

AT A GLANCE

## 200 years of sovereign debt crises: Serial restructurings may be accompanied by higher creditor losses

By Josefin Meyer

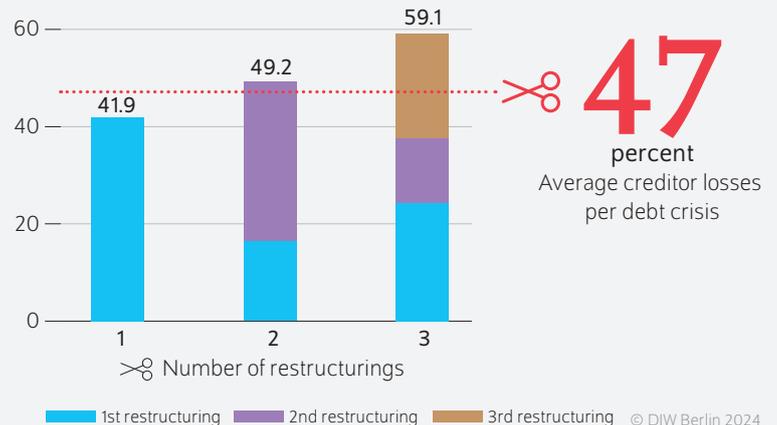
- Study investigates creditor losses due to external sovereign defaults over the past 200 years worldwide
- Investors lost 43 percent on average over 321 debt restructurings
- Two or more restructurings are needed to settle a default in one third of debt crises
- Debt crises with serial restructurings are associated with larger total creditor losses — on average, losses per default spell rise to 47 percent
- Debt sustainability analyses could determine optimal haircut size to reduce serial debt restructurings with haircuts that are too low

### One deep debt restructuring is better for creditors on average than multiple smaller ones



Source: Authors' calculations.

Cumulative creditor losses in percent



### FROM THE AUTHORS

*“Ultimately, it is important to find the optimal time and the correct haircut size in order to settle a debt crisis quickly and thus limit creditor losses. International institutions such as the International Monetary Fund can help with debt sustainability analyses.”*

— Josefin Meyer —

### MEDIA



Audio Interview with Josefin Meyer (in German)  
[www.diw.de/mediathek](http://www.diw.de/mediathek)

# 200 years of sovereign debt crises: Serial restructurings may be accompanied by higher creditor losses

By Josefin Meyer

## ABSTRACT

Many sovereign defaults have occurred worldwide over the past 200 years. An analysis of 321 sovereign debt restructurings since 1815 shows that foreign private and institutional investor losses were 43 percent on average. Notably, beginning in the 1970s, several debt exchanges have increasingly been required to resolve a default. To understand this new phenomenon better, this Weekly Report looks at total creditor losses across all restructurings during a default spell. Instead of focusing on each individual restructuring, the cumulative haircut adds up all losses across a default spell. These calculations show that debt crises with serial restructurings resulted in greater overall losses for creditors than a major one-off restructuring. The results conclude that it makes sense to perform a debt sustainability analysis independently and in a timely manner when determining the size of a haircut. This could lessen debt restructurings with shallow haircuts that do not manage to bring countries back to their sustainable debt path.

Defaults tend to be painful for debtors and creditors alike. Sovereign debtors may lose access to the international capital market, fall into a protracted recession, or suffer from social upheavals, while private and institutional creditors generally must accept losses in their portfolios sooner or later.

There has still been comparatively little research on the magnitude of a debt crisis on debtors and creditors. Unlike other crises, such as currency crashes, inflation, or banking crises, debt crises are generally characterized in a binary manner, i.e., did a crisis occur or not, irrespective of whether the crisis was resolved with minor or total losses for investors.

Moving beyond a simple characterization of sovereign debt crises, this Weekly Report examines the history of defaults since 1815 using a comprehensive dataset.<sup>1</sup> It focuses on the amount lost by creditors, also known as haircuts.<sup>2</sup> Moreover, this Weekly Report takes a closer look at the new phenomenon of serial restructurings and its relationship to the size of creditor losses.<sup>3</sup> Serial restructurings should not be confused with serial default. Usually, serial restructurings occur within a single default spell when the earlier restructuring deals do not provide enough debt reduction to place the country on a sustainable debt path.<sup>4</sup> A default spell is considered final when no further defaults occur within two years after the last default.

**1** This Weekly Report is based on a paper for the 24th Jacques Polak Annual Research Conference of the International Monetary Fund. Cf. Clemens Graf von Luckner, Josefin Meyer, Carmen M. Reinhart und Christoph Trebesch, "Sovereign Debt: 200 years of creditor losses," Mimeo, 2023 (available online. Accessed on January 22, 2024. This applies to all other online sources in this report unless otherwise noted).

**2** The data are based on work by Juan J. Cruces and Christoph Trebesch, "Sovereign Defaults: The Price of Haircuts," *American Economic Journal: Macroeconomics* 5, no. 3 (2013): 85-117; Josefin Meyer, Carmen M. Reinhart, and Christoph Trebesch, "Sovereign Bonds Since Waterloo," *The Quarterly Journal of Economics* 137, no. 3 (2022): 1615-1680. The analysis follows in the tradition of Carmen M. Reinhart and Kenneth Rogoff, "The Aftermath of Financial Crises," *American Economic Review* 99, no. 2 (2009): 466-472.

**3** The paper this Weekly Report is based on also investigates how much creditors lose during debt crises that are related to geopolitical shocks (wars, revolutions, empires breaking up), major external debt, or low per capita income of debtor countries, cf. Graf von Luckner et al., "Sovereign Debt."

**4** The term "serial restructuring" refers to two or more debt exchanges within a single default spell, cf. Carmen M. Reinhart, Kenneth S. Rogoff, and Miguel A. Savastano, "Debt Intolerance," *Brookings Papers on Economic Activity*, no. 23, 1 (2003) (available online).

### 321 restructurings over the past 200 years

The analysis considers the period from 1815 to 2020 and includes 200 default spells of countries on external debt instruments with a total of 321 debt restructurings (Figure 1). These instruments are held by private external creditors such as foreign or institutional investors like funds, insurers, and commercial banks (e.g., the London Club creditor banks during the 1970s or 1980s).<sup>5</sup> Domestic or external official creditors are excluded.

A default occurs when either the sovereign debtor misses debt payments beyond the grace period or when there are changes to the debt contract that are less favorable for the creditor, for example if an existing financial instrument such as a government bond or loan is exchanged for a new one. These restructurings mostly occur in the context of geopolitical or domestic political crises.

In this Weekly Report, the calculation of haircuts is limited to defaults and restructurings of medium and long-term debts. Restructurings that are solely involved with short-term debt, such as short-term credit line maintenance, 90-day debt roll-overs, or instances of short-term maturity extension of less than a year are excluded.

For cases where there are serial debt restructurings occurring close together, they must be aggregated to quantify the full extent of creditor losses between the start of debt distress and when it is resolved. To do so, the Bulow-Rogoff haircut (BR) is introduced, named after Jeremy Bulow and Kenneth Rogoff (Box). Only observing individual haircuts could distort the creditor losses. However, the BR method captures the dynamic aspects of multiple debt exchanges by aggregating the creditor losses. For example, during its debt crisis in the 1980s, Brazil recorded six individual haircuts (from nine percent in 1983 to 29 percent in 1994). The cumulative haircut according to the BR method during this 13-year-long default spell was 46.6 percent.

### There is a large heterogeneity in the size of haircuts

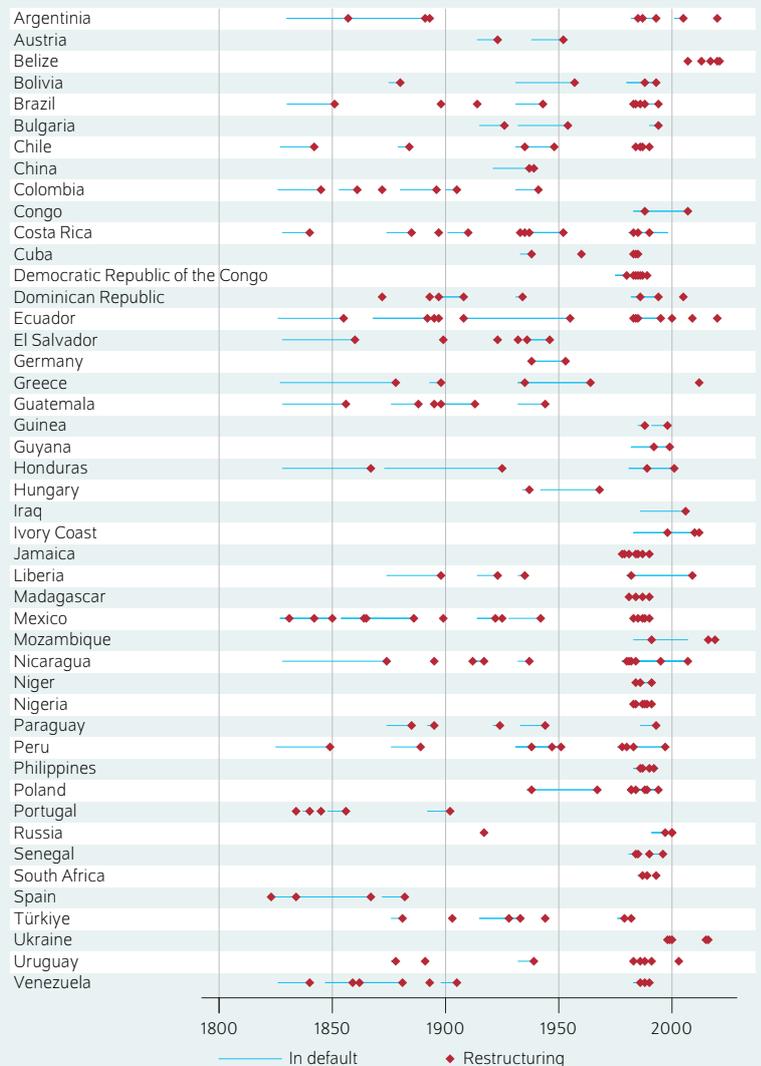
Average investor losses are around 43 percent per restructuring. According to the BR method, this figure was as high as 47 percent for each default spell (Table). Over the past 200 years, there have been around a dozen cases in which haircuts were negative. In these cases, the net present value after the debt exchange was higher than before. This can happen, for example, when sovereigns extend debt maturities at higher interest rates than in the previous contract in advance to avoid a default. Such debt restructurings are rare and almost always occur during the earlier stages of a crisis.

<sup>5</sup> The London Club is an informal group of banks that generally act as creditors to emerging markets. These banks coordinate and represent their common interests and concerns related to their loan and financial relationships to these countries.

Figure 1

### Selected debt crises and restructurings worldwide from 1815 to 2020

By country in alphabetical order



Notes: The selection was limited to debt crises in 46 countries. In total, 91 countries have been affected by sovereign debt crises over the past 200 years. A default spell is considered final when no further defaults have occurred within two years after the default has been settled.

Source: Authors' calculations based on Graf von Luckner et al., "Sovereign Debt: 200 years of creditor losses."

© DIW Berlin 2024

While there have been more restructurings worldwide in the past decades, there have been fewer long default spells.

Table

**Creditor losses by sovereign debt crisis from 1815 to 2020**  
In percent

	Creditor losses				
	Number	Average	Median	25 <sup>th</sup> percentile	75 <sup>th</sup> percentile
<b>Total</b>					
Individual haircuts (through restructurings)	321	43	38	18	65
Default spells according to Bulow-Rogoff	200	47	44	18	79
<b>By time period</b>					
<b>Individual haircuts</b>					
1815–1970 (government bonds)	136	51	48	25	81
1970–1997 (bank loans)	138	34	30	16	46
1998–2020 (government bonds)	47	45	42	15	69
<b>Cumulative haircuts according to Bulow-Rogoff</b>					
1815–1970 (government bonds)	106	46	42	13	79
1970–1997 (bank loans)	55	47	45	22	75
1998–2020 (government bonds)	39	51	54	23	86

Notes: In the 1970s and 1980s, the dominant form of borrowing was syndicated loans from banks. The resolution of the 1980s Latin American debt crisis marked the end of financing through bank loans and the resumption of bonds as a significant source of government financing.

Source: Authors' calculations based on Graf von Luckner et al., "Sovereign Debt: 200 years of creditor losses."

© DIW Berlin 2024

They can be advantageous for the state in the short term, as extending the terms may smooth out repayment and mitigate acute refinancing risks.

The other extreme is a full repudiation. Ten of the debt restructurings discussed here fall into this category. Mostly, these extreme cases are related to geopolitical turbulence or revolutions in which legislative or executive authorities declare the defaulted debt as illegitimate, such as happened after the Russian revolution in 1917 or after the Chinese default in 1949.

**Serial restructurings are increasingly common**

Defaults often require multiple rounds of debt restructuring until they are settled. On average, 1.6 restructurings are needed to settle a default, with some cases requiring as many as seven distinct restructurings (Figure 2). More than one third of the 200 default spells covered required two or more restructurings to cure the default.

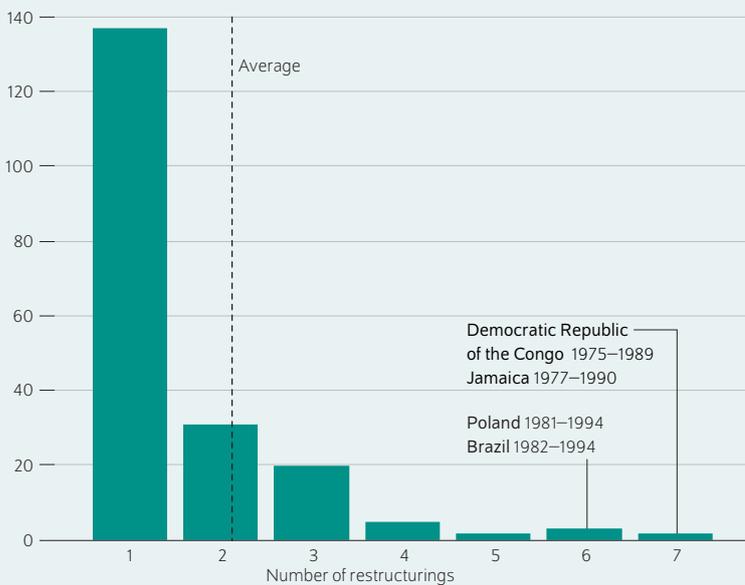
When observing the entire history of defaults and debt restructurings, serial restructurings have become more important in past decades (Figure 3). This could be due to the changes in institutional and contractual frameworks. For example, the introduction of collective action clauses could have improved restructuring coordination.<sup>6</sup>

The increase in interim restructurings is accompanied by shorter default spells (bottom of Figure 3). In the 19th century during the long nation-building process in Latin America and Europe, defaults often stretched out over decades, such as in the case of Greece from 1824 to 1878. These defaults were delayed by events such as border wars, internal revolutions, and disarray.<sup>7</sup> In the later 19th century and early 20th century, political conditions stabilized. At the same time, default spells also became shorter.

Default spells became even shorter in the beginning of the 1970s. At the same time, multilateral institutions increased their involvement in emerging markets and developing countries. However, defaults now typically involve more interim restructuring deals, which often see low haircuts (Figure 3).<sup>8</sup> Whether shorter default spells with multiple restructurings are associated with fewer creditor losses will be investigated in the following section.

Figure 2

**Default spells by number of restructurings since 1815**  
Number of default spells



Note: A default spell is considered final when no further defaults have occurred within two years after the default has been settled.

Source: Authors' calculations based on Graf von Luckner et al., "Sovereign Debt: 200 years of creditor losses."

© DIW Berlin 2024

Worldwide, sovereign debt crises are ended after 1.6 restructurings on average.

<sup>6</sup> Collective action clauses (CACs) are contractual conditions of bonds (debt securities) that enable a majority of creditors to change the conditions of debt securities, even if not all creditors agree. CACs are often used in international bonds or bonds of emerging markets.

<sup>7</sup> Miguel Angel Centeno, *Blood and debt: War and the nation-state in Latin America* (Penn State Press: 2002).

<sup>8</sup> For a historical perspective on the changing mission of the International Monetary Fund, cf. Carmen M. Reinhart and Christoph Trebesch, "Sovereign debt relief and its aftermath," *Journal of the European Economic Association* 14, no. 1 (2016): 215–251.

Box

**Method for calculating creditor losses**

Creditor losses resulting from debt restructurings are known as haircuts. To calculate the net present value (NPV) haircut  $H_{i,t}$  for a restructuring  $i$  at time  $t$ , the net present value of the contractual payment streams of the new debt issued during the restructuring is compared with the NPV of the old debt in default, accounting for arrears and cash payments.

$$H_{i,t} = 1 - \frac{NPV_{New}}{NPV_{Old}}$$

The new financial instruments such as government bonds or loans differ from the old ones typically in either one or in all three dimensions: the interest rate, maturity, and face value of the obligation. This metric accounts for the characteristics of both old and new debt as well as any changes in maturity and interest structure. The haircut calculated compares the present value of the new and the old debt in a hypothetical scenario in which the country continues to pay any remaining outstanding "old" debts as if no default had occurred with what the country must pay with the newly issued debt. Both payment streams are discounted using the same interest rate.<sup>1</sup>

For cases in which there is more than one debt restructuring, haircuts must be aggregated over the multiple restructurings with the aim of quantifying the full creditor losses between the start of debt distress and when it is finally resolved.

The Bulow-Rogoff haircut<sup>2</sup> is used to estimate the cumulative creditor losses of serial debt restructurings during a single default spell. This cumulative metric captures the compound loss experienced by a passive investor who held a portfolio of all the securities or loans placed by the country, including those restructured in the previous debt restructuring deals. Specifically, for the final restructuring event  $i$ , the Bulow-Rogoff haircut can be computed as:

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

where  $J - 1$  represents the number of interim restructuring deals that occurred before the final restructuring deal  $i$ .  $R_{NPV}^{i,j}$  denotes the wealth conservation ratio in the  $j$ th restructuring event. The wealth conservation ratio, or recovery rate, is defined as 1 minus the effective estimated haircut for the restructuring event and is derived from debt data to private creditors at time  $t$ .

The BR haircut allows for a comprehensive evaluation of the long-term cumulative creditor losses due to serial restructurings. It is useful when comparing across eras with different restructuring modalities. The BR haircut is particularly pertinent when there are numerous interim restructurings with low haircuts that were followed by follow-up deals with deeper haircuts in the same default spell, as was the case during the 1980s in Brazil and Poland (Figure 1). Observing haircuts individually would distort creditor losses, as it gives too much weight to interim low-haircut deals where the share of debt covered by the exchange also tends to be much lower. It can markedly understate creditor losses during a period when serial restructurings were commonplace. The BR haircut captures the dynamic aspect of serial debt exchanges, offering a unified summary of creditor losses.

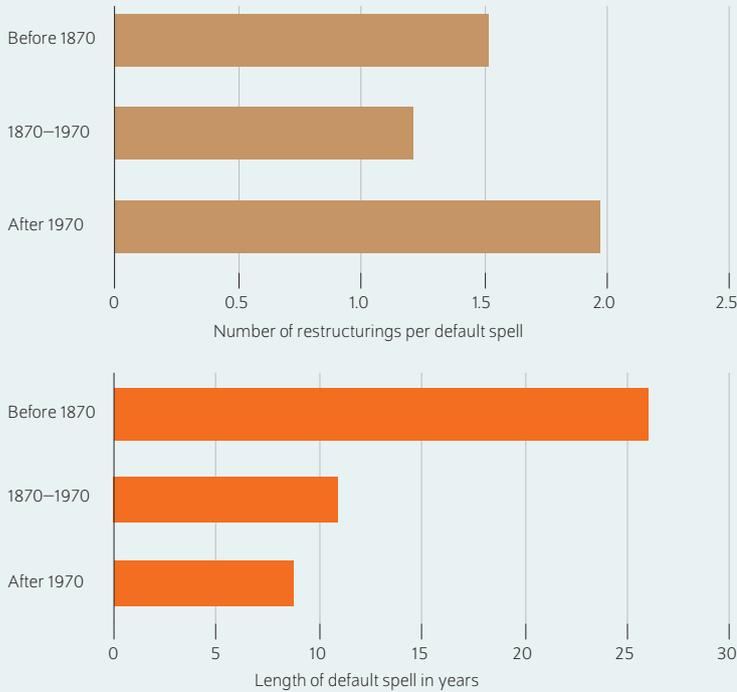
<sup>1</sup> Data on restructuring and haircuts for 1815 to 1970 are from Meyer, Reinhart, and Trebesch, "Sovereign Bonds Since Waterloo;" for 1970 to 1998, Cruces und Trebesch, "Sovereign Defaults;" and for 2017 to 2022, Asonuma Toman and Christoph Trebesch, "Sovereign Debt Restructurings: Preemptive or Post-Default," *Journal of the European Economic Association* 14, no. 1 (2016): 175–214 as well as Chuck Fang, Julian Schumacher, and Christoph Trebesch, "Restructuring Sovereign Bonds: Holdouts, Haircuts and the Effectiveness of CACs," *IMF Economic Review* 69 (2021): 155–196 for 1999 to 2016, and Graf von Luckner et al., "Sovereign Debt."

<sup>2</sup> Cf. Jeremy Bulow and Kenneth Rogoff, "A constant recontracting model of sovereign debt," *Journal of Political Economy* 97, no. 1 (1989): 155–178.

Figure 3

**Restructurings by time period**

Number of restructurings and length of crisis in years



Note: A default spell is considered final when no further defaults have occurred within two years after the default has been settled.

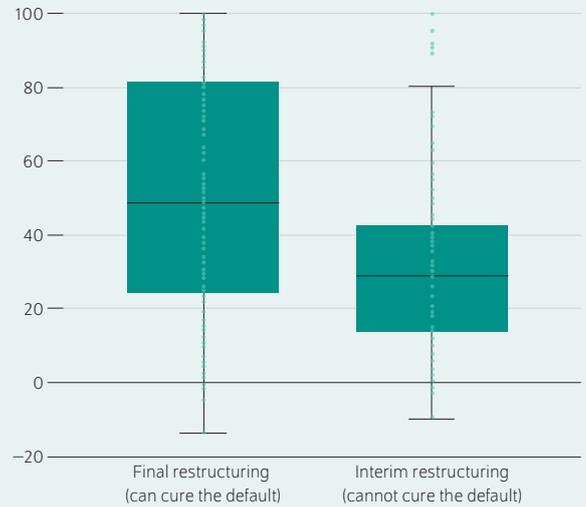
Source: Authors' calculations based on Graf von Luckner et al., "Sovereign Debt: 200 years of creditor losses."

© DIW Berlin 2024

The number of restructurings per debt crisis may have increased after 1970, but the length of sovereign debt crises has become considerably shorter.

Figure 4

**Distribution of creditor losses resulting from interim and final restructurings since 1815**  
In percent<sup>1</sup>



<sup>1</sup> The green area represents the accumulation of the respective debt restructuring in the mean distribution. The black line indicates the median. Negative values arise when creditors make profits through crisis-related contract adjustments. This could happen, for example, when countries extend the maturity of their debts and, in return, accept higher interest rates than in the previous agreement.

Source: Authors' calculations based on Graf von Luckner et al., "Sovereign Debt: 200 years of creditor losses."

© DIW Berlin 2024

Restructurings with low creditor losses have mostly not led to an end of a debt crisis.

**Interim restructurings have smaller haircuts than final restructurings**

The 321 individual restructurings of the 200 default spells can be divided into two groups: restructurings that could settle a sovereign default (final restructurings) and restructurings that could not end the default spell (interim restructurings). At 30 percent, interim restructurings have a significantly lower median haircut size compared to final restructurings at 50 percent (Figure 4). The distribution of interim restructurings is concentrated strongly in the lower area: The majority of creditor losses from interim restructurings are between 20 to 40 percent. In comparison, final restructurings have a more even distribution of haircuts across the entire spectrum of creditor losses.

However, the analysis shows that the more restructurings required, the higher the total creditor losses (Figure 5). The first restructuring shows haircuts with creditor losses of a bit over 40 percent, while creditors accumulate average losses of 60 percent under defaults with three or more restructurings. Cumulative creditor losses are higher on average after

1998 (51 percent) compared to the previous decades (46 percent) (Table).

**Conclusion: Debt sustainability analysis could help to find the optimal haircut**

Research thus far has focused on haircuts in each individual restructuring separately instead of considering the full crisis spell when calculating creditor losses. Considering the entire default spell, average cumulative creditor losses are significantly higher in cases of serial restructurings. Despite serial restructurings, it is often not possible to establish a sustainable debt trajectory to settle the default. One possible reason for this is that restructurings were too low or happened too late, setting the stage for ongoing sovereign debt crisis. Other reasons can include emerging domestic and foreign political upheavals or overly optimistic economic predictions.<sup>9</sup> As defaults occur for a variety of reasons, often with

<sup>9</sup> For a further analysis of the reasons, see Christoph Trebesch et al., "External sovereign debt restructurings: Delay and replay," *VoxEU column*, March 30, 2021 (available online).

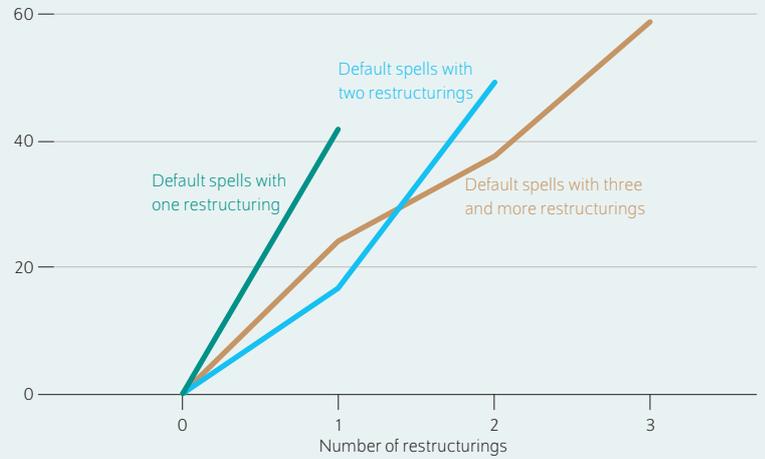
multiple factors at play, it is difficult to make causal conclusions about a default settlement based on the number of restructurings and the size of the haircuts. The results here simply show that in many cases, the initial debt restructuring terms are not enough to put a country's debt onto a sustainable debt path.

In the interests of all parties involved, debtors should not end up with more debt nor creditors with a worse portfolio due to incorrect assumptions about debt sustainability. Thus, it is important to determine the correct size of the haircut at the right time to limit creditor losses and to keep the country's default spell relatively short.

International institutions can help to reduce the probability of unsustainable debt restructuring with low haircuts by providing realistic evaluations in their debt sustainability analyses. These should cover all types of debt that pose a risk to a country's public finances in order to, for example, recognize maturity or currency mismatches. Based on this, financing needs and potential sources of funding could be calculated and identified.

Figure 5

**Creditor losses by number of debt restructurings**  
In percent



Note: A default spell is considered final when no further defaults have occurred within two years after the default has been settled.

Source: Authors' calculations based on Graf von Luckner et al., "Sovereign Debt: 200 years of creditor losses."

© DIW Berlin 2024

More restructurings during a default spell are frequently associated with higher cumulative creditor losses.

Josefin Meyer is Head of the International Macroeconomics Research Group in the Macroeconomics Department at DIW Berlin | [jmeyer@diw.de](mailto:jmeyer@diw.de)

JEL: E4, F3, F4, G1, N0

Keywords: Sovereign debt, Sovereign debt crises and defaults, haircuts

## LEGAL AND EDITORIAL DETAILS

---



DIW Berlin — Deutsches Institut für Wirtschaftsforschung e. V.

Mohrenstraße 58, 10117 Berlin

[www.diw.de](http://www.diw.de)

Phone: +49 30 897 89-0 Fax: -200

Volume 14 February 07, 2024

### Publishers

Prof. Dr. Tomaso Duso; Sabine Fiedler; Prof. Marcel Fratzscher, Ph.D.;

Prof. Dr. Peter Haan; Prof. Dr. Claudia Kemfert; Prof. Dr. Alexander S. Kritikos;

Prof. Dr. Alexander Kriwoluzky; Prof. Karsten Neuhoff, Ph.D.;

Prof. Dr. Carsten Schröder; Prof. Dr. Katharina Wrohlich

### Editors-in-chief

Prof. Dr. Pio Baake; Claudia Cohnen-Beck; Sebastian Kollmann;

Kristina van Deuverden

### Reviewer

Prof. Dr. Peter Haan

### Editorial staff

Rebecca Buhner; Dr. Hella Engerer; Ulrike Fokken; Petra Jasper; Sandra Tubik

### Layout

Roman Wilhelm; Stefanie Reeg; Eva Kretschmer, DIW Berlin

### Cover design

© imageBROKER / Steffen Diemer

### Composition

Satz-Rechen-Zentrum Hartmann + Heenemann GmbH & Co. KG, Berlin

Subscribe to our DIW and/or Weekly Report Newsletter at

[www.diw.de/newsletter\\_en](http://www.diw.de/newsletter_en)

ISSN 2568-7697

Reprint and further distribution—including excerpts—with complete

reference and consignment of a specimen copy to DIW Berlin's

Customer Service ([kundenservice@diw.de](mailto:kundenservice@diw.de)) only.