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Sovereign Debt Puzzles

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Abstract*

We review the state of the sovereign debt literature and point out that the canonical model of sovereign debt cannot be easily reconciled with several facts about sovereign debt pricing and servicing. We identify and classify twenty puzzles. Some are well known and documented, others are less so and are sometimes based on anecdotal evidence. We classify these puzzles into three categories: puzzles about how sovereigns issue debt; puzzles about the pricing of sovereign debt; and puzzles about sovereign default and the working out of defaults. We conclude by suggesting possible avenues for new research aimed at reconciling theory with what we observe in the real world.

Keywords: Sovereign Debt, Sovereign Default, Public Debt

JEL Codes: F30; F34; G15, K12

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The most popular class of theoretical models, those building on Eaton and Gersovitz (1981) seminal reputation model of debt repayment, has limited practical relevance, despite decades of elegant generalization and extensions (Rogoff, 2022)

1 Introduction

Sovereign debt pricing and credit risk is tied to a sovereign's debt capacity and sustainability. The canonical framing of the sovereign debt problem in the literature, however, is in terms of the sovereign's *willingness to pay*. This basic framing cannot be easily reconciled with several facts about sovereign debt pricing and servicing in practice. Multiple puzzles emerge when one looks at sovereign debt markets through the lens of the canonical sovereign debt framework. We are not the first to point out that there is a mismatch between the predictions of the canonical model of sovereign debt and the reality of sovereign debt markets (see e.g., Rogoff, 2022, Mitchener and Trebesch, 2022, Gelpern and Panizza, 2022, on discrepancies between theory and practice).¹ Our contribution here is to identify and classify the main sovereign debt puzzles and to suggest alternative explanations. Some of the anomalies we describe are well known, others are less so. All in all, we identify twenty puzzles and classify them into three categories: (i) puzzles about how sovereigns issue debt; (ii) puzzles about the pricing of sovereign debt; and (iii) puzzles about sovereign default and the working out of sovereign debt defaults.

The sovereign debt literature builds on the seminal work of Eaton and Gersovitz (1981). The simplest formulation of this model assumes that the sovereign borrows abroad to smooth (exogenous) income fluctuations and that sovereign borrowers cannot be forced to repay because of either sovereign immunity or the impossibility of credibly pledging collateral located within the sovereign's own borders. The logical consequence of these two assumptions is that the sovereign will repay (and lenders will lend) only if the cost of defaulting is higher than the value of the debt that needs to be repaid. Hence, the cost of default defines how much a country can borrow, its debt capacity.

The key question, however, is: what is the cost of default? Eaton and Gersovitz's (1981) original assumption was that countries repay to protect their reputation in the international capital market. In their model, countries that default lose their reputation as creditworthy borrowers and permanently lose access to international capital markets. There are two issues with this assumption in reflecting

¹ Surveys of the economics literature of sovereign debt and default also include Aguiar and Amador (2021, 2014), Tomz and Wright (2013), Das et al. (2012), and Panizza et al. (2009).

reality. First, the evidence suggests that reputational costs tend to be short-lived (Panizza et al., 2009, Mitchener and Trebesch, 2022, and Gelpern and Panizza, 2022). Second, quantitative models of sovereign debt predict that reputation alone would imply debt limits close to zero (for a textbook treatment see Uribe and Schmitt-Grohé, 2017). In an attempt to (partly) reconcile the model with the data, Arellano (2008) introduced the assumption that sovereign defaults have an exogenous output cost. This is now a standard assumption in the literature (see Uribe and Schmitt-Grohé, 2017, and Aguiar and Amador, 2022). One difficulty with this simple assumption, however, is that it is not clear what causes these output losses. Several of the puzzles we describe in our review are tied to this fundamental question.

Our review is organized as follows: Section 2 describes the puzzles relating to sovereign debt issuance; Section 3 covers the puzzles on sovereign debt pricing; Section 4 focuses on the puzzles about sovereign default and default resolution. Section 5 concludes by discussing possible directions for bridging these gaps between theory and the real world. We do not review the canonical model as Uribe and Schmitt-Grohé (2017) and Aguiar and Amador (2022, 2014) describe the baseline model and its extensions.

2 Puzzles about sovereign debt issuance

2.1. Too Much Debt

By the willingness to pay framing many sovereigns seem to be able to borrow far more than the theory would predict. The “too much debt” puzzle is actually two puzzles. The first is that countries borrow more than what is predicted by standard quantitative models of sovereign debt. Lenders are not supposed to be lending more than what countries are willing to repay, yet in practice they often do. The second related puzzle is that countries seem to borrow more than is optimal from a long-term growth maximization perspective.

The most well-known and best documented puzzle in the sovereign debt literature is that quantitative models of sovereign debt based on Eaton and Gesovitz (1981) predict sustainable debt levels which are lower than observed debt levels. Reputation costs alone generate sustainable levels of debt that are close to zero (Aguiar and Gopinath, 2006, Arellano, 2008, Uribe Schmitt-Grohé, 2017). This is because in a purely reputational model the cost for the sovereign of losing its reputation is the inability to smooth consumption in the future through external borrowing. As the welfare costs of

consumption volatility are not very high (Lucas, 1987), loss of reputation is not a strong punishment. Adding an ad-hoc output cost of default (Arellano, 2008) improves the model predictions but the model still yields low levels of sustainable debt.

There is another aspect of the “too much debt” puzzle. Countries borrow more than what appears to be optimal. Countries borrow abroad to both smooth consumption and to finance investment to stimulate growth. Yet, Aguiar and Amador (2021) point out that higher levels of debt in reality are associated with higher volatility and with debt crises, which contradicts the consumption-smoothing motive. What is more, higher debt levels are not associated with higher growth (Gourinchas and Jeanne, 2013), which contradicts the investment motive. The evidence rather is that countries characterized by high rates of GDP growth pay down their external public debt and accumulate foreign assets (Aguiar and Amador, 2011). So, why do countries borrow so much and why is foreign debt accumulation accompanied by lower growth?

The answer could be related to political economy considerations and to the political agency problems arising from the behavior of self-interested politicians that are inclined to overborrow (relative to what a social planner would do). Acharya et al. (2022) propose elements of such a political economy explanation for over-indebtedness. Yet, in the Eaton-Gersovitz model augmented with output costs of defaults, the presence of self-interested politicians would reduce the country’s willingness to pay its debts and hence amplify the first puzzle.

2.2 No contingent debt.

Contingent debt is debt whose payment obligations vary together with a country’s capacity to pay. The main reason for structuring debt in this way is to avoid incurring unnecessary costs of default. If the country finds itself in a situation where it is unable to meet its debt obligations, it would have no choice but to default and pay the creditors less than what it had promised. Creditors know that they cannot obtain what was promised in such a situation and would be prepared to settle for less. Rather than go through a protracted and costly default process, it would be better for the contracting parties to directly specify a reduced repayment in such exigent circumstances to the extent that this can be anticipated. Yet, such contingent-repayment contracts are almost non-existent for sovereign debt (IMF 2020).

While it is true that there are contingencies that cannot be contracted on ex-ante (we return to this below), there are also many events that can be easily incorporated into a debt contract. For instance, and many have suggested this, payments could be made contingent on GDP growth, on commodity prices, or on natural disasters (IMF 2020; Kamstra and Shiller 2009); Consiglio and Zenios 2015; Borensztein and Mauro 2002). Some have argued that sovereign debt is an implicitly contingent contract if one takes into account possible future changes in debt refinancing (Grossman and Van Huyck 1988). Yet, if there are deadweight losses in the default process and there is uncertainty about what makes a default excusable, specifying these contingencies explicitly in a contract is likely to be more efficient than adopting a costly ex-post process aimed at separating excusable from non-excusable defaults.

One factor that may limit the use of GDP-indexed bonds is the fear of debtor moral hazard. Countries may underreport GDP and could have lower incentives to grow if this mechanically allows them to reduce their debt obligations.² Borensztein and Mauro (2004) convincingly dismiss moral-hazard related concerns. Moreover, in the case of Argentina the opposite response—politicians exaggerating GDP numbers for a few years, resulting in over-payments on their GDP warrants (Weidemaier and Gulati 2022)—seems to have occurred. It also bears mentioning that there are several possible types of contingent bonds for which moral hazard is not a concern. This is the case for instance for bonds indexed to commodity prices for exporters that do not have pricing power, or for catastrophe bonds with parametric triggers for countries subject to natural disasters risk. These are instruments for which payments can be based on verifiable parameters on which the borrowing country has no influence. Over the decades, numerous groups of policy makers and academics—often supported by Official Sector institutions such as the UN, the IMF and various Central Banks—have advocated various formulations of indexed sovereign debt instruments (IMF 2020; Bank of England 2016; Manuelides 2017; United Nations, 2005; and Griffith-Jones and Sharma 2006). The market, however, has shown a general lack of interest in all these proposals. Why?

Commonly mentioned explanations point to signaling concerns, or market and political failures (Weidemaier and Gulati 2020). Signaling concerns have to do with investor perceptions that countries who choose to use these products may be at risk of potential future weaknesses

² Another possibility (not mentioned in the academic literature but that seems to be on the mind of investors) is that state contingent debt could reduce the ability to pay even if it increases the sovereign's willingness to pay. In the context of commodity index loans, Anderson et al. (1989) suggest that this problem could be addressed through multilateral guarantees.

(Borensztein et al., 2006). The market failure hypothesis relates to the presence of a positive market-creation externality: the first mover must pay the cost associated with creating the market for innovative instruments, but, with free entry, cannot reap all the benefits associated with the creation of this market. Another possibility is financial market segmentation: investors in sovereign bonds tend to be specialists in fixed income securities. These investors see contingent instruments as too much like equity instruments that are outside their expertise. They believe that they would not be able to price these instruments (IMF 2020) with confidence. The political failure hypothesis relates to the fact that issuing a contingent bond is analogous to buying insurance that, by its nature, implies a premium that must be paid in advance. A forward-looking benevolent policymaker would see that the premium, when appropriately priced, more than compensates for the risk mitigation property of the instrument and that, under certain conditions, it is worth paying (especially if the country has limited risk-bearing capacity). However, myopic policymakers will discount negative events that only materialize when they are no longer in office and may find the premium expensive relative to the short-term risk exposures while they are in office. They may thus opt for an ex-ante cheaper plain vanilla bond.

We find the signaling explanation perplexing, especially for bonds indexed to variables on which the country has no control. There is at least one recent example of a country that did not appear to be punished for including a contingency clause into its debt contract on a variable over which it had almost full control. In several its sovereign and quasi sovereign bonds issued after 2018, Russia included a provision that allows it to pay creditors in rubles if events “beyond its control” prevented it from paying in foreign currency. The context was that Russia had been subject to international sanctions in the wake of its 2014 Crimean invasion and was perhaps anticipating future sanctions (which did materialize after the 2022 invasion of Ukraine). Important for our purposes is that there was little or no objection from creditors to the use of the clause: the bond was oversubscribed and there was no meaningful price differential between bonds with and without the clause (Bradley et al., 2022).

The market failure story is also perplexing because there are plenty of innovations in financial markets, and market participants seem to be able to price instrument that are much more complicated than simple indexed bonds. The political failure story seems more convincing.

2.3 Confusing contractual structure

When they issue bonds in the international market, countries hire top investment banks and white-shoe law firms as advisors. Yet, sovereign bond contracts appear to be more the product of path dependence, with random errors sprinkled in, than the carefully designed structure one might expect for multi-billion-dollar financial deals (Scott, Choi and Gulati 2022). Below, we discuss four puzzling characteristics of these standard-form documents that turn out to contain a substantial amount of variation buried in the fine print.

a. Lack of a single standard form

In theory, having a market with bonds that all contain the same standard package of legal terms increases transparency, facilitates trading, and, other things equal, reduces issuance and borrowing costs (Kahan and Klausner 1997). In such a market, one would expect to see a substantial amount of contract stickiness, where inefficient terms are retained longer than they should because of the value of sticking to the standard form. Research into sovereign bonds confirms the stickiness phenomenon, where it often takes a substantial effort from official sector institutions to induce market-wide change (Choi and Gulati 2004; Choi, Gulati and Scott 2018).

Thus, one might expect that the industry—both debtors and creditors—would find a way to have a standard form that they could all use and to have some credible organization update that form as needed. And maybe they could have a set of industry experts with a deep understanding of market practices and history be the adjudicators in disputes. After all, we precisely see this for the world of financial derivatives and swaps where ISDA plays this role (Choi and Gulati, 2006). But why not in the multi trillion-dollar sovereign debt context?

b. How boilerplate is the boilerplate?

As noted, contract provisions for actively traded securities are typically thought of as boilerplate or standard form. That makes the instruments easy to buy and sell, without traders having to find out the implications of small differences in wording for the prices at which differently worded instruments should be traded. And this assertion that the instruments are boilerplate, except for maybe some inconsequential variations, is one that one would come away with after talking to pretty much anyone involved in the real world of sovereign debt, trading—investors, traders, debt managers, bankers or lawyers.

Yet, frequently, parties discover when a sovereign goes into default (and contract provisions are scrutinized) that the standard terms they thought they had entered into are not so. Indeed, almost every modern sovereign restructuring episode seems to have at least some debts that end up with terms that vary slightly from the others in ways that could make a significant difference in a court of law and end up being the subject of negotiation (Scott, Choi and Gulati 2022). In a world of multi-billion dollar and euro issuances marketed by the top banks and documented by the most expensive lawyers, one might imagine that contract language would be as tight as possible. Yet, small variations in wording across contracts is common (Weidemaier 2008). For every single provision in the supposedly standard sovereign bonds, one can find small wording variance across deals—in the same rating class—at any given point in time (Scott, Choi and Gulati, 2018; Choi, Gulati and Scott 2021). And, in a world where the judges in the two primary jurisdictions under whose laws sovereign bonds are governed follow plain meaning or strict textualism in interpreting contracts small wording variations can have huge implications. The question then is whether these variations are the product of intentional bargains or random mutations.

c. Mutations

Among of the most iconic ideas about the efficient contract paradigm is that one can safely assume that harmful contractual mutations will die out. The much-quoted language being the claim that: “Harmful heuristics, like harmful mutations. will die out” (Smith and Warner 1979). Although these ideas are firmly held about contracts that have been around for at least a half century, they have been the subject of little investigation (Lyons 1996). A simple articulation of the questions on the table might be: How many mutations are there? Do they die out over time? What fraction of them are potentially harmful to the parties? What we mean by “plain meaning” or “strict textualism” as a mode of interpretation is that if the words have a clear and plausible meaning on their face, that’s what the parties get—because that’s what sophisticated commercial parties are assumed to want. Research suggests, however, that harmful mutations abound and that many do not disappear over time (Scott, Choi and Gulati, 2022). Some even spread and mutate further (Choi, Gulati and Scott 2018). These findings lead to more questions: (i) why does this happen? and (ii) is this something specific to sovereign debt contracts?

d. Innovations and adoptions

The question of how and when contract innovation occurs in sovereign debt contracts has not been examined systematically, except for a handful of provisions such as the Collective Action Clause (CACs) (Gelpern and Zettelmeyer 2019; Gelpern, Gulati and Zettelmeyer 2019). The presumption has largely been that sovereign debt is the kind of thick market with sophisticated parties where contracting innovation will take place when necessary or optimal. In the real world, by contrast, sovereign bond contracts are infamously sticky (Gulati and Scott 2013). That is, the markets are highly resistant to changes to the standard terms.

The standard story explaining stickiness has to do with externalities. There is a value in using the same provision that everyone else uses and has used for a long time. Such provisions are well understood by everyone and, therefore, can be easily priced. The incentive of individual parties is to stick to the standard form even though it can land the market in a suboptimal equilibrium, and even though a new contract could benefit everyone, if, that is, everyone adopted it. But no-one adopts the better contract because the cost of any individual party changing terms is too high. The foregoing theory lends itself to a simple prediction. Innovation will occur when big market players or official actors—institutions such as the IMF and the ECB—help disseminate information among market actors and coordinate market-wide shifts to a new standard. And there are prominent examples of suboptimal clauses that were eventually changed through coordinated efforts by Official Sector institutions and big private market actors (Gelpern and Gulati, 2006; Gelpern, Setser and Heller, 2015). But, if one digs, it turns out that individual issuers innovate as well. And they sometimes do so quietly and, best we can tell, with little indication of market penalty for deviating from the market standard. We do not, however, have theories of why and when contract innovation occurs quietly versus loudly and why certain innovations diffuse quickly but others do not (Choi, Gulati and Posner 2012; Choi, Gulati and Scott 2017; Panizza and Gulati, 2021).

2.4 Under-contracting

Some contractual dimensions are left incomplete because of problems of verifiability, limitations of language, conflicts in understandings, asymmetric information and so on. But many material matters that can be contracted on are left out. Why is that?

a. Default interest rate

A question that occurs in every sovereign default is what default interest rate applies to the unpaid amounts when the sovereign stops paying—that is, when it decides it can no longer pay and declares a moratorium so that it can do a renegotiation with its creditors. This is something that the debtor and creditors can negotiate for *ex ante* but typically do not. If the sovereign is defaulting on all its creditors and cannot pay any of them the amount they are owed, this default interest rate for the period the sovereign is in default is irrelevant. However, sovereigns generally default selectively; they keep paying some creditors while they are not paying others (e.g., the Official Sector lenders who have given them emergency financing typically get repaid). In other words, only some creditors are going to be in a moratorium state—others will be getting paid their regular contractually specified amounts.³

Things get more complicated when creditors sue the sovereign for the unpaid amounts. Under the laws of jurisdictions such as New York, the receipt of a judgement from a court comes with a state-specified default interest rate. This rate can vary considerably with the type of court ones sues in (and sovereign instruments typically allow creditors to sue in multiple different jurisdictions). That then means that creditors must make choices as to whether to bring a suit and then get the state-specified default rate or stay with the contract rate (Weidemaier and Gulati 2021). This last piece of the puzzle causes creditors consternation on a regular basis. On occasion it leads them to delay bringing litigation, which can result in costs.⁴ This has happened especially in New York, where the default interest rate in federal court is set extremely low (close to the US Treasury rate) for all judgements and creditors do not want to be stuck with such a low rate.

There is a solution: prespecify the default interest rate. Yet, this does not happen in sovereign bond contracts despite creditors encountering this problem in default after default.

b. Necessity/Force Majeure

Commercial contracts often contain force majeure, “act of god”, clauses or the equivalent. These clauses modify performance in the event of a large shock (wars, epidemics, pandemics, hurricanes

³ Syndicated loans to sovereigns, as opposed to bonds (we are told), often specify default interest rates. So, creditors to sovereigns in at least some settings think it makes sense to have the default rate prespecified. (Buchheit 2006).

⁴ Delay in bringing litigation can allow others, who do bring suit, to gain an advantage if they are able to find assets to seize. Further, there is always the danger that an undue delay will run afoul of the statute of limitations.

and so on) that occurs through no fault of the contracting parties. When a calamity hits a sovereign borrower, it needs to be able to spend its limited resources on its own recovery rather than payments to creditors. Indeed, creditors would likely agree *ex ante* to the debtor being able to delay payments in such a situation—since forcing the debtor into a hasty default would harm both sides (Bolton and Rosenthal 2001).

Depending on how the debtor and creditors view their relationship and want to allocate risk, the clauses can be written as narrow or broad—allowing for the postponement or modification of obligations in some acts-of-God events but making clear that other similar events will not count as excuses for postponement. In most jurisdictions there are background laws (default rules) that will apply in these cases (legally they fall under the names of the doctrines of impossibility, impracticability, frustration of purpose). The force majeure contract provisions are, therefore, an attempt by the parties to specifically contract around the background default rules for their specific preferences.

In sovereign bonds, however, unlike many other sophisticated commercial contracts such as Mergers and Acquisition contracts, force majeure provisions are almost never present. Instead, the matter is left unclear. And this is even though there is a special version of the “act of god” doctrine that might apply as a default when nations enter into agreements. This is the doctrine of necessity that says that countries may temporarily postpone compliance with their international obligations when domestic necessities demand so (Bolton, Panizza and Gulati 2021). The puzzle deepens when one sees that there are recent occasions in which the question of whether the doctrine of necessity applies has come up both in public discussions and actual litigation—and there is no clarity either way (Weidemaier and Gulati 2020). Rational contracting parties, one might think, would want to make things clear one way or the other.

c. Legal uncertainty for multilateral sector priority

One of the defining features of sovereign debt markets is that multilateral lending (i.e., lending by the IMF, the World Bank and other multilateral institutions) has *de facto* priority over all other lending.⁵ The multilaterals get paid back first, and in full, before anyone else. The explanation being that they provide countries with short-term emergency financing at below-market rates when the

⁵ Cordella and Powell (2021) discuss the theoretical underpinning of the persistence of this *de facto* priority.

country has lost market access and, more generally they continue lending during bad times (Galindo and Panizza 2018). To be able to do that in a financially sustainable fashion, these institutions need to be assured repayment.

But the puzzle is that this priority is not legally formalized even though there seems no logical reason why it cannot or should not be. The lack of legal formalization presents a risk for almost all involved if some maverick creditor gets a legal judgement that gives them a formal right to payment on an equal basis as all other creditors. Legally, this would put the multilateral institutions' right to payment in jeopardy. And this risk manifested itself in the case of Argentina about a decade ago in its *pari passu* battle (Boudreau and Gulati 2014).

In the case of Argentina, the IMF and Argentina were able to make sure that that the payments going from Argentina to the IMF were protected against the holdout creditors seeking to stop or seize them. But lawyers had to expend effort to ensure this and there was the ever-present risk that lawyers for the mavericks would find a clever strategy to get at the IMF payments. Given the experience with Argentina, and the increasing likelihood of maverick litigation against restructuring sovereigns in recent decades, the question is—why not formalize the priority of any Official Sector institution that provides emergency or bridge financing to a distressed sovereign?

Related to this lack of clarity on seniority is the fact that the international monetary system still has no generally accepted global standard on how to assess debt sustainability. The IMF and the World Bank have affirmed a methodology for low-income countries (IMF 2021b). In addition, the IMF has recently updated its debt sustainability analysis for market access economies (IMF 2021c). Even these commonly used approaches for assessing debt sustainability are not universally accepted (for instance, China has its own approach for evaluating debt sustainability in countries that participate in the Belt and Road initiative). Moreover, these methodologies are not fully transparent. The IMF claims that the lack of transparency is because the “methodology by which the Fund makes its sustainability (and thus lending) decisions is potentially market-sensitive” (IMF 2021c, p. 39). Yet there is evidence that this lack of transparency is also associated with politically motivated decisions (Lang and Presbitero, 2018). Hence, a concern with relying on the IMF as a standard setter on debt sustainability is that the Fund is also a lender which, in debt restructuring events, needs to protect its own resources. A formal recognition of the seniority of IMF loans would mitigate this conflict of interest.

d. *Legal uncertainty about the classification of bilateral debt*

Government-to-government debts are mostly negotiated in the Paris Club, and private debts are negotiated elsewhere (in the London Club, that usually has no connection to London). When most of the government lending by governments was from advanced economies (US, Canada, Japan, and Europe) to emerging and developing economies, and the private lending was by regulated banks in these same countries, this system worked (more or less). Governments would do their negotiations in Paris, possibly with back-channel input from the influential banks in their nations, and then a deal would be struck. The country (and, implicitly, the private sector) would then be told that that deal would hold only if private sector lenders provided “comparable treatment.” The presence of “new” bilateral creditors (mostly China, but also a few other large emerging economies such as India) which are not part of the Paris club amplifies two sources of uncertainty: who counts in the “official category” of debts and what is “comparable treatment”. (Buchheit and Gulati 2022). On the former, the official debt category, how should lending by state-controlled, or state-sponsored, institutions be treated? As for the meaning of comparable treatment, the concept of “comparable” is vague enough that a lot of variation in treatments can count as “comparable”.

In response to the Covid Pandemic, in April 2020 the G20 adopted a Debt Service Suspension Initiative (DSSI) aimed at preventing a debt crisis in low-income economies. While the DSSI focused on official bilateral debt, it was expected that commercial lenders would provide equivalent relief. As anticipated by Bolton et al. (2020), this did not happen. When the DSSI was set to expire at the end of 2020 (it was extended until December 2021) the G20 endorsed a *Common Framework* for debt treatments beyond the DSSI. The Common Framework is expected to coordinate debt relief by G20 bilateral creditors, including those that do not belong to the Paris Club (China is the largest of these creditors) and to involve private creditors. The ultimate objective of the Common Framework is to provide comparable treatment to different creditor groups while still protecting the seniority of multilateral development institutions (see the FES Roundtable Report, *Responding to risks of COVID debt distress* (2021) for a detailed discussion of the common framework and how to augment it).⁶

As significant as the common framework initiative is in addressing some of the institutional gaps in sovereign debt resolution, several issues have become apparent with its implementation. Indeed, only three debt distressed countries (Chad, Ethiopia, and Zambia) have applied for treatment under the

⁶ Schlegl et al. (2019) find that bilateral debt is junior to private sovereign debt, with private creditors being typically paid before bilateral creditors and facing lower haircuts.

common framework, even though the number of countries with debt servicing challenges is much larger. Moreover, for the three countries that are seeking relief under the common framework negotiations have been moving at a glacial pace, which could explain why others have been dissuaded from applying. There are already calls for reforming the common framework, in particular for greater clarity on the timeline of resolution and on comparability of treatment with commercial creditors (Georgieva and Pazarbasioglu, 2021) (possibly bringing commercial creditors into the negotiation from the very beginning and establishing a transparent formula for the allocation of claims between official and commercial creditors (Gill, 2022, and Rivetti, 2022)).

An important step forward with the common framework is that it provides a roadmap for the inclusion of bilateral lenders that are not part of the Paris club, most importantly China. Chinese lending to low and middle-income countries has grown to the point that China is now the largest official creditor to developing countries according to Horn et al. (2021). Given that China is not part of the Paris club, there is no reporting mechanism in place of its bilateral loans. As a result, there is uncertainty about the amounts and the terms of Chinese loans (Horn et al., 2021 and Brautigam and Hwang, 2020) as well as the official status of some of the loans. Although almost all Chinese lending to developing economies is extended by either the central government or by state-owned institutions, China itself does not consider all its lending as official bilateral debt. This naturally raises the question of how Chinese lending should be treated in a debt restructuring. Should all Chinese lending be treated as bilateral official debt or only part of it? Indeed, the application of a clear formula for allocating claims of different groups of creditors would require a consensus on how lending extended by China's policy banks should be treated. What is more, many Chinese loans appear to have a set of unique confidentiality and seniority terms that makes them harder to renegotiate (Gelpern et al., 2022).

Why is this vague, norm-based system persisting? If inertia and circumstance largely drive the institutional foundations of today's sovereign debt markets, how much can economic models based on rational intertemporal optimization reflect the reality of sovereign debt?

e. Anti-merger clauses

Some jurisdictions, including the US and UK, have what is called the doctrine of merger. It means that once a creditor gets a judgment in court, their contract rights get merged into the judgement. As

a practical matter, this means that the contract disappears and what is left in its place is a court judgement.⁷

The concern with merging contract rights into a judgement is that some valuable debtor rights might be lost in the process. This is the case for collective action clauses (CAC) under scenarios of protracted default. The CAC is a contract term that allows a super majority of creditors to force a restructuring solution on a minority of dissenting creditors. It is a sovereign's most important weapon against holdout creditors. But the merger doctrine, as the IMF itself has recognized, could mean that the CAC disappears when creditors obtain a judgement against a debtor in default, thereby giving creditors an easy way to get around the CAC (IMF 2020; Weidemaier 2020; Gulati 2020).

The puzzle is why debtors and creditors who presumably agreed upon the need to have CACs at the outset of their deal have not put in place provisions that explicitly say to any court that they intend for their CAC rights to survive a judgment. Such a provision has not been tested, but it seems likely to hold up in court—especially in New York, where the philosophy is to try and give parties what they contract for as long as it does not conflict with public policy interests.

2.5 No mix and match of parameters

When a country issues debt, it can choose to do it under either local or foreign parameters. For instance, it can issue debt in the domestic market or in the international capital market, it can choose between domestic currency and foreign currency, and between domestic and international law. There are tradeoffs involved in these decisions. With domestic parameters the issuer retains discretion in managing the issue and with foreign parameters it relinquishes control to third parties. While relinquishing control can complicate debt management, it may reduce borrowing costs as it prevents the sovereign from debasing the debt through inflation or arbitrary decisions by domestic courts.

However, the frictions that countries are trying to address by issuing debt with foreign parameters are country specific. We should therefore observe bonds with combinations of domestic and foreign parameters. In fact, most countries do issue bonds with both domestic and foreign parameters, but they rarely mix and match domestic and foreign parameters (Bradley et al., 2018). Most bonds either have only foreign parameters (they are issued abroad, in foreign currency, and under foreign law) or

⁷ The dynamic here is similar to the default interest puzzle described above.

only domestic parameters (they are issued domestically, in domestic currency, and under domestic law). Why?

2.6 No clear definition of external debt

Theoretical models of external debt focus on the transfer of resources between residents and non-residents and on the role of external debt for international risk sharing. The official definition of external debt is in line with these theoretical models as it is tied to the residence of the creditor (Panizza, 2008).⁸

There are two issues, with this residency-based definition. One has to do with measurement and the second relates to the choices of foreign investors. Identifying the residency of the creditors was easy when most international borrowing took the form of syndicated bank loans. However, applying the residency definition is more difficult for tradable securities because most developing and emerging economies do not have tools for identifying the residence of the ultimate holders of their bonds. This was not much of an issue when there was a clear separation between domestic and international issuances, with foreign investors only buying bonds issued in the international capital market (and with foreign parameters in terms of currency, listing and governing law) and domestic investors mostly buying bonds issued in the domestic market. However, tracking external debt is now difficult because foreign investors have become active in several local bond markets.

For instance, the World Bank's International Debt Statistics (IDS) is one of the most commonly used sources of data on external debt. It also the only freely available dataset that includes information on external debt levels and composition for all developing and emerging economies going back to the 1980s. However, IDS underestimates external debt because it often does not include information on domestically issued bonds held by non-residents (Eichengreen et al., 2022).⁹

The second issue has to do with the choices of foreign investors and is related to the previous puzzle on the dichotomy between bonds with only foreign parameters and bonds with only domestic parameters. Why are foreign investors willing to either buy bonds denominated in US dollars, issued

⁸ There is an issue on whether the relevant concept should be the residence or the nationality of the creditor. Here, we assume that residence and nationality are equivalent concepts.

⁹ Arslanalp and Tsuda (2014) do track true external sovereign debt, but their data only cover 22 emerging economies going back to 2004.

in New York and under New York law or bonds denominated in rands issued in Johannesburg under South African law?¹⁰ One explanation might have to do with market size. Another explanation is related to the fact that by mingling with domestic investors, foreign investors receive a type of implicit protection because governments care about their voters (see, for instance, Broner et al. 2010). While this is true for default risk (explicit defaults on domestic debt are infrequent, although, not unheard-of, Beers et al, 2022), this reasoning does not apply to inflation risk. Domestic debt has often been debased via inflation (Reinhart and Sbrancia, 2015). An important challenge for models of sovereign debt is to recognize this richer characterization of external debt which allows countries to respond to shocks with both default and debasement.

Related, but unexplored in the literature, is how private lenders themselves define external indebtedness. Bond issuances in foreign currency, for example, will typically tie themselves together via cross default, *pari passu* and negative pledge clauses, to other external indebtedness. And the term “external indebtedness” will have a specific definition in the contract. Given the importance of what counts as external indebtedness and the question of whether it has changed over time, one might think that the evolution of the definitions of the term might have been examined. But they have not been.

3 Bond pricing puzzles

Corporate bond pricing to a large extent reflects credit risk, the probability of default times the loss given default. While sovereign debt pricing also reflects default risk, the link between spreads and default risk is less clearcut.

3.1 Spreads are too high with respect to default frequency

Calibrated models of sovereign debt understate expected sovereign spreads. For instance, the average spread of Argentina during its inter-default period (1994-2001) was 7.4% and a standard model calibrated using data for Argentina predicts a spread of about 3.5% (Uribe and Schmitt-Grohé 2017). This is a general phenomenon linked to the fact that standard models predict average spreads which are close to the average probability of default, while real world spreads appear to be much higher than the average default frequency. It is possible in principle to conduct a calibration exercise that

¹⁰ There are a small number of exceptions to this pattern where a few countries have issued bonds in local currency under foreign law and under foreign currency with local law.

matches observed spreads, but it is more difficult to match both average sovereign spreads and the average frequency of default. This problem is amplified by the fact that the standard model assumes a 100% haircut. Assuming a lower (and more realistic) haircut could yield sovereign spreads which are about one-third the default frequency (Uribe and Schmitt-Grohé, 2017).

A corollary of the high spreads observation is that emerging market sovereign bonds have ex-post long-run returns which are substantially higher than those of comparable “safe” debt instruments (Meyer et al., 2021).¹¹ Why the excess returns? What features of the markets are the models failing to incorporate?

3.2 Pricing – mutations and innovations

As discussed above there are both small variations from standard contractual forms (mutations in language) and occasional contract innovations in the restructuring context (Choi, Gulati and Posner 2012; Scott, Choi and Gulati 2022). An obvious question is whether these mutations or innovations are priced. For example, if a contract for Ruritania, in some crucial clause requiring the sovereign to do something important for creditors says “may” instead of the standard “shall”, does it get priced? When we talk with practitioners who work on these deals, they laugh at the idea that the mutations are priced. Maybe so, if mutations are too difficult to notice for busy market participants.

But what about the innovations—such as countries like Argentina (2005 and 2010) and Uruguay (2003) including Aggregated Collective Action Clauses in their post-restructuring bonds in 2010, before any other sovereign had done so (Buchheit and Pam 2004). Or Grenada (Buchheit and Karpinski 2006) and Belize (Buchheit and Karpinski 2007) including hurricane clauses in their bonds before anyone else? Or Russia including an anti-sanctions clause in its bonds after the west imposed sanctions in the wake of its Crimean incursion in 2014 (Bradley et al. 2022)? Practitioners claim that these particular legal terms do not affect bond prices either. Can that be?

3.3 Sovereign guarantees

Sovereigns frequently provide guarantees for lending by their domestic institutions. For a variety of reasons, including the fact that a debt that has the sovereign plus some other institution on the hook

¹¹ See also Eichengreen and Portes (1989), Klingens et al. (2004) and Panizza (2022a).

for paying it is going to be more likely to pay that the sovereign on its own, one might think that the guaranteed debt would be valued more highly by the market than a pure sovereign instrument (Buchheit and Gulati 2014). Yet, the opposite relationship holds: sovereign instruments tend to trade at a higher value than their sovereign guaranteed brethren. And this seems to be the case even when the guaranteed instrument has such superior terms that the creditors could easily stay out of any restructuring process should they choose. One explanation for this potential puzzle is liquidity. Further, the latter, the guaranteed instruments, will vary as a function of the underlying entity being guaranteed (e.g., Greek Railways versus Athens Bus Company) whereas the former, the sovereign instruments, will be largely fungible. However, the positive value of liquidity should flip when a crisis hits and a restructuring is highly likely. In a restructuring the instruments that are idiosyncratic can be more valuable because they require a particularized deal structure to be formulated and the restructurers will be focused primarily on getting the sovereign bonds restructured. Idiosyncratic instruments, if they are too hard to restructure, will sometimes, experience shows, escape the restructuring altogether (Choi and Gulati 2016). While the question has received little examination, it seems that markets often do not recognize this dynamic with guaranteed instruments until late in the game (Choi and Gulati 2016; Panizza, Weidemaier and Gulati 2022).

3.4 Are (big) and small sovereign contract terms priced?

One of the most basic assumptions about efficient markets is that public information about financial deals will be priced in. One would expect, therefore, that differences in key contract terms – such as the differences between a contract requiring a 100% vote of the creditors to be changed versus one requiring a 75% vote—would be priced. Assuming investors worry about sovereign debtors too readily asking for the debt to be restructured if the contracts more readily allow for restructurings to be engineered (i.e., debtor moral hazard) bonds with the higher vote threshold should carry a higher price than those with the lower vote threshold.

This question of whether differences in contractual vote thresholds are priced by the market is perhaps the single most studied contract pricing question in the sovereign debt literature, if not the literature on contracts more broadly, with dozens of papers having been written on the topic. The results, however, are puzzling. A number of papers find no pricing differentials, some find pricing differentials going one way for a subset of issuers and the other way for another subset, some other papers find the opposite, and yet other papers find the pricing effects seems to show up only very late in the game, when a debtor is in deep distress and almost certain to need a restructuring (Carletti

et al., 2021; Chung and Papaioannou. 2021; Chari and Leary 2021; Bradley and Gulati 2013; Eichengreen and Mody 2004; Becker, Richards and Thaicharoen 2003).

When one gets beyond vote thresholds to variation in terms such as trust versus fiscal agency structures, early redemption clauses, types of governing laws, whether one uses an arbitration clause, types of pari passu clauses and so on, the results of the pricing studies get murkier still (Haseler 2012; Weidemaier 2008; Panizza and Gulati 2021; Bradley et al. 2022; Gulati and Scott 2013).

Bottom line, despite the prediction from theory that these terms should be priced from the outset, the empirical evidence does not clearly support that. The most we can say that highly salient contract terms do sometimes appear to get priced when it is highly likely that those terms are going to matter in determining final payouts.

3.5 The (Un)importance of information about municipal bankruptcy access

A much-debated questions in sovereign debt is the value of giving sovereigns access to bankruptcy (White 2002; Shleifer 2003). The value of a bankruptcy scheme to a distressed sovereign with tens of thousands of obligations that need to be resolved is that it provides a mechanism that both offers the sovereign temporary relief and subsequently enables a coordinated resolution. Absent a bankruptcy mechanism, what can result is a long drawn-out, chaotic process with the sovereign trying to make thousands of separate deals where each set of creditors both wants a preferential deal and is worried that others are getting better deals. Throw in some litigation and the costs can be immense. These ex-post savings though must be balanced against ex-ante incentive effects. If it is too easy for sovereigns to default, that argument goes, they will borrow too much because they know that the costs of defaulting are small.

The question is an empirical one and there are multiple academic research papers on this matter. What almost everyone in this debate assumes though is that access to bankruptcy or a bankruptcy-like mechanism matters. But what if investors do not care about this? What if they care instead about something else?

One setting where the foregoing can be examined is that of US municipalities, because US states get to decide whether their local municipalities are allowed to file for bankruptcy or not. This sets up a test scenario because one can, in theory, compare the costs of borrowing for similar municipalities

across states that provide differential access conditions for bankruptcy. Multiple studies have used this framing. Some find that the availability of bankruptcy raises the costs of borrowing, and some find the converse (Gao, Lee and Murphy 2019; Parikh and He 2017; Moldogaziev, Kioko and Hildreth 2017).

All the studies though assume, as theory predicts, that access to bankruptcy is of importance to creditors. Yet, if this matter of access were important, one would expect it to be disclosed to investors in the sales documents (which are subject to the anti-fraud laws if important matters are reported in an incomplete fashion). Turns out, when one digs into the sales documents, that issuers (and, therefore, presumably investors) care very little about giving clear predictions about bankruptcy access to their investors in their prospectuses (Schragger and Gulati 2023).

3.6 *Domestic laws as credible commitments*

The classic articulation of the idea that sovereigns can reduce their cost of capital by making credible commitments to creditors uses the example of constitutional lawmaking (North and Weingast 1989). If one looks around the world one sees numerous examples of this kind of lawmaking in the form of debt limits, promises to maintain balanced budgets, taxation constraints, statutory liens, promises of priority for creditors and so on. And, on occasion, as with Spain during the height of the Eurozone sovereign debt crisis, countries in crisis pass such credibility enhancing laws to try and reduce their borrowing costs (Gousgounis, Buchheit and Gulati 2021).

As with contract promises, the question is whether any of these statutory promises persuade creditors that the debtor is more likely to behave responsibly in repaying them? The research on this topic is small and almost none of it examines sovereign promises. At the local, municipal level, where reversing promises is harder (national law may impose restrictions), there is some evidence that these promises might matter (e.g., Feld et al 2017; Heppke-Falk and Wolf 2008; Moldogaziev, Kioko and Hildreth 2017; Gulati et al., 2020). However, at the sovereign level, we have found little evidence for at least one of these promises – the promise to pay creditors on a priority basis (Gousgounis, Buchheit and Gulati 2021; Gulati et al. 2020). But if there is little evidence of a reduction in the cost of capital, why pass such laws, given that these laws do pose some risk of costly creditor litigation?

4 Puzzles about sovereign debt restructuring

4.1 Variety of defaults

Most of the theoretical literature on sovereign debt assumes that there is just one type of default: countries stop paying and the haircut is often assumed to be 100%. Until recently, this was also the case for the empirical literature, with defaults being classified as dichotomous events following a definition similar to that adopted by rating agencies. In the empirical literature, there is now a growing consensus that researchers should move away from a binary definition of default as there are many different ways in which countries default and restructure their debts.

For instance, debt restructuring can take place after the default has happened or be preemptive (Asonuma and Trebesch, 2015). Debt restructurings also vary in their degree of coerciveness (Enderlein et al. 2011). We also observe interim restructurings that fail to restore debt sustainability (and are thus part of longer default spells) and decisive restructurings that mark the end of a default spell (Reinhart and Trebesch, 2016). Meyer et al. (2021) provide a historical perspective on the variety of defaults, and Caselli et al. (2021) discuss the case of Colombia which is often considered as the only large Latin American country that did not default in the 1980s, although for all practical purposes, it reprofiled its debt like most other Latin American countries.

4.2 Delayed defaults

Theoretical models that build on Eaton and Gerosvitz (1982) assume that borrowing and repayment decisions are made by a social planner. Therefore, defaults take place when this is optimal from society's point of view. This prediction is difficult to reconcile with the empirical evidence that countries often appear to unduly delay debt-restructuring (Borensztein et al. 2006); that they default "too little and too late, thus failing to reestablish debt sustainability and market access in a durable way" (IMF, 2013 p.1).

Delaying necessary defaults is costly because of all the debt overhang distortions that remain in place. Moreover, avoiding default often requires harsh adjustment measures which lack credibility and thus fail to restore full market access and debt sustainability. During the adjustment period unrealized default risk leads to a further deterioration of economic conditions through the detrimental impact of increased uncertainty on investment and financial stability. Delayed defaults are also costly for the lender because they reduce the country's future debt sustainability.

Delayed defaults could be due to imperfection in the international financial architecture or to political frictions. If creditors only punish strategic defaults (Grossman and van Huyck, 1988) but there is some uncertainty about when a default is truly unavoidable, debtor countries may decide to delay an unavoidable default in order to signal that they are not strategic defaulters (Alfaro and Kanczuk, 2005, Borensztein and Panizza, 2008). Delayed defaults are then a form of second-best solution in an international financial architecture that lacks an efficient statutory mechanism for dealing with sovereign defaults. But delayed defaults may also be driven by the presence of self-interested politicians who decide to gamble for redemption in order to prolong their political careers.

These two explanations have different implications. The first explanation implies that fixing the delayed default problem requires reforming the international financial architecture. The second explanation implies that the bankruptcy/restructuring decision cannot rest entirely with the debtor.

4.3 Higher debt-to-GDP at exit from default

Countries default with very different levels of haircuts. Mean and median levels of haircuts range between 35% and 50% depending on how the haircut is measured and on the period under consideration (Meyer et al., 2021, found that haircuts were higher before 1970). The fact that haircuts vary across countries and episodes is not surprising if one considers that countries may need different levels of debt reduction in order to restore debt sustainability. It is however difficult to reconcile with theoretical models that assume that the cost of default does not depend on the haircut.

What is more puzzling is that defaults often fail to restore debt sustainability (Reinhart and Trebesch, 2016). Countries often exit default with higher debt-to-GDP ratios than when they enter default (Benjamin and Wright, 2013). Sturzenegger and Zettelmeyer (2007) suggest that inefficient restructuring is driven by policymakers' concerns about their ability to access the capital market in the post-restructuring period.

4.4 Default in good times

A basic prediction of quantitative models of sovereign debt with costly default is that the sovereign is more likely to default during recessions. For example, the quantitative model of Tomz and Wright (2007) predicts that 86% of default should happen when the economy is contracting and that the average output gap at the time of default is -7.4%. Tomz and Wright (2007) go on to show that these

predictions are not matched by the data; nearly 40% of defaults happen when output is above its long-run trend and the average output gap at the time of default is a modest -1.6%.

This puzzling result may be related to the peculiarities of the business cycle in emerging and developing economies. Another possibility is that the filtering technique used to compute the output gap may result in mismeasurements of the depth of recessions. With respect to the first issue, Aguiar and Gopinath (2007) have shown that in emerging and developing economies output volatility is driven by shocks to trend growth, so that there is no clear way of separating business cycle fluctuations from trend growth. The second concern relates to the assumptions underlying the Hodrick-Prescott detrending method. Using the detrending strategy proposed by Hamilton (2018), Panizza (2022b) finds that only 19% of default episodes occur during “good times” and that the average output gap during default episodes is close to -7%.

4.5 *Violations of structural subordination in restructurings*

Sovereign in distress often have different classes of bonds outstanding with varying terms. Some bonds give creditors an individual right of acceleration whereas others might require a vote of 25% of the creditors to accelerate. Also, some bonds require a vote of 90% of the creditors to revise key payment terms while others only require a 75% vote. These are substantial differences which make it harder or easier to renegotiate the terms of the bonds. A bond requiring 90% approval to change key payment terms is going to be harder to restructure than the one requiring 75% approval. The former, therefore, one might presume is structurally senior to the latter – because the former is harder to restructure (Bolton and Jeanne 2009). One should also expect creditors in the structurally senior bond to be able to demand a higher amount in a restructuring than the junior bonds.

There is anecdotal evidence that these structural differentials rarely, if ever, result in sovereigns making differential offers to creditors. Indeed, this does not seem to be the case even when the differential is extreme, such as with foreign law versus local law governed bonds. We saw this concretely in the Greek restructuring of 2012 where the restructuring offer made to both foreign and local law sovereign bonds and sovereign guaranteed bonds was identical, even though the holders in these categories had very different rights (indeed, there were significant differences even among the foreign bonds, as a function of the legal jurisdiction in question) (Zettelmeyer, Trebesch and Gulati 2013). There is occasionally talk of sweeteners in the offers of a few cents (on the dollar) more to subgroups of creditors with stronger contract rights, but nothing close to what they might recover if

they were to choose to litigate the matter. Why differentials in contract rights matter so little at the back end, in the renegotiation stage, is a puzzle. Why put these differential rights into the contract in the first place if they don't matter ex post? And why do the renegotiated terms reflect so little of the differential rights that matter in a litigation setting?

4.6 *(Not) rushing to the courthouse*

One of the central problems with restructuring sovereign debt is coordinating dispersed creditors, especially for countries with a large debt stock. This is why proposals are recurrently made to introduce an international bankruptcy scheme for sovereigns along the lines of the sovereign debt restructuring mechanism (SDRM) proposed by the IMF in 2001.

It has often argued that the problem with dispersed creditors taking individual actions in an uncoordinated way is that when a sovereign ends up in financial distress, creditors' knee-jerk reaction is to "run to the courthouse", which makes it nearly impossible to get a comprehensive restructuring agreement. In practice though, through multiple recent crises – Argentina, Venezuela, Lebanon – dispersed creditors appeared to refrain from pulling the trigger and filing suit. If anything, creditors seem reluctant to take the step of filing suit.

The theory that creditors would rush to file claims, given the built-in advantages of being the first to attach scarce assets and the risk of losing one's claims altogether if one waits too long, makes logical sense. However, in the real world there might be an option value of waiting. But waiting for what? A bailout? An economic recovery of the sovereign? Strategic delay is yet another dimension that complicates the analysis of sovereign debt restructuring that has not been addressed so far in the literature.

4.7 *Buybacks*

Companies sometimes use excess cash to repurchase outstanding debt and it is sometimes argued that sovereigns should do the same when their debt trades at a discount. However, Bulow and Rogoff (1988b, 1991) have argued that sovereign debtors are typically made worse off, and creditors better off, when they buy back their own debt at market prices. The reason being that the buyback, by

lowering the sovereign's continuation debt, increases the value of the remaining debt. And yet, we do recurrently observe debt buybacks.¹²

So, why would countries buy back their debt if it is not to their advantage? Are there possibly conditions under which debt buybacks make sense? Dornbusch (1988) has suggested that, if defaults are costly for the debtor, a buyback that can help avert default makes sense for the debtor (see Chamon et al., 2022 for a formal proof). Another possibility has to do with secret buybacks. Buckley (1998) and Buchheit (1991) suggest that the secret buybacks of the 1980s might have been beneficial to the issuers. While the secret buybacks of the 1980s were later viewed with disfavor by investors (with allegations that they amounted to the equivalent of insider trading or market manipulation), in practice sovereign debt contracts explicitly authorize buybacks with no constraints whatsoever.

There is also the question of whether buybacks may make economic sense for sovereigns far from default. Much of the academic treatment of buybacks, including Bulow and Rogoff (1991), is in the context of sovereign distress. In a situation where countries are far from debt distress, but yet face market discounts for their securities because investors are in distress, it may be rational for the sovereign to take advantage of investor distress by purchasing the debt at a discount. Bottom line: This is an understudied issue (IMF, 2021a, summarizes the existing literature) that deserves more research.

5 Conclusions

In this paper we describe twenty sovereign debt puzzles. To address the disjunction between the predictions of the canonical theory of sovereign debt and ground realities we see three possible directions for future research.

First, we need a more complete picture of ground realities. There are many areas where we have little more than anecdotes to go on. Important historical events have not been adequately investigated and memories are fading. Second, we need to imagine new paradigms, and not just make marginal fixes to the existing ones. There are too many disjunctions between reality and the existing paradigm. Third, we must break out of artificial disciplinary silos. Our own listing of anomalies remains

¹² An (in)famous debt buyback was the one conducted by Ecuador in 2009 where there were accusations of market manipulation by the sovereign (The Economist, 2009). Market participants tell us that sovereign buybacks as part of routine "liability management" exercises, however, are frequent.

incomplete. Among other things, it does not include all the numerous historical, political, and sociological analyses of sovereign debt crises (see e.g., Flandreau 2022a; Flandreau 2022b).

Among the biggest gaps in our understanding of sovereign debt is with respect to legal immunity. It is standard in economics and finance models to assume away legal enforcement on the grounds that sovereigns have—or, in more nuanced treatments, had—immunity. This centerpiece of many models has long been inaccurate. The *default assumption* is that sovereigns have immunity (Bulow and Rogoff, 1988b, 1989a, are an important exception as they recognize that creditors have rights in foreign courts). Yet, sovereigns have always been able to waive their immunity. And they normally do so when they borrow internationally (Weidemaier and Gulati 2018; Weidemaier 2014; Waibel 2011). Further, courts are sometimes willing to find that immunity was implicitly waived if the sovereign has taken actions such as agreeing to a venue for litigation or a governing law clause indicating that the sovereign is acting as a commercial actor (Weidemaier 2014; Coyle 2022). Enforcing judgments remains difficult, but if immunity were to truly protect the sovereign, we would see far less litigation; attempts to enlist the courts to collect would be seen as fruitless (Weidemaier and Gulati 2015). The lack of an absolute sovereign immunity is also exemplified by certain contractual terms which sovereigns take great effort to negotiate and (in some cases) markets price (Ratha, De, and Kurlat 2018, Bradley et al. 2022; Choi, Gulati, and Posner 2011, Weidemaier and Gulati 2017).

Several other important areas also call out for further exploration. We do not fully understand how different contractual features affect bond pricing in normal times and how they affect the restructuring process in the aftermath of debt crises (Rogoff, 2022). To name just one critical set of terms: what is the role of collective action clauses in shaping negotiations and how are these clauses priced? To what extent do debt restructuring negotiations occur in the shadow of these contract provisions? We assume that there is a shadow, but we do not actually know its extent or even if it is there. Another gap in our knowledge is the role of domestic political institutions and markets, with sovereigns in crisis constantly under the microscope of domestic and foreign media, while at the same time much less scrutiny is directed at the maneuverings of highly sophisticated creditors. Debt restructurings are also affected by the presence of multilateral and bilateral lenders, but their presence is rarely accounted for in sovereign debt restructuring models. In sum, sovereign debt restructuring in modern times has become a complex strategic game that has not been sufficiently studied and remains poorly understood. The fact that countries often exit from a debt restructuring with higher debt-to-GDP ratios, so that the restructuring has failed to restore debt sustainability, is indicative of

both the power of creditors and the inefficiency of the existing restructuring practice.

Finally, we need a better, more realistic, account of the political economy of borrowing and default decisions. The literature is characterized by a dichotomy between those models that focus on advanced economies and the models that focus on emerging and developing economies. The former assumes away default risk and model self-interested politicians with incentives to overborrow. The latter build on the sovereign immunity assumption and assume that the country is constrained in its borrowing because of commitment problems. Eliminating political frictions in these two classes of models would lead to the prediction that debt levels are lower in advanced economies and higher in emerging economies. These assumptions and conclusions are at odds with reality, especially in the current situation in which the separation between external and domestic debt is not as clearcut as it used to be. The fact that in many countries external debt is now both in domestic and foreign currency requires an integration of real models (used to study foreign currency debt that cannot be debased with inflation) and monetary models (used to study domestic currency debt). Promising research that incorporates political-economy factors has been undertaken by Aguiar and Amador (2011), Aguiar et al. (2009), Acharya and Rajan (2003) and Acharya et al. (2022). Assuming away limited commitment along the lines of Ghosh et al. (2011) and Collard et al. (2015, 2022) is especially promising.¹³ Indeed, a central prediction of Collard et al. (2022) is that unlike in models with limited commitment, a higher cost of default lowers the debt limit instead of increasing it. More generally, the economic and political costs of default are not exogenous to the decision by the defaulting government of when and how to default, and we lack a theory of these endogenous costs of default. Political economy of course introduces a rich new set of variables, and one might be concerned that it gives the analyst too many degrees of freedom, but this is an exciting area for future research.

¹³ Corsetti and Maeng (2022) have shown that seemingly different models can be reconciled in an integrated analytical framework.

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