Policies for Improving Sovereign Debt Restructurings

By Kushal Patel and Horacio Sapriza

Recent sovereign default restructurings during the COVID-19 pandemic have reignited interest in research and policy suggestions for improving these restructuring episodes. Evidence for the effectiveness of these policies has largely come from empirical analysis of past episodes, but this type of analysis makes it difficult to explicitly evaluate the economic improvements from implementing these polices. We develop and calibrate a model that allows us to analyze the effects of the proposed policies.

Past sovereign debt crises have prompted a search for policies to improve the structure of debt and the resolution of crises. More recently, large increases in sovereign debt in several economies in the wake of the COVID-19 pandemic have reignited concerns about debt sustainability and interest in policy proposals for improving sovereign debt restructurings.

Policies and Sovereign Debt Restructurings

Policy proposals linked to restructurings have mainly been grounded either on empirical research stemming from previous defaults and restructurings or on policymakers' judgements with little contribution from quantitative models. My (Horacio's) 2022 paper "Improving Sovereign Debt Restructurings" — co-authored by Maximiliano Dvorkin, Juan Sanchez and Emircan Yurdagul — introduces a quantitative model of sovereign default and restructuring that serves as a laboratory to study frequently discussed policy proposals linked to restructurings. In this article, we discuss two such proposals.

Distributing Losses Across Bondholders

The first policy we examine involves rules about the distribution of losses across holders of sovereign bonds of different maturities. It relates to preserving asset values and creditors' rights, a major source of uncertainty in sovereign debt restructurings. The International Monetary Fund has noted concerns that strong aggregation mechanisms could lead to intercreditor equity concerns where, for example, a majority of creditors holding certain types of claims impose an agreement on a minority of creditors that hold different claims.¹
Such a problem could arise where aggregation involves claims of different seniority or where the claims being aggregated continue to have different maturities. In this regard, the data suggest that creditors with short-maturity securities tended to suffer significantly larger losses than creditors with long-maturity securities during recent sovereign restructuring episodes, as noted in the 2015 paper "Sovereign Debt Restructurings and the Short-Term Debt Curse (PDF)." One notable example was Greece's sovereign debt restructuring in 2011-12.

Indexing Sovereign Bonds to GDP During Restructuring

The second policy relates to the use of debt instruments that may help the debtor return to viability and growth. As noted in 2012 by the United Nations Economic and Social Council, borrowers would benefit from some "breathing space" after debt restructurings. GDP-indexed debt is a type of credit instrument that pays contingent on output and has been widely discussed as a tool for debt management and sovereign-risk reduction that may strengthen public debt sustainability.

At the same time, there is broad recognition that, except for cases in which GDP-indexed bonds are introduced in the context of a debt restructuring, it would require several years of consistent issuance before the share of these bonds in total government debt became large enough to significantly enhance the resilience of public debt to adverse economic shocks.

Model Results on Sovereign Debt Restructuring

We find that a rule that tilts the distribution of creditor losses during restructurings toward holders of long-maturity bonds reduces short-term bond yield spreads in bad times, thus reducing the default probability during periods of elevated credit-market stress. Having GDP-indexed bonds exclusively during distressed debt restructurings can contribute to remedying the lack of market access experienced by troubled borrowers and can significantly reduce the probability of repeated restructurings, with the effects being more substantial with the issuance of GDP-linked bonds.

While indexation policies have received more attention than redistribution policies in the literature, we find welfare gains of similar magnitude, suggesting that more attention should be paid to redistribution policies. Finally, our results suggest that the policies exhibit complementary effects when jointly implemented.

Studying Sovereign Debt and Policies Linked to Restructurings

As a starting point for assessing policies aimed at improving debt restructurings, we rely on a quantitative model of sovereign default that can replicate key stylized facts about sovereign debt dynamics and restructuring episodes. We consider an economic environment with a sovereign entity that issues bonds in international credit markets, where the bond portfolio choice involves the maturity of the bond and the per-period payment amount. The market value
of each bond depends on expectations about its future payoffs, which are determined by several factors summarized in our setup by the issuing country's income, the promised per-period payment, the maturity of the bond and the state of the international economy.

In our model, a country in good credit standing may pay its debt and remain in good credit standing, or it may default and enter a restructuring. The country is also subject to sudden stops in international financial markets, or exogenous events that abruptly interrupt credit access for the country, which then cannot borrow. A defaulting country enters a restructuring process that delivers a new level of per-period coupon payments and new debt maturities. After a restructuring agreement, the country begins paying off its new debt portfolio.

Importantly, and consistent with the data, our setup also considers that a country likely faces a period of exclusion from international credit markets upon exiting the restructuring negotiation (that is, after a restructuring offer is accepted), during which the country makes payments on its newly restructured debt (good credit standing) but cannot issue new debt (market exclusion). Such an exclusion period may be due to a stigma associated with defaults and restructurings.²

Within this framework, we next evaluate the effects of the redistribution and indexation policies on borrowers and creditors around restructurings and in general.

**Distributing Losses Across Creditors Holding Bonds of Different Maturity**

A debt restructuring policy that alters the creditors' loss distribution can make the process more predictable by improving creditor coordination and facilitating the resolution of intercreditor equity concerns. It can also directly affect bond-pricing and bond-holding incentives across maturities, affecting a country's default decision and the behavior of restructuring participants.

In our baseline framework, restructuring proceedings are distributed to holders of bonds of different maturities proportional to the number of yearly payments of those bonds. For example, consider one creditor with a zero-coupon bond with a face value of $60 and another creditor with a one-year bond with the same face value. If a country defaults on these bonds and a new debt with a market value of $100 is agreed upon, both creditors receive $50 as repayment.

We then implement an alternative distribution scheme where the proceedings of restructuring are distributed to holders of bonds of different maturities proportional to the present value of the number of yearly payments discounted at the interest rate (that is, the rate for determining the recovery payments to the creditors) set in the restructuring. As this interest rate increases, later payments are discounted more heavily, so the share of proceedings to bondholders of shorter-term maturities increases.

**Evaluating the Rule for Distributing Creditor Losses**

There are two findings we highlight:
• The redistribution of creditor losses significantly impacts bond yield spreads (over the corresponding risk-free rate).
• Policies that favor short-term bondholders in restructurings lead to a lower average yield spread and term premium (or spread of 10-year bond yields minus one-year bond yields) mainly in bad times (when a country's income is below its mean), largely due to a decline in short-term spreads.

More specifically, our results suggest both that sovereign bond yields decrease monotonically as the restructuring interest rate increases and that the effect is largely experienced in bad times. This result is driven mainly by significant decreases in the one-year yield spreads. The intuition is that, as a larger share of the restructuring proceedings goes towards holders of shorter-term maturity debt, the value of holding shorter-term maturity bonds increases, decreasing one-year yield spreads. This decline then drives up the term premium. As restructurings are more likely to occur in bad times, the effect of the redistribution policy on bond yields is stronger in these periods.

Similarly, maturity decreases particularly in bad times to take advantage of the decrease in financing costs at short maturities during those periods. This means that redistributing losses toward longer-maturity bonds in a restructuring makes debt maturity more procyclical. Additionally, the monotonical decline in the default rate suggests that countries can avoid more defaults because of the lower cost of short-term debt in bad times. Leverage increases along with bond interest rates after restructuring, before decreasing for rates beyond 40 percent.

Finally, for loss redistribution policies that favor short-term bond holders, the debt restructurings tend to rely more on debt-maturity extensions and less on face-value haircuts, and the measure of debt haircuts edges lower on net. The intuition for this result is that — as the policy tilts the debt maturity profile toward shorter-term debt especially in bad times, and we know from the literature that the country engages in a restructuring when output recovers — a restructuring that relies more on maturity extensions and less on face-value haircuts takes the country closer to its preferred maturity profile, given the procyclicality of debt maturity. The stronger reliance on maturity extensions vis-a-vis face-value haircuts that the policy incentivizes brings the restructuring more in line with the 2017 paper "State-Contingent Debt Instruments for Sovereigns," which argues in favor of considering more debt reprofilings (or debt restructuring resolutions involving maturity extensions and little or no face value haircuts) to address distressed debt negotiations.

**GDP-Indexed Bonds**

As noted earlier, GDP-indexed bonds work by adjusting debt payments to the income growth of the debtor country. The purpose is to improve risk sharing between the country and international creditors, thereby increasing welfare and diminishing the probability of debt crises. Thus, amidst increasing macroeconomic uncertainty in several emerging economies after the COVID-19 pandemic, policymakers have strongly encouraged the exploration of GDP-indexed bonds in the context of sovereign debt restructurings.
Yet, unlike the previous literature on GDP-contingent sovereign debt, our proposed policy means that the bonds will be subject to the GDP-indexation scheme only immediately after the restructuring is agreed upon (that is, during the post-restructuring years when the country is excluded from financial markets).

An advantage of using GDP-indexed bonds exclusively in restructuring is that they have significant economic impact while only modestly modifying the current regulatory framework. The reason is that countries remain excluded from financial markets for several years following debt restructuring episodes. Having a policy that represents a small change to the status quo should make the process more appealing to international investors. In turn, this should help alleviate adoption and liquidity concerns of these instruments (a problem generally associated with indexed bonds), as noted in the 2013 paper "Sovereign Defaults: The Price of Haircuts."

We consider two ways to implement GDP-indexed bonds: GDP warrants and GDP-linked bonds. The prevalent form in restructurings was initially the GDP warrant, whereby payments increase only when the borrower's income growth exceeds a threshold. Thus, under this instrument, the indexation adjustment is asymmetric only to the upside.

The 2016 G20 meeting emphasized instead the GDP-linked bond. This instrument has a symmetric indexation adjustment factor, whereby payments increase when the issuer country experiences positive income growth and decrease during times of negative income growth.

**Evaluation of GDP-Indexed Bonds**

For a country that enters the post-restructuring period, the proposed GDP-indexation policy increases the value of staying excluded from credit markets with good credit standing, relative to the value of defaulting. The default rate decreases noticeably in the first couple of years after restructuring, suggesting that the issuance of GDP-indexed bonds may reduce the incidence of repeated restructurings. The effects are similar on the default rate at longer horizons (overall default rate) and increase in the magnitude of the indexation adjustment factor. Under an upside-only GDP indexation scheme, lenders enjoy a higher degree of risk sharing relative to non-indexed debt, which makes the debt more attractive.

This translates into higher bond prices (lower yield spreads) and a lower overall rate of default. The overall default rate decreases more under a symmetric GDP-indexation scheme (that is, using GDP-linked bonds) than under GDP warrants, because GDP-linked bonds provide the country with an additional risk-sharing measure during times of slow or negative income growth, when countries are generally more likely to default. Consistent with the decreasing pattern in the default rate, leverage (or the debt-to-income ratio) increases in the indexation adjustment factor and more pronouncedly for symmetric indexation schemes.

Focusing on restructuring dynamics, we find that GDP warrants have opposite effects than linked bonds on debt haircuts. The reason is that there are two opposing effects of the indexation policies on haircuts:
• Debt-level effect: As pointed out in my (Horacio’s) 2021 paper "Sovereign Debt Restructurings" — also co-authored by Dvorkin, Sanchez and Yurdagul — countries that default with higher leverage will experience higher haircuts in a restructuring.
• Welfare effect: As debt becomes contingent, the country is better off for any given level of haircut compared to the non-indexation scenario.

The lower default rates we documented point to this latter gain for the country in particular under symmetric indexation. Thus, when negotiating a debt restructuring, part of that gain is transferred to creditors through lower debt haircuts.

We find that the debt-level effect dominates the welfare effect for the upside-only indexation — leading to an increase in haircuts — while the opposite is true under symmetric indexation. Overall, our results suggest that GDP-linked bonds may be better at reducing overall default rates and decreasing the need for haircuts.

Welfare Effects
After analyzing how the two policies affect default rates, we assess their effects on welfare. We measure welfare as the percentage change in consumption in every period necessary to make people living in an economy without the policy live in an economy with the policy.

A rule that distributes losses toward creditors of larger bond maturities delivers welfare gains that are largest for countries in default that have not yet restructured their debt. Our results also suggest that the use of GDP-indexed instruments during restructurings increases welfare. The effect increases with the debt-adjustment factor due to the decreasing default rates associated with larger adjustment factor values in indexation. The policies exhibit some welfare complementarity. That is, the welfare effects of jointly implementing redistribution and GDP-indexation policies is larger than the sum of the welfare effects of the individual policies.

Conclusion
Our work provides a framework to discuss the implications of policy interventions for sovereign debt restructuring outcomes. Policies that tilt the distribution of creditor losses toward holders of long-term maturities increase welfare by lowering short-term spreads and maturity, which lowers overall default probability of the country at times of high credit stress. Having GDP-indexed bonds during restructurings helps remedy the lack of market access experienced by troubled borrowers and helps significantly reduce the probability of repeated restructurings. The two policies complement and reinforce each other along most dimensions of debt, default and welfare metrics considered in the analysis, suggesting benefits from their joint implementation.

Kushal Patel is a research associate and Horacio Sapriza is a senior economist and policy advisor in the Research Department at the Federal Reserve Bank of Richmond.

Short-term bond yield spreads are usually calculated in reference to the interest rate of a risk-free bond, such as the interest rate on U.S treasury bonds. Short-term yield spreads therefore supply a measure of how risky a bond is.

The 2013 paper "Sovereign Defaults: The Price of Haircuts" provides evidence about the exclusion period, showing that it usually takes the country some time to get back to credit markets after a restructuring event.

In the 2008 paper "Haircuts: Estimating Investor Losses in Sovereign Debt Restructurings, 1998–2005," the present values of both the new and old debt are considered in measuring haircuts, rather than just the face value of the debt.
RC Balaban
(804) 697-8144

© 1997-2023 Federal Reserve Bank of Richmond