

I. Introduction and Motivation

Following the European debt crisis of 2011–12, which caught many by surprise, IMF (2013) summarized policy initiatives aimed at promoting orderly sovereign debt restructuring. It acknowledged that the debt crisis in Europe, and the Greek restructuring in particular, has revived the debate over the adequacy of the existing market-based debt resolution approach. Specifically, several proposals were put forward with a view to establishing (formal or informal) frameworks for overcoming common hurdles to debt restructurings (stemming from both private and official sector coordination problems) and facilitating a timely and orderly debt restructuring.¹ However, to date, the market-based approach remains the only one in use, implicitly suggesting that it works most of the time for most participants.

More recently, efforts have been made to describe the market-based restructuring process in detail. Buchheit *et al.* (2019) explain that the sovereign, as the party seeking to modify the terms of its existing debt contracts, is responsible for preparing proposals that lay out both the overall quantum of debt relief the sovereign will be seeking from private creditors as well as the methods (e.g., haircuts, maturity extensions, coupon adjustments, etc.) used to convey that relief. However, as documented in detail by Grund (2023), legal challenges are still common (appearing in both in pre- and post-default cases), making a successful restructuring a function of a variety of (often interrelated) factors. Papers that focus on the specifics of individual restructuring episodes (e.g., Grigorian, Alleyne, and Guerson (2012), Zettelmeyer, Trebesch, and Gulati (2013), Anthony, Impavido, and van Selm (2020), and Asonuma, Papaioannou, and Tsuda (2021)) have aimed to shed light on those factors in individual cases.

One feature of sovereign debt restructurings that stuck out in recent years was a secular increase—both in numbers and in relative importance—of domestic debt restructuring (DDR) episodes (Erce, Mallucci, and Picarelli, 2022). This, however, should not come as a surprise. While the market for *international* (foreign law) sovereign debt securities has a volume of roughly US\$1 trillion, the total outstanding amount of domestic securities is about 40 times as large.² In Emerging Markets and Developing Economies (EMDEs), where debt restructuring is likelier to happen (than in Advanced Markets; AMs), the share of domestic debt in total debt has risen from 31 to 46 percent from 2000 to 2020 (see IMF, 2021).

This trend-increase in domestic debt restructuring episodes has been rather pronounced. During the 1980s and early 1990s, DDRs were rare (compared to alternatives), as most EMDEs tended to resort to a combination of financial repression and high inflation to reduce the real value of excessive domestic debt burdens.³ From the mid-1990s onward, many EMDEs liberalized their financial systems and upgraded their policy frameworks, including by adopting inflation targeting, which reduced the reliance on inflating away debt or on financial repression. Reflecting these changes, DDRs have become more common. During 1990–2020, there were roughly as many DDRs (30 episodes) as standalone external debt restructurings (EDRs) (27 episodes). At present, inflation or financial repression continue to be unpopular and largely nonviable policy options to erode

¹ The most recent of these efforts is the G20 Common Framework (CF) for debt treatments, which is intended to deal with insolvency and protracted liquidity problems in developing countries, along with the implementation of an IMF-supported reform program. The CF requires private creditors to participate on comparable terms to overcome collective action challenges and ensure fair burden sharing. However, the take-up has been slow and to date only four countries—Chad, Ethiopia, Ghana, and Zambia—have made requests for debt relief under the CF, subject to significant delays.

² According to Bank for International Settlements (2021), the global market for central government domestic currency debt amounted to US\$46.7 trillion while that for foreign currency instruments to US\$1.0 trillion.

³ This also reflected a wave of sovereign external debt defaults that swept through EMDEs in the 1980s.

the real value of debt in crisis conditions for most countries, hence a renewed focus on market-based ways of restructuring debt, especially domestic debt.

A salient outcome of recent restructuring cases is that, despite the fact that a sovereign's control over its domestic legal and regulatory framework affords it a considerable degree of influence over the DDR process, domestic restructurings are often subject to a wide range of other—economic and financial—factors and constraints. However, the success of a DDR should primarily be measured as that of any other restructuring—by its ability to help secure debt sustainability and restore market access.⁴ In case of DDRs, the latter can be measured more narrowly as the restoration of credit to the economy, both to its private and public sectors.

IMF (2021) formalizes a framework for DDR and provides a comprehensive review of case studies of such restructurings that took place since 1980. The paper introduces a decision framework, the objective of which is to “identify the type of restructuring that will restore public debt sustainability while minimizing potential economic costs and financial system disruptions.” It consists of the following six steps:

- Step 1: Estimate the debt relief target (DRT) necessary to restore public debt sustainability.
- Step 2: Identify the perimeter of claims (i.e., instrument type) and categories of creditors holding “restructurable debt”.
- Step 3: For each category of creditors, determine the potential contribution to DRT.
- Step 4: Assess the economic costs associated with obtaining relief.
- Step 5: Ensure the normal operation of the Central Bank (CB), including of the payments system, and assess the need for any immediate (or future) recapitalization(s) needs.
- Step 6: Determine which claims to restructure in order to minimize overall costs while also achieving the DRT and supporting broader macroeconomic reforms.

While some terms referenced in the framework are relatively easy to define and calculate analytically (e.g., restructurable debt, perimeter, etc.), others may require specialized knowledge, including of other/similar restructuring episodes (e.g., potential/feasible debt reduction, *net* debt relief, etc.).

This paper builds on IMF (2021). It spells out the concepts/terms used in the context of DDRs and helps operationalize the above six steps intended to guide the country authorities in their choice of type of restructuring (i.e., EDR, DDR, or both), and specifically for ways to tackle a DDR (by providing examples of their use in stylized analytical illustrations). As in IMF (2021), here domestic sovereign debt is defined as public debt liabilities that are governed by domestic law, and subject to the exclusive jurisdiction of the domestic courts of a sovereign. Debt issued under foreign law is considered “external.” Note that this definition is separate from the currency denomination or the residency of the holders of the debt (definition used in IMF's Debt Sustainability Analysis, DSA), although there is a considerable overlap in practice.

While implicit in a DDR context, the paper does not explicitly deal with the issue of the captive nature of domestic investor base. Although its degree varies across countries, this feature by and large affords sovereign authorities leverage over domestic investors and may have made the holdout problem less of an issue in DDR cases in recent years. Similarly, the paper does not discuss the ability of the government to restructure

⁴ Other criteria for success may include an improved repayment profile (rollover risk), lower exchange and interest rate risks, as well as cash savings in the short run.

domestic debt by retroactively changing the legal terms of bond contracts.⁵ Countries that have used this “local law advantage” and introduced Collective Action Clauses (CACs) in their domestic law contracts prior to restructuring their debt in recent years are Greece (2012) and Barbados (2018).

The remainder of the paper is structured in the following way. Section II discusses key concepts behind DDRs, net vs. gross debt relief and restructuring Laffer curve and provides a stylized example. Armed with these concepts, Section III builds an analytical model for determining what, if any, types of claims to restructure once a sovereign’s debt has been determined to be unsustainable. Section IV provides some stylized examples of the application of the model and the decision framework of IMF (2021). Finally, Section IV concludes.

II. Gross vs. Net Relief and Domestic Debt Restructuring Laffer Curve

Domestic restructurings possess a distinct feature that separate them from external debt restructurings. This feature—in essence a negative externality—is that domestic restructurings impose direct costs on the local financial system, potentially reducing the (fiscal) savings for the sovereign from the debt exchange. These costs are due to the existence of a typically strong nexus between sovereign and financial institutions (especially banks), which during episodes of sovereign stress could impact the balance sheet (both asset and liability side) and income of those institutions.⁶ When internalized, this externality will result in a smaller debt relief accrued to the sovereign and *ceteris paribus* make it less likely for a domestic restructuring (relative to an external debt restructuring) to take place.

Given the size of the banking sector relative to non-bank financial institutions (NBFIs) in most countries and their role in propagating economic and financial shocks, the remainder of this section focuses on banks. However, in countries with sizable non-bank financial sectors, the design of a DDR should explicitly factor in the impact of a restructuring on balance sheet and income potential of public pension funds and insurance companies.⁷ Depending on the size of the impact and the pre-restructuring financial condition of pension funds, pension reform might be required to address the impact. In cases where pension reform could not feasibly fill up the hole created by a DDR without materially affecting policyholder benefits, public funds (i.e., a fiscal subsidy) needed to achieve pension sustainability should be included in the calculation of net debt relief (see below).

As shown below—if recapitalization and financial stability costs are an increasing function of haircut—there is a maximum value of haircut beyond which the gross relief obtained from increasing the haircut are outweighed by recapitalization and financial stability costs, rendering the marginal net debt relief negative. In practice this maximum can be obtained iteratively, by estimating the recapitalization and financial stability costs associated with every level of haircut.

⁵ For a detailed discussion on this issue see IMF (2021), Section III.C.

⁶ Dell’Ariccia et al. (2018a) and Grigorian and Manole (2017) provide thorough discussions on the potential channels of such impact.

⁷ This is especially relevant in those countries where investment guidelines limit NBFIs’ exposure to domestic corporate and foreign asset holdings, making them disproportionately dependent on their investments in government debt securities. DDRs could thus raise solvency issues that would prevent these institutions from honoring existing policies, undermining the social safety net.

Table 1 below demonstrates stylized calculations of net debt relief (NDR) accrued to a sovereign under a variety of restructuring scenarios. In this example, the banks hold two types of assets—government securities and loans—the value of which are affected by debt restructuring.⁸ They also have liabilities, which are not affected by the restructuring. The difference between total assets and liabilities is the shareholder equity. As shown in the example, prior to the restructuring the capital-to-(risk-weighted)-asset (CAR) ratio of the aggregate banking sector is at 15 percent, above the regulatory requirement of 12 percent. Applying a face value haircut (ranging from 10 to 60 percent), and assuming a loan impairment ratio an increasing function of haircut, results in a capital shortfall that grows exponentially with haircut.

In the example below, the assumption of the impairment being an increasing function of haircut hinges on the premise that the higher the haircut required to establish debt sustainability, the more severe are the prevailing conditions faced (also) by the private sector (impacting its ability to pay), thus rendering bank loans more risky and therefore worth less. In reality, banks may also face deposit withdrawals (increasing in intensity with economic/fiscal shock), potentially forcing them to liquidate some assets at fire sale prices, further strengthening the (positive) correlation between haircut and asset impairment ratio modeled in the example.⁹

⁸ This reduction in market value can be due to a reduction of the face value of debt security but also of its earning potential, due to a reduced coupon.

⁹ In addition to reducing banks' capital, a DDR could also have implications on banks' liquidity and access to payment and settlement services. By reducing the value of government securities—a widely accepted form of collateral by CBs for monetary operations or by payment and settlement systems—a DDR may add to liquidity pressures on the banks, which would have to top up the value of their pledged collateral using other liquid assets. The higher the haircut, the more costly for banks to maintain such collateralized positions.

Table 1. A Stylized Example of Capital Shortfall and Debt Relief Calculations

| | | |
|----------------------|-----------|-------------------|
| Haircut | 0 percent | |
| Loan impairment | 0 percent | |
| Risk-weighted Assets | | Liab. and Equity |
| Gov. bonds | 2,000 | 9,000 Liabilities |
| Loans | 8,000 | 1,000 Equity |
| Memo: | CAR | 12.5% |
| | Shortfall | 0 |

| | | |
|----------------------|------------|------------------|
| Haircut | 10 percent | |
| Loan impairment | 1 percent | |
| Risk-weighted Assets | | Liab. and Equity |
| Gov. bonds | 1800 | 9000 Liabilities |
| Loans | 7920 | 720 Equity |
| Memo: | CAR | 9.1% |
| | Shortfall | 230 |

| | | |
|----------------------|------------|-------------------|
| Haircut | 20 percent | |
| Loan impairment | 2 percent | |
| Risk-weighted Assets | | Liab. and Equity |
| Gov. bonds | 1,600 | 9,000 Liabilities |
| Loans | 7,840 | 440 Equity |
| Memo: | CAR | 5.6% |
| | Shortfall | 501 |

| | | |
|----------------------|------------|-------------------|
| Haircut | 30 percent | |
| Loan impairment | 4 percent | |
| Risk-weighted Assets | | Liab. and Equity |
| Gov. bonds | 1,400 | 9,000 Liabilities |
| Loans | 7,680 | 80 Equity |
| Memo: | CAR | 1.0% |
| | Shortfall | 842 |

| | | |
|----------------------|------------|-------------------|
| Haircut | 40 percent | |
| Loan impairment | 7 percent | |
| Risk-weighted Assets | | Liab. and Equity |
| Gov. bonds | 1,200 | 9,000 Liabilities |
| Loans | 7,440 | (360) Equity |
| Memo: | CAR | -4.8% |
| | Shortfall | 1,253 |

| | | |
|----------------------|------------|-------------------|
| Haircut | 50 percent | |
| Loan impairment | 11 percent | |
| Risk-weighted Assets | | Liab. and Equity |
| Gov. bonds | 1,000 | 9,000 Liabilities |
| Loans | 7,120 | (880) Equity |
| Memo: | CAR | -12.4% |
| | Shortfall | 1,734 |

| | | |
|----------------------|------------|-------------------|
| Haircut | 60 percent | |
| Loan impairment | 15 percent | |
| Risk-weighted Assets | | Liab. and Equity |
| Gov. bonds | 800 | 9,000 Liabilities |
| Loans | 6,800 | (1,400) Equity |
| Memo: | CAR | -20.6% |
| | Shortfall | 2,216 |

Summary Calculations

| Haircut (%) | Capital shortfall (below 12% CAR) | Public recap. cost (Shortfall above \$400) | Gross debt relief (Haircut * Gov bonds) | Net debt relief (GDR - Public recap. cost) |
|-------------|-----------------------------------|--|---|--|
| 0 | 0.0 | 0.0 | 0 | 0.0 |
| 10 | 230.4 | 0.0 | 200 | 200.0 |
| 20 | 500.8 | 100.8 | 400 | 299.2 |
| 30 | 841.6 | 441.6 | 600 | 158.4 |
| 40 | 1252.8 | 852.8 | 800 | -52.8 |
| 50 | 1734.4 | 1334.4 | 1000 | -334.4 |
| 60 | 2216.0 | 1816.0 | 1200 | -616.0 |

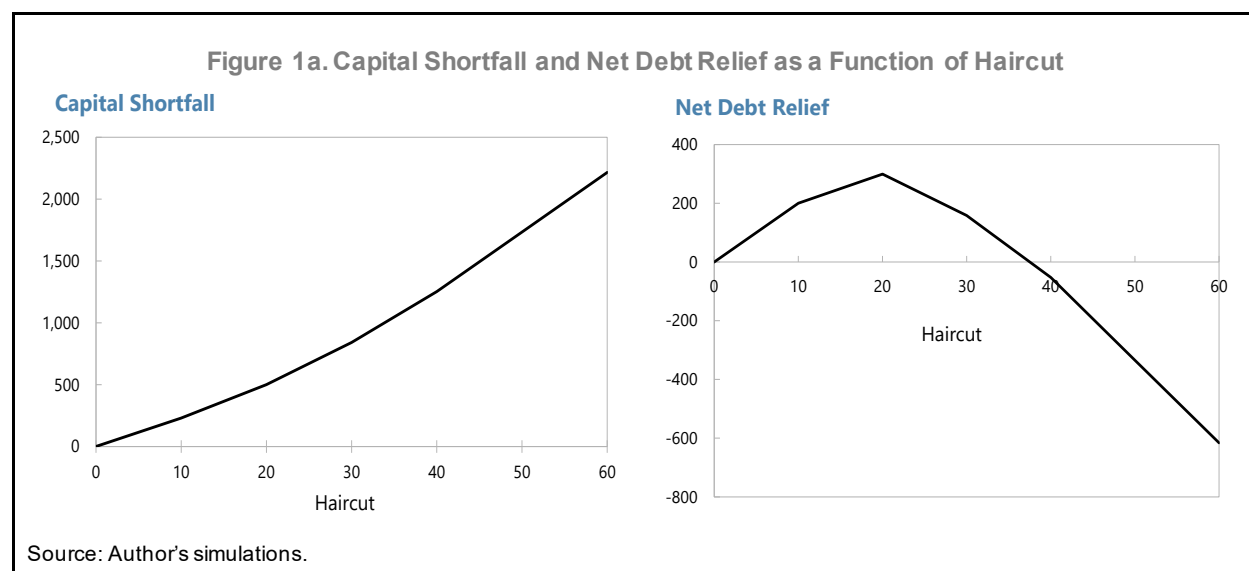


Figure 1a plots the summary findings. The right panel is in essence the DDR *Laffer Curve* (hereafter RLC). It shows that net debt relief accrued to the sovereign increases with haircut for values of haircut below 20 percent. However, the NDR declines beyond 20 percent haircut and even becomes negative (for values of haircut just below 40 percent). In this stylized example, the sovereign should not impose a haircut above 20 percent, since going beyond this threshold will reduce the NDR accrued to the sovereign (potentially even making it negative) while likely subjecting the financial sector to higher financial stability risks and imposing increasing costs to it (beyond what can be captured in *ex ante* calculations of the capital shortfall).

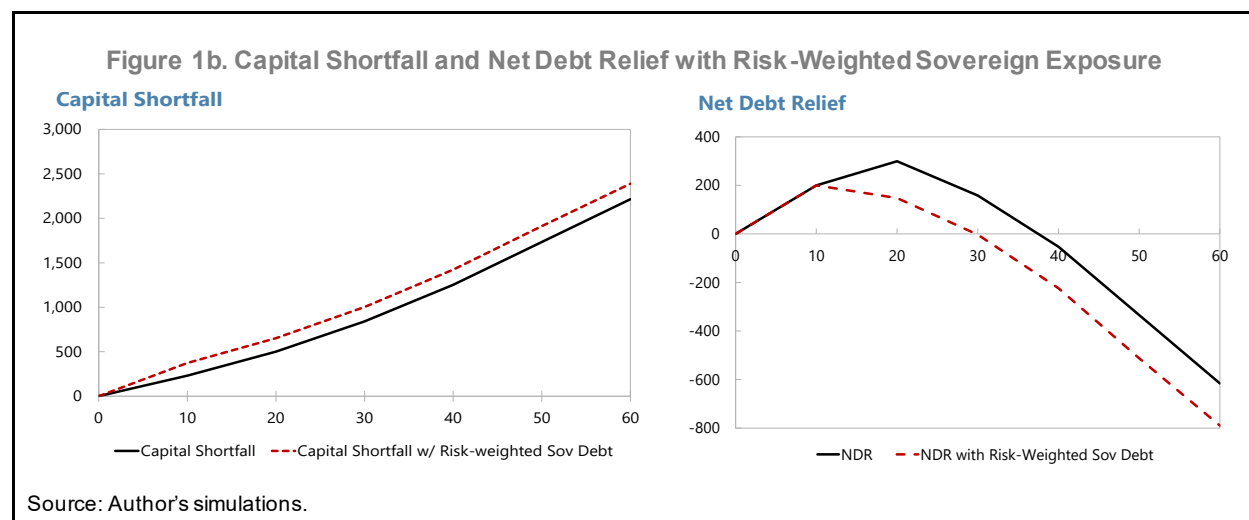
To calculate NDR, the overall fiscal costs of recapitalization should be calculated. In doing so it should be noted that the fiscal costs of recapitalization are likely to be different from the capital shortfall faced by the banks. To the extent that some (smaller and systematically unimportant) banks can be liquidated and/or private owners can replenish the capital shortfall (fully or partially), the actual fiscal cost of restructuring will be less than the capital shortfall. In the stylized example above, it is assumed that the sum of these two adjustments is \$400, leaving the balance (i.e., the shortfall minus \$400) to be recapitalized using public funds.¹⁰

The shape of RLC may differ depending *inter alia* on the regulatory treatment of impaired assets as well as the structure of liabilities. For example, relaxing the assumption of zero risk weight on government securities (explicit in the above example) and instead adopting weights for distressed sovereign exposures recommended by the Basel Committee on Banking Supervision (2017) would pivot the RLC downwards (Figure 1b shows the impact on capital shortfall and RLC under the assumption of (a conservative) 50 percent risk weighting for sovereign securities).¹¹ On the liabilities' side, availability of "bail-in-able" deposits may reduce the need for public intervention (e.g., Cyprus, 2013) and thus shift the RLC upwards. Also, in cases where funding is largely wholesale (as opposed to deposit-based), during a sovereign debt restructuring and subsequent rating

¹⁰ In reality, this number itself could be a declining function of haircut, since the private investors' ability to replenish bank capital may be a negative function of the shock faced by the economy, hence be correlated inversely with the haircut required to establish sustainability.

¹¹ Basel Committee on Banking Supervision (2017) (Table 4) recommends 50 percent risk weighting for sovereigns rated between BBB+ and BBB-; 100 percent for sovereigns rated between BB+ and B-; and 150 percent for sovereigns rated below B-. A sovereign that is undergoing a debt restructuring is rated Selective Default (SD) and would, therefore, require a 150 percent risk-weighting per this metric.

downgrades banks may be under pressure to repay credit lines or top up collateral, with potential implications for capital buffers. This may pivot the RLC downward since these pressures are likely to be stronger, the higher the haircut necessary to establish debt sustainability.



Safeguarding Financing Stability and Recapitalizing Financial Institutions

As shown in the above example, a sovereign DDR will have a direct impact on the balance sheet and earning potential of financial institutions holding sovereign debt and therefore on their ability to provide credit to the economy. The impact on bank balance sheets could be significant where sovereign securities comprise a large share of bank assets. Any loss in value of government debt exposures will lead to capital losses in financial institutions at the time of the restructuring unless these have already been absorbed by loan-loss provisioning and mark-to-market accounting prior to the restructuring. Such reduction in value of government debt portfolio could be due to any changes to the original contractual value of the debt security, such as, face value haircut, coupon reduction, and maturity extension (with below-market coupon rates).

The precise impact on the financial institutions will depend on the accounting and regulatory treatment of the debt restructuring by the authorities.¹² When banks are able to absorb losses without having to resort to a recapitalization using public funding, debt relief sought from other creditors and/or fiscal consolidation required to restore debt sustainability would be smaller. This will also reduce the probability of a financial crisis being triggered by the debt restructuring. This becomes important because, as shown in IMF (2021), debt restructurings accompanied by banking crises are associated with larger output losses. Therefore, during the design stage of a DDR, measures should be taken to safeguard financial stability and avoid financial sector stress developing into a full-blown crisis. This can be done by both strengthening contingency planning and crisis management capabilities but also by recapitalizing affected institutions.¹³

It should be noted that the design of the restructuring may have implications for financial stability and immediate recapitalization needs (and therefore for NDR). Specifically, restructurings involving coupon

¹² For a more detailed discussion on accounting and regulatory treatment of the impact of a DDR on the banking sector see IMF (2021, Section IV.B).

¹³ For a discussion on the best practice of recapitalizing affected banks using public funding see Dobler, Moretti, and Piris (2020).

reduction or maturity extension are likely to have less of a direct impact on domestic financial institutions' balance sheet than exchanges involving face value haircuts. This is consistent with the fact that only around 18 percent of DDRs feature face value reductions (Erce, Mallucci, and Picarelli, 2022). Yet, as mentioned above, within the same design category, analysis could be conducted iteratively to minimize the *ex-ante* capital shortfall (or maximize NDR) as a function of design characteristics (e.g., haircut).

To estimate the capital shortfall and thus the size of a recapitalization under various restructuring scenarios with any precision, stress testing and asset quality reviews should be conducted prior to the announcement of the restructuring. This requires detailed bank-by-bank data of the most recent available vintage and a series of assumptions on both macroeconomic outlook and restructuring design.¹⁴ While most CBs employ advanced stress testing methodology that would be suitable for measuring potential bank losses, Cihak (2007) offers a useful alternative reference. Ownership interlinkages between various financial intermediaries (e.g., banks and insurance companies) need to be studied thoroughly as a potential source of a contagion and be factored into the design and costing of the financial stability safety net for the debt restructuring.¹⁵

Recognition of losses need to be followed by a strategy to restore capital buffers if those losses produce shortfalls in regulatory bank capital. If the strategy ends up requiring public funding for recapitalization, policymakers should be aware of the downsides associated with bailouts (e.g., moral hazard, etc.), as outlined by Dell'Ariccia *et al.* (2018b), and minimize them to the extent possible. In their analyses of the effects of government and CB interventions in 69 systemic banking crises since 1980, Homar and van Wijnbergen (2017) find that timely bank recapitalizations substantially reduce the duration of recessions, underscoring the distortions caused by “zombie banks” and the costs of regulatory forbearance.

It is not inconceivable for public funds used for recapitalizing financial institutions to return a profit in the future. However, at the time of booking these capital injections are typically treated as expenditure—fully or partially, depending on the expectation of a realistic return—with a corresponding adjustment booked when the position is liquidated.¹⁶ In the context of financial crisis in general, Laeven and Valencia (2020) report (see Figure 8) that the median *gross* fiscal cost of a bank recapitalization in low and middle income countries is 10 percent of GDP, while the median *net* fiscal cost (minus recoveries whenever there were available data on them) is 9.58 percent.¹⁷ This suggests practically zero recovery of public funds used in the recapitalization exercise.

Table 2 below summarizes an attempt to narrow Laeven and Valencia (2020) data down to recapitalization episodes that are only associated with DDRs (and not just any financial crisis), as specified in Table 2a in the Background Paper accompanying IMF (2021). In two cases where both gross and net fiscal outlays are available (e.g., Cyprus and Ghana) the recovery is zero. In Mozambique and Sierra Leone (where crises led to

¹⁴ It is important to exercise caution with respect to estimates of capital shortfall. Potential underestimation could come from difficulties of predicting and modeling all possible adverse eventualities and overestimation is possible if the macroeconomic environment after the restructuring improves faster than expected.

¹⁵ For this, the fiscal and monetary authorities can build upon the interlinkages' module that have become standard for the joint World Bank-IMF Financial Sector Assessment Programs (FSAPs).

¹⁶ According to the Government Finance Statistics Manual (IMF, 2014; p. 303), a capital injection into a (financial) corporation in distress should be recorded as an expense for the (a) difference between the financial asset acquired and the present value of the amount expected to be received; or (b) portion of the investment on which no realistic return can be expected; and an increase in financial assets in the form of equity owned in the corporation in distress (equal to the portion of the investment on which a realistic claim can be expected).

¹⁷ The results should be treated with caution since the sub-samples (for calculation the gross and net values) differ due to availability of information.

significant increases in public debt despite debt restructurings) and in El Salvador (where public debt declined significantly) data on fiscal interventions are lacking. It may, therefore, be prudent to assume *ex ante* recoveries from capital injections using public funds to be small, if any.

Table 2. Gross and Net Fiscal Cost of DDRs

| Country | Start | End | Fiscal Costs, Gross 1/ | Fiscal Costs, Net 1/ | Increase in Public Debt |
|--------------|-------|---------|------------------------|----------------------|-------------------------|
| Cyprus 2/ | 2011 | 2015 3/ | 18.0 | 18.0 | 21.3 |
| El Salvador | 1989 | 1990 | ... | ... | -29.6 |
| Ghana | 1982 | 1983 | 6.0 | 6.0 | 15.5 |
| Mozambique | 1987 | 1991 3/ | ... | ... | 60.9 |
| Sierra Leone | 1990 | 1994 3/ | ... | ... | 62.9 |

1/ Fiscal costs refer to outlays directly related to the restructuring of the financial sector.

2/ Numbers include the recapitalization of Cyprus Popular Bank, which took place following the Greek debt restructuring, thus overstating the fiscal intervention associated with Cyprus' own restructuring.

3/ The duration of crisis is truncated at 5 years starting with the first crisis year.

Source: Laeven and Valencia (2020) database.

Finally, the cost of safeguarding financial stability too should be included in the calculations of the fiscal cost of restructuring. These could be the costs of *inter alia* setting up financial stability funds and contributing to the deposit insurance fund, both intended to strengthen the government's crisis preparedness and bank resolution frameworks in case of a financial crisis.¹⁸ As hypothesized above, these costs could be a rising function of the haircut, thus tilting (not just shifting) the NDR curve in Figure 1a downwards. Box 1 below presents a successful example of designing a financial stability fund during Jamaica (2010) restructuring.

¹⁸ Structural issues, such as share of non-bank financial institutions in total and share of state-owned banks in total, may have an impact on potential financial stability costs.

Box 1. Jamaica Financial Sector Support Fund ¹

In January 2010, Jamaican authorities established a Financial Sector Support Fund (FSSF) as a contingent measure to address possible negative impacts of Jamaica's sovereign debt exchange (JDX) on the financial sector. Funding from the FSSF was to be available to individual institutions that encounter specified problems, primarily liquidity, directly related to the debt exchange.

The FSSF was established by the government of Jamaica, had a size of US\$950 million (sourced from multilateral, mostly IMF, funds) and managed by the Financial Regulatory Council (FRC). The latter was an existing interagency body, chaired by Bank of Jamaica (BOJ), which was charged with overseeing the disbursement of funds under the FSSF.

Access to the fund was restricted to those financial institutions—banks, securities dealers, and insurance companies—that participated at a rate of at least 90 percent of their holdings of debt securities in the debt exchange. In this context, the FSSF acted as an incentive to participate in the debt exchange. The primary use of the FSSF was to provide liquidity support in the event of external funding calls or pressure on deposits or assets under management that were attributable to the debt exchange. The interest rate was to set to avoid any fiscal costs. Any borrowing from the FSSF was to be repaid within 6 months or else a punitive rate would begin to apply. Liquidity support above a threshold level (as a percent of the capital of the borrowing institution) would trigger increased regulatory intervention. Banks and nonbank financial institutions would be intervened if a maximum level was breached.

All financial institutions that accessed the FSSF for capital support would be subject to enhanced monitoring by the BOJ or financial services commission (FSC). Deposit taking institutions and nonbank institutions would be required to submit a five-year business plan by December 2010 and December 2011 respectively, substantiating their viability and ability to comply with the minimum capital requirements over a 2- to 3-year horizon. Government of Jamaica (GOJ) capitalization support would come with additional conditions. GOJ would place representatives on the entity's board of directors, and supervisory oversight would be more intensive, reporting requirements more demanding, while operations might be restricted, depending on circumstances.

Fortunately, following the launch of the JDX on January 14, 2010, key risks to the stability of the financial sector did not materialize and no financial institution requested assistance from the FSSF. Discussions with market participants had revealed the importance of the FSSF as a safety measure designed to prevent financial sector distress. Overall, the exchange (which was closed on February 26) was perceived as successful and generated a participation rate of 99.2 percent on a stock of eligible debt of 65 percent of GDP. The FSSF was brought back to life again and used as a safeguarding measure also during the 2013 restructuring in Jamaica. Like in 2010, in 2013 the FSSF remained untapped.

¹ Based largely on Grigorian, Alleyne, and Guerson (2012).

As highlighted in IMF (2021), special care should be given to CBs' holdings of domestic sovereign debt to ensure its normal operations, including the conduct of monetary policy and the payments system. While CBs can in principle function with a negative capital (and some do), recapitalization needs of the CB following a restructuring that involves its holdings of sovereign debt should be assessed. In principle, restructuring of CB holdings of government debt does not reduce the overall public sector indebtedness, but the alternative may have implications for burden sharing and may even incentivize CBs to buy distressed debt prior to restructuring. Conversely, restructuring of CB holdings may delay the transfer of seigniorage revenues (that

may otherwise be available) to the budget, thus (temporarily) reducing future fiscal revenues. In some jurisdictions it may be impossible to carve out the CB holdings of government securities, making the negative impact of a DDR on CB capital inevitable.¹⁹

III. Analytical Framework

The starting point of a sovereign's analysis on whether a restructuring is needed is to determine whether public debt is sustainable or not. IMF's definition of debt sustainability (widely used for this purpose) incorporates the concepts of solvency and liquidity. From a liquidity perspective, the sovereign must be able to refinance obligations falling due and to finance new fiscal deficits at interest rates that prevent market stress or aggravate the solvency position. From a solvency perspective, the sovereign must be able to sustain a given debt level without a substantial risk of reverting to explosive debt dynamics or requiring protracted primary surpluses that could undermine growth. These criteria—operationalized in DSA—help determine the *debt relief target* (DRT) to be sought from creditors required to achieve sustainability.

If sovereign debt is deemed unsustainable, restructuring may be the solution. The decision as to what type of claims to restructure will hinge on a number of factors pertaining to size and structure of debt as well as an array of other economic and financial factors.

The first step in the decision process is to determine the “restructurable” debt. This includes categories of claims that can contractually be restructured. As a rule of thumb, most categories of claims on sovereign—with the exception of those held by International Financial Institutions (IFIs), which are treated as the most senior—are considered restructurable. However, when it comes to determining the actual perimeter of the exchange, some categories of liabilities (in addition to those owed to IFIs) could be left out for political, technical, or financial stability reasons. For domestic debt, the perimeter of restructurable debt could also be expanded to include liabilities of public bodies beyond the central government, such as municipal or state-owned enterprises (SOE) debt.²⁰ In general, broadening the perimeter of “restructurable” debt will help reduce the debt relief sought from creditors, as it will make public debt more sustainable.

Having identified the restructurable debt, the next step is to estimate the *potential (or feasible) debt relief* that may be obtained given the structure of claims and the composition of their holders. For *external debt*, debt restructuring episodes in other countries may provide guidance as to the extent of potential debt relief that could feasibly be obtained from external debt holders. The contractual terms of debt instruments being restructured (i.e., CAC thresholds and coverage, *pari passu* and other clauses, etc.) too could play a significant role in what can be achieved. For *domestic debt*, potential debt relief depends mainly on the impact of the restructuring on the domestic financial system (as discussed in Section II) and is, therefore, country specific.

Once the potential debt relief from each category of claims is estimated, the next step is to assess the economic costs associated with restructuring these categories of claims. Here, the term economic costs

¹⁹ For example, following the Greece (2012) restructuring where carving out did in fact take place, the European Central Bank (ECB) pledged its *pari passu* status in Outright Monetary Transactions (OMT) program to reassure markets that it would no longer exclude its government debt holdings in a restructuring (Grund and Grle, 2016).

²⁰ Here due consideration should be given to cases where restructuring of debt may disrupt vital functions performed by SOEs or subnational entities via impeding their ability to access funding for their working capital needs.

broadly refers to any economic (e.g., credit conditions after the restructuring, prospects for domestic market development, external financing conditions), political economy (e.g., distributional aspects of a restructuring, role of special interests in the process), legal (e.g., associated with litigation), and reputational (e.g., affecting external market re-entry and restoration of domestic credit flows) considerations that may influence the desirability of restructuring one category of debt and its creditors relative to another. It should be noted that economic costs are distinct from and should not include the fiscal costs of restructuring explicitly factored into the NDR calculations in Section II.

The remainder of the section presents an analytical framework that helps bring together these definitions and help determine how much, if any, of any type of restructuring (domestic and external) should be undertaken.

The Model

Formally, the condition for undertaking any debt restructuring could be presented as follows:

$$ER^{max} + DR^{max} \geq DRT$$

where, ER^{max} is maximum *gross* external debt relief that can be secured (that is, potential external debt relief), DR^{max} is the maximum *net* domestic relief (that is, potential gross domestic debt relief minus fiscal cost of recapitalization, as defined in Section II), and DRT is the debt relief target required by DSA to make debt sustainable.²¹ Put it simply, this (quantity) condition verifies whether any feasible amount of restructuring (alone, without accompanying fiscal consolidation) is sufficient to make the debt sustainable.

If the above condition is satisfied, the levels of external and domestic relief, ER^* and DR^* , should be selected to minimize the following objective function (depicting the total economic cost of restructurings):

$$\text{Minimise Total Cost (TC)} = w * ER^* + \mu * DR^*$$

$$\text{Subject to: } ER^* + DR^* = DRT, ER^* \leq ER^{max}, \text{ and } DR^* \leq DR^{max}$$

where, w is the expected economic cost of a unit of *external* debt relief and μ is the expected economic cost of unit of *domestic* debt relief. Both are assumed constant for simplicity. Given the domestic political economy considerations involved in a restructuring, it is likely that $\mu \geq w$, making the slope of the objective function less than that of the first constraint (as shown on Figures 2 and 3 below). However, this observation is not critical for the framework.

If μ is *sufficiently* large, then no domestic debt will be restructured, putting the burden for securing the required relief only on the external debt. In Figure 2 the solution is achieved at $DR^* = 0$ and $ER^* > 0$. Conversely, if w is greater than μ , the solution would be achieved at $ER^* = 0$ and $DR^* > 0$, that is, only domestic debt will be restructured.

²¹ Debt relief parameters can be presented either in net present value (NPV) or face value (FV) terms. A broad equivalence (i.e., positive monotonic mapping) between the two presentations exists except for cases where a reprofiling (i.e., a restructuring involving only coupon reduction and/or maturity extension) takes place. Therefore, in cases involving reprofiling the analysis should be conducted in NPV terms. It should also be noted that variables of the model are expressed in instantaneous terms (i.e., at the time of the restructuring) using appropriate discount rates (see below for a discussion on this). This also includes the DSA-suggested levels of DRT, for which instantaneous equivalent (of otherwise medium-term-based) values can/should be derived.

Similarly, if ER^{max} is *sufficiently* small, domestic debt too will have to be restructured to satisfy the first constraint above. In Figure 3, the solution is achieved at $DR^* > 0$ and $ER^* = ER^{max}$. Conversely, if DR^{max} is *sufficiently* small and ER^{max} is large enough, domestic debt could be spared from restructuring.

In sum, depending on the parameters, the result to this simplified optimization problem could be: (1) an *interior* solution or a *comprehensive* restructuring (i.e., both ER^* and DR^* are greater than zero), resulting in both an EDR and a DDR, and (2) a *corner* solution (i.e., either ER^* or DR^* are zero), resulting in either an EDR-only or a DDR-only solutions. Finally, if the quality condition $ER^{max} + DR^{max} \geq DRT$ is not satisfied (i.e., if the required relief is greater than the aggregate potential debt relief), no debt restructuring will take place.²²

An interesting corollary to this simple linear model (where economic costs are not a function of haircut) is that if an interior solution is selected, the type of claims (i.e., external or domestic), which have lower economic costs of restructuring will have to be restructured to the level of the maximum obtainable relief (i.e., ER^{max} or DR^{max} , or DRT, whichever is smaller) *before* the other type of debt is restructured. This suggests that if the type of debt that has a lower economic cost *also* has a maximum obtainable debt relief that is greater than DRT, only that type of debt will be restructured.

In reality, the above optimization could be made more complicated by various political economy and technical issues. For instance, given the burden-sharing (i.e., fairness) considerations and their impact on participation rate during external restructurings, ER^* will be a function of DR^* , requiring a game-theoretic/two-stage approach to solving the optimization problem. Another possible complication is that μ and w could be increasing functions of haircut (i.e., *nonlinearities of scale*), which will *ceteris paribus* reduce the level of relief obtainable via a restructuring. Conversely, there may be *nonlinearities of scope*, whereby economic cost of a combined restructuring is greater than the sum of its individual components, thus *ceteris paribus* favoring an EDR- or DDR-only scenarios over a combined restructuring.

²² In practical terms, this means that the authorities may have to conduct another iteration of DSA using a tighter fiscal path (i.e., larger future primary balances) that would reduce the debt relief required to achieve sustainability. However, fiscal tightening has limits as it may both be impossible to implement practically (e.g., there are very few historic examples of continuous primary balance adjustments of over six percent of GDP per year) but may also affect growth/recovery going forward. While repeat restructurings have happened in the past (e.g., Argentina, Jamaica, Belize), no sovereign debt restructuring will succeed if ex ante it fails to demonstrate that it will lead to debt sustainability (i.e., that another restructuring down the road would be required).

Figure 2. Corner Solution—Only EDR Takes Place

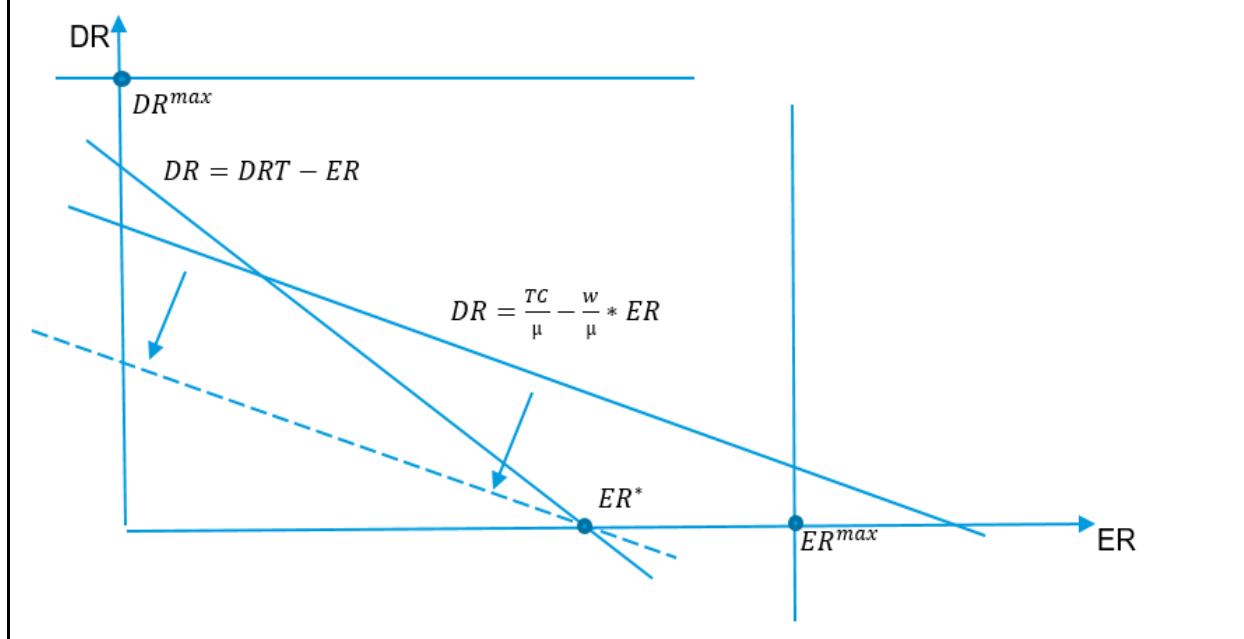
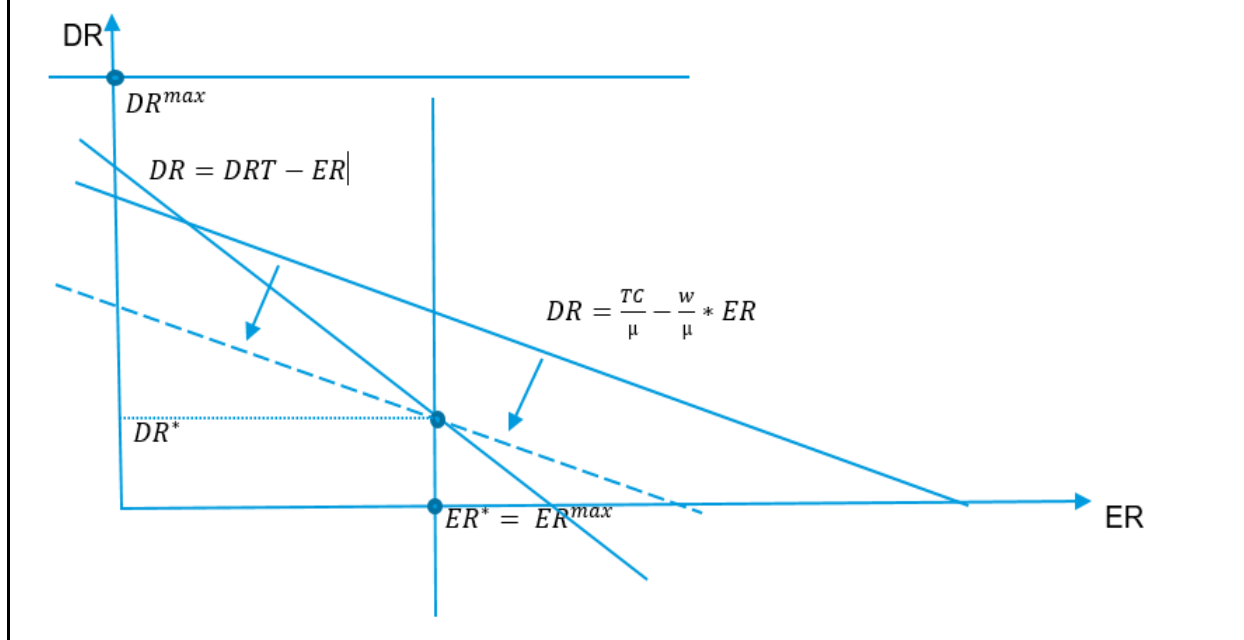


Figure 3. Interior Solution—Both EDR and DDR Take Place



Making (Practical) Sense of Economic Costs and Quantity Constraints

The above analysis highlights the importance of the role played by economic costs in decision making. As defined earlier, economic cost of a debt restructuring is an aggregate measure of purely economic/financial, political economy, legal, and reputational considerations/costs that are associated with a decision to restructure sovereign debt relative to its original contractual (including financial) terms. Much of these costs are country-specific and require a nuanced understanding of determinants involved.

However, the above stylized model predicts that what *really* matters from decision-making perspective is the *relative* economic cost, that is, the economic cost of one type of restructuring relative to another (or $\frac{w}{\mu}$, as shown on Figure 2 and 3). If economic cost of one type of restructuring (e.g., DDR) is seen as markedly greater than that of the other type (EDR), then the low-cost alternative (i.e., EDR) becomes the likely choice, subject to quantity considerations described above. If, however, economic costs of EDR and DDR are broadly identical, the choice between EDR and DDR gets blurred and the optimal solution will lie on $ER^* + DR^* = DRT$ line (i.e., *ceteris paribus* making them equally likely subject to quantity constraints).

Past restructuring episodes may shed light on the relative sizes of economic costs for external and domestic restructurings. While these are *ex post* assessments, which may be contaminated by information on the actual conduct of restructuring operations and therefore be different from *ex ante* estimates of those costs, these may nevertheless be helpful. Here is a shortlist of relevant empirical findings based on recent debt restructuring episodes summarized in IMF (2021):

- DDRs typically took less time to complete than other restructurings, likely due to a greater sovereign control over the terms/laws governing domestic debt and the financial institutions themselves.²³
- Stand-alone DDRs were more likely to be chosen when the financial system was either shallow or resilient (and therefore the impact of the restructuring more manageable).
- Comprehensive restructurings were associated with sharper post-restructuring economic contractions, likely driven by the simultaneous impairment of domestic and external financing channels. In contrast, the repercussions of DDRs on external financing conditions were limited.²⁴

Economic costs of a restructuring could also vary depending on macroeconomic and financial conditions facing the country. A comparison of the real GDP contractions (see IMF, 2021) suggests that the worst outcomes were observed when banking crises occurred in the same year as debt restructurings, followed by debt restructurings that occurred after banking crises, that is, when financial systems were already weak.

Empirical evidence also offers interesting insights into the quantitative constraints deployed in the model. Specifically:

²³ This is also confirmed by Erce, Mallucci, and Picarelli (2022), who show that domestic bond restructurings without CACs took on average 20.6 months to complete, those with CACs took 8.7 months to complete, compared with 38.3 months on average for EDRs.

²⁴ The more muted credit contractions in DDRs compared to comprehensive restructurings could be explained by relatively shallow financial systems in countries that opted for DDRs.

- A stand-alone restructuring (external or domestic) is avoided if the share of that type of debt in total (and therefore the potential debt relief from restructuring) is small.
- In countries where comprehensive restructurings (EDR/DDRs) were attempted, the share of restructured debt in total was higher than in those that undertook DDRs or EDRs;
- Comprehensive restructurings (EDR/DDRs) tended to be selected when both the debt sustainability problem and pre-restructuring economic stress were significant, that is, a situation in which a corner solution (i.e., stand-alone EDR or DDR) was unlikely to have delivered the required debt relief.

These observations can help policymakers better calibrate their restructuring proposals to fit their own circumstances.

Additional Considerations

A simplified model such as the one described above cannot possibly account for all country-specific factors and eventualities that pop up during sovereign debt exchange operations. Here is a list of other factors—not explicitly discussed in the analytical framework above—that should be part of a policymakers’ checklist while undergoing the preparatory work before the launch of a restructuring. Failure to predict and address such issues are likely to understate both the fiscal cost as well as economic costs of domestic restructurings and lead to suboptimal outcomes post-exchange.

Potential Legal Issues

In some jurisdictions, legality/constitutionality of a restructuring may need to be ascertained before a domestic debt exchange is announced. Restructuring of domestic securities held by foreign investors may create legal problems, most notably by potentially violating constitutional norms in the debtor country or triggering claims under international investment treaties (e.g., bilateral investment treaties (BITs) or free trade agreements (FTAs)).²⁵ These can lead to international investment arbitration in different tribunals (e.g., International Centre for Settlement of Investment Disputes, ICSID) and be costly. Therefore, fiscal authorities may seek a formal legal opinion on this issue *ceteris paribus* as a way to assess the potential for legal challenges brought by creditors in court.²⁶

Legal and operational challenges of implementing a debt restructuring involving failure of (a large number of) financial institutions need to be considered. A review of the financial crisis management framework relating to banks and non-bank financial institutions may be warranted ahead of the announcement of the restructuring to determine what, if any, changes could be made to strengthen the resolution regime and the operational capacity to resolve banks and other financial institutions. Similarly, potential legal and operational stumbling blocks to implementing bank resolution need to be reviewed to allow smooth application of the resolution tools, including the bailing in of subordinated and/or senior creditors or recapitalizing banks using public funds, while mitigating the risks of contagion.

²⁵ Grund (2023) discusses the case of Greece, a successful restructuring, which nevertheless involved a significant degree of litigation and arbitration. Some FTAs (e.g., Canada-EU Trade Agreement, CETA) have attempted to address this issue by making it more difficult for investors to challenge negotiated debt restructurings (see Bianco, 2021).

²⁶ The constitutionality of a debt exchange involving a face value reduction of claims was assessed as potentially the most important impediment for a debt exchange in Jamaica. The Attorney General’s recommendation in the context of JDX stressed the voluntary nature of the exchange as key for making it constitutionally acceptable.

Non-resident Investors

Another factor that may impact the financial sector balance sheet (while not being a restructuring policy instrument *per se*) is the composition of the investor base. Presence of foreign investors could reduce the impact of a debt restructuring on domestic financial institutions and should, therefore, be taken into account in designing the restructuring. For any given level of haircut, the larger the share of nonresident investors, the smaller the recapitalization need of the domestic financial sector (thus larger the NDR, resulting in an upward shift of the RLC).

In general, the presence of nonresident investors helps reduce the direct link between domestic financial institutions and government and through that reduce their vulnerability to sovereign risk, with implications for both the asset and liability sides of the financial institutions' balance sheet (e.g., Grigorian and Manole, 2017). However, while empirical evidence is inconclusive, this may come at the expense of greater (price and exchange rate) volatility and result in more pronounced capital outflows at a time of stress/restructurings. (See Grigorian (2019) and references therein).²⁷

Burden Sharing and Intercreditor Equity

Burden sharing (between creditor types, debt instruments, etc.) is neither a necessary nor a sufficient element for a successful debt restructuring.²⁸ However, to the extent the authorities find it important to establish it (e.g., for fairness considerations or to achieve higher participation rates, etc.), burden sharing could be incorporated into the restructuring framework more explicitly.²⁹ In this case, it is important to adequately measure the burden that will have fallen on each group of creditors by factoring in the specifics of individual debt instruments being restructured. For example, in case of domestic currency-denominated securities, the loss of purchasing power due to inflation may be considered and measured using either the exchange rate or a relevant asset price index.

However, *ex ante* lack of perceived intercreditor equity could undermine the success of a modern debt restructuring often involving official, commercial, and bilateral creditors.³⁰ This may happen due to suspicions among creditor group about the restructuring deal that other groups may have received, leading to a tougher negotiating stance. Buchheit and Gulati (2022) suggest a mechanism, a “most favored creditor” clause, to achieve intercreditor equity as a way of breaking a potential impasse. However, as admitted by authors, enforcing comparability of treatment remains subject to transparency and methodological issues (e.g., selection of an appropriate discount rate across all creditor groups) among other challenges, and is therefore very challenging to achieve.

Asonuma, Niepelt, and Ranciere (2022) provide empirical evidence and corresponding rationale for *ex post* differences in treatment between debt securities along the maturity curve during sovereign restructuring episodes using instrument-specific haircuts accepted by private creditors during 1999–2020. They find that *ex ante* creditor losses during sovereign debt restructurings are larger for short- than for long-term debt.

²⁷ It is the expectation of an unpredictable and potentially more litigious behavior by a large body of nonresident bondholders that may have influenced the decision of Greek authorities in 2012 to issue the new securities in foreign instead of domestic law (as was the case with old/restructured securities).

²⁸ The fact that there are successful EDR-only and DDR-only restructuring cases proves this point.

²⁹ This could be done via introduction of constraints in the model that specifically rule out the corner solutions.

³⁰ The G20 CF has in fact acknowledged this problem and attempted to solve it, albeit so far with limited success.

Choice of the Discount Rate

The choice of the discount rate used for evaluating sovereign debt restructurings—specifically for calculating the haircut passed on to the creditors by the debtor—in emerging markets is an important one. Most widely used methods are as follows:

$$\text{Haircut} = 1 - (\text{PV of the new debt}/\text{FV of the old debt});$$

$$\text{Haircut} = 1 - (\text{PV of the new debt}/\text{PV of the old debt})^{31}$$

where FV is the face value (often 100) and PV is the present value calculated at the discount rate in question. The ratio in the parenthesis on the right-hand side of the equations is the estimate of the recovery value of old debt instruments.

Kozack (2005) discusses the selection of discount rates for evaluating restructuring outcomes. She points out that the sensitivity of NPV calculations to the choice of the discount rate can affect assessments of individual debt restructuring cases and “has led to some skepticism regarding their use.” To see why, note that the haircut is a positive function of the discount factor under both formulas.³² Therefore, debtors have an incentive to use lower discount factors in calculations (thus *understating* the haircut they impose), while the creditor have the incentive to use higher discount factors (thus *overstating* the haircut they receive).³³ Practitioners often use exit yield proxies for market conditions after the restructuring as discount factors, which can be equally problematic. For the assessment of comparability of treatment (at least in the context of the G20 CF), Rivetti (2022) proposes to replace the existing discretionary methodology with a common discount rate of the borrower’s “market exit yield” or a proxy of the cost of debt post-restructuring.

One such proxy for the use as a discount factor in DDR-only cases, in our view, is the CB policy rate at the time of the restructuring. A CB policy rate is typically strongly correlated with cost of funding; is a forward-looking indicator of macro-financial conditions; and, therefore, is a suitable proxy for a discount factor in assessing restructuring outcomes. In cases where the policy rates had differed from the fiscal yields prior to the crisis/restructuring (i.e., during tranquil times), a spread—equal the difference between the fiscal rate and CB’s policy rate—could be added to the CB policy rate. Doing so may reduce the arbitrariness of the use of exit yields and the incentives of creditors and debtors to influence the narrative. It is unlikely that an independent CB would reduce its policy rate to fit the incentive of fiscal authorities (to report lower haircuts) at the expense of undermining its own stance (presumably chosen given the macro-financial challenges facing the economy).

The subsequent section discusses a few simple hypothetical scenarios of sovereigns facing unsustainable debt overhang where restructurings are considered part of the strategy to restore sustainability. The above model is then applied to see what portions of public debt, if any, could be restructured to that end while minimizing economic disruptions caused by the exchange.

³¹ This option is used by Sturzenegger and Zettelmeyer (2005), where the authors discount the flows using the yield of the new instruments immediately after the results of the exchange became public information, a method not feasible for *ex ante* estimation of restructuring outcomes.

³² This is less so in the case of the first formula, since the denominator of the ratio in parenthesis in the second formula moves to partially compensate for the drop of the numerator.

³³ This is only relevant if maturity extensions and interest rate reductions are part of the calculation. Face value reduction is not affected by the choice of the discount factor/exit yield.

IV. Stylized Applications of the Decision Framework

Country A's overall public debt is at 130 percent of GDP and is considered unsustainable. DSA estimates suggest that a reduction of FV of debt by 40 percentage points will render the debt sustainable on forward looking basis. The distribution of Country A's debt by creditors is as follows:

| Type of creditor | Existing debt | Framework-predicted restructured/new debt |
|--------------------------------------|---------------|---|
| <i>in percent of GDP</i> | | |
| Multilateral financial institutions | 20 | 20 |
| Official bilateral (inc. Paris Club) | 10 | 5 |
| External private | 70 | 35 |
| Domestic private | 30 | 30 |
| Total | 130 | 90 |

The authorities' estimate of the economic cost of domestic restructuring is higher than that of external restructuring, due to a broad domestic investor base (including retail) and the potentially significant reduction of credit by the affected domestic banks. The authorities also feel that they could cut the face value of the bilateral obligations in half, due to a special relation they enjoy with the creditor. They also estimated the maximum NDR given the shape of Country A-specific restructuring Laffer Curve to be 10 percent of GDP, achievable at a haircut of 40 percent (implying 2 percent of GDP in recapitalization costs).³⁴ Finally, given the history of similar debt restructuring episodes and the secondary market value of its externally traded debt the authorities think they could achieve an amicable restructuring by offering a 50 percent haircut on its external private debt.

Taking these factors into consideration and applying the above framework would suggest a bilateral debt relief of 5 percent and an EDR-only debt exchange (i.e., domestic private debt is not restructured) that will result in additional 35 percent reduction of stock of debt.

Country B owes 120 percent of GDP in debt to its creditors, a debt burden that is considered unsustainable. Given the country's low capacity to carry debt, a DSA-suggested reduction of at least 60 percent of GDP will be required to bring debt to a sustainable level. The distribution of Country B's debt by creditors is shown below.

| Type of creditor | Existing debt | Framework-predicted restructured/new debt |
|--------------------------------------|---------------|---|
| <i>in percent of GDP</i> | | |
| Multilateral financial institutions | 10 | 10 |
| Official bilateral (inc. Paris Club) | 10 | 0 |
| External private | 80 | 48 |
| Domestic private | 40 | 22 |
| Total | 140 | 80 |

³⁴ $10.0 = 30.0 \times 0.4 - 2.0$ (that is, gross debt relief of 12 percent of GDP—after applying a 40-percent haircut to the outstanding stock of debt of 30 percent of GDP—minus an estimated 2 percent of GDP of recapitalization cost).

The authorities feel that they can achieve a complete write-down of bilateral debt by offering the creditor a special access privileges on the development of its new hydrocarbon project. In addition, the authorities and their advisers estimate the maximum haircut they can impose on private external creditors is 40 percent, potentially generating gross debt relief of 32 percent of GDP. Finally, they estimate that the NDR obtainable from the domestic creditors reaches its maximum at 20 percent of GDP at a haircut of 60 percent (implying 4 percent of GDP in recapitalization costs).³⁵ Finally, the authorities assess the economic cost of a DDR to be markedly greater than that of an EDR.

Taking these factors into consideration, the above framework would predict a write-off of bilateral debt and a combined EDR-DDR with 32 percent gross savings from EDR (i.e., at 40 percent haircut) and 18 percent NDR secured via DDR (i.e., less than the maximum achievable of 20).³⁶

Country C owes much of its 110 percent of GDP debt to official—both multilateral and bilateral—lenders. It is assessed that the country needs to reduce its public debt to below 60 percent of GDP (i.e., by at least 50 percent) to be sustainable. The distribution of Country C's debt by creditors is as follows:

| Type of creditor | Existing debt | Framework-predicted restructured/new debt |
|--------------------------------------|---------------|---|
| <i>in percent of GDP</i> | | |
| Multilateral financial institutions | 55 | 55 |
| Official bilateral (inc. Paris Club) | 30 | ... |
| External private | 15 | ... |
| Domestic private | 10 | ... |
| Total | 110 | ... |

A market-based debt restructuring is unlikely to reduce Country C's debt to a sustainable level (which would require a near complete write-off of its bilateral and private debt) without triggering a financial crisis (with a resulting need for sizable fiscal injections) and messy litigations and cutting the country off from the markets for an extended period of time. Therefore, the framework would predict no restructuring given the parameters of the exercise. This implies that a new DRT—consistent with a tighter fiscal path—should be designed to secure debt sustainability for another iteration of the framework. However, in practice, fiscal adjustment has its limits and provides no guarantees that a solution could be found.

As expected, the framework's predictions change along with the parameter assumptions. If the estimate of the economic cost of external restructuring in Country A turned out to be greater than that of the domestic restructuring, both EDR and DDR would take place, securing debt relief of 25 and 10 percent of GDP, respectively. Similarly, if the feasible debt relief obtainable from external creditors in Country B was 20 percent (and not 40 percent), no restructuring would take place because no feasible debt restructuring will reduce the debt stock to a sustainable level.

³⁵ $20.0 = 40.0 \times 0.6 - 4.0$

³⁶ The fact that EDR is maxed out (i.e., the maximum relief is obtained from external debt holders) before the savings from DDR are applied is a result of the assumption that the economic cost of the unit of DDR is higher than that of EDR.

V. Conclusion

DDRs are becoming part of a standard toolkit for reducing sovereign indebtedness. While already occurring as often as external debt restructurings, they are likely to gain even more prominence in the post-COVID-19 world where both the overall debt as well as domestic debt have climbed to unprecedented levels.

The paper is intended as a practical guide to policymakers tasked with addressing unsustainable public debt. The decision to restructure is entirely their own. The paper simply offers guidance on how to navigate through the maze of an otherwise complex process of restructuring domestic sovereign debt once such a decision has been made.

The success of DDRs should be looked at from the same prism as any other restructuring—it should secure debt sustainability and restore access to credit. A restructuring that falls short of achieving these objectives should be carefully weighed against the economic and financial costs involved and perhaps be shelved in favor of fiscal adjustment.

Understanding and properly measuring the net fiscal gains from a restructuring are key to the decision whether or not to restructure domestic debt. In this context, the paper discusses the inputs for proper measurement of fiscal costs of recapitalizing financial institutions and safeguarding financial stability.

Just as important is the notion of economic cost of restructuring, for both external and domestic debt, which policymakers should aim to minimize. Economic costs are comprised of any economic, political economy, and reputational considerations that may influence the desirability of restructuring one category of debt and its creditors relative to another. While country circumstances may vary widely, the paper offers guidance as to what factors may influence the *relative* economic costs (of domestic vs. external restructurings), a key variable in the decision-making framework outlined in Section III.

The paper emphasizes the importance of financial stability risks and ways/costs of ringfencing it. This is because domestic restructurings impose direct costs on the local financial system, potentially reducing the (fiscal) savings for the sovereign from the debt exchange. Also, if left unchecked, financial instability may jeopardize efforts to stabilize debt and add to fiscal burden. The paper shows that when internalized, this externality may result in a smaller debt relief accrued to the sovereign and *ceteris paribus* make it less likely for a domestic restructuring to take place.

Finally, the paper highlights a checklist of legal and structural issues (such as, burden sharing and the choice of the discount factor for evaluating restructuring outcomes) that should be part of the decision process. Subsequent research could focus on factors that may influence access to domestic credit in the aftermath of a DDR. While we conjecture that sovereign debt restructurings that do not involve face value haircuts of debt securities (i.e., include coupon reduction and/or extension of maturities) *ceteris paribus* have smaller impact on the balance sheet of domestic banks (and therefore on their ability to lend post restructuring), more evidence of this as well as on other factors influencing access to credit would be useful.

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