

Sovereign defaults at home and abroad

This paper provides a systematic comparison of domestic and external sovereign defaults from 1980 to 2018, covering details of the default events, the different macro-financial, political and geo-economic environments in which they occur, and type of restructuring applied.



Aitor Erce

Navarra Public University

Enrico Mallucci

Board of Governors of the Federal Reserve System

Mattia Picarelli

European Stability Mechanism

Disclaimer

This working paper should not be reported as representing the views of the ESM. The views expressed in this Working Paper are those of the authors and do not necessarily represent those of the ESM or ESM policy.

European Stability Mechanism



Sovereign defaults at home and abroad

Aitor Erce¹ Navarra Public University

Enrico Mallucci² Board of Governors of the Federal Reserve System

Mattia Picarelli³ European Stability Mechanism

Abstract

We systematically compare sovereign defaults on debt issued externally and domestically. Defaults at home and abroad are equally frequent, and governments often default selectively. Compared to domestic defaults, external defaults are larger and take longer to resolve. Both external and domestic defaults are often resolved through maturity extensions and coupon reductions. Face value reductions are infrequent, especially as part of domestic restructurings. Yet, domestic defaults are more punitive, as they are associated with larger creditor losses. We also document that domestic and external sovereign defaults occur in markedly different macro-financial, political and geo-economic environments. Our stylised facts inform a growing theoretical literature concerned with sovereign defaults in the presence of domestic debt markets.

Keywords: Public debt, sovereign default, domestic market, external market, stylised facts, theory.

JEL codes: E62, E65, F34, G01, H12, H63, K00, K41

¹ erceaitor@gmail.com

² enrico.mallucci@frb.gov

³ m.osvaldopicarelli@esm.europa.eu

Disclaimer

This Working Paper should not be reported as representing the views of the ESM. The views expressed in this Working Paper are those of the authors and do not necessarily represent those of the ESM or ESM policy. No responsibility or liability is accepted by the ESM in relation to the accuracy or completeness of the information, including any data sets, presented in this Working Paper.

© European Stability Mechanism, 2024 All rights reserved. Any reproduction, publication and reprint in the form of a different publication, whether printed or produced electronically, in whole or in part, is permitted only with the explicit written authorisation of the European Stability Mechanism.

Sovereign defaults at home and abroad^{*}

Aitor Erce[†], Enrico Mallucci[‡] & Mattia Picarelli[§]

Abstract

We systematically compare sovereign defaults on debt issued externally and domestically. Defaults at home and abroad are equally frequent, and governments often default selectively. Compared to domestic defaults, external defaults are larger and take longer to resolve. Both external and domestic defaults are often resolved through maturity extensions and coupon reductions. Face value reductions are infrequent, especially as part of domestic restructurings. Yet, domestic defaults are more punitive, as they are associated with larger creditor losses. We also document that domestic and external sovereign defaults occur in markedly different macro-financial, political and geo-economic environments. Our stylised facts inform a growing theoretical literature concerned with sovereign defaults in the presence of domestic debt markets.

JEL classification: E62, E65, F34, G01, H12, H63, K00, K41

Keywords: Public debt, sovereign default, domestic market, external market, stylised facts, theory.

^{*}We thank Tito Cordella, Ricardo Correa, Anna Gelpern, Kenneth Rogoff, Christoph Trebesch, Jenny Sellin and seminar participants at European Central Bank, Kiel Institute, Bank of Spain, International Monetary Fund, DebtCon5, 2022 Barcelona Summer Symposium and 2022 NBER Summer Institute for comments. Karol Siskind provided excellent editorial support. These are our views and not those of the Board of Governors of the Federal Reserve or the European Stability Mechanism.

[†]Corresponding author. Navarra Public University, Pamplona, Spain. E-mail: erceaitor@gmail.com

[‡]Board of Governors of the Federal Reserve System, Washington, U.S.A. E-mail: enrico.mallucci@frb.gov

[§]European Stability Mechanism, Luxembourg, Luxembourg. E-mail: m.osvaldopicarelli@esm.europa.eu

1 Introduction

Sovereign debt markets have experienced radical transformations in recent decades, especially in emerging market economies (Buchheit et al., 2019). Perhaps the most radical change of all has been the increasingly important role played by domestic debt markets (Reinhart and Rogoff, 2008; Guembel and Sussman, 2009; Broner et al., 2010; Arellano and Kocherlakota, 2014; Chamon et al., 2018; IMF, 2021). Traditionally, domestic debt markets for emerging sovereigns were either non-existing or closed to foreigners (CGFS, 2007).¹ Since the 1990s, however, emerging sovereigns have increasingly fund their financing needs using domestic debt markets as a result of financial deepening.²

Reflecting this trend, a growing number of theoretical contributions have proposed models where sovereigns borrow and default domestically. Gennaioli et al. (2014), Bocola (2016) or Sosa-Padilla (2018) study the interplay between sovereign risk and banking crises, highlighting the financial stability implications of domestic defaults. Guembel and Sussman (2009), Mendoza and D’Erasmo (2016) or Hermann and Scholl (2023) analyze the distributional implications of domestic defaults, and how electoral concerns and political constraints shape defaults. Broner et al. (2014), Mallucci (2022) and Thaler (2021) highlight the importance of debt composition in explaining governments’ borrowing decisions and incentives default. These papers show that domestic and external defaults can differ substantially, and present governments with contrasting trade-offs.³

Due to the lack of granular data about domestic sovereign defaults and restructurings, this theoretical literature has grown without the support of robust empirical evidence to guide modeling choices.⁴ In this paper we fill this gap by comparing, across multiple dimensions, data on defaults and restructurings of sovereign debt issued externally (Asonuma and Trebesch, 2016), with data on defaults and restructurings of sovereign debt issued domestically (Erce et al., 2022). Combining these sources, we create a new database with detailed information on 116 restructurings involving debt issued domestically and 177 restructurings involving debt issued externally.⁵ The database contains the universe of sovereign defaults on private sector creditors from 1980 to 2018, enabling us to compare, in a systematic way, sovereign defaults on debt issued externally with default on debt issued domestically.

¹Emerging sovereigns could only borrow externally in foreign currencies and international markets (Eichengreen and Panizza, 2005).

²Mexico exemplifies well this trend. BIS data show that domestic debt accounted for 22% of Mexico’s public debt in 1995. By 2010 domestic debt accounted for over 80% of total debt.

³When external debt is involved, governments weigh the benefit of not repaying against the cost of exclusion from international financial markets. Instead, if domestic debt is involved and domestic creditors face severe wealth losses, financial stability, distributional and political considerations become more relevant.

⁴Hatchondo et al. (2010) discuss issues in calibrating quantitative models of external sovereign default.

⁵Our focus on the market of issuance is justified by the fact that it directly affects governments’ ability to restructure debt. Domestically issued debt falls under local law and, as described in Chamon et al. (2018) or Reinhart and Rogoff (2008), can be restructured using legislative or executive measures. In contrast, externally issued debt can only be restructured seeking an agreement with creditors. The literature offers other definitions of domestic and external debt. Some papers focus on the currency (Gumus, 2013; Jeanneret and Souissi, 2016), others on the nationality of creditors (Sturzenegger and Zettelmeyer, 2008; IMF, 2021).

Our analysis shows that domestic default restructurings are nowadays as frequent as external ones. It also highlights that selectivity is the norm. Restructuring episodes that only involve either domestic or external debt account for more than 70% of all episodes. We also document that domestic debt restructurings differ from external restructurings along a number of key dimensions. Domestic restructurings are on average resolved faster and involve smaller volumes of debt compared to external restructurings. At the same time, domestic restructurings are associated with larger losses for investors. When we analyse how governments implement restructurings, we find that domestic and external restructurings share several similarities. Maturity extensions and amendments to the coupon structure are the most frequent forms of restructurings both for domestic and external debt. Face value reductions are rare, and feature more frequently in external restructurings than in domestic ones. Domestic and external debt restructurings are also similar in that authorities prefer to conduct them pre-emptively, without missing any payments.

The macro-financial environment surrounding domestic and external defaults also differs markedly. Growth falters around both domestic and external restructurings. Yet, while domestic defaults happen at times of financial instability, characterised by low private credit growth and a high likelihood of banking crises, external restructurings happen at times of significant external adjustments, characterised by trade surpluses and substantial capital flight. These findings are consistent with theories suggesting that domestic default and restructurings affect financial stability (Sosa-Padilla, 2018), while external restructurings affect the capacity to obtain financing from abroad (Mendoza and Yue, 2012).

We also document differences in the political and geo-economic landscape in which external and domestic defaults occur. In line with some theoretical models (Andreasen et al., 2019; Hermann and Scholl, 2023), we find that external defaults happen in periods of heightened political tensions, are less likely when centre-right parties are in power, and when political constraints are tighter. The results are drastically different for domestic defaults. Domestic defaults are more likely when political constraints are tighter, and governments' ideologies shows no relation to them. Similarly, the interplay between bilateral and official lending and defaults involving private creditors are profoundly different depending on whether domestic or external debt is involved. Finally, we show that domestic and external defaults are dealt with using different elements of the international financial architecture. While IMF programmes often overlap with domestic defaults but not external ones, debt restructurings of official debt often accompany external defaults but not domestic ones.

The collection of stylised facts we present in this paper can inform the growing theoretical literature concerned with sovereign default in the presence of domestic public debt markets, as well as policymakers interested in understanding modern-time sovereign default and restructuring patterns. To give one example, we believe that the comparison between domestic and external restructurings can provide guidance for the calibration of quantitative sovereign default models. Table 1 reports moments that are frequently targeted by the literature. Targeted values differ noticeably for domestic and external defaults. External defaults are larger and take longer to resolve. Domestic restructurings, on the other hand, are more punitive. They are associated with larger NPV losses. These findings suggest that researchers should

calibrate their models differently depending on whether they are focusing on domestic or external restructurings. Our works provides guidance on how to choose such values.

Table 1. Calibration Targets

	External (Asonuma and Trebesch, 2016)	Domestic (Erce et al., 2022)
Restructured debt to GDP	12.7%	7.7%
Default duration (quarters)	13.0	10.0
Default frequency (annual)	3.0%	2.1%
Creditor losses (NPV haircuts)	37.0%	42.0%

Average moments for domestic and external debt restructuring events from 1980 to 2018.

The rest of this paper is organised as follows. Section 2 describes the data used in the analysis. Section 3 compares different aspects of domestic and external debt restructuring. We focus on the frequency, size and duration of the default events. We also systematically compare changes in the terms of the debt instruments applied when the debt was restructured. Where possible, we also provide a comparison according to the type of debt instrument. Section 4 studies how key macro-financial, political and geo-economic variables fluctuate around domestic and external restructuring episodes. Section 5 concludes.

2 Data and Sources

Our key data sources are Asonuma and Trebesch (2016) and Erce et al. (2022). Erce et al. (2022) report information on 134 restructuring events involving domestic debt instruments from 1980 to 2018. Asonuma and Trebesch (2016) report information on 197 restructuring events involving external debt from 1978 to 2010. To facilitate the merger of these two data sources, we extended the database of Asonuma and Trebesch (2016) to include external default events from 2010 to 2018.⁶ The variables in the database measure the volume of debt being restructured, the duration of the restructuring process, the losses for creditors, and the amendments to the original debt instruments.

To identify domestic restructurings, Erce et al. (2022) focus on the jurisdiction of the market of issuance of the debt instruments involved, while Asonuma and Trebesch (2016) focus on the

⁶Cruces and Trebesch (2013) and Asonuma and Trebesch (2016) provide detailed information about the volume of debt being restructured, the losses for creditors, and the amendments to the original debt instrument for external restructurings before 2010. For external restructurings after 2010 we consulted a wide array of sources, including documents from the IMF, the World Bank and the OECD, policy reports from development banks and other international institutions, accounts from ministries and central banks, rating agencies publications, debt exchange offers, academic books, and research papers.

residence of creditors.⁷ This raises concerns about the comparability of the two databases. To address this concern, we checked each restructuring event reported by [Asonuma and Trebesch \(2016\)](#) and verified that each event can be classified as external also according to the definition adopted by [Erce et al. \(2022\)](#). We found that only two restructuring events, Russia 1998 and Ukraine 1998, cannot be classified as external restructurings according to the definition adopted by [Erce et al. \(2022\)](#), as they involve debt issued domestically, and we eliminated them from the database.⁸ To further ease the merger of the two databases, we decided to focus exclusively on events involving bonds or bank loans, and disregarded events involving deposit freezes, as they are only reported by [Erce et al. \(2022\)](#).⁹ Finally, to align the time windows of the two databases, we eliminated restructurings happening before 1980 and after 2018. The resulting database contains information about 116 restructuring events involving debt issued domestically and 177 restructuring events involving debt issued externally, from 1980 to 2018 in 84 countries.

Governments often choose to restructure several debt instruments simultaneously or within a short period of time. To account for the fact that some restructurings are just part of a broader restructuring programme, in some sections of the paper, we shift our focus from restructuring *events* to restructuring *episodes*. Domestic and external restructuring episodes are obtained merging restructuring events that occurred in two consecutive years, or events that fall within a comprehensive restructuring program announced by the government. Using these two criteria, the 116 domestic restructuring events can be grouped into 68 domestic default episodes, and the 177 external default events into 98 external default episodes.

3 Sovereign Default At Home and Abroad

3.1 Domestic and external defaults happen worldwide and are equally frequent

Sovereign defaults and restructurings have happened in every decade spanned by our database. [Figure 1](#) plots the total number of restructurings of domestic debt and external debt occurring in overlapping four-year windows from 1980 to 2018. Domestic restructurings were relatively rare in the first half of the 1980s and became increasingly frequent in the 1990s

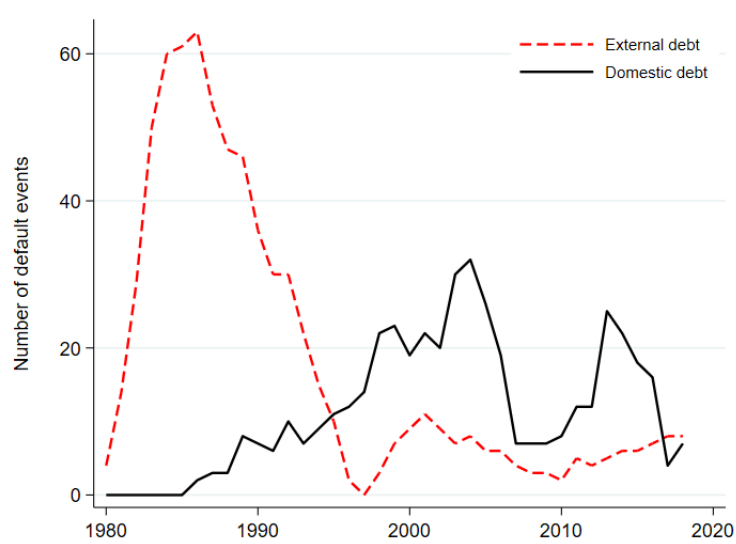
⁷Other works have used different definitions of domestic debt. In particular, [IMF \(2021\)](#) classify debt according to the residence of investors, while [Beers and de Leon-Manlagnit \(2019\)](#) classify debt according to its currency of denomination. [IMF \(2021\)](#) extends [Reinhart and Rogoff \(2008\)](#), who provide a set of annual dummies corresponding to a broad definition of default, but offer no other information regarding the debt in default or the restructuring process. Even though the database of [Erce et al. \(2022\)](#) does not include de-facto defaults, such as those associated with hyperinflation, it reports 30 defaults that are not included in [Beers and de Leon-Manlagnit \(2019\)](#) database, and 39 defaults that are not included in [IMF \(2021\)](#).

⁸We removed default events related to Yugoslavia and Yemen due to the lack of official data on GDP.

⁹[Erce et al. \(2022\)](#) also report domestic arrears, defined as overdue payments to suppliers, civil servants and pensioners. We do not include them in this analysis either.

and in the 2000s, mirroring the expansion of domestic debt markets since the 1990s. Conversely, external restructurings peaked in the mid-1980s, and became less frequent in later years, reflecting the ending of the Latin American Debt Crisis and the deepening of domestic financial markets in many emerging markets. As a result of these trends, domestic restructurings have become more frequent than external restructurings since the mid-1990s.

Figure 1. Distribution of Domestic Debt Restructuring Events



The solid black line plots the four-year rolling sum of domestic default events. The dashed red line plots the four-year rolling sum of external default events.

Table 2 reports the breakdown of restructuring events by instrument. Bonds are the instruments that are restructured more frequently, and the number of domestic and external restructuring events involving bonded debt has increased over time. This pattern suggests that the secular shift from bank loans to bond financing has affected not only external debt, as often highlighted by the literature (Gelpern, 2008), but also domestic debt. That said, while the fraction of external restructurings involving bank loans and commercial credit has declined over time, the share of domestic restructurings involving bank loans and commercial credit has remained fairly constant.

To gain further insights about the relative frequency of domestic and external defaults, we shift our focus to default episodes which bundle together restructuring events that are part of a broader restructuring programme, providing a better insight about creditors’ discrimination. In line with the findings of Bolton and Jeanne (2007), we find that selective defaults are the norm, as governments often discriminate between domestic and external debt.¹⁰ In 70% of our default episodes, only one type of debt, either domestic or external, is involved. Non-selective default episodes, involving both domestic and external debt during the episode,

¹⁰Broner et al. (2014), Arellano et al. (2019), Erce and Mallucci (2018), Paczos and Shakhnov (2016) model selective and partial defaults.

Table 2. Breakdown of Debt Restructuring Events

	Full Sample	1980-1989	1990-1999	2000-2009	2010-2019
Domestic debt					
<i>N</i> ° of events	116	8	35	41	32
Bonds	84	6	24	32	22
Bank loans and commercial credit	32	2	11	9	10
External debt					
<i>N</i> ° of events	177	121	29	13	14
Bonds	27	1	4	11	11
Bank loans and commercial credit	150	120	25	2	3

Number of external and domestic restructuring events involving bonds or bank loans broken down by decade.

account for the remaining 30% of episodes.¹¹

Domestic and external restructurings happen worldwide. As shown in the upper panel of Table 3, the incidence of domestic and external restructurings is the highest in Latin America and Africa. Countries that restructure domestic debt are often the same countries that restructure external debt. In fact, roughly 50% (35%) of the countries that restructure domestic (external) debt also restructure external (domestic) debt at some point. About two-thirds, 60 out of 84, of the countries in our sample report multiple restructuring events. Poland is the country reporting the highest number of external restructuring events. Grenada reports the highest number of domestic default events.

Table 3. Restructuring Events by Continent and Income Group

	Total	Africa	America	Asia	Europe	Oceania
Domestic debt	116	30	67	8	10	1
External debt	177	61	75	15	26	0
	Total	Low income	Lower middle income	Upper middle income	High income	
Domestic debt	116	11	41	46	18	
External debt	177	28	54	64	31	

Number of external and domestic restructuring events across continents and income groups.

The lower panel of Table 3 breaks down the frequency of restructurings by income group.¹²

¹¹Almost 40% of domestic defaults are part of non-selective episodes. The proportion almost halves (to 23%) for external defaults.

¹²We use the World Bank classification that refers to the gross national income per capita in US dollars (Atlas methodology) to group countries in low-, lower middle-, upper middle-, and high-income.

Most restructuring episodes, both domestic and external, have occurred in lower-middle income and upper-middle income countries. That said, restructuring events have also happened in advanced economies, confirming that sovereign defaults are a pervasive phenomenon.

3.2 External defaults are larger

Table 4 reports summary statistics for the volume of debt in default. Domestic restructurings are smaller than external ones. Bonds involved in restructuring events account, on average, for 7.7% of GDP in domestic events and 12.7% of GDP in external ones. The difference is even more evident when we compare median values. The median volume of debt involved in external defaults is almost three times larger than in domestic ones. The K-sample test reported in Table 14 shows that the difference is statistically significant.

The volume of restructured debt varies depending on the instruments involved. Bond restructurings are, on average, much larger than those involving bank loans. This finding is true for both domestic and external defaults. That said, the largest domestic and external default and restructuring events recorded in our sample involve bank loans.

Table 4. Volume of Restructured Debt by Instrument (% of GDP)

	Mean	Median	SD	Min	Max	N
Domestic debt	7.7%	2.7%	14.8%	0.0%	84.1%	116
Bonds	8.1%	3.6%	14.7%	0.0%	84.1%	84
Bank loans and commercial credits	6.5%	1.7%	15.2%	0.1%	84.1%	32
External debt	12.7%	5.3%	16.9%	0.0%	94.9%	177
Bonds	17.2%	6.6%	21.1%	0.0%	90.8%	27
Bank loans and commercial credits	11.9%	5.1%	16.0%	0.0%	94.9%	150

Summary statistics for the volume of debt involved measured as a percentage of GDP.

3.3 Domestic defaults are resolved faster

We next compare the length of time that it takes to complete a debt restructuring exercise.¹³ In Table 5 we report summary statistics for the duration of restructuring events.¹⁴ A domestic debt restructuring is resolved, on average, in roughly 30 months. The average duration

¹³Benjamin and Wright (2013) propose a theory to explain delays in external debt restructuring.

¹⁴The start date of a restructuring event is identified by either the date of default or the date of the announcement of the restructuring operation, whichever comes first. The end date is defined as either the date in which all arrears are cleared or the date when a restructuring agreement is reached, whichever comes first. The duration of a sovereign debt restructuring is the period from the start date to the end date.

of external restructuring is longer, reaching almost 40 months. There is, however, a wide dispersion in the duration of sovereign restructurings. In fact, the longest restructuring event in our sample is domestic. Median values confirm that domestic restructuring is carried out much faster than external ones. The median domestic restructuring event lasts just 9 months, while the median external restructuring lasts 17 months. As confirmed by the K-sample tests reported in Table 14, this difference is statistically significant.

We also check whether duration varies with the type of instrument involved. Table 5 shows that bonds are restructured much faster than bank loans or commercial credit. Domestic bond defaults are resolved, on average, in 20 months, while it takes more than 55 months to resolve domestic bank loan restructurings (Table 14). External restructurings display the same pattern. Restructurings involving external bank loans take almost twice as much as those involving external bonds to be resolved (Table 14).¹⁵ When we compare domestic and external restructurings of bank loans and commercial credit, we find that external restructurings resolve faster.¹⁶

Table 5. Duration of Restructuring Events

	Mean	Median	SD	Min	Max	N
Domestic debt	30.1	9.0	54.0	0.0	303.0	116
Bonds	20.6	2.0	45.9	0.0	303.0	84
Bank loans and commercial credit	55.1	38.5	65.5	0.0	301.0	32
External debt	39.0	17.0	50.2	1.0	271.0	177
Bonds	25.1	11.0	39.6	1.0	173.0	27
Bank loans and commercial credit	41.5	19.0	51.6	1.5	271.0	150

Summary statistics for the duration (in months) of domestic and external defaults.

The comparison of mean and median values does not fully capture all the differences. Table 6 reports the percentage of domestic and external restructuring events resolved within specific time windows. Most domestic debt restructurings are resolved within one year. Yet, the mass of domestic restructurings taking longer than 3 years to resolve accounts for almost one third of all domestic events. Turning to external defaults, the mass of events with a duration of 6 months or less is clearly smaller than that of domestic restructurings. In fact, most external defaults take from 6 months to 3 years to be resolved.

Looking at their evolution over time, we find that the duration of sovereign debt restructurings has shortened since the 1990s. The pattern is evident for external restructuring, whose average duration has declined from roughly 47 months to 14 months in the past three

¹⁵Bai and Zhang (2012) show that the duration of restructuring episodes involving foreign bank loans is five times longer than the duration of restructurings involving foreign bonds, and that restructurings involving foreign bonds last 12 months.

¹⁶One explanation could be existing IMF policies. During most of the 1980s and 1990s, the IMF was unable to lend to countries in default with external private creditors. This gave sovereigns an incentive to settle faster with external banks than with local banks.

Table 6. Distribution of Restructuring Events' Duration

	Less than 6	From 6 to 12	From 12 to 36	Longer than 36
Domestic restructurings	46%	12%	16%	27%
External restructurings	13%	23%	35%	29%

Percentage of domestic and external restructurings lasting less than 6 months, from 6 to 12 months, from 12 to 36 months, and longer than 36 months.

decades, likely reflecting the adoption of less contentious restructuring strategies and the introduction of collective action clauses in bond contracts (Carletti et al., 2020).

These findings are especially relevant in light of the importance of the correct calibration of parameters governing the length of the exclusion time from financial markets in theoretical sovereign default models à la Eaton and Gersovitz (1981). In such models, shorter exclusion times are associated with higher default frequencies and smaller debt levels (Hatchondo et al., 2010). Such predictions align well with our empirical findings that domestic debt defaults are faster and involve lower volumes of debt than external defaults.

3.4 Face value reductions are rare both at home and abroad

How do governments modify debt securities when they restructure their debt? To answer this question we use available information on maturity amendments, coupon amendments, and reductions of the face values.¹⁷ Table 7 summarises our findings.

Maturity extension is the most common form of amendment both during domestic and external restructurings. In 87% of the domestic restructuring events in our sample, the government amended the original maturity of instruments. Maturity amendments also feature in more than 90% of the external defaults.¹⁸ Amendments to the coupon structure are also frequent. They feature in 88% of the external restructuring events and in 83% of domestic events that report information of coupon amendments. Most amendments involve a reduction of the coupons and the exchange of variable-rate coupons for fixed-rate ones.¹⁹ Face value reductions are far less common, especially in domestic debt restructurings. One out of three external debt restructurings feature them, while only one out of four domestic debt restructurings does. Financial stability considerations help explain why face value reductions

¹⁷Depending on the involvement of creditors in the restructuring process, Erce et al. (2022) also classify restructuring episodes as either negotiated or unilateral. However, Asonuma and Trebesch (2016) do not offer analogous information for external restructurings, preventing us from comparing this feature.

¹⁸The size of maturity extensions varies greatly on a case-by-case basis, ranging from maturity shortenings in few sporadic cases, such as Slovenia in 1995, to a 45-year extension in St. Kitts and Nevis in 2011.

¹⁹However, in a few instances, such as Argentina's 2001 Megaswap, the restructuring produced an increase in coupons, at least for a fraction of the debt instruments.

are less frequent (Sosa-Padilla, 2018).²⁰

Table 7. Prevalence of Restructuring Amendments

	Maturity Change	Coupon Change	Face Value Reduction
Domestic debt			
<i>N</i> ^o of events featuring the amendment	86	69	19
<i>N</i> ^o of events reporting information	(99)	(83)	(84)
External debt			
<i>N</i> ^o of events featuring the amendment	154	148	61
<i>N</i> ^o of events reporting information	(169)	(168)	(177)

Number of restructurings by type of amendment. Events featuring more than one type of amendment are double counted. The number in parenthesis report the number of events for which information about the amend is available.

Restructurings featuring the simultaneous amendment of coupons, maturities, and face values are not infrequent. Almost 20% of domestic restructuring events and 25% of external ones featured amendments of all three debt features simultaneously.

3.5 Pre-default restructurings are increasingly frequent

Restructuring agreements can happen before or after the government defaults. Table 8 shows that the frequency of pre-default and post-default restructurings is similar for domestic and external restructurings. About 46% of the domestic events and 39.5% of the external ones are pre-emptive. Asonuma and Trebesch (2016) show that pre-default external debt restructurings are quicker and have lower haircuts than post-default restructurings (Table 15). The same is true for domestic default. Domestic pre-default restructurings take, on average, 2.2 months to be resolved. According to the same metric, post-default domestic restructurings take more than four years to be resolved.

Table 16 reports the evolution of pre- and post-default restructurings over time. The share of external pre-default restructuring has soared from 28% to 71% in the past three decades. In contrast, the share of pre-default domestic restructurings displays no clear trend.

²⁰The experiences of Uruguay in 2002, Jamaica in 2010, or Cyprus in 2013 shed a light on why value reductions are rare. In each of these cases, creditors expressed their preference for maturity extensions, concerned about the more negative impact of face value reductions would have on their balance sheets.

Table 8. Pre-default vs. Post-default Restructurings

	% (all events)	Size (% of GDP)	Duration (months)	NPV Losses
Domestic debt				
Pre-default	46%	10.4%	2.2	31.8%
Post-default	54%	6.7%	51.1	42.5%
External debt				
Pre-default	39.5%	13.0%	11.1	20.9%
Post-default	60.5%	12.5%	57.2	47.0%

Average values for pre-default and post-default debt restructurings.

3.6 External defaults deliver smaller investor losses

Debt restructurings entail losses for investors. These losses are normally measured in net present value (NPV) terms. While [Asonuma and Trebesch \(2016\)](#) report NPV losses for most of the events in their sample, [Erce et al. \(2022\)](#) report NPV losses for a subset of domestic restructuring events.²¹ [Table 9](#) reports summary statistics for investors' NPV losses due to domestic and external debt restructurings.

Table 9. Creditor Losses

	Mean	Median	SD	Min	Max	N
Domestic debt						
Bonds	42%	49%	22%	-5%	100%	40
Bank loans and commercial credit	50%	54%	19%	5%	65%	8
External debt						
Bonds	37%	33%	27%	-10%	93%	175
Bank loans and commercial credit	33%	32%	23%	-6%	77%	27
Bank loans and commercial credit	38%	33%	27%	-10%	93%	148

Summary statistics for creditors' losses during external and domestic defaults broken down by instrument. Losses are expressed as a percentage of the NPV of the restructured liability.

The K-sample tests reported in [Table 14](#) show that creditor losses are larger during domestic restructurings, and that the difference between losses in external and domestic defaults is statistically significant. This finding, together with the evidence presented in [Section 3.2](#), suggests that domestic restructurings are smaller, and yet more punitive for creditors. While,

²¹To ensure that the sample of available domestic default NPV estimates is representative of the whole sample, we compared key moments of the sub-sample of events with data on NPV losses and in the full sample. We find that the median volume of debt involved in the restructuring event is on average larger in the sub-sample with information on NPV losses, suggesting that NPV losses are more readily available for more recent and larger bond restructurings.

given the limited coverage of NPV data, we prefer to remain cautious about drawing firm conclusions, we note that these findings point against the notion of a stronger creditor bias in the presence of domestic debt (Broner et al., 2010; Hermann and Scholl, 2023), and are in contrast with those in IMF (2020).

Looking at the breakdown by instrument, in Table 14 we show that creditor losses are similar for bonds and bank loans during external defaults. In contrast, during domestic defaults, the size of creditors' losses depends on the instruments involved. In particular, losses are much larger when default affects domestic bank loans (Table 14).

Table 17 reports the evolution of NPV losses over time. There is no discernible trend for domestic debt restructurings, while losses associated with external restructurings have consistently declined after peaking in the 1990s. This trend likely reflects improvements in the bargaining process between debtor countries and creditors and the erosion of sovereign immunity (Gelper and Panizza, 2022).

3.7 Size, duration and losses correlate during external defaults

Additional interesting facts emerge from comparing, across external and domestic defaults, the correlation between different restructuring features. Table 10 reports, both for external and domestic defaults, the correlation matrix for three key variables: the volume of restructured debt, the duration of the restructuring process, and the losses suffered by creditors.

Table 10. Correlations

Domestic debt			
	Debt restructured (% of GDP)	Duration (months)	NPV loss
Debt restructured (% of GDP)	1.00		
Duration (months)	-0.08	1.00	
NPV loss	-0.05	0.58***	1.00
External debt			
	Debt restructured (% of GDP)	Duration (months)	NPV loss
Debt restructured (% of GDP)	1.00		
Duration (months)	0.34***	1.00	
NPV loss	0.24***	0.64***	1.00

Correlations between the volume of debt restructured (as a percentage of GDP), the duration of the restructuring processes, and NPV losses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

In line with theoretical models (Hatchondo et al., 2010; Benjamin and Wright, 2013), we find a significant and positive correlation between the three characteristics for the sample of external defaults. Larger defaults go hand in hand with longer restructuring durations and larger NPV losses. In contrast, the volume of debt restructured during domestic defaults

shows a non-significant correlation to either NPV losses or restructuring durations, perhaps pointing to the fact that the governments have greater bargaining power in domestic restructuring episodes regardless of the volume of debt being restructured. That said, we still find a significant and positive correlation between the duration of the restructuring process and the losses suffered by investors, hinting to the fact that delays in the restructuring process are harmful to investors. Table 18 in the Appendix verifies that the differences in correlation values across domestic and external defaults are statistically significant.

4 Domestic and external defaults occur in different economic and political environments

In this section we compare the macro-financial, political and geo-economic environment in which domestic and external sovereign defaults occur.²² In contrast with the existing literature (Andreasen et al., 2019; Azzimonti and Mitra, 2022; Hermann and Scholl, 2023), that either only focuses on external defaults or lumps domestic and external defaults together, we model a distinct, potentially asymmetric, relation between domestic and external defaults and our selected indicators.

Our empirical analysis relies on two econometric specifications in which we introduce separate dummy variables to account for domestic and external default episodes. When the dependent variable y_{it} is not binary, we use a contemporaneous linear panel regression:

$$y_{it} = \gamma_0 + \gamma_D D_{i,t}^D + \gamma_E D_{i,t}^E + \alpha_i + \beta_t + \epsilon_{i,t}. \quad (1)$$

where y_{it} is the variable of interest, $D_{i,t}^D$ and $D_{i,t}^E$ are the two dummies capturing domestic and external restructurings. $D_{i,t}^D$ takes value one in those years in which a country is in a domestic default. $D_{i,t}^E$ is built analogously using external defaults. α_i and β_t represent country and year fixed effects.

When the dependent variable y_{it} is binary, we use a probit model:

$$P(y_{i,t} = 1) = \Phi(\gamma_0 + \gamma_D D_{i,t}^D + \gamma_E D_{i,t}^E) + \epsilon_{i,t}. \quad (2)$$

where $\Phi(\cdot)$ is the cumulative normal distribution function, and $D_{i,t}^D$ and $D_{i,t}^E$ are defined as before.

In both specifications, we are interested in the size and sign of γ_D and γ_E , as well as in their difference $\gamma_E - \gamma_D$. γ_D and γ_E measure how far $y_{i,t}$ deviates from its normal-times average during domestic and external restructurings, respectively. The Wald test reported in the

²²As the interplay between macroeconomic variables and sovereign restructurings likely reflects the complexity of the overall restructuring processes, we focus our attention on restructuring episodes.

regression tables indicates whether the difference ($\gamma_E - \gamma_D$) is statistically different from zero. Table 11 and Table 12 report coefficient estimates for both empirical specifications.²³

Table 11 focuses on macro-financial variables.²⁴ The first column reports results obtained when the cyclical component of GDP is the dependent variable.²⁵ GDP is on average 2.5% below its trend during both external and domestic defaults. The second column reports regression estimates when the dependent variable is the public debt to GDP ratio. Coefficient estimates are positive and significant, suggesting that both default episodes happen when public debt is high.

Columns three and four focus on net exports and foreign capital inflows. Net exports are larger and foreign inflows lower during external defaults. In contrast, during domestic defaults, net exports are no different and capital inflows are just modestly below normal times. This finding suggests that external defaults occur in periods of substantial external adjustments while domestic defaults do not. We dig further into the behaviour of capital flows by checking whether dramatic capital flights feature systematically around our sovereign default episodes.²⁶ Column five shows that coefficients for both domestic and external defaults are positive and significant, but the coefficient associated to external default is twice as large, and the difference is significant at a 1% confidence level. We conclude that while both domestic and external sovereign defaults tend to occur under tight external financing conditions, these constraints are more severe and prevalent during external defaults.

Column six in Table 11 focuses on the behavior of private credit. Private credit falls, on average, 15% below trend during domestic defaults. This contrasts with a smaller insignificant coefficient for external defaults.²⁷ We further investigate the interplay of sovereign defaults and financial stability by merging our database with data on the timing of bank crises from Reinhart (2010) and Laeven and Valencia (2020). As shown in column seven, the coefficients for both domestic and external defaults are positive and significant. This indicates that sovereign defaults, both at home and abroad, happen at times of substantial financial distress. In the last column, we investigate the interplay between global conditions, as measured by the Federal Funds Rate (FFR), and sovereign defaults. Our results show that external defaults are more likely when FFR is high and domestic defaults are more likely when FFR is low.²⁸

²³The Wald tests in Table 11 check whether the differences between γ_E and γ_D is statistically significant.

²⁴Data for real GDP, public debt to GDP and net exports come from the World Bank. Data on capital inflows and private credit are from the IMF's International Financial Statistics Database. To measure financial instability we use banking crises from Laeven and Valencia (2020) and Reinhart (2010). Global financial conditions are measured using Fed Funds Rate data obtained through Reuters.

²⁵Deviations from the trend are computed taking the log of real GDP and removing the trend. Credit to the private sector is de-trended in the same way.

²⁶Similar to Forbes and Warnock (2012), we build a dummy indicator for extreme capital flights that takes value one when foreign capital outflows are at least 1.5 standard deviations above their average level.

²⁷This finding speaks to the literature on the financial stability implications of sovereign default (Sosa-Padilla, 2018; Gennaioli et al., 2014).

²⁸We interpret this result as reflecting the evolution over time of the incidence of domestic and external defaults. The majority of external defaults occurred before 2000, when FFR rates were high. On the other

Table 12 analyses the political and geo-economic environment surrounding external and domestic debt restructurings.²⁹ The first column reports results when the political instability index is used as the dependent variable. Sovereign defaults, at home and abroad, happen in periods of heightened political instability. This result is confirmed by the results reported in the second column. These show that elections are more likely to happen both during external and during domestic defaults. A recurrent finding in the literature (Kohlscheen, 2005; Azzimonti and Mitra, 2022; Hermann and Scholl, 2023) is that the tightness of political constraints, defined as the extent to which a change in the preferences of any relevant actor may lead to a change in government policy, reduces the incidence of default. Column three reports regression estimates obtained using a measures of political constraints from The Political Constraint Index Dataset by Henisz (2000, 2002). We find that external defaults occur at times at which political constraints are looser. This is in line with pre-existing literature. However, when we focus on domestic defaults, we find that the opposite result. Domestic defaults are more likely at times of tighter political constraints.

Ideology also affects sovereign default incentives. Column four reports results of our probit model, when the dependent variable is a dummy taking the value of one when the government is led by centre-right parties.³⁰ In line with the existing literature focusing on external defaults (Andreasen et al., 2019; Hermann and Scholl, 2023), we find that more centre-right oriented governments are less likely to be in power when sovereign governments default externally. In contrast, we do not observe that any type of ideology is more prevalent during periods of domestic default.

In the last two columns of Table 12 we analyse whether geo-economic factors, as represented by multilateral and official debt relief and lending, differ around domestic and external sovereign defaults. Also the geo-economics of domestic and external sovereign default are markedly different. As shown in column five, countries receiving financing from the IMF are more likely to default on their domestic debt and less likely to default on their external debt. These results suggest that countries receiving IMF support prioritise external private creditors at the expenses of domestic ones, as suggested by (Erce, 2014). Turning to the last column, official debt relief from Paris Club countries often coincides with external debt restructurings. However, there is no systematic relation between the provision of relief by governments of advanced economies and debt restructuring of domestic debt (Gelpern,

hand, most domestic defaults have occurred after 2000 when FFR rates were lower (see also Section 3.1).

²⁹The political instability index comes from the World Bank and measures perceptions of the likelihood of political instability and/or politically-motivated violence. In our analysis we focus on the percentile rank, which indicates the country’s rank among all countries covered by the aggregate indicator. Data on political constraints is taken from The Political Constraint Index Dataset by Henisz (2000, 2002) and measures the extent to which a change in the preferences of any one actor may lead to a change in government policy. Data on the political leaning of the government as well as on the number of elections held in each country are taken from the Database of Political Institutions. The index ranges from 0 to 1. Higher values are associated with tighter political constraints. We take the log of such index. Data on the number of elections on one country also come from The Political Constraint Index Dataset by Henisz (2000, 2002). Finally, data on the involvement of official actors is taken from the IMF and Cheng et al. (2018), and respectively report whether a country was in a IMF programme and whether it was negotiating with the Paris Club.

³⁰Centre-right parties are those that express centrist or right-leaning ideologies.

2008). Taken together, results in columns five and six, show how the international financial architecture uses different instruments to handle domestic and external default.

Summing up, these results further show that differences between domestic and external defaults abound and can be profound. The macro-financial forces at play during domestic and external restructurings are different: a domestic credit channel is at play during domestic defaults, while an external adjustment channel is active during external ones. Moreover, domestic and external defaults interact distinctively with key political frictions, and are resolved through various conduits of the international financial architecture.

Table 11. Sovereign Defaults at Home and Abroad. Macro-Financial Environment.

	GDP Growth	Public Debt	Net Exports	Foreign Inflows	Capital Flight	Private Credit	Bank Crisis	Fed Funds Rate
$D_{i,t}^{Ext}$	-2.476*** (0.489)	22.960*** (2.817)	3.439*** (0.487)	-4.310*** (0.653)	0.593*** (0.083)	-1.761 (2.628)	0.411*** (0.063)	2.537*** (0.172)
$D_{i,t}^{Dom}$	-2.517*** (0.766)	16.647*** (4.650)	0.351 (0.812)	-2.356** (0.921)	0.272** (0.128)	-15.667*** (3.336)	0.312*** (0.088)	-2.532*** (0.220)
N	6202	4903	6412	5239	5240	5761	6165	8078
Wald-Test: $D_{i,t}^{Ext}=D_{i,t}^{Dom}$	0.041	6.313	3.088	-1.954	0.321	13.906	0.099	5.069
p-value	0.967	0.292	0.002	0.089	0.056	0.002	0.401	0.000
Model	OLS	OLS	OLS	OLS	Probit	OLS	Probit	OLS
Country-Effects	Yes	Yes	Yes	Yes	No	Yes	No	Yes
Year-Effects	Yes	Yes	Yes	No	No	Yes	No	No
R^2	0.085	0.565	0.745	0.234		0.083		0.030

GDP and private credit are measured in percentage deviations from the long-run trend. Debt, net exports, and foreign capital inflows are measured as a fraction of GDP. The capital flights variable is a dummy variable that is equal to one when capital outflows are at least 1.5 standard deviations above their average level. Banking crises data are from [Reinhart \(2010\)](#) and [Laeven and Valencia \(2020\)](#). $D_{i,t}^D$ and $D_{i,t}^E$ are dummies that identify domestic and external defaults, respectively. Standard errors are in parentheses and *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table 12. Sovereign Defaults at Home and Abroad. Political and Geo-Economic Environment

	Political Stability	Elections	Political Constraints	Centre-right Government	IMF Programme	Official Debt Relief
$D_{i,t}^{Ext}$	-4.558*** (1.068)	0.167** (0.070)	-0.065** (0.031)	-0.367*** (0.071)	-0.354*** (0.083)	1.339*** (0.063)
$D_{i,t}^{Dom}$	-3.817*** (1.036)	0.310*** (0.096)	0.077* (0.046)	0.189 (0.118)	0.624*** (0.083)	0.060 (0.117)
Wald-Test: $D_{i,t}^{Ext}=D_{i,t}^{Dom}$	-0.741	-0.143	-0.142	-0.556	-0.978	1.279
p-value	0.659	0.272	0.013	0.000	0.000	0.000
N. Observations	3,959	6,200	4,110	3,591	8,078	8,078
Model	OLS	Probit	OLS	Probit	Probit	Probit
Country-Effects	Yes	No	Yes	No	No	No
Year-Effects	Yes	No	Yes	No	No	No
R ²	0.904		0.593			

Political instability measures the probability of political instability and/or politically-motivated violence. The political constraint index measures the extent to which a change in the preferences of any one actor may lead to a change in government policy. —A government is assessed to be centre-right oriented when it follows center and right ideologies. The elections variable reports data on the number of elections held in each country. IMF Programme and Official Debt Relief variables are dummies that equal one when countries receive IMF loans or debt relief from the Paris Club, respectively. $D_{i,t}^D$ and $D_{i,t}^E$ are dummies that identify domestic and external defaults, respectively. Standard errors are in parentheses and *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

5 Conclusion

This paper uses a uniquely detailed database to offer a systematic comparison of sovereign defaults involving public debt issued at home and abroad. Our analysis shows that domestic sovereign defaults, nowadays, occur as frequently as external sovereign defaults. We also find that selective defaults are the norm. More often than not, governments discriminate between debt issued domestically and debt issued abroad. When we compare domestic and external sovereign defaults, we find that:

1. Domestic debt restructurings are normally smaller, proceed faster, and are associated with larger creditor losses than external ones.
2. Governments have a preference for pre-default restructurings, especially when external debt is involved. Maturity extension and changes in the coupon structure are the most frequent forms of restructuring. Face value reductions are rare especially when domestic debt is being restructured.
3. The macro-financial, political and geo-economic environment surrounding domestic and external defaults differ substantially.

In a world where public debt, both domestic and external, is growing alarmingly fast, our stylised facts offer important information and analytical material for policymakers who design policies to tackle debt in distress. These stylised facts can also inform researchers developing quantitative models of sovereign defaults that involve domestic debt. In particular, our paper provides a comprehensive set of statistics for the correct calibration of theoretical sovereign default models featuring domestic debt. Our analysis can also be useful for political scientists and sociologists interested in the interplay between domestic defaults and political cycles, geo-economics, institutional stability, social cohesion, or economic inequality, among other topics.

References

- Andreasen, Eugenia, Guido Sandleris, and Alejandro van der Ghote**, “The Political Economy of Sovereign Defaults,” *Journal of Monetary Economics*, 2019, 104 (23-36).
- Arellano, Cristina and Narayana Kocherlakota**, “Internal debt crises and sovereign defaults,” *Journal of Monetary Economics*, 2014, 68 (Supplement), S68–S80.
- , **Xabier Planas, and Victor Rios-Rull**, “Partial Default,” *NBER Working Paper*, 2019, (26076).
- Asonuma, Tamon and Christoph Trebesch**, “Sovereign Debt Restructurings: Pre-emptive or Post-Default,” *Journal of the European Economic Association*, 2016, 14 (1), 175–214.
- Azzimonti, Marina and Nirvana Mitra**, “Political Constraints and Sovereign Default,” *Stony Brook University, Manuscript*, 2022.
- Bai, Yan and Jing Zhang**, “Duration of sovereign debt renegotiation,” *Journal of International Economics*, 2012, 86, 252–268.
- Beers, David and Patrisha de Leon-Manlagnit**, “The BoC-BoE sovereign default database: what’s new in 2019?,” Bank of England working papers 829, Bank of England September 2019.
- Benjamin, David and Mark L. J. Wright**, “Recovery before redemption: A theory of delays in sovereign debt renegotiations,” Technical Report April 2013.
- Bocola, Luigi**, “The Pass-Through of Sovereign Risk,” *Journal of Political Economy*, 2016, 124 (4), 879–926.
- Bolton, Patrick and Olivier Jeanne**, “Structuring and Restructuring Sovereign Debt: The Role of a Bankruptcy Regime,” *Journal of Political Economy*, 2007, 115 (6), 901–924.
- Broner, Fernando, Aitor Erce, Alberto Martin, and Jaume Ventura**, “Sovereign Debt Markets in Turbulent Times: Creditor Discrimination and Crowding-Out Effects,” *Journal of Monetary Economics*, 2014, 61 (C), 114–142.
- , **Alberto Martin, and Jaume Ventura**, “Sovereign Risk and Secondary Markets,” *American Economic Review*, 2010, 100 (4), 1523–1555.
- Buchheit, Lee, Guillaume Chabert, Chanda DeLong, and Jeromin Zettelmeyer**, “The Restructuring Process,” In “*Sovereign Debt: A Guide for Economists and Practitioners*” (edited by S. A. Abbas, A. Pienkowski, and K. Rogoff), Oxford University Press Scholarship Online, 2019.
- Carletti, Elena, Paolo Colla, Mitu Gulati, and Steven Ongena**, “The Price of Law: The Case of the Eurozone Collective Action Clauses,” *The Review of Financial Studies*, 12 2020, 34 (12), 5933–5976.

- CGFS**, “Financial stability and local currency bond markets,” Committee on the Global Financial System Papers 28, Bank for International Settlements September 2007.
- Chamon, Marcos, Julian Schumacher, and Christoph Trebesch**, “Foreign-Law Bonds: Can They Reduce Sovereign Borrowing Costs?,” *Journal of International Economics*, 2018, *114*, 164–179.
- Cheng, Gong, Javier Díaz-Cassou, and Aitor Erce**, “Official debt restructurings and development,” *World Development*, 2018, *111*, 181–195.
- Cruces, Juan J. and Christoph Trebesch**, “Sovereign Defaults: The Price of Haircuts,” *American Economic Journal: Macroeconomics*, 2013, *5* (3), 85–117.
- Eaton, Jonathan and Mark Gersovitz**, “Debt with Potential Repudiation: Theoretical and Empirical Analysis,” *Review of Economic Studies*, 1981, *48* (2), 289–309.
- Eichengreen, Barry and Ugo Panizza**, “Currency Mismatches, Debt Intolerance, and the Original Sin: Why They Are Not the Same and Why It Matters,” In “*Capital Controls and Capital Flows in Emerging Economies: Policies, Practices and Consequences*” (edited by S. Edwards), University of Chicago Press, 2005.
- Erce, Aitor**, “Banking on Seniority: The IMF and the sovereign creditors,” *Governance*, 2014, *28* (2), 219–236.
- **and Enrico Mallucci**, “Selective Sovereign Defaults,” International Finance Discussion Papers 1239, Board of Governors of the Federal Reserve System (U.S.) November 2018.
- , – , **and Mattia Picarelli**, “A Journey in the History of Sovereign Defaults on Domestic-Law Public Debt,” International Finance Discussion Papers 1338, Board of Governors of the Federal Reserve System (U.S.) March 2022.
- Forbes, Kristin J. and Francis E. Warnock**, “Capital flow waves: Surges, stops, flight, and retrenchment,” *Journal of International Economics*, 2012, *88* (2), 235–251.
- Gelper, Anna and Ugo Panizza**, “Enough Potential Repudiation: Economic and Legal Aspects of Sovereign Debt in the Pandemic Era,” *Graduate Institute of International and Development Studies, Working Paper Series*, 2022, (HEIDWP09).
- Gelpern, Anna**, “Domestic Bonds, Credit Derivatives, and the Next Transformation of Sovereign Debt,” *Kent Law Review*, 2008, *147*.
- Gennaioli, Nicola, Alberto Martin, and Stefano Rossi**, “Sovereign Default, Domestic Banks, and Financial Institutions,” *Journal of Finance*, 04 2014, *69* (2), 819–866.
- Guembel, Alexander and Oren Sussman**, “Sovereign Debt without Default Penalties,” *The Review of Economic Studies*, 10 2009, *76* (4), 1297–1320.
- Gumus, Inci**, “Debt Denomination And Default Risk In Emerging Markets,” *Macroeconomic Dynamics*, 2013, *17* (05), 1070–1095.

- Hatchondo, Juan Carlos, Leonardo Martinez, and Horacio Sapriza**, “Quantitative properties of sovereign default models: solution methods,” *Review of Economic Dynamics*, October 2010, *13* (4), 919–933.
- Henisz, Witold J.**, “The Institutional Environment for Economic Growth,” *Economics and Politics*, March 2000, *12* (1), 1–31.
- , “The institutional environment for infrastructure investment,” *Industrial and Corporate Change*, 2002, *11* (2), 355–389.
- Hermann, Tim and Almuth Scholl**, “The Political Economy of Domestic and External Sovereign Debt,” *CEPR Working Papers*, October 2023, (18510).
- IMF**, “The International Architecture for Resolving Sovereign Debt Involving Private- Sector Creditors - Recent Developments, Challenges, and Reform Options,” Policy Paper 12020/043, International Monetary Fund 2020.
- , “Issues in Restructuring of Sovereign Domestic Debt,” Policy Paper 2021/071, International Monetary Fund 2021.
- Jeanneret, Alexandre and Slim Souissi**, “Sovereign Defaults by Currency Denomination,” *Journal of International Money and Finance*, 2016, *60* (C), 197–222.
- Kohlscheen, Emanuel**, “Sovereign Risk : Constitutions Rule,” Technical Report 2005.
- Laeven, Luc and Fabian Valencia**, “Systemic Banking Crises Database II,” *IMF Economic Review*, June 2020, *68* (2), 307–361.
- Mallucci, Enrico**, “Domestic Debt and Sovereign Defaults,” *Journal of Money, Credit and Banking*, 2022, *54* (6), 1741–1775.
- Mendoza, Enrique and Pablo D’Erasmus**, “Distributional Incentives in an Equilibrium Model of Domestic Sovereign Default,” *Journal of the European Economic Association*, 2016, *14* (1), 7–44.
- **and Vivian Yue**, “A General Equilibrium Model of Sovereign Default and Business Cycles,” *The Quarterly Journal of Economics*, 2012, *127* (2), 889–946.
- Paczos, Wojtek and Kirill Shakhnov**, “Sovereign Debt Issuance and Selective Default,” Technical Report 2016.
- Reinhart, Carmen**, “This Time is Different Chartbook: Country Histories on Debt, Default, and Financial Crises,” NBER Working Papers 15815 March 2010.
- **and Kenneth Rogoff**, “The Forgotten History of Domestic Debt,” Working Paper 13946, National Bureau of Economic Research April 2008.
- Sosa-Padilla, Cesar**, “Sovereign Defaults and Banking Crises,” *Journal of Monetary Economics*, 2018, *99*, 88–105.

Sturzenegger, Federico and Jeromin Zettelmeyer, “Haircuts: Estimating investor losses in sovereign debt restructurings, 1998-2005,” *Journal of International Money and Finance*, September 2008, *27* (5), 780–805.

Thaler, Dominik, “Sovereign Default, Domestic Banks and Exclusion from International Capital Markets,” *The Economic Journal*, 2021, *131*, 1401–1427.

Appendix A Additional Tables

Table 13. Debt restructuring episodes

Country	Domestic Restructuring Events	External Restructuring Events
Albania		1991
Algeria		1990
Angola	2010	
Antigua-Barbuda	1998, 2008	
Argentina	1989, 2001	1982, 2001
Barbados	2018	2018
Belize		2006, 2012, 2016
Bolivia		1980
Bosnia	1992	1992
Brazil	1986, 1990, 1993, 1996	1982
Bulgaria		1990
Cameroon	1993, 2001	1985
Cabo Verde	1998, 2018	
Central African Rep.	1992	
Chad		2014, 2017
Chile		1983, 1990
Congo Dem. Rep.	1997	1982
Congo Rep.	1992	1983
Costa Rica		1981
Cote d'Ivoire	1989, 2001, 2011	1983, 2000
Croatia		1991
Cuba		1983
Cyprus	2013	
Dominica	2003	2003
Dominican Rep.	1996	1982, 2004
Ecuador	1997	1982, 1999, 2008
El Salvador	2017	
Ethiopia		1990
Gabon	1997, 2001	1986, 1989
Gambia	2017	1984
Greece	2011	2011
Grenada	2004, 2013	2004, 2013
Guinea		1985, 1991
Guyana		1982
Honduras		1981
Iraq		1986
Jamaica	2010, 2013	1983

Continued on next page

Table 13 – *Continued from previous page*

Country	Domestic Restructuring Events	External Restructuring Events
Jordan		1989
Kenya		1992
Liberia	1989, 2016	1980
Macedonia		1992
Madagascar	2002	1981
Malawi		1982, 1987
Mali	2011	
Mauritania		1992
Mexico		1982
Moldova		2001
Mongolia	1997	2017
Montenegro	1991	
Morocco		1983, 1989
Mozambique		1983, 2015
Nicaragua	1994, 1996, 1999, 2003, 2008	
Niger		1983
Nigeria	1995	1982, 1986
Pakistan	1998	1998
Panama	1998	1984, 1987
Paraguay	2002	1986
Peru	1992	1983
Philippines		1983
Poland		1981, 1986
Romania		1981, 1986
Russia	1998	1991
Rwanda	1989, 1994	
Sao Tome and Principe		1984
Senegal		1981, 1990, 1992
Serbia	1991	1992
Seychelles	2010	2008
Sierra Leone		1980
Slovenia	1995, 2002	1992
Solomon Islands	1996	
South Africa		1985, 1989, 1992
Sri Lanka	1996	
St. Kitts and Nevis	2011	2011
Sudan	2007	
Tanzania		1981
Togo		1987, 1991
Trinidad and Tobago		1988

Continued on next page

Table 13 – *Continued from previous page*

Country	Domestic Restructuring Events	External Restructuring Events
Turkey	1999	1981
Ukraine	1998	1998, 2015
Uruguay	2002	1983, 1985, 2003
Venezuela	1998, 2002	1983, 1989
Vietnam		1982
Zambia		1983
Zimbabwe	2001, 2006	

Domestic and external debt restructurings from 1980 to 2018. The first column lists the domestic debt events included in [Erce et al. \(2022\)](#). The second column reports the external default events included in [Asonuma and Trebesch \(2016\)](#).

Table 14. **K-sample Test on the Equality of Medians**

External vs Domestic Restructurings	
	Difference (External - Domestic)
Debt restructured (% of GDP)	2.54**
Duration	8.0**
NPV loss	-16.25**
Domestic Bonds vs Domestic Loans	
	Difference (Bonds - Loans)
Debt restructured (% of GDP)	1.86
Duration	-36.5***
NPV loss	-6.5
External Bonds vs External Loans	
	Difference (Bonds - Loans)
Debt restructured (% of GDP)	1.54
Duration	-8.0
NPV loss	-1.15

The K-sample test on the equality of the medians examines whether the two samples came from populations with the same median. The null hypothesis is that the samples were drawn from populations with the same median. The alternative hypothesis is that the samples were drawn from populations with different medians. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table 15. K-sample Test on the Equality of Medians: Pre- vs Post-Default

Domestic: Pre-default vs Post-default Restructurings	
	Difference (pre - post)
Debt restructured (% of GDP)	-0.47
Duration	-30.0***
NPV loss	-18.0
External: Pre-default vs Post-default Restructurings	
	Difference (pre - post)
Debt restructured (% of GDP)	0.48
Duration	-24.5***
NPV loss	-24.16***

The K-sample test on the equality of the medians examines whether the samples came from populations with the same median. The null hypothesis is that the samples were drawn from populations with the same median. The alternative hypothesis is that they were drawn from a population with a different median. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table 16. Share of Pre-default Restructurings by Decade

	1980-1989	1990-1999	2000-2009	2010-2019
Domestic debt				
Pre-Default	63%	34%	58%	36%
N° of events	8	35	40	22
External debt				
Pre-Default	37%	28%	54%	71%
N° of events	121	29	13	14

Summary statistics for pre- and post-default restructurings by decade.

Table 17. Breakdown of NPV losses

	1980-1989	1990-1999	2000-2009	2010-2019
Domestic debt				
Average NPV losses	100	36.57	31.78	45.85
Median NPV losses	100	47.5	40.5	54
N° of events	1	7	10	22
External debt				
Average NPV losses	35.46	46.56	38.81	25.64
Median NPV losses	31.7	38.3	36.9	8.55
N° of events	121	29	13	12

NPV losses for external and domestic restructuring events by decade.

Table 18. Correlation Differences

Domestic vs External debt			
	Debt restructured	Duration	NPV loss
Debt restructured	0.00		
Duration	-0.42***	0.00	
NPV losses	-0.29*	-0.06	0.00

The table reports the differences in the correlations between restructuring features in domestic and external defaults and the p-values of the test of equality of correlation. Debt restructured is measured as % of GDP. Duration is measured in months. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table 19. Summary Statistics

	N. Obs.	Mean	Median	St. Dev.	Min	Max
Real GDP (cyclical component)	6226	0.45	0.01	9.75	-62.88	138.91
Public Debt (% of GDP)	4914	55.36	45.37	45.01	0.00	600.62
Net Exports (% of GDP)	6438	-6.22	-3.86	18.16	-164.78	81.70
Foreign Capital Inflows (% of GDP)	5258	7.78	5.11	18.85	-135.58	298.57
Private Credit (cyclical component)	5788	6.85	1.74	44.59	-89.83	905.98
Federal Funds Rate (%)	8107	4.73	4.96	3.99	0.09	16.38
Political Stability (rank)	3962	49.31	48.79	28.83	0.00	100.00
Political Constraints (log)	4136	-1.08	-0.92	0.59	-5.91	-0.32
Center-Right Government	3611	0.49	0.00	0.50	0.00	1.00
Capital Flight	5258	0.05	0.00	0.21	0.00	1.00
Bank Crises	6194	0.11	0.00	0.32	0.00	1.00
IMF Programs	8107	0.09	0.00	0.29	0.00	1.00
Paris Club	8107	0.05	0.00	0.21	0.00	1.00
Elections	6227	0.10	0.00	0.30	0.00	1.00
Domestic Defaults	8107	0.04	0.00	0.21	0.00	1.00
External Defaults	8107	0.08	0.00	0.27	0.00	1.00

The table reports the summary statistics for the variables used in this study.

European Stability Mechanism



6a Circuit de la Foire Internationale
L-1347 Luxembourg

Tel: +352 260 292 0

www.esm.europa.eu

info@esm.europa.eu

