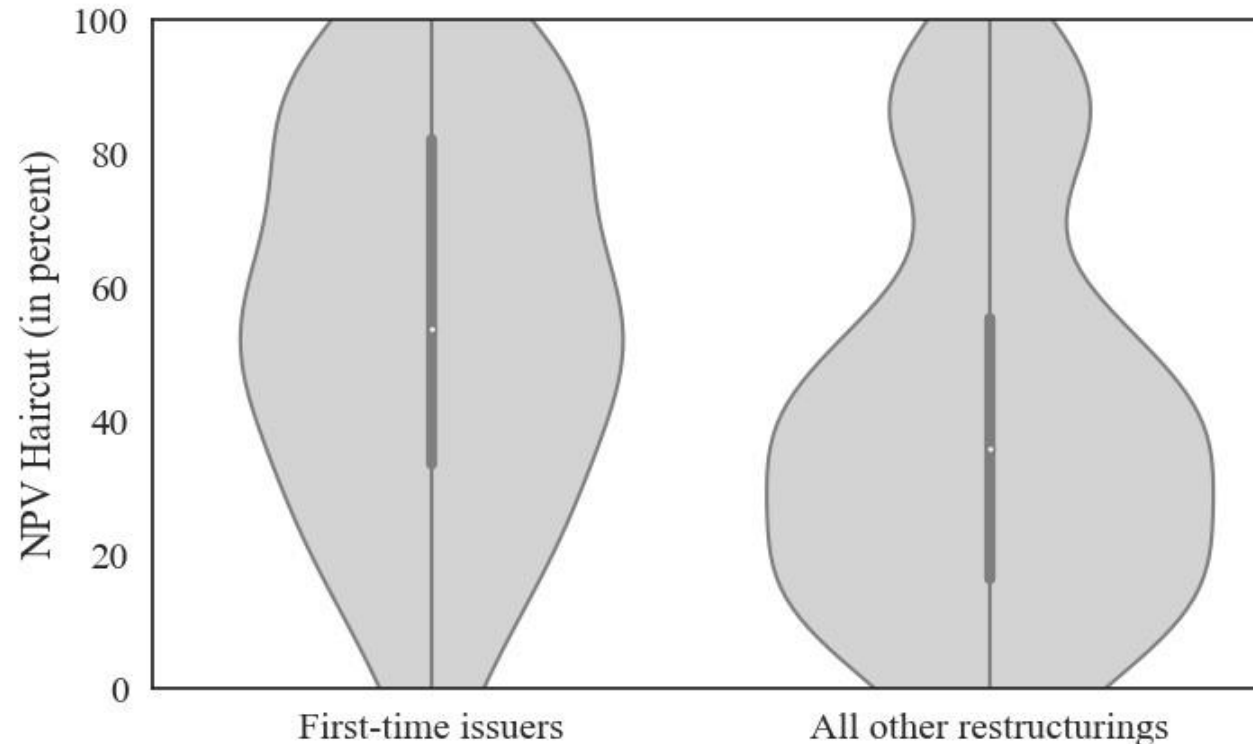


Note: The percentile rank in global per capita income is calculated per year to reflect the defaulter's relative economic development three years prior to the default (in order to reflect income levels prior to a possible economic downturn around the default).

Sources: World Bank WDI; Maddison Project (Van Zanden and Bolt, 2013); Meyer, Reinhart, and Trebesch (2022).

(7) Haircuts are higher for first-time sovereign issuers/borrowers

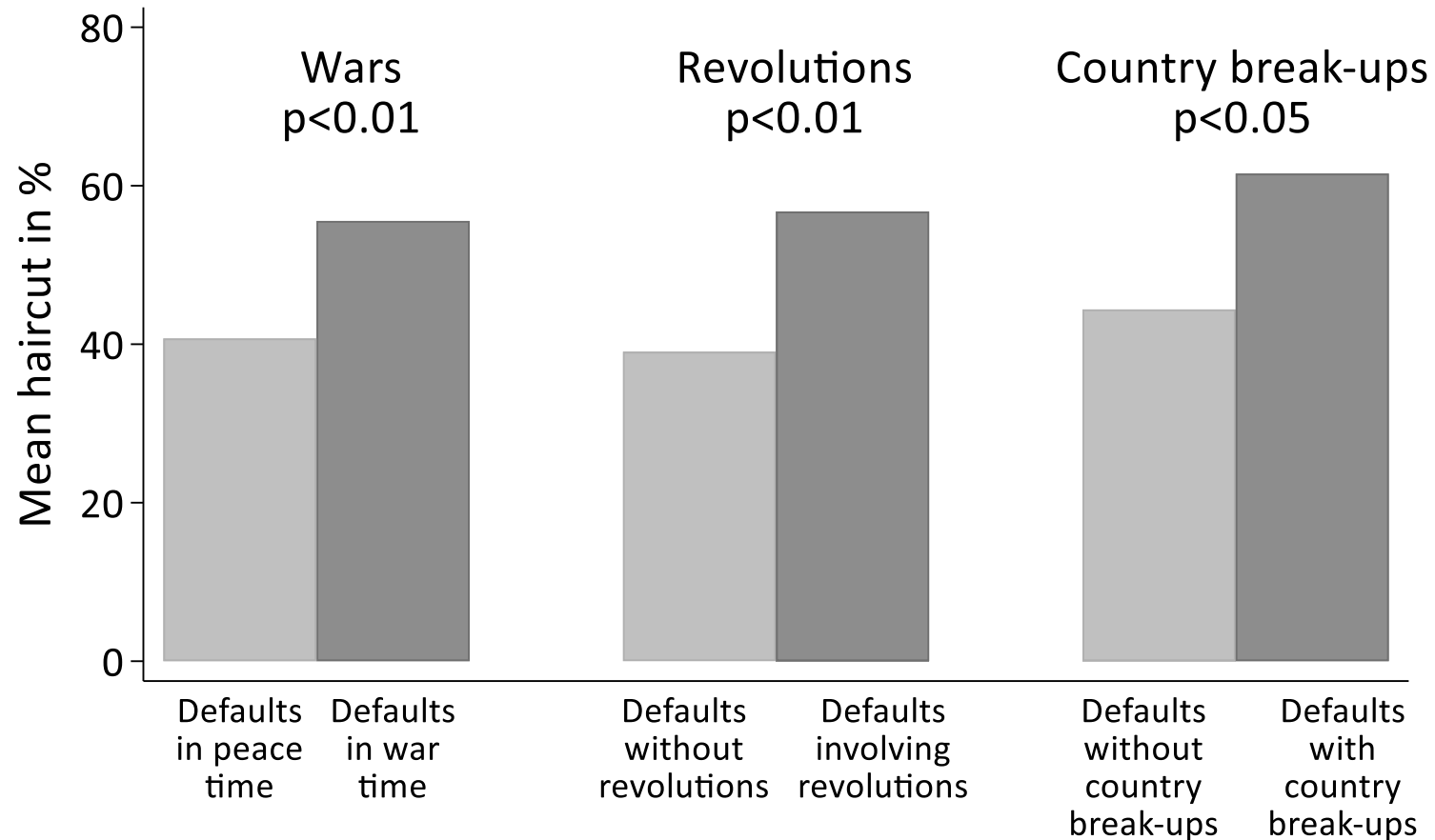
We introduce a new dataset that captures 28 such cases over 1815-2020



The median individual Haircut for first-time borrowers is 55% vs. 36% for all others

Note: 287 cases with data on whether default included first market issuance. To identify defaults on first market issuance of debt instruments, we rely on bond issuance for the period before 1970 and data from the World Bank's IDS thereafter. For the post 1970 period, where bank loans took the place of bonds, we consider non-trade-credit loans from private financial institutions as market issuance. Sources: World Bank IDS (2022), Meyer et al. (2022); Farah Yacoub et al. (2022); Cruces and Trebesch (2013); Fang et al. (2021); and authors' calculations.

(8) Haircuts are markedly higher in cases involving wars, revolutions, or country break-ups: 1815-2020



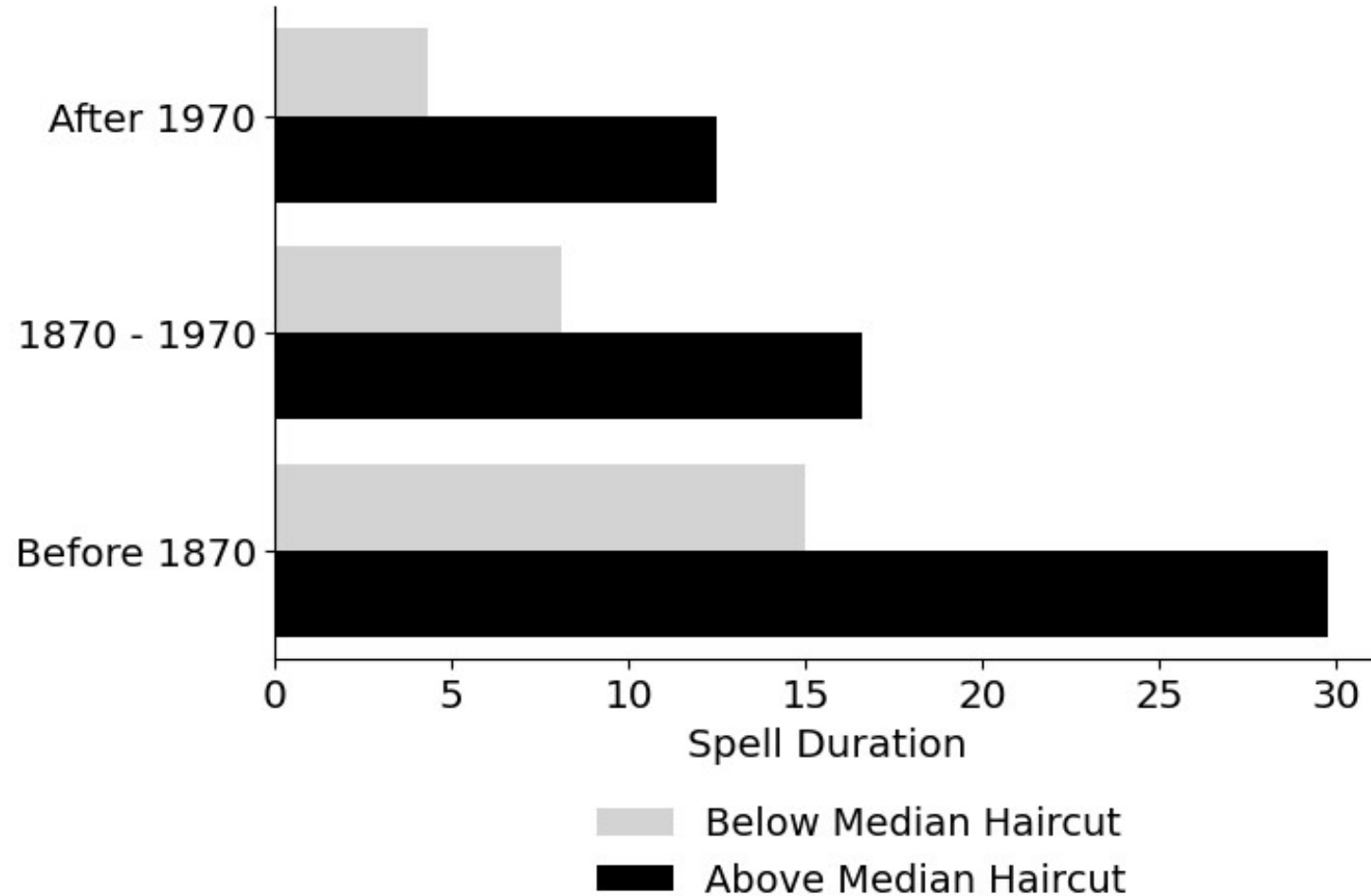
Sources: Meyer Reinhart, and Trebesch (2022); Farah, Graf Von Luckner, and Reinhart (2023) We use interstate-war data from Horn et al. (2021b), Sarkees and Wayman (2010), Nils Petter Gleditsch and Strand (2002) and Davies et al. (2023). Revolutions dates come from Arthur Banks database.

(8) Geopolitical disasters and haircuts: The largest creditor losses, 1815-2020

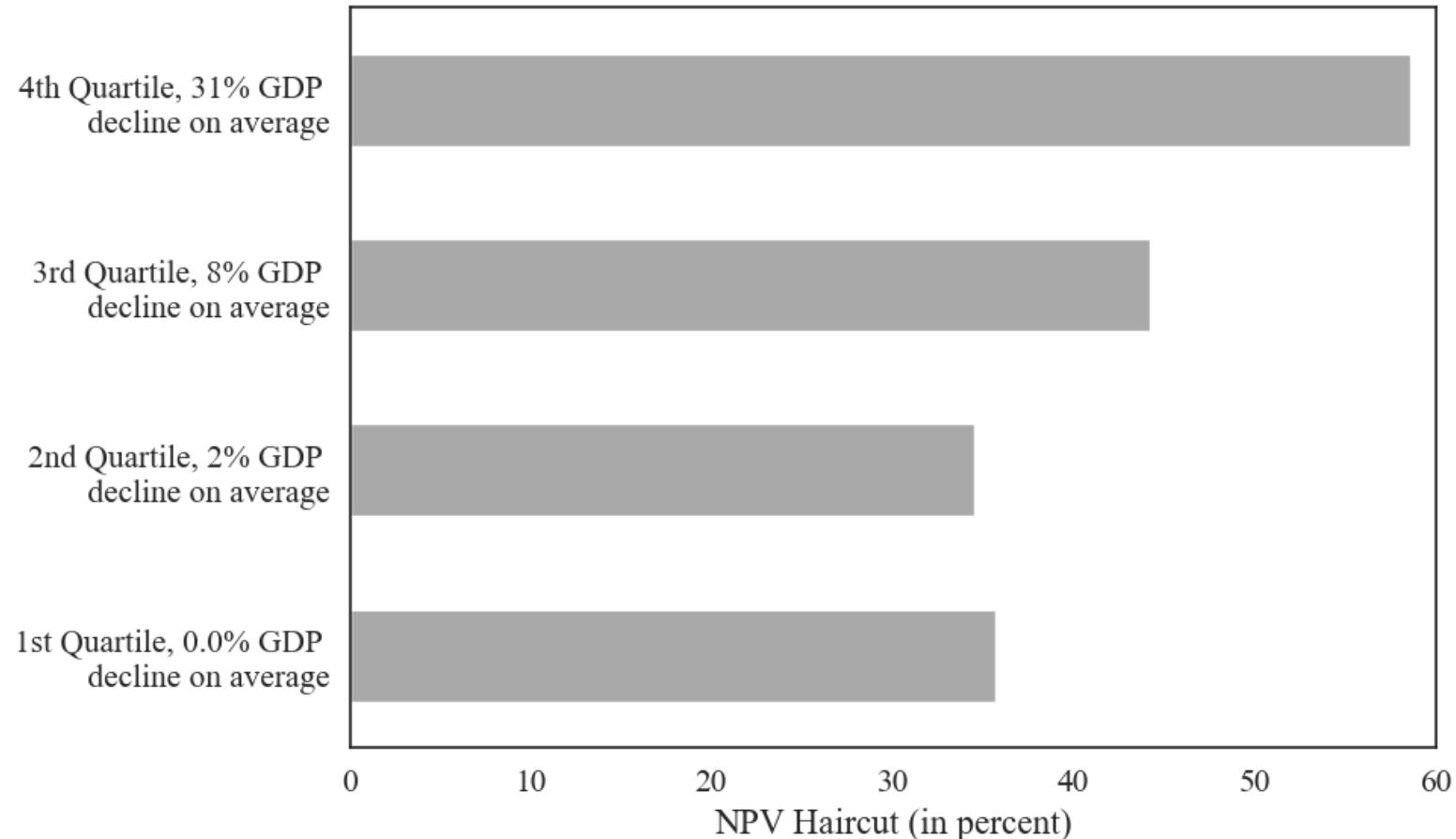
Debtor country	Default start	Default end	Haircut size in %	Volume in m USD	Type of shock	Context
Spain	1823	1833	100	2.44	Foreign intervention	Debt raised during “liberal Triennium” repudiated after absolute monarchy was reinstated under Ferdinand
Portugal	1834	1834	100	na	Foreign intervention	Debt raised by Dom Miguel declared void after he is toppled with the help of foreign powers
Mexico	1865	1865	100	na	Foreign intervention	Debt raised by French-installed king Maximilian I declared void after the Republic is reinstated
Dom. Republic	1872	1872	100	137	Domestic only	Parliament rejects debt restructuring agreement and declares debts as illegitimate.
Russia	1917	partly rest.*	100	23.892	Revolution	Lenin cancels all foreign debts plus seizure of foreign assets
China	1938	partly rest.*	100	4.109	Revolution	Mao fully repudiates foreign debts after 1949
Lithuania	1940	1940	100	180	Foreign annexation	Foreign debts never repaid after Soviet annexation
Latvia	1940	1940	100	109	Foreign annexation	Foreign debts never repaid after Soviet annexation
Cuba	1960	1960	100	299	Revolution	Castro repudiates all foreign debts
Ottoman Empire	1915	1928	100	6.304	Break-up	Debts of the dissolved Ottoman empire are fully repudiated
Romania	1933	1959	98	1.17	Foreign intervention	Debts repudiated in the wake of WW2 and Soviet control
Yugoslavia	1932	1967	98	924	Foreign intervention	Debts repudiated in the wake of WW2 and Soviet control
Liberia	1980	2009	97	1.278	Multiple	Civil wars, instability, natural disasters
Yemen	1983	2001	97	725	Multiple	Civil wars, instability, natural disasters
Nicaragua	1979	2007	96	1.438	Revolution	Sandinista Revolution, 1978/79 plus natural disasters
Peru	1931	1947	95	645	War	Long-delayed default after the Great Depression and WW2
Turkey	1944	1944	95	9.293	Break-up & war	Former restructured Ottoman Empire debt

(9) Haircuts are higher for longer debt crises

Default duration (in years) and B-R haircut size



(10) Haircuts are higher for cases with deeper (post-default) output contractions



Note: The decline in GDP is measured from two years prior to default to the “first” trough following the default. Due to data gaps, the sample consists of 164 default spells. Sources: Sources: World Bank WDI; Maddison Project Van Zanden and Bolt (2013); Meyer, Reinhart, and Trebesch (2022); Cruces and Trebesch (2013); Fang et al. (2021) and authors’ calculations.

Persistent knowledge gaps and concluding remarks

- There is significant variation in crisis outcomes, and determinants of haircut size are diverse → Rules of thumb presented here are far from exhaustive
- Avenues for future research:
 - What is the lasting impact of substantial haircuts, not just on market re-entry speed but also on official lending outcomes, especially in low-income countries.
 - Studying official creditor losses can provide a more comprehensive perspective on external debt negotiations and debt relief, reminiscent of Bulow and Rogoff's calls for grants over loans.
 - Even with its limitations, external debt crises and their resolution are far better understood than their domestic debt counterparts, where documentation is scarce and conceptual issues on the measurement of a “haircut” remain vague (as inflation is another tool for delivering a haircut).