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.

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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

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Sovereign Defaults at Home and Abroad*

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Abstract

We systematically compare sovereign defaults on domestic and external debt markets. Domestic defaults involve smaller debt quantities and are resolved faster; nonetheless, both types of default deliver similar creditor losses. Domestic and external defaults often involve only a fraction of outstanding debt and are routinely resolved using maturity extensions or coupon reductions, rather than through face value reductions. Governments default at home and abroad selectively, with different types of default occurring in different macro-financial and political environments. Our findings challenge key assumptions used in the theoretical literature and provide empirical guidance for the improved calibration of sovereign default models.

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Keywords: Public debt, sovereign default, domestic markets, international markets, stylized facts, theory.

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1 Introduction

Sovereign debt markets have experienced radical transformations in recent decades, especially in emerging markets. Historically, developing countries could only borrow externally in foreign currencies and international markets (Eichengreen and Panizza, 2005). Their domestic debt markets were either non-existing or closed to foreigners (CGFS, 2007; Dos Santos, 2024). Since the 1990s, underpinned by the notion that a properly functioning domestic bond market is key to unlocking stable economic development (Rajan and Zingales, 1998), sovereigns increasingly meet their funding needs using domestic debt markets (Reinhart and Rogoff, 2008; Hatchondo et al., 2016; Broner and Ventura, 2016; Bianchi and Mondragon, 2021). Nowadays, domestic debt markets have become the bedrock of capital markets (IMF, 2021; Adrian et al., 2025), and are more important than external ones in many countries.[1]

Reflecting this trend, a growing number of theoretical contributions have proposed models where sovereigns can not only borrow and default externally, as in seminal sovereign default models (Eaton and Gersovitz, 1981; Arellano, 2008), but also domestically (Guembel and Sussman, 2009; Broner et al., 2010; Arellano and Kocherlakota, 2014; Bocola, 2016). When external debt is involved, governments weigh the benefit of a default against the cost of the exclusion from international goods and capital markets (Mendoza and Yue, 2012; Amador and Phelan, 2023). When domestic debt is involved, financial and political instability considerations are key (Sosa-Padilla, 2018; Chari et al., 2020; D'Erasmo and Mendoza, 2021).

In contrast to the theoretical literature on external sovereign defaults, which relies on an ample body of empirical work (Asonuma and Trebesch, 2016; Arellano et al., 2023), the literature on domestic defaults is growing with scant empirical evidence to inform modeling choices (Reinhart and Rogoff, 2008). In this paper, we fill this gap by systematically comparing detailed data on external sovereign defaults, coming from Asonuma and Trebesch (2016), with similarly granular data on domestic sovereign defaults coming from Erce et al. (2022). Our dataset contains information on 115 restructuring events involving debt issued on domestic markets and 182 restructuring events involving debt issued on external markets, covering the universe of sovereign defaults on private creditors from 1980 to 2019.[2]

Our analysis uncovers key differences and similarities between domestic and external sovereign defaults and restructurings, providing guidance on the correct design and calibration of theoretical models of sovereign risk. We show that domestic defaults involve smaller amounts of debt and are resolved faster.[3] Despite these differences, the size of investors' losses is

[1] Mexico exemplifies well the change. BIS data shows that domestic debt accounted for 22% of Mexico's public debt in 1995. By 2010, it accounted little less than 90% of total debt. In 2024, emerging markets' local bonds amounted to 80% of their total bond stock (OECD, 2025).

[2] Our definition of the domestic and external debt is based on the market of issuance. Domestic (external) government debt is intended as debt issued by governments on a domestic (international) market. The literature offers other definitions of domestic and external debt (Du and Schreger (2016) looks at the currency and D'Erasmo and Mendoza (2021) at the creditors' residence).

[3] This follows from the fact that the residence of the market affects the process (Chamon et al., 2018). Domestic debt can be restructured using legislative measures. External debt can not.

similar. We further document a positive and significant correlation between the duration of restructuring processes and investors' losses in both domestic and external defaults.

When we analyze how governments implement restructurings, we find that domestic and external sovereign debt restructurings share similarities. Maturity extensions and amendments to the coupon structure are the most common forms of restructuring for both external debt (Cruces and Trebesch, 2013) and domestic debt. Face value reductions are, instead, rare (Mihalache, 2020). This finding contrasts with the prevailing assumption in the literature that sovereign defaults, both domestic and external, occur through face value reductions (Eaton and Gersovitz, 1981; Aguiar and Gopinath, 2006; Arellano, 2008; Broner et al., 2010; Bassetto and Galli, 2019; D'Erasmo and Mendoza, 2021; Bianchi and Mondragon, 2021). Domestic and external defaults are also similar in that payment arrears emerge during the process (Hatchondo et al., 2014; Asonuma and Trebesch, 2016; Asonuma et al., 2024).

The theoretical literature nearly invariably assumes that defaults affect the total debt stock, both domestic and external (Broner et al., 2010; Broner and Ventura, 2016; D'Erasmo and Mendoza, 2021), and that all debt instruments are treated uniformly (Perez, 2015; Bocola, 2016; Hatchondo et al., 2016; Mallucci, 2022; Bianchi and Mondragon, 2021). In stark contrast, we document that sovereigns discriminate both within and across debt markets. We show that selective defaults, involving exclusively domestic or external debt, are the norm, and offer evidence that such selective behavior does not merely reflect the debt structure. Moreover, in line with Arellano et al. (2023), we show that sovereign defaults are frequently partial, as they often only involve a fraction of the debt issued in foreign markets. We provide new evidence that domestic defaults are markedly more partial than external ones.

Finally, we document that the macro financial and political environment surrounding domestic and external defaults differs. Growth falters around both domestic and external defaults. However, while domestic defaults happen at times of financial instability, characterized by an abrupt credit deleveraging by the private sector and a high likelihood of banking crises (Sosa-Padilla, 2018; Chari et al., 2020), external defaults occurr in times of significant external adjustment, characterized by an improvement in the trade balance and substantial capital flight (Mendoza and Yue, 2012). In contrast to the standard narrative arguing that sovereign defaults can be avoided by resorting to inflation (Bassetto and Galli, 2019; Sunder-Plassmann, 2020; Hurtado et al., 2023), we find that hyperinflation is not a substitute for domestic sovereign default. Instead, hyperinflation episodes often co-exist with defaults, especially external ones, which are also often accompanied by currency crises (Reinhart and Rogoff, 2011; Na et al., 2018; Bianchi and Mondragon, 2021). Turning to the political environment, in line with predictions of some theoretical models (Andreasen et al., 2019; D'Erasmo and Mendoza, 2021; Hermann and Scholl, 2023), we document that external and domestic defaults occur in periods of political upheaval, and that elections are more likely when countries are in default. External defaults are more likely when radical parties are in power. In contrast, domestic defaults and governments' ideologies show no association. We document the contrasting roles played by official creditors and the International Monetary Fund (IMF) during external and domestic sovereign defaults. While IMF programs often overlap with domestic defaults but not with external defaults (Morris and

Shin, 2006; Corsetti et al., 2006; Boz, 2011; Fink and Scholl, 2016), debt restructurings of official debt recurrently accompany external defaults but not domestic ones (Horn et al., 2020; Arellano and Barreto, 2025; Wicht, 2025; Liu et al., 2025).

Our definition of the domestic and external debt is based on the market of issuance. Yet, the literature offers alternative definitions of domestic and external debt. We compare our market definition with sovereign default data focusing on the currency of the debt in default (Beers and de Leon-Manlagnit, 2019) and with the residence of the creditors facing the default (IMF, 2021). We document that episodes of default on externally issued debt often involve debt denominated in foreign currency and held by foreign creditors. Instead, domestic debt defaults often involve debt that is not denominated in local currency and is not held by resident creditors. The triple coincidence of market, residence, and currency that is often assumed in sovereign default models may not be a good approximation for domestic debt.[4]

The collection of findings we present in this paper provides guidance for the large quantitative literature that brings models á la Eaton and Gersovitz (1981) to the data (Arellano, 2008; Arellano et al., 2023). The comprehensive collection of stylized facts that we report informs the calibration of moments, such as the length of the restructuring periods, that are crucial for their quantitative performance (Hatchondo et al., 2016). At the same time, our findings strongly suggest that models that aim to quantitatively replicate domestic sovereign default patterns should have different calibration targets than those that aim to replicate external sovereign default patterns.

Our findings also provide first-hand guidance for the choice of realistic modeling assumptions. We show that reality is in conflict with mainstream modeling choices. In particular, the fact that sovereign defaults are selective and partial is at odds with the often-made assumption that all debts are involved and are treated equally during sovereign default episodes. Similarly, the fact that default episodes are mostly resolved using maturity extension and without altering the nominal value of the outstanding debt is at odds with the widespread assumption that restructurings are implemented through face value reductions. Finally, we document that the triple coincidence of market, residence, and currency that is often assumed by sovereign default models only holds for external debt.

The remainder of this paper is organized as follows. Section 2 describes the data. Section 3 compares different aspects of domestic and external debt restructurings. Section 4 provides evidence on patterns of discrimination within and across debt markets. Section 5 evaluates whether different definitions of domestic and external defaults overlap. Section 6 studies how key macro-financial, political, and geoeconomic variables fluctuate around domestic and external defaults. Section 7 highlights the implications of our empirical findings for the theoretical literature. Section 8 concludes.

[4]Most theory models assume that domestic (external) debt is in pesos (dollars) and held locally (abroad).

2 Data and sources

Our key data sources are Asonuma and Trebesch (2016) and Erce et al. (2022). Asonuma and Trebesch (2016) report information on 197 restructuring events involving external debt from 1978 to 2020. Erce et al. (2022) report information on 134 restructuring events involving domestic debt instruments from 1980 to 2019. To keep the granularity of these two data sources, we extended the database of Asonuma and Trebesch (2016) to include the details of external default events from 2010 to 2019.[5] The variables in the database include measures of the volume of debt being restructured, the duration and characteristics of the restructuring process, the amendments to the original debt instruments, and the losses to creditors.[6]

To identify debt defaults and restructurings, Erce et al. (2022) focus on the (residence of the) market where the debt instruments are issued, while Asonuma and Trebesch (2016) focus on the (residence of the) creditors holding the debt.[7] To address potential concerns about the comparability of the two databases, we checked each event reported by Asonuma and Trebesch (2016) and verified they classified as external also according to the definition adopted by Erce et al. (2022). We found a handful of external restructuring events that could not be classified as external according the market-based criterion adopted by Erce et al. (2022), as they involved debt issued domestically but held externally, and we reclassified these events accordingly.[8] To further ease the merger of the two databases, we 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 2019. The resulting database contains information about 115 restructuring events involving debt issued domestically and 182 restructuring events involving debt issued externally in 84 countries.

Information at the instrument level is useful to understand the incidence of default, as

[5] Cruces and Trebesch (2013) and Asonuma and Trebesch (2016) provide detailed information about the quantity 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.

[6] Other relevant information, such as data on debt maturities, is missing from both databases.

[7] IMF (2021), which extends Reinhart and Rogoff (2008), classifies defaults according to the residence of investors, and Beers and de Leon-Manlagnit (2019) classifies defaults according to the currency. None of these datasets offers detailed information about the debt in default or the restructuring process. In Erce et al. (2022) we analyzed the overlap of these different default databases with a focus on the domestic side. Despite Erce et al. (2022) excludes non-contractual defaults, such as hyper-inflationary processes, it reports 30 defaults not included in Beers and de Leon-Manlagnit (2019) and 39 defaults not included in IMF (2021).

[8] The list of events that we reclassified includes Russia, Ukraine, Dominica, Greece, and Grenada. We also added missing external defaults for Antigua and Barbuda in 2008 and for Argentina in 2001. We adjusted the end date of an external default episode of Nicaragua from 1995 to 2007. Finally, we removed default events related to Yugoslavia and Yemen due to the lack of official data on GDP.

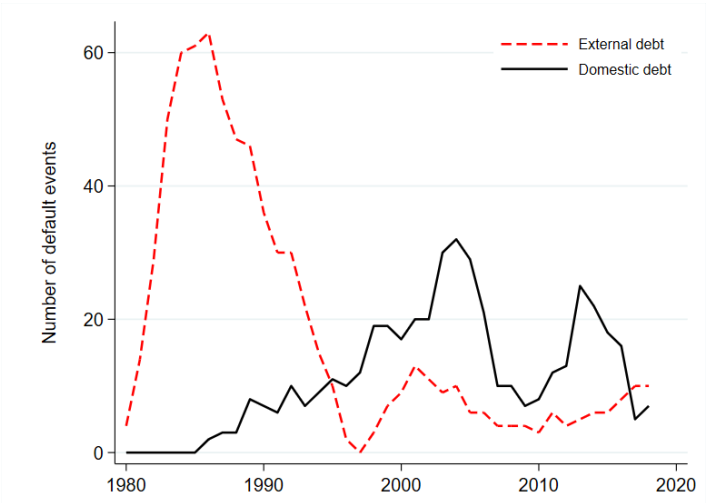
[9] Erce et al. (2022) also report multiple events of domestic arrears, defined as overdue payments to local suppliers, civil servants, and pensioners. We do not include them in this analysis either.

well as the mechanics through which different debt instruments are restructured. However, governments often choose to restructure several instruments simultaneously or within a short time frame. Hence, multiple restructuring events are often part of a broader restructuring program. To have a better perspective of how sovereign defaults play out in practice, we bundle our restructuring events into default episodes.[10] As in Erce et al. (2022), we bundle different default events into a single episode if at least one of the following two conditions is met: (i) two or more restructuring events occur in the same or in the following year; (ii) the government announced a comprehensive debt restructuring. Using these two criteria, we obtain 67 domestic default episodes and 101 external default episodes.

3 Sovereign default at home and abroad

Domestic and external sovereign defaults have taken place in every decade spanned by our dataset. Figure 1 plots the total number of default events on domestic and external debt occurring in overlapping four-year windows of time from 1980 to 2019.

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.

Domestic defaults were relatively rare in the 1980s and became increasingly frequent in the 1990s, mirroring the expansion of domestic debt markets. External defaults, instead, peaked in the mid-1980s and became less frequent thereafter. From 1980 to 2018, the average frequency of external default episodes, defined as the number of defaults in a given year divided by the total number of countries in the world, is 3%, significantly higher than the

[10]Episodes collect all debt components that eventually go into default enabling us to gather more accurate insights into whether and how sovereigns engage in debt restructuring in different debt markets.

frequency of domestic defaults (2%). However, if we focus only on default events after 1998, domestic defaults have become more frequent (4.6%) than external defaults (3%).

Table 1 breaks down default events geographically and by income group.[11] As shown in the upper panel of Table 1, domestic and external restructurings have occurred worldwide. The incidence of default has been highest in Latin America and Africa. Domestic and external sovereign defaults often occur in the same countries. Almost two-thirds of the countries in our sample report multiple defaults. Roughly 74% (49%) of the countries that restructure domestic (external) debt also restructure external (domestic) debt at some point in time. Focusing on income levels, the lower panel of Table 1 shows that most sovereign defaults in our sample, domestic and external, have occurred in low- and middle-income countries. That said, domestic and external defaults have also occurred in advanced economies.[12]

Table 1. Restructuring Events by Continent and Income Group

	Total	Africa	America	Asia	Europe	Oceania
Domestic debt	115	29	67	7	11	1
External debt	182	63	78	15	26	0
	Total	Low income	Lower middle income	Upper middle income	High income	
Domestic debt	115	11	38	47	19	
External debt	182	28	56	66	32	

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

3.1 Domestic defaults are smaller and faster to resolve but deliver similar losses

Sovereign default outcomes can be summarized using three key variables: the volume of debt involved in the process, the lenght of time it took to cure the default, and the extent of losses imposed on investors. In this section we sytematically compare these three feature across domestic and external defaults. Table 2 reports both the average and the median values for the size, duration and creditor losses of external and domestic defaults. Table 2 also includes K-sample tests and T-tests to help us gauge whether differences between external and domestic defaults medians and means are statistically significant.[13]

[11] We adopt the World Bank classification of income groups. According to the classification, countries are grouped into four baskets (low income, lower middle income, upper middle income, and high income), based on income per capita in US dollars (Atlas methodology) in 2020.

[12] Table 12 reports the breakdown of default events by instrument. Nowadays, most events, domestic or external, involve bonds. This pattern highlights how the secular shift away from bank loans and into bond financing has equally affected debt instruments issued in domestic and external markets (Gelpern, 2008).

[13] K-sample tests examine whether domestic and external defaults come from populations with the same median. T-tests examine whether they come from populations with the same mean. The null (alternative)

Table 2. External vs Domestic Defaults. Mean and Median Values

		External Defaults	Domestic Defaults	Difference
Debt restructured	Mean	21.7	12.1	9.6***
	Median	10.3	5.6	4.7**
Duration	Mean	71.3	40.8	30.5***
	Median	50.0	13.0	37.0***
Creditor's losses	Mean	42.6	38.7	3.9
	Median	36.0	36.0	0.0

Debt restructured is measured in percentage of GDP, duration is measured in months, and creditors' losses are measured in NPV terms. The table reports T-tests on the equality of means and K-sample tests on the equality of the medians. $*$, $**$, and $***$ indicate the statistical significance at the 10%, 5%, and 1% level, respectively.

External default episodes are larger than domestic ones. The median external default involves debt securities amounting to 10.3% of GDP. The median domestic default is half as large, involving debt securities amounting to 5.6% of GDP, and the result of the K-test shows that the difference is statistically significant. Results are similar when we analyze average values. External defaults, on average, involve debt amounting to 21.7% of GDP, while domestic default episodes involve, on average, debt amounting 12% of GDP.[14]

Next, we compare the speed of the restructuring processes.[15] Debt issued in domestic markets falls under local law and, as described in Chamon et al. (2018), can be restructured using legislative measures. In contrast, externally issued debt can only be restructured seeking an agreement with creditors (Cruces and Trebesch, 2013). Thus, in principle the market of issuance can have a strong impact on the duration of the restructuring process.

According to Table 2, the resolution of domestic defaults takes, on average, 41 months, significantly less than the average resolution of external defaults, which is 71 months. Median values confirm that domestic restructurings are faster than external ones. The median domestic default episode lasts only 13 months, while the median external restructuring lasts 50 months. As indicated by the K-sample tests, this difference is statistically significant. [16]

Means and medians mask some relevant heterogeneity. Table 3 reports the percentage of domestic and external restructuring events resolved within specific time intervals. One in

hypothesis is that the samples were drawn from populations with identical (different) median/mean.

[14]Table 13 in Appendix A reports detailed summary statistics for the average size of debt in default.

[15]The start date of a default event is defined as 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.

[16]Table 14 in Appendix A reports detailed summary statistics for the duration of default episodes.

three domestic defaults is resolved within one year. Conversely, only one in 11 external defaults is resolved within one year. Yet,the likelihood that the process protracts is subtantial for both domestic and external defaults. One in four domestic defaults takes more than 3 years to resolve while more than half external defaults take more than 3 years. While on average domestic defaults are resolved faster, the odds that they protract subtantially are far from marginal.

Table 3. Distribution of Default Durations

	Less than 6	From 6 to 12	From 12 to 36	Longer than 36
Domestic debt	33%	16%	22%	28%
External debt	8%	9%	26%	57%

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

Finally, we compare investors' losses in the event of a default measured in net present value (NPV) terms. While Asonuma and Trebesch (2016) report NPV losses for a majority of the events in their sample, Erce et al. (2022) report NPV losses only for a subset of domestic restructurings. This leaves us with a biased sample that requires caution in the interpretation of our empirical findings on investors' losses.[17] Median values, reported Table 2, are exactly the same with NPV losses at 36% for both domestic and external defaults. Average NPV losses are, on average, 4 percentage points higher when governments default on domestic debt. These findings do not support the preferential-treatment assumption for domestic debt that is often found in the literature (Broner et al., 2010; Hermann and Scholl, 2023).[18]

Additional interesting facts emerge from analysing whether and how size, duration and losses correlate. Table 4 reports correlations for the quantity of restructured debt, the duration of the restructuring process, and NPV losses suffered by creditors.[19] The correlation between the duration of the restructuring process and investors' losses is positive and significant regardless of the type of default, indicating that losses are larger when restructurings are slower. Instead, the correlation between the quantity of debt being restructured and the duration is positive only in the case of external restructurings, perhaps indicating that governments' bargaining power in domestic defaults does not depend on the quantity of debt being restructured. The correlation between the size of restructured debt and the size of the creditors' losses is not significant in either default types.[20]

[17]To verify if the available sample of NPV estimates for domestic defaults is representative of the whole sample, we compare key moments of the subsample with those of the full sample. Reflecting the fact that NPV losses are more readily available for larger and more recent domestic default episodes, we find that the median quantity of restructured debt is larger in the sample with information on NPV losses.

[18]Table 15 in Appendix A reports detailed summary statistics for the NPV losses of debt in default.

[19]Table 16 in Appendix A reports differences in the correlation values for domestic and external restructurings, and tests whether such differences are statistically significant.

[20]These results are somewhat in contrast with the predictions of standard sovereign default models, where there is a strong and positive correlation between the size of defaults, the duration of the exclusion from

Table 4. Correlations

	Domestic debt		
	Debt restructured	Duration	NPV loss
Debt restructured	1.00		
Duration	-0.07	1.00	
NPV loss	0.10	0.72***	1.00

	External debt		
	Debt restructured	Duration	NPV loss
Debt restructured	1.00		
Duration	0.36***	1.00	
NPV loss	0.01	0.56***	1.00

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

3.2 Maturity extensions are the norm, haircuts are the exception

Standard sovereign default models assume that sovereign defaults are resolved through haircuts. That is, debt restructurings are implemented through a reduction of the face value of debt. Is this assumption backed by the data?

Table 5 reports summary statistics on how the terms of sovereign debt are modified through restructuring in our sample of sovereign defaults. Face value reductions are the exception not the norm, especially in domestic debt markets.[21] One in two only external defaults features haircuts; and less than one in four domestic defaults features haircuts. Financial stability considerations may explain why face value reductions are less frequent during domestic defaults. Domestic sovereign debt is often held by domestic banks that may need to write down equity when a default is resolved using harcuts, potentially triggering financial stress (Sosa-Padilla, 2018; Chari et al., 2016).[22]

Instead, maturity extensions is, by a large margin, the most common method to restructure debt, both in domestic and external defaults. 92% (88%) of domestic (external) defaults feature maturity extensions. Amendments to the coupon structure are also ubiquitous, as they are implemented in 83% of the external defaults and in 86% of the domestic defaults.

financial markets, and the size of the creditors' losses (Hatchondo et al., 2010a; Benjamin and Wright, 2013; Arellano et al., 2023).

[21] Cruces and Trebesch (2013) and Mihalache (2020) also note the prevalence of maturity extensions over face value reductions during external defaults.

[22] The experiences of Jamaica in 2010 and Cyprus in 2013 shed light on why face value reductions are rare. In these two episodes, due to concerns about the lasting negative impact of face value reductions on their balance sheets, local banks expressed their preference for maturity extensions (Erce, 2021).

Table 5. Incidence of Restructuring Amendments

	Maturity Change	Coupon Change	Face Value Reduction
Domestic debt			
N° of episodes featuring the amendment	54	44	12
N° of episodes reporting information	(59)	(51)	(52)
External debt			
N° of episodes featuring the amendment	86	81	55
N° of episodes reporting information	(98)	(97)	(101)

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 amendment is available.

Restructuring events that feature simultaneous amendments to the coupon structure, changes in maturities, and face value reduction are not rare. Almost 23% of domestic default events and 40% of external default events feature simultaneous amendments to the three dimensions.

3.3 Post-default restructurings are frequent

A feature that has been the focus of recent theoretical and empirical work is whether sovereigns approach external debt restruturing before or after missing due payments (Asonuma and Trebesch, 2016). Do governments approach debt restructurings before or after missing due payments? Table 17 in Appendix A reports the frequency of pre-default and post-default restructurings for domestic and external debt. Table 17 shows that the frequency of pre-default and post-default restructurings is similar for domestic and external restructurings. For the full sample, one third of the domestic default episodes and one quarter of the external ones are pre-default. Since 2001, the frequency of pre-default domestic and external restructuring has increased to 37% and 55% respectively.

Asonuma and Trebesch (2016) show that pre-default external debt restructurings are faster to resolve and have lower haircuts than post-default restructurings. We confirm the findings in Asonuma and Trebesch (2016) and document similar characteristics for domestic defaults. Domestic pre-default restructurings take, on average, 4.4 months to be resolved, and carry an average NPV loss for creditors of 33%. Post-default domestic restructurings, instead, take almost five years to resolve and lead to much bigger NPV losses of roughly 41.4%.[23]

[23]Table 18 in Appendix A reports K-sample tests comparing median values for key restructuring characteristics in pre-default and post-default episodes. We find that the duration of the median ex-ante restructuring is shorter than the duration of the median ex-post restructuring, and this is true for both domestic and external defaults. Conversely, NPV losses associated with the median pre-default restructuring are smaller than the NPV losses of the median post-default restructuring only for external defaults. The size of ex-post and ex-ante restructuring is similar.

4 Sovereigns discriminate within and across markets

Standard sovereign default models assume that default affects entire debt stock and that all existing debts are restructured uniformly (Arellano, 2008; Broner et al., 2010; Broner and Ventura, 2016; Bocola, 2016; D'Erasmo and Mendoza, 2021; Bianchi and Mondragon, 2021). However, a handful of papers challenge this assumption and model discriminatory behavior during sovereign defaults. Grossman and Huyck (1988) and Arellano et al. (2023) propose theoretical sovereign default featuring partial defaults on external debt. In those models, doscrimation happens because not all external sovereign debt is affected by the default. Bolton and Jeanne (2007), Broner et al. (2014), Erce and Mallucci (2018), Paczos and Shakhnov (2016), and Chari et al. (2020) propose models that feature selective defaults and, therefore, discrimination across creditors and types of debt.

To be able to judge whether sovereign defaults discriminate within and across markets of issuance, we needed information about the composition of debt at the time of the defaults. Due to the lack of a reliable database that provides the breakdown of government debt into domestic market debt and external market debt, we built a database on our own. The database contains information on government debt composition in the year before a default.[24]

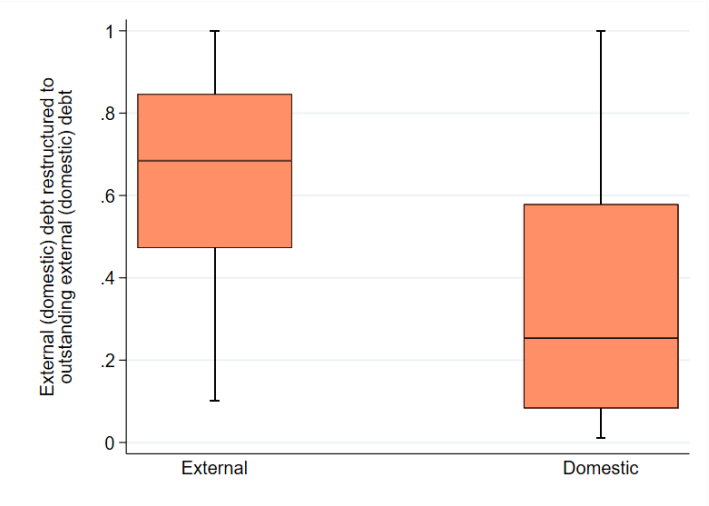
4.1 Defaults are partial, especially at home

Figure 2 summarizes our evidence on whether soverign defaults are partial. Figure 2 plots the share of external restructured debt as a fraction of total outstanding external debt for external default episodes. It also plots the share of domestic restructured debt as a fraction of total outstanding domestic debt. Total debt, domestic and external, is measured one year before the default event.

In line with Arellano et al. (2023), we document that external defaults normally do not involve the entire debt stock. External defaults involve, on average, about 70% of the outstanding external debt stock. This partial approach to sovereign default is even more pronounced in domestic defaults. On average, domestic defaults involve roughly 35% of the outstanding stock of domestic debt, and only one in four domestic defaults involves more than half of the outstanding stock of domestic debt.

[24]The data collection process implied the consultation of several sources. IMF and World Bank reports, national central banks' databases, and publications from the ministries of finance constituted our primary sources of information. Whenever these sources did not provide data enabling us to remove official debt from external debt and central bank's holdings from domestic debt, we retrieved them from the dataset of Arslanalp and Tsuda (2014). For each episode, we verify that the data on debt composition are consistent with the restructured volumes recorded in our dataset. Only for the non-selective default of Brazil in 1986, due to unspecified accumulated payment arrears, reported total outstanding external debt was lower than the restructured external amount. For this case, we decided to set the total outstanding external debt equal to the amount of restructured external debt.

Figure 2. Partial Default



The y-axis reports the share of external (domestic) restructured debt as a fraction of total outstanding external (domestic) debt before a restructuring event. The two whiskers represent minimum and maximum values. The box goes from the 25th and the 75th percentiles. The horizontal line represents the median.

4.2 Selective defaults are the norm

In order to determine whether defaults are non-selective (affect both markets) or occur selectively (only affect an specific market) we use the following rule: defaults are non-selective whenever external and domestic defaults occur at the same time, or whenever a default on either type of debt happens when a country is still in default on the other type of debt. Using this definition, we find that 84% of the default episodes in our database are selective, as they only involve domestic or external debt. 54% of all default episodes are selective external and 30% are selective domestic.

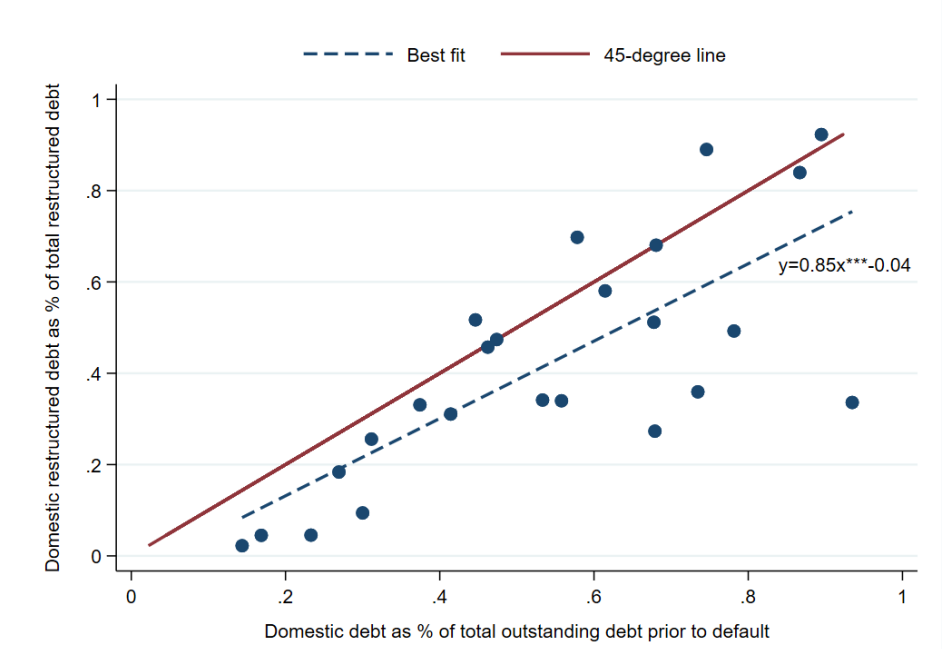
The high incidence of selective defaults does not simply reflect the debt structure before default.[25] When we look at the composition of sovereign debt ahead of defaults, we observe that the debt structure is skewed towards external debt ahead of external defaults, and toward domestic debt ahead of domestic defaults. Still, in both cases a substantial amount of debt is excluded from the default. Table 19 in Appendix reports moments for the composition of government debt ahead of selective defaults. Domestic debt amounts to 38.1% of the total outstanding debt before selective external defaults, and amounts to 72.8% of the total outstanding debt ahead of selective domestic defaults.[26] These findings clearly show that selective defaults deliberately leave large amounts of debt outside the default space.

[25] Governments defaulting only externally (domestically) may only have external (domestic) debt.

[26] Table 19 also reports K-sample tests for the difference in the debt structure before selective domestic and selective external default episodes. Results show that there is significantly more external (domestic) debt ahead of selective external (selective domestic) defaults.

By definition, selective defaults are not equitable, they discriminate against specific debt categories. What about non-selective defaults, are they equitable? Do they respect the pre-existing composition of debt? Our data suggest so. Figure 3 plots the share of restructured domestic debt over total restructured debt (y-axis) against the share of outstanding domestic debt over total outstanding debt prior default (x-axis) for the subset of nonselective defaults for which data on the composition of government debt was available.[27] Defaults are perfectly equitable when they fall on the 45-degree line (the solid red line), as the share of domestic debt that is restructured exactly coincides with the share of domestic debt.

Figure 3. Are Non-Selective Debt Restructurings Discriminatory?



The x-axis reports the share of domestic debt as a fraction of total outstanding domestic debt before a restructuring event. The y-axis reports the share of domestic restructured debt as a fraction of total restructured debt. The red solid line is the 45-degree line. The dotted black line is the OLS fit of the y-axis against the x-axis. *** denote that the beta from the OLS regression is significant at a 1% level.

[27] As some non-selective defaults are very lengthy, and the composition of government debt can change rapidly, we chose to rely on debt stocks that were as close as possible to the date of the implementation of the restructurings were implemented. Thus, once we identified a non-selective default episode, we took the debt structure of the year preceding the end of the first default event (either domestic or external) included in the episode. We applied a few exceptions this rule. Due to data unavailability, we used data from 1999 for the 2001 Cameroon default. Similarly, for the 1990 non-selective default in Brazil used data on debt composition from 1988. In addition, we split the default episode in Saint Kitts and Nevis in two to take into account a domestic debt for land swaps implemented by the government. One nonselective default episodes from 2011 to 2013, and one selective domestic default spanning from 2015 to 2016. Finally, given the long duration of the external default episode afflicting Cameroon from 1985, we decided to split the episode in two, a domestic selective default in 1993 and a non-selective default in 2003, and discard the first part of the external default as it did not lead to a restructuring of external debt.

Although most observations lie below the 45-degree line, thus signaling some degree of discrimination against external debt, an OLS regression of the y-axis against the x-axis delivers a highly significant coefficient of 0.85, which is not statistically different from 1. In other words, data indicate that selective defaults respect the initial structure of government debt.

5 Market of issuance, currency of denomination, and investors' residence. An imperfect overlap

Our definition of domestic and external defaults is grounded on the market of issuance: domestic defaults and restructurings are those that involve debt issued in domestic markets. Other authors have adopted the currency denomination (Jeanneret and Souissi, 2016; Du and Schreger, 2016; Beers and de Leon-Manlagnit, 2019) or the residence of investors (Sturzenegger and Zettelmeyer, 2008; Reinhart and Rogoff, 2010; IMF, 2021) as the guiding principle to establish whether a sovereign default is domestic or external.

How well do these different definitions of domestic and external default align? Table 6 compares our database with those of Beers and de Leon-Manlagnit (2019) and IMF (2021), that respectively define domestic and external debt according to the currency denomination and the creditors residence.[28] We find that only 19 of our 67 domestic default episodes also classify as domestic according to the currency denomination principle adopted by Beers and de Leon-Manlagnit (2019). In fact, 43 of our 67 domestic default episodes classify as external according to Beers and de Leon-Manlagnit (2019). In turn, 34 of our domestic defaults also classify as domestic under the residence criterion used by IMF (2021), while 33 classify as external. In other words, less than one third of the domestic defaults involve debt instruments denominated in local currency, and only half of them involve creditors that are domestic residents. A triple coincidence of market, currency and creditor residence holds tighter for external defaults. According to Beers and de Leon-Manlagnit (2019), 98 of our 101 external defaults also classify as external. Smilarly, according to IMF (2021), 92 of our 101 external market defaults also classify as defaults with external creditors.

[28] Note that there could be a double-counting when matching default episodes of one database with those of another database. One domestic (external) default classified according to the criterion used in one database can correspond to both a domestic and an external default as per the definition in another database. This can happen if, for example, domestic market debt is issued in both local and foreign currencies.

Table 6. Market, Currency, and Residence. Full sample

		Market		Currency		Residence	
		Domestic	External	Domestic	External	Domestic	External
Market	Domestic	67		19	43	34	33
	External		101	11	98	22	92
Currency	Domestic			40		21	20
	External				142	33	105
Residence	Domestic					60	
	External						121

Sovereign defaults according to currency (Beers and de Leon-Manlagnit, 2019), residence (IMF, 2021) and market (our database).

Table 20 in Appendix focuses on the more recent period. Table 20 shows that the overlap between the market of issuance and the residence of the investors has become stronger. Yet, the overlap between the market of issuance and the currency of denomination is instead more tenuous. In summary, our analysis shows that the triple coincidence of market of issuance, residence, and currency denomination, often assumed in sovereign default models, is not fully supported by the data.

6 Domestic and external defaults occur in different macroeconomic and political environments

In this section we compare the macrofinancial and political environment in which domestic and external sovereign defaults occur. In contrast with the existing literature (Andreasen et al., 2019; D'Erasmo and Mendoza, 2021; Azzimonti and Mitra, 2022; Hermann and Scholl, 2023), that either 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.

The analysis relies on two econometric specifications. When the dependent variable y_{it} is not binary, we use a contemporaneous linear panel regression model:

$$y_{it} = \gamma_0 + \gamma_D D^D_{i,t} + \gamma_E D^E_{i,t} + \alpha_i + \beta_t + \epsilon_{i,t}. \tag{1}$$

Where y_{it} is the variable of interest, $D^D_{i,t}$ is a dummy that captures periods in which a country is in domestic default, and $D^E_{i,t}$ is a dummy that captures periods in which a country is in external default. α_i and β_t are country- and year fixed effects.

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

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

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

In both specifications, our focus is on the size and sign of the coefficients γ_D and γ_E, as well as on their difference $\gamma_E - \gamma_D$. Coefficients γ_D and γ_E measure how far $y_{i,t}$ deviates from its normal-time average during domestic and external defaults. Table 7 to Table 9 report coefficient estimates for both specifications and Wald tests for the difference $\gamma_E - \gamma_D$.

Table 7 focuses on selected macrofinancial variables.[29] The first column reports results when the cyclical component of GDP is the dependent variable.[30] GDP is on average 2.5% below normal times both during external defaults and during domestic defaults. Column two reports regression when $y_{i,t}$ is the public debt-to-GDP ratio. Coefficient estimates are positive and significant, suggesting that during domestic and external defaults public debt is significantly above the average level observed in normal times. Columns three to six focus on primary balances, net exports, private credit, and foreign capital inflows. Primary balances are significantly higher during external default, signaling that a fiscal adjustment is in progress. At the same time, net exports are significantly higher, and foreign inflows are lower during external defaults. In contrast, during domestic defaults, primary balances and net exports are similar to normal times, and capital inflows are only modestly lower. Private credit falls, on average, 16% below trend during domestic defaults, while it does not deviate from trend during external defaults. Altogether, these findings suggest that external defaults coincide with periods of fiscal consolidation and external re-balancing while domestic defaults coincide with periods of strong private sector deleveraging.

In Table 8 we check whether defaults co-exist with other crises such as capital flights, bank crises, hyperinflation, and currency crises.[31] The indicator for capital flights is the dependent variable in the first column of Table 8. The associated coefficients for both types of default are positive and statistically significant but their size is different. The coefficient for the external default dummy is twice as large as the coefficient for the domestic default dummy, and the difference is statistically significant. Thus, tight external financing conditions are more likely during external defaults. The second column focuses on banking crises. Again, we find that both coefficients are positive and significant. However, this time the two coefficients are statistically equivalent,indicating that sovereign defaults, both at home and abroad, occur at times of substantial financial distress.

[29]Data for real GDP, public debt, primary balance, inflation, and net exports come from the World Bank. Data on capital inflows and private credit are from the IMF. See Table 21 for summary statistics.

[30]Deviations from the trend are computed taking the log of real GDP and removing the trend. Credit to the private sector is detrended in the same way.

[31]Similar to Forbes and Warnock (2012), we build a dummy indicator for capital flights that takes value one when foreign capital outflows are at least 1.5 standard deviations above their average level. To measure financial instability we use indicators of banking crises from Laeven and Valencia (2020) and Reinhart and Rogoff (2010). Indicator for currency crises are from Reinhart and Rogoff (2010).

In column 3 we explore how hyperinflation interacts with sovereign default. As in Reinhart and Rogoff (2010), the hyperinflation dummy is set equal to one whenever the annual inflation rate exceeds 500 percent.[32] In contrast with the standard narrative arguing that defaults can be avoided by resorting to inflation (Bassetto and Galli, 2019; Sunder-Plassmann, 2020; Hurtado et al., 2023), our results show that hyperinflation is not a substitute of outright defaults. Our findings actually indicate that hyperinflation is more likely during defaults, especially external ones.To gain a better understanding of the interplay between hyperinflation and defaults, we analyze how sovereign defaults relate to currency crises, that we identify using the database in Reinhart and Rogoff (2010). We find that currency crises are more likely during external defaults (Na et al., 2018; Bianchi and Mondragon, 2021) but obtain no indication that currency crises are likely to co-exist with domestic defaults. This finding suggests that exchange rate pressures may be a key driver behind inflation pressures during external defaults.

Global conditions and sovereign default patterns are also interlinked. Columns 5 and 6 investigate the relationship between sovereign defaults, the Federal Funds Rate (FFR), and the EMBI Global Index.[33] EMBI spreads are abnormally elevated when countries are in default, either domestic or external. This finding is indicative of the fact that sovereign stresses come in waves, either because countries are hit by common shocks or because contagion is at play (Cole et al., 2024). Our results also show that external defaults are more likely when FFR is high and domestic defaults when FFR is low. However, this result likely reflects the evolution over time of domestic and external defaults. Most external defaults occurred before 2000, when rates were high, while most domestic defaults have occurred after 2000 when rates were lower.

Finally, Table 9 analyzes the political environment surrounding sovereign defaults.[34] Sovereign defaults, both at home and abroad, happen in periods of heightened political instability. This result is confirmed by the fact that we find that elections are more likely to happen both during external defaults and during domestic defaults. Ideology is also related to sovereign default patterns. In line with the existing literature focusing on external defaults (Andreasen et al., 2019; Hermann and Scholl, 2023), we find that center-right governments are less likely to be in power when governments default externally. In contrast, neither left-oriented nor

[32]Results are robust to alternative definitions of hyperinflation. In particular results remain similar when we use a threshold of 250 percent to identify hyperinflation, as experienced by Argentina in recent years.

[33]We obtained data on Federal Funds Rate and EMBI Global Index through Reuters.

[34]The political stability 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 relative to the other countries covered by the aggregate indicator. 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 political leaning index ranges from 1 to 3, with one indicating right-leaning governments, 2 indicating centrist governments, and 3 indicating left-leaning governments. Data on the number of elections in every country and on political constrains come from The Political Constraint Index Dataset by Henisz (2000, 2002). The political leaning index ranges from 0 to 1, with 0 indicating no political constraints (autocracy) and 2 indicating maximum constraints (many independent veto players). 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 program and whether it was negotiating with the Paris Club.

right-oriented governments are more likely in power during domestic defaults.[35] We also document that autocracies are less likely to default domestically.

The last two columns of Table 9 analyze whether the international financial architecture, as represented by debt relief by official creditors and crisis support from the IMF, differs around domestic and external sovereign defaults. Countries receiving financing from the IMF are more likely to be in default on their domestic debt but not on their external debt.[36] This contrasts with the role of official debt relief from official creditors. While official debt relief often coincides with external default, we observe no systematic relation between the provision of official debt relief and domestic default.

Taken together, our results confirm that the macrofinancial forces at play during domestic and external defaults 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 different channels of the international financial architecture (Gelpern, 2008).

[35] Center-right parties are those that express centrist or right-leaning ideologies.

[36] This result suggests that countries receiving IMF support prioritize external private creditors at the expenses of domestic ones (Erce, 2014).

Table 7. Sovereign Defaults at Home and Abroad. Macrofinancial Environment.

	(1) GDP Growth	(2) Debt	(3) Primary Balance	(4) Net Exports	(5) Private Credit	(6) Foreign Inflows
$D_{i,t}^{Ext}$	-2.578***	23.438***	2.614***	3.071***	-0.435	-4.419***
	(0.473)	(2.739)	(0.516)	(0.470)	(2.486)	(0.612)
$D_{i,t}^{Dom}$	-2.138***	15.508***	-0.215	0.352	-16.394***	-2.218**
	(0.822)	(4.787)	(0.402)	(0.832)	(3.449)	(0.964)
N	6393	5093	5054	6596	5941	5416
Wald-Test: $D_{i,t}^{Ext}$=$D_{i,t}^{Dom}$	-0.440	7.930	2.829	2.719	15.959	-2.201
p-value	0.665	0.201	0.000	0.008	0.000	0.059
Model	OLS	OLS	OLS	OLS	OLS	OLS
Country-Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year-Effects	Yes	Yes	Yes	Yes	Yes	No
R^2	0.088	0.556	0.205	0.735	0.085	0.238

GDP and private credit are measured in percentage deviations from the long-run trend. Debt, primary balance, net exports, and foreign capital inflows are measured as a fraction of GDP. $D_{i,t}^{D}$ and $D_{i,t}^{E}$ are dummies that identify periods of domestic and external default, respectively. Standard errors are in parentheses and $*$, $**$, and $***$ indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table 8. Sovereign Defaults at Home and Abroad. Links to internal and external instability.

	(1) Capital Flight	(2) Bank Crisis	(3) Hyperinflation	(4) Currency Crisis	(5) Fed's Fund Rate	(6) EMBIG Global
$D_{i,t}^{Ext}$	0.631***	0.500***	0.763***	0.940***	2.494***	0.980***
	(0.080)	(0.060)	(0.115)	(0.062)	(0.167)	(0.228)
$D_{i,t}^{Dom}$	0.278**	0.325***	0.265	-0.008	-2.551***	0.351**
	(0.131)	(0.091)	(0.188)	(0.119)	(0.224)	(0.176)
N	5417	6175	8296	8296	8296	806
Wald-Test: $D_{i,t}^{Ext}$=$D_{i,t}^{Dom}$	0.353	0.175	0.498	0.947	5.045	0.629
p-value	0.039	0.140	0.049	0.000	0.000	0.075
Model	Probit	Probit	Probit	Probit	OLS	OLS
Country-Effects	No	No	No	No	Yes	No
Year-Effects	No	No	No	No	No	No
R^2					0.030	0.403

Capital flight is measured using a dummy that equals one when foreign capital flows are over 1.5 standard deviations below their country-specific average level. Banking crises data are from Reinhart and Rogoff (2010) and Laeven and Valencia (2020). Hyperinflation si measured using a dummy variable that is equal to one when the annual inflation rate exceeds 250 percent. Currency crises data are from Reinhart and Rogoff (2010). $D_{i,t}^{D}$ and $D_{i,t}^{E}$ are dummies that identify periods of domestic and external defaults, respectively. Fed Funds' rate and EMBI Global data comes from Haver Analytics. Standard errors are in parentheses and $*$, $**$, and $***$ indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table 9. Sovereign Defaults at Home and Abroad. Political Environment

	(1) Political Stability	(2) Elections	(3) Autocratic Regime	(4) Centre-right Government	(5) IMF Program	(6) Official Relief
$D_{i,t}^{Ext}$	-4.289***	0.216***	0.074	-0.371***	-0.024	1.342***
	(1.028)	(0.068)	(0.056)	(0.068)	(0.065)	(0.062)
$D_{i,t}^{Dom}$	-3.264***	0.267***	-0.306***	0.131	0.757***	0.089
	(1.071)	(0.101)	(0.095)	(0.119)	(0.081)	(0.119)
Wald-Test: $D_{i,t}^{Ext}$=$D_{i,t}^{Dom}$	-1.024	-0.051	0.380	-0.502	-0.781	1.253
p-value	0.555	0.701	0.001	0.001	0.000	0.000
N. Observations	4,162	6,208	6,506	3,611	8,296	8,296
Model	OLS	Probit	Probit	Probit	Probit	Probit
Country-Effects	Yes	No	No	No	No	No
Year-Effects	Yes	No	No	No	No	No
R^2	0.903					

Political stability is measured using the probability of political instability or politically-motivated violence. Autocratic regime is measured using a dummy measuring whether the country is a closed autocracy. A government is assessed to be center-right oriented when it follows center or right ideologies. The elections dummy reports whether elections were held in each country in a given year. IMF Programme and Official Debt Relief are dummies that are 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 periods of domestic and external default, respectively. Standard errors are in parentheses and $*$, $**$, and $***$ indicate statistical significance at the 10%, 5%, and 1% level, respectively.

7 Lessons for Theory

Our empirical findings are especially informative for the large and growing theoretical literature on sovereign risk. The comprehensive collection of empirical moments reported in our paper informs the quantitative literature trying to bring models á la Eaton and Gersovitz (1981) to the data (Arellano, 2008). In these settings, the calibration of moments, such as the length of the restructuring process, and the frequency of defaults, is crucial for the quantitative performance of the models (Hatchondo et al., 2010b).

Table 10 reports empirical values extracted from our database for moments that are frequently targeted in quantitative exercises. The comparison between domestic and external sovereign defaults shows substantial differences. Domestic defaults involve less debt and are resolved faster and, yet, are as punitive as external defaults for investors. Models aiming to quantitatively replicate domestic default patterns (Bocola, 2016; Hurtado et al., 2023) should, therefore, target different values than those aiming to replicate external default patterns (Mendoza and Yue, 2012; Amador and Phelan, 2023).[37]

Table 10. Calibration Targets

	Full sample		**Diff.**
	External	Domestic	
Restructured debt to GDP	21.7%	12.1%	9.6***
Default duration (months)	71.3	40.8	30.6***
Default frequency (annual)	3.0%	2.0%	1.0%***
Creditor losses (NPV haircuts)	43%	39%	4.0

Average moments for domestic and external debt restructuring events from 1980 to 2019.

The fact that the resolution of external defaults takes longer than that of domestic defaults speaks to the theoretical literature concerned with understanding the role of debt renegotiation in the outcome of sovereign defaults. Papers like Yue (2010) or Mihalache (2020), which model renegotiation as a one-shot Nash bargaining game, may provide a valid framework to model shorter-lasting domestic restructurings. In contrast, papers interested in modeling the duration of external sovereign defaults may be better served by models like Pitchford and Wright (2012), Asonuma and Joo (2020) or Dvorkin et al. (2021), in which renegotiation through bargaining enables longer durations. Relatedly, the wide dispersion in the duration of the restructuring processes and NPV losses that we see in the data conflicts with the assumption that governments can precisely predict the consequences of their default decisions. Models introducing uncertainty about the restructuring process (Chamon and Roldán, 2023) may provide a more accurate description of how governments make default decisions.

[37] In such models, shorter exclusion times are associated with higher default frequencies and smaller debt levels (Hatchondo et al., 2010a). Such predictions align well with our empirical findings that domestic defaults are faster and involve lower volumes of debt than external defaults.

Additionally, our analysis provides useful indications on the correct choice of modeling assumptions in theoretical papers. Our collection of stylised facts challenges several of the most widespread assumptions embedded in sovereign default risk models. In particular:

The fact that the vast majority of defaults are selective, as they discriminate between domestic and external debt, and partial, as they only involve a fraction of the debt stock (Grossman and Huyck, 1988; Arellano et al., 2023), contradicts the assumption that sovereign defaults involve the full stock of debt and that all debt instruments are treated equally (Mendoza and Yue, 2012; Hurtado et al., 2023).[38] Theoretical models featuring partial defaults (Arellano et al., 2023; Amador and Phelan, 2023) and heterogeneity in the composition of government debt (D'Erasmo and Mendoza, 2021; Erce and Mallucci, 2018) should be developed further, as they can provide guidance to understand the tradeoffs that determine the the discrimination patterns, both within and across markets, that we observe in the data.

The fact that only a residual fraction of sovereign defaults occur through face value reductions is at odds with the fact that the vast majority of sovereign defaults model assumes that defaults are resolved by reducing the face value of government debt. Models featuring endogenous maturity choices (Arellano and Ramanarayanan, 2012; Hatchondo et al., 2016; Sánchez et al., 2018) and default through maturity amendment (Dvorkin et al., 2021; Bai et al., 2017; Mihalache, 2020), should be developed further to bridge the gap between the literature and the data.

The fact that the market of issuance, the currency denomination, and the residence of the investors often do not coincide indicates that the triple coincidence assumption, commonly made in sovereign default models, is only valid for external defaults. Consequently, domestic default models should be structured to account for default episodes that involve foreign-held debt and liabilities denominated in foreign currency, reflecting the empirical heterogeneity of the composition of domestic debt.

Finally, the fact that domestic and external defaults differ substantially in terms of the economic and political environment in which they develop, suggests that (i) sovereign default models should feature different channels of transmission to the macroeconomy depending on whether the default is domestic or external.[39], and (ii) sovereign default models should be enriched with third party actors such as the IMF and official creditors (Corsetti et al., 2006; Boz, 2011; Fink and Scholl, 2016; Wicht, 2025; Arellano and Barreto, 2025; Liu et al., 2025).

[38] At the same time the fact that losses are, on average, similar for domestic and external debt challenges the assumption that domestic debt receives a preferential treatment (Broner et al., 2010; Gaballo and Zetlin-Jones, 2016).

[39] Models with domestic debt should feature a feedback mechanism linking default to financial and political stability considerations. Models with external debt should consider the role of external adjustment and exchange rate dynamics (Mendoza and Yue, 2012; D'Erasmo and Mendoza, 2021).

8 Conclusion

This paper draws on a uniquely detailed database to provide a systematic comparison of sovereign defaults involving public debt issued in the domestic and international debt markets. In a world where public debt, both domestic and external, is growing alarmingly fast (OECD, 2025), our analysis offers important information and analytical material for academics and policymakers interested in the design of policies to tackle public debt in distress.

We learn two key lessons from our analysis. First, several modeling assumptions that are regularly embedded in sovereign default models should be revisited, as they are not supported by the data. Sovereign defaults, in particular at home, are more often than not partial, selective, and implemented through maturity extensions. All these characteristics are ruled out by standard sovereign default models. Second, our collection of empirical findings shows that domestic and external defaults are different and can inform the correct calibration of quantitative sovereign default models that involve domestic debt. Ultimately, we firmly believe that reconciling the theoretical models with the empirical findings in this paper should be a priority for future research.

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Appendix A Additional Tables

Table 11. Debt restructuring episodes

Country	Domestic Restructuring Episodes	External Restructuring Episodes
Albania		1991
Algeria		1990
Angola	2010	
Antigua-Barbuda	1998, 2008	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	
Central African Rep.	1992	
Chad		2014, 2017
Chile		1983, 1990
Congo Dem. Rep.	1997	1982
Congo Rep.	1992	1983, 2016
Costa Rica		1981
Cote d'Ivoire	1989, 2001, 2011	1983, 2000
Croatia		1991
Cuba		1983
Cyprus	2013	
Dominica	2003	2003
Dominican Rep.	2000, 2005	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
Jordan		1989
Kenya		1992
Liberia	1989, 2016	1980
Macedonia		1992
Madagascar	2002	1981
Malawi		1982, 1987
Mali	2011	
Mauritania		1992

Continued on next page

Table 11 – *Continued from previous page*

Country	Domestic Restructuring Episodes	External Restructuring Episodes
Mexico		1982
Moldova		2001
Mongolia	1997	2017
Montenegro	2002	
Morocco		1983, 1989
Mozambique		1983, 2015
Nicaragua	1994, 2003, 2008	1981
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	2002	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
Turkey	1999	1981
Ukraine	1998	1998, 2015
Uruguay	2002	1983, 1985, 2003
Venezuela	1998, 2002, 2005	1983, 1989
Vietnam		1982
Zambia		1983
Zimbabwe	2001,2006	

Domestic and external debt restructurings from 1980 to 2019. The first column lists the domestic debt episodes included in Erce et al. (2022). The second column reports the external default episodes included in Asonuma and Trebesch (2016) complemented by our data.

Table 12. Restructuring Events by Instrument

	Full Sample	1980-1989	1990-1999	2000-2009	2010-2019
Domestic Debt	115	8	31	44	32
Bonds	82	6	21	34	21
Bank loans	33	2	10	10	11
External Debt	182	121	29	16	16
Bonds	31	1	4	13	13
Bank loans	151	120	25	3	3

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

Table 13. Volume of Restructured Debt (% of GDP)

	Mean	Median	SD	Min	Max	N
Domestic debt	12.1	5.6	19.2	0.0	99.7	67
Bonds	12.7	4.8	19.8	0.0	81.9	39
Bank loans	4.7	2.0	5.5	0.1	17.7	14
Both instruments	17.8	13.2	24.5	1.1	99.7	14
External debt	21.7	10.3	25.7	0.3	113.8	101
Bonds	19.9	18.9	11.4	5.1	40.6	18
Bank loans	22.9	9.6	28.7	0.3	113.8	76
Both instruments	13.3	5.9	14.9	2.3	44.5	7

Summary statistics for the volume of debt involved, measured as a percentage of GDP, in domestic and external default episodes.

Table 14. Default Duration

	Mean	Median	SD	Min	Max	N
Domestic debt	40.8	13.0	65.5	0.0	303.0	67
Bonds	22.5	6.0	54.4	0.0	303.0	39
Bank loans	76.4	47.5	81.7	0.0	301.0	14
Both instruments	56.1	40.0	62.1	7.0	209.0	14
External debt	71.3	50.0	71.4	1.0	318.0	101
Bonds	30.7	12.0	50.7	1.0	179.0	18
Bank loans	83.3	58.5	73.9	3.0	318.0	76
Both instruments	46.1	20.0	43.2	15.0	109.0	7

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

Table 15. Creditor Losses

	Mean	Median	SD	Min	Max	N
Domestic debt	39	36	28	0	100	21
Bonds	29	27	19	0	57	12
Bank loans and commercial credit	63	63	.	63	63	1
Both instruments	50	50	35	5	100	8
External debt	43	36	28	-3	100	100
Bonds	34	33	20	-3	68	18
Bank loans and commercial credit	46	37	30	0	100	75
Both instruments	25	20	16	6	51	7

Summary statistics for creditors' losses during external and domestic default episodes. Losses are expressed as a percentage of the NPV of the restructured liability.

Table 16. Correlation Differences

	Domestic vs External Defaults		
	Debt restructured	Duration	NPV loss
Debt restructured	0.00		
Duration	0.43***	0.00	
NPV losses	0.09	0.16	0.00

The table reports the absolute values of 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 17. Pre-default vs. Post-default Restructurings

	% (all events)	Size (% of GDP)	Duration (months)	NPV Losses
Domestic debt				
Pre-default	33%	16.3%	4.4	33.3%
Post-default	67%	10.0%	58.6	41.4%
External debt				
Pre-default	28%	21.8%	16.8	22.9%
Post-default	72%	21.7%	92.3	49.9%

Mean values for pre-default and post-default debt restructuring episodes.

Table 18. K-sample Test on the Equality of Medians: Pre- vs Post-Default

Domestic Defaults: Pre vs Post	
	Difference (Pre - Post)
Debt restructured (% of GDP)	0.83
Duration	-30.0***
NPV loss	-12.77
External Defaults: Pre vs Post	
	Difference (Pre - Post)
Debt restructured (% of GDP)	1.23
Duration	-58***
NPV loss	-26.3***

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 19. K-sample Test on the Equality of Medians: Debt Structure and Selective Defaults

	Selective Domestic	Selective External	Difference (K-sample test)
Pre-default domestic debt ratio	72.8%	38.1%	34.7%***

Domestic debt ratio refers to the proportion of domestic debt on the total public debt stock. $*$, $**$, and $***$ indicate the statistical significance at the 10%, 5%, and 1% level, respectively, of a K-sample test on the equality of the medians. The K-sample test examines whether selective domestic and selective external defaults come from populations with the same median. The null hypothesis is that both samples were drawn from populations with the same median. The alternative hypothesis is that they were drawn from populations with different medians.

Table 20. Market, Currency, and Residence. Since 2000

		Market		Currency		Residence	
		Domestic	External	Domestic	External	Domestic	External
Market	Domestic	36		7	27	22	17
	External		23	2	22	12	21
Currency	Domestic			11		6	4
	External				44	15	27
Residence	Domestic					30	
	External						26

Sovereign defaults according to currency (Beers and de Leon-Manlagnit, 2019), residence (IMF, 2021) and market (our database).

Table 21. Summary Statistics

	N	Mean	Median	SD	Min	Max
Real GDP growth rate (cyclical component)	6393	0.47	0.04	9.92	-64.16	155.21
Public debt (% of GDP)	5105	55.46	45.57	44.75	0.00	600.62
General government primary balance (% GDP)	5066	-0.81	-0.51	13.99	-549.84	126.46
Net exports (% of GDP)	6596	-6.19	-3.83	18.13	-164.78	81.70
Credit (cyclical component)	5947	6.92	1.87	44.60	-89.91	905.56
Total capital inflows (% of GDP)	5417	7.80	5.11	18.94	-135.58	298.57
Capital flight	5417	0.05	0.00	0.21	0.00	1.00
Bank crises	6194	0.11	0.00	0.32	0.00	1.00
Hyperinflation	8315	0.01	0.00	0.08	0.00	1.00
Currency crises	8315	0.06	0.00	0.23	0.00	1.00
Federal funds rate (%)	8315	4.66	4.20	3.96	0.09	16.38
EMBIG (normalized)	807	-0.05	-0.29	0.92	-2.36	3.88
Political stability (rank)	4165	49.28	48.74	28.81	0.00	100.00
Elections	6227	0.10	0.00	0.30	0.00	1.00
Autocratic Regime	6525	0.25	0.00	0.43	0.00	1.00
Center-right government	3611	0.49	0.00	0.50	0.00	1.00
IMF programs	8315	0.12	0.00	0.33	0.00	1.00
Paris Club	8315	0.05	0.00	0.21	0.00	1.00
External defaults	8315	0.08	0.00	0.28	0.00	1.00
Domestic defaults	8315	0.03	0.00	0.18	0.00	1.00

The table reports the summary statistics for the variables used in the regressions.

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