

# INNOVATIVE FINANCING INSTRUMENTS IN LATIN AMERICA AND THE CARIBBEAN

Esteban Pérez Caldentey  
Francisco G. Villarreal  
(Editors)



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# Innovative financing instruments in Latin America and the Caribbean

Esteban Pérez Caldentey  
Francisco G. Villarreal  
(Editors)



UNITED NATIONS



This document was prepared and coordinated by Esteban Pérez Caldentey, Chief of the Financing for Development Unit in the Economic Development Division of the Economic Commission for Latin America and the Caribbean (ECLAC), and Francisco G. Villarreal, Economic Affairs Officer in the same Unit.

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A portion of the document was prepared as part of the activities of the United Nations Development Account project 2023Z, "Response and Recovery: Mobilising financial resources for development in the time of COVID-19".

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United Nations publication  
LC/TS.2022/229  
Distribution: L  
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Printed at United Nations, Santiago  
S.22-00765

This publication should be cited as: E. Pérez Caldentey and F. G. Villarreal (eds.), "Innovative financing instruments in Latin America and the Caribbean", *Project Documents* (LC/TS.2022/229), Santiago, Economic Commission for Latin America and the Caribbean (ECLAC), 2023.

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## Summary

In the aftermath of the Global Financial Crisis (GFC) (2008-2009) the external financing needs of Latin America and the Caribbean have increased significantly reflecting a process of external debt accumulation that has occurred in all developing regions. This process of debt accumulation has been reinforced by the impacts of COVID-19. Latin America and the Caribbean (LAC) is the most indebted region in the developing world. LAC's debt profile makes the region highly vulnerable to changes in international lending conditions and to perceptions of risk in issuing countries, increasing their volatility, and making them more liable to sudden reversals. This context has placed a major constraint on government responses to confront the urgency of COVID-19 and, in the medium-term, undermines their capacity to recover. This book focuses on two proposals to address these challenges: (i) expanding and redistributing liquidity from developed to developing countries through innovative uses of Special Drawing Rights (SDRs); (ii) expanding the set of innovative instruments aimed at increasing debt repayment capacity and avoiding excessive indebtedness. The innovative instruments comprise state contingent instruments, hurricane clauses, green bonds and a multilateral credit rating agency.



## Introduction

*Esteban Pérez Caldentey  
Francisco G. Villarreal*

### **A. Latin America's widening financing gap and debt accumulation**

In the aftermath of the Global Financial Crisis (GFC) (2008-2009) the external financing needs of Latin America and the Caribbean (LAC)<sup>1</sup> have expanded significantly. Between 2010 and 2020 these increased from US\$279 to US\$643 billion dollars (figure 1). The rise in external financing needs reflects on the one hand, the deterioration of the region's current account position between 2010 and 2018 (-US\$ 99 and -140 billion dollars respectively).

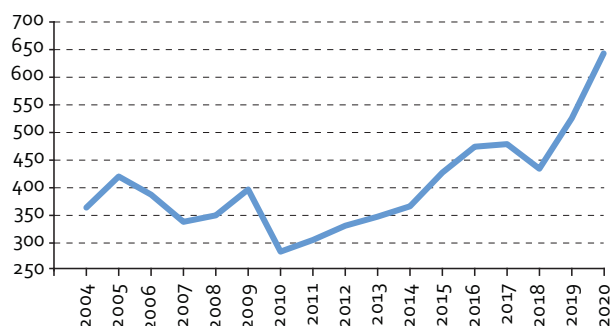
On the other hand, the increase in financing needs captures a more important process of external debt accumulation that has occurred in all developing regions since before the end of the GFC. Latin America and the Caribbean is the most indebted region within the developing world and also exhibits the highest debt-service ratio. Between 2007 and 2020 total external debt service as percentage of exports of goods and services for emerging and developing economies rose from 26.5% to 38.6%. At the regional level, for the same period, total debt service increased from 19.5% to 50.2%, 37.0% to 59.5%, from 15% to 29.9% and from 19.1% to 32.8% for Emerging and developing Asia, Latin America and the Caribbean, Middle East and Central Asia, and Sub-Saharan Africa respectively.<sup>2</sup>

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<sup>1</sup> The external financing needs are computed as the sum of the current account balance plus external debt amortization.

<sup>2</sup> IMF (2022a).

**Figure 1**  
**The evolution of the external financing**  
**needs of Latin America and the**  
**Caribbean 2004-2020**  
*(Billions of dollars)*



Source: On the basis of IMF (2022a).

Note: Financing needs are computed as the sum of the current account balance and private and public debt amortization.

The process of debt accumulation is to large extent driven by the international capital market. Between 2010 and 2020, the share of international securities as a percentage of total external finance for Latin America and the Caribbean increased from 43% to 50%. The process of debt accumulation has affected all the different institutional sectors including the central/general government, private banks, and the non-financial corporate sector. This is a distinctive feature of this period relative to the 1990s and the early 2000s, when external debt was concentrated mainly within the general government sector.<sup>3</sup>

As seen in figure 2, in the 1990s, the issuance of bonds by the government increased whereas it remained flat for private banks and the non-financial corporate sector. Prior to the onset of the Global Financial Crisis which can be dated to the fall of Lehman Brothers in September 2008, the stock of debt issued in the international bond market hovered above US\$ 200 billion largely surpassing that of private banks and non-financial corporations (US\$ 10 and 50 billion).

Although not all countries have access to the international capital market, and not all those with access enjoy the same conditions, there has been an increasing number of Latin American and Caribbean economies that since 2007 have turned to the capital market for finance. Between 2007 and 2020 an average of 14 Latin American and Caribbean countries, including larger, medium, and small sized countries, issued bonds in the international capital markets.<sup>4</sup>

The increase in indebtedness in the international capital market was facilitated to a great extent by the adoption of an expansionary monetary policy by the major central banks of the developed world. Between 2007 and 2013 the combined balance sheet of the Federal Reserve Board of the United States, the European Central Bank, the Bank of Japan, and the Bank of China more than doubled (US\$ 5 and 13 trillion dollars). This expansionary stance continued throughout the 2010s to reach US\$ 31 trillion dollars in 2021.<sup>5</sup>

As a result, long-term yields recorded significant declines. In the United States the ten-year benchmark treasury bond declined from 4.6% in 2007 to 2.4% in 2013 to 1.44% in 2021. Similarly, in the case of the Euro Zone, the 10-year benchmark yield declined from 4.3%, to 3.6% to 0.20% for the same years.<sup>6</sup>

Low long-term yields lured investors into seeking higher returns by investing in riskier assets in the developing world. This greater demand was matched by an increased supply of bonds from emerging and developing economies. The low yields for external debt issue increased the relative cost of issuing debt denominated in domestic currency versus debt denominated in foreign currency. Also, the decline in international interest rates lowered exchange change risk.

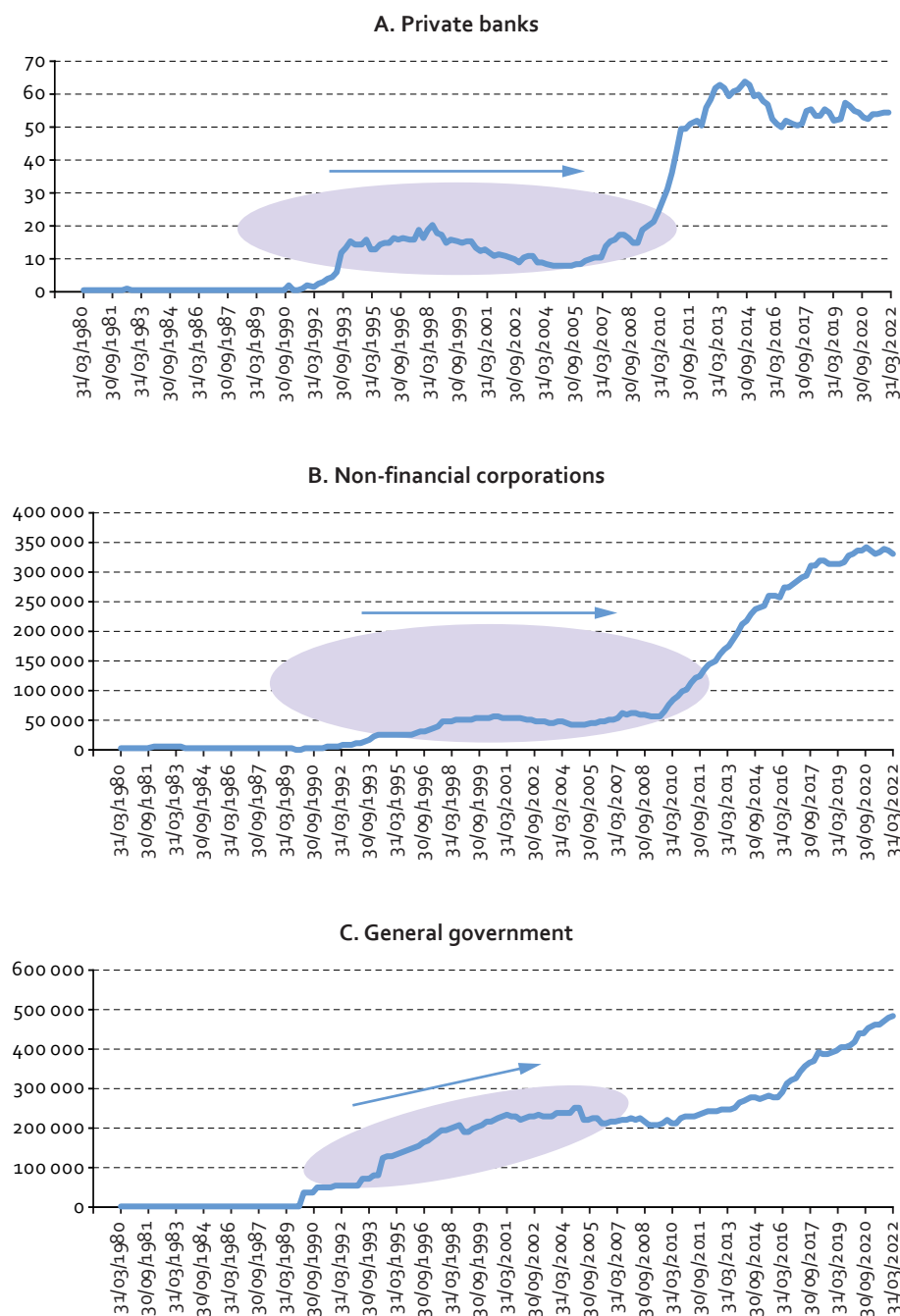
<sup>3</sup> BIS (2022b).

<sup>4</sup> ECLAC (2022b).

<sup>5</sup> Yardemis (2022a).

<sup>6</sup> Fred (2022).

**Figure 2**  
**Stock of debt for private banks, non-financial corporations,**  
**and the general government, March 1980-March 2022**



Source: On the basis of BIS (2022b).

As in the case of other developing economies, countries of Latin America and the Caribbean were also able to issue bonds in the international capital markets with longer maturities. The average maturity of all bond issues reached 13 years in 2020 with a minimum and a maximum of 2 and 64 years respectively. By comparison in 2010 the average of Latin American and Caribbean bonds was 9 years, with a minimum and a maximum of 0 and 60 years respectively. An analysis by type of debt issuer shows that the longest

maturities are found in sovereigns (17.6 years on average), followed quasi sovereigns (15.6 years on average), non-financial sector corporates (12.5 years on average), and banking sector issuers and supra-nationals (6.8 and 5.9 years on average) (ECLAC 2022b). Longer bond maturities also minimize the possibility of debt restructuring which tends to be interpreted by private investors as a *de facto* default.

Since 2021 international financial conditions have become more restrictive as a result of the significant recent surge in inflation. The surge in inflation is a global phenomenon affecting both developed and developing economies. Inflation is seen as a major stumbling block to a post-pandemic sustainable recovery. Irrespective of its origins, the task of reducing inflation has been addressed through restrictive central bank policies, including by increasing short-term interest rates and through quantitative tightening. For their part, long-term yields have also increased.

In the case of the Federal Reserve Bank of the United States which is the most important central bank in the world, quantitative tightening began to be implemented in June 2022. The objective is to reduce the current balance sheet standing at nearly US\$ 9 trillion dollars to US\$ 6 trillion dollars by around 2025.<sup>7</sup>

Quantitative tightening aims at reducing monetary stimulus by, on the one hand, not rolling over a given percentage of maturing treasury bonds and, on the other hand, by selling agency debt and agency mortgage-backed securities. The limit placed on maturing treasury bonds was set at US 30 billion dollars in June 2022 increasing to 60\$ billion in September of the same year. The limit placed on agency debt and agency mortgage-backed securities was established at US\$ \$17.5 billion per month in June 2022 which will increase to \$35 billion per month in September.<sup>8</sup>

The potential effects of quantitative tightening are not well known. The only precedent is the episode that took place during 2017-2019. From October 2017 to July 2019, the Federal Reserve decreased its security holdings by US\$ 640 billion, which was equivalent to a 16% reduction in its open market securities portfolio. This episode was brought to halt by the significant liquidity restriction it caused in the short-term funding market.<sup>9</sup>

All major central banks with the exceptions of Japan and China have increased their short-term rates of interest to respond to the rise in prices. The steepest rises in policy rates have been implemented in the developing world. This responds not only to inflation concerns but also to the fact that the rise in interest rates in developed countries puts significant pressure of nominal exchange rates and country risk in developing countries increasing the external debt burden.

## B. The weak response of multilateral financing institutions

Latin America and the Caribbean received the largest financial support from the IMF relative to other regions. In 2021, IMF emergency financing to Latin America and the Caribbean reached US\$ 118 billions which was much higher than that received by Asia and the Pacific, Emerging Europe, Middle East and Central Asia and Sub-Saharan Africa (US\$ 2.6, 6.7, 17, 26 billion respectively). However, in the case of the World Bank, most of the support provided for fiscal years 2020 and 2021 went to Africa with 38% of the total while Latin America and the Caribbean received 14% of the total.<sup>10</sup>

If all the financial support provided by multilateral institutions is taken into account for the year 2020, Latin America and the Caribbean received US\$ 322 and 220 billion dollars (with and without IMF flexible credit lines) covering only 31% and 15% of the financing needs of the region (figure 3).<sup>11</sup>

Not only has the multilateral response fallen short of the liquidity needs of developing countries including those of Latin America and the Caribbean but it has also failed to provide a short-term and long-term solution to the debt problematic, which is one of the most pressing issues in developing world.

<sup>7</sup> Hirt and Quigley (2022).

<sup>8</sup> Federal Reserve Board (2022).

<sup>9</sup> Hirt and Quigley (2022).

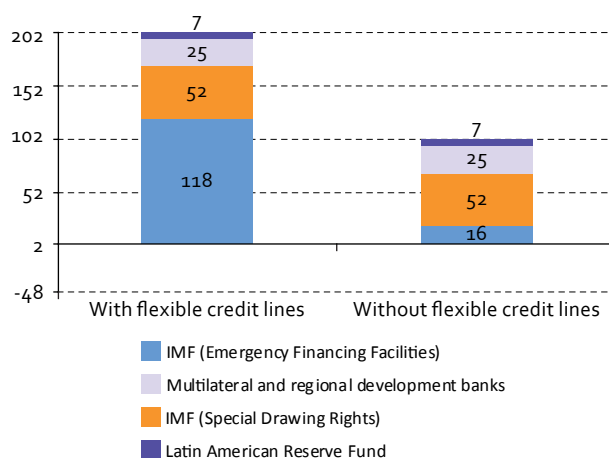
<sup>10</sup> IMF (2022b).

<sup>11</sup> See ECLAC (2021).



As a response to the inevitable increase in debt resulting from higher expenditures to confront the effects of the Pandemic and lower tax intake due to the contraction in economic activity, the G20 approved the only initiative to provide debt relief to developing countries, the Debt Service Suspension Initiative (DSSI). The DSSI was implemented in April 2020 and ended in December 2021. The DSSI was a temporary suspension of debt service (principal or interest) to official bilateral creditors, which accounted for a minority of the total for participating countries (around 38% of the total).

**Figure 3**  
**Latin America and the Caribbean**  
**Financial response of multilateral/regional institutions to the Pandemic, 2020**  
*(Billions of dollars)*



Note: Multilateral and regional development banks include the World Bank, the Latin American Development Bank (CAF), the Central American Bank for Economic Integration (CABEI), the Caribbean Development Bank (CDB) and FONPLATA.

Source: On the basis of ECLAC (2021a) and IMF (2022a).

According to the most recent available data (IMF, 2022c) 60% of developing countries that were either eligible/participating in the DSSI initiative are at high risk or already in debt distress (at a more general level 30 percent of emerging market countries and 60 percent of low-income nations are in or near debt distress). This indicates that a debt moratorium does not solve the debt problematic and does not shield countries from debt distress.

Debt alleviation is, by definition, a temporary measure. It cannot address a long-term, structural problematic such as the rise in debt that has affected developing countries for more than, a decade. The G 20 Common Framework for Debt Treatment is meant to tackle longer term debt problems suffers from shortcomings that are similar to those that affected the Debt Service Suspension Initiative (DSSI):<sup>12</sup> lack of participation of relevant stakeholders and limited applicability (applied only to low-income countries and vulnerable middle-income countries (ECLAC 2021a). Only three countries are participating (Ethiopia, Ghana, and Zambia) and there have been significant delays in its implementation. The War in Ukraine and the consequent rise in food and energy prices adds additional pressure to this context.

### C. Proposals to address the debt and liquidity problematic of Latin American countries

Latin America and the Caribbean's predicament reflects the general problematic of middle-income countries (MICs). MICs represent an important component to world growth in terms of aggregate demand and population. MICs represent 45% and 30% of total investment and exports, and a third of global GDP.

<sup>12</sup> The G 20 Common Framework for Debt Treatment is "...an agreement of the G20 and Paris Club countries to coordinate and cooperate on debt treatments for up to 73 low-income countries that are eligible for the Debt Service Suspension Initiative (DSSI)." IMF (2021). See also G20 (2020). The DSSI lasted from May 2020 to December 2021 and it provided relief of US\$ 13 billion dollars to 48 countries.

They are also important for global financial stability as they account for 96% of developing country debt (excluding China and India). Furthermore, they also represent more than 75% of the world's population. At the same time, they are characterized by similar challenges to those confronting low-income countries. MICs are home to 62% of the world's poor.<sup>33</sup> MICs are thus key actors to comply with Agenda 2030 and the fulfillment of the sustainable development goals.

Yet at the same time their middle-income status prevents them, in general, from having access to the same type of international cooperation allowed to low-income countries.

Per capita income is considered by the international cooperation system including multilateral financial institutions as the key variable that summarizes the level of development of countries. It is also assumed that the increase in per capita income is accompanied by an improvement in the quality of institutions of emerging market and developing economies, and most important by a greater capacity to mobilize domestic and external resources to finance their economic and social development. As a result, when countries move up in the income ladder, they should become less dependent on grants and concessional finance, and even on the financing provided by multilateral institutions. They should rely more on private external finance.

This point of view ignores the fact that middle income countries face similar economic and social challenges as lower income countries, and that the impact of external shocks such as COVID-19 does not distinguish between levels of income and can deepen the structural imbalances of both low and middle-income countries.

The available empirical evidence also demonstrates that the capacity to mobilize domestic and external resources is not necessarily related to GDP per capita. In economies highly dependent on the external sector (both in real and financial terms) the mobilization of domestic resources depends on the international economic cycle, on structural factors (the composition of the tax) and also on the willingness and efficiency of international cooperation to combat tax evasion and illicit flows.

For its part, access to external resources may depend on a wide range of factors beyond per capita income criteria including external conditions that are beyond the control of middle-income countries, risk perceptions, external demand conditions, and country size.

In addition, countries that share similar income levels, such as upper-middle-income have different capacities to mobilize domestic and external resources. Mobilization capacities must also be adapted to very different realities in their economic and social development, including different levels of access to social protection mechanisms, quality in education and health, different levels of financial inclusion, and differentiated levels of resilience to face economic and social shocks.

The COVID-19 pandemic and its devastating effects related to the short and longer run, the lack of capacity of emerging and developing market economies to engineer a sustained recovery, the current challenges posed by the surge of inflation which is forcing countries to increase monetary policy rates, and the uncertain external context created by the war in Ukraine underscore the urgency of addressing the financing for development predicament of emerging market and developing economies, including those of Latin America and the Caribbean.

The Economic Commission for Latin America and the Caribbean (ECLAC) proposed an innovative financing for development agenda for the recovery in the region based on five policy actions: (i) expand and redistribute liquidity from developed to developing countries; (ii) strengthen regional cooperation by enhancing the lending and response capacity of regional, subregional and national financial institutions, and strengthening linkages between them; (iii) carry out institutional reform of the multilateral debt architecture; (iv) expand the set of innovative instruments aimed at increasing debt repayment capacity and avoiding excessive indebtedness and (v) integrate liquidity and debt reduction measures into a development financing strategy aimed at building forward better (ECLAC, 2021a).

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<sup>33</sup> ECLAC (2021d).

This text expands the proposals described in ECLAC's innovative financing for development agenda for the recovery (ECLAC 2021a) related to the expansion and redistribution of global liquidity from developed to developing countries focussing on innovative uses of Special Drawing Rights (SDRs), and the proposals for long-term debt reduction and debt sustainability through the use of innovative financing instruments. The text is divided into six chapters focussing on SDRs, State Contingent Debt Instruments, including an in-depth discussion of Income-linked Bonds and the adoption of Hurricane Clauses, green and sustainable linked bonds and a proposal for a Multilateral Credit Rating Agency.

## D. Special drawing rights as a tool for economic and social development<sup>14</sup>

The first chapter centers on Special Drawing Rights (SDRs) explains their advantages, builds the case for the reallocation of SDRs from developed to developing economies and argues that SDRs can be used for other purposes beyond those of buffing up international reserves, including for government expenditures and as equity. It further sustains that the latter use need not conflict or undermine its function as a reserve asset.

The SDR is defined as an interest-bearing reserve asset created by the IMF to supplement other reserve assets of member countries. SDRs can be held and used only by participants in the SDR department (established after the creation of the SDR to conduct all SDR transactions)<sup>15</sup>, by the IMF through the General Resources Account (GRA) and by the fifteen existing prescribed SDR holders.<sup>16</sup> Latin America and the Caribbean have only two prescribed holders: the Latin American Reserve Fund (FLAR) and the Eastern Caribbean Central Bank (ECCB).

In an official sense the SDR is on the one hand a "bookkeeping device...a computer entry on the books of the IMF."<sup>17</sup> It also performs the function of unit of account for all IMF transactions and for some private transactions. Current private transactions that include the SDR as a unit of account include the transit fees for the Suez Canal, airline liability limits for luggage and persons established by the Montréal Convention (1999).<sup>18</sup> It also functions as a means of payments among monetary authorities of the participating countries of the IMF and also between monetary authorities of the participating countries of the IMF and the IMF.

SDRs offer five advantages to IMF member countries. First, they are an automatic line of credit and are available to all countries regardless of their level of income. Second, SDRs do not generate debt, as they do not entail an obligation for repayment of the principal. Third, SDRs do not carry any associated policy conditionalities. Fourth, the use of SDRs generates a very low, below-market interest rate (0.05%), which is advantageous for countries that have high risk premiums. Finally, SDRs increase reserve assets without countries having to incur the costs that are normally associated with reserve accumulation.<sup>19</sup>

There is no prescribed use for SDRs. The recommendation is that their use be consistent with macroeconomic sustainability including monetary and external sustainability and stability (IMF, 2021e, 2021k). The available empirical evidence shows that developing countries have a much greater demand for SDR use than developed ones, and that this gap between SDR use in developing and developed countries widens significantly during crises episodes. Between August 2021 and January 2022 only developing countries made use of their stock of SDRs (which includes the SDR allocation of US\$ 650 billion implemented in August 2021) (figure 4).

<sup>14</sup> Chapter I complements work by ECLAC on SDRs that was partly undertaken as part of the Development Account Project and that served as input for ECLAC's 12<sup>th</sup> Policy Brief (ECLAC 2021a) which was presented at the United Nations Headquarters in November 2021 to Latin American and Caribbean member states.

<sup>15</sup> All IMF members are also members of the SDR department.

<sup>16</sup> IMF (2010).

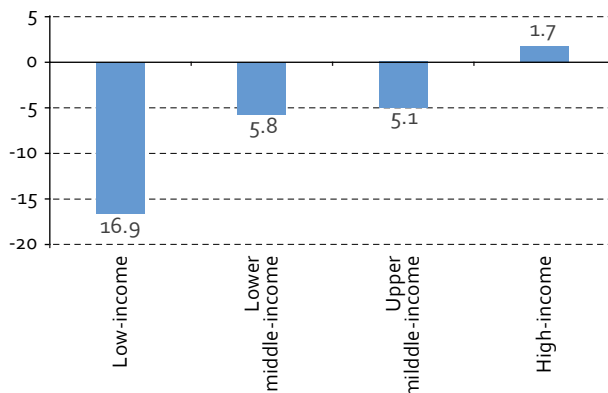
<sup>17</sup> FRBNY (1981-82).

<sup>18</sup> See IMF (1981) pp.97-98 for examples of other transactions that use the SDR as a unit of account. See also, Hogue and Tadesse (2011).

<sup>19</sup> See ECLAC (2021a) for a more detailed explanation of the advantages of SDRs.

The evidence shows that SDRs are used for different purposes including fiscal purposes through different schemes, repayment of official debt and reserve accumulation. During the GFC, several economies, including Bosnia and Herzegovina, Mauritania, the Republic of Moldova, Serbia, Ukraine and Zimbabwe, used a significant part or their entire allocation for fiscal purposes. In the current pandemic context, 39 countries —among them Colombia, Ecuador and Paraguay in Latin America and the Caribbean— have recorded US\$ 37.3 billion worth of SDRs on government balance sheets (Arauz & Cashman, 2021 and 2022).

**Figure 4**  
Change in SDR in holdings, August 2021-January 2022  
(Percentages)



Source: On the basis of Plant (2022).

A further use of SDRs' introduced by the shift from responding to the pandemic to the design of policy initiatives to build forward better is as equity capital to be used by a trust fund or a development bank. The chapter on SDRs presents a preliminary proposal for a trust fund for middle income countries in line with the recommendation of the Secretary-General of the United Nations that the "establishment of a new trust fund to be housed at the IMF should ... be considered to support middle-income countries, and SIDS in particular, in their response and recovery efforts" (United Nations, 2021)<sup>20</sup>. The trust fund would largely be financed using SDRs as capital to leverage resources.

The chapter supports proposals to use SDRs to capitalize development banks and leverage resources. According to Lazard (2022), given the leverage ratio of multilateral banks, 100 SDR could produce SDR 300 or 400 in investments. If this reasoning is applied to regional development banks in Latin America and the Caribbean, 100 SDR could produce about SDR 200 in investments.

Using SDRs as capital is opposed by mainstream economic thinking on the grounds that it conflicts with the reserve asset nature of SDRs which means that it must be highly liquid and carry very low or zero risk for the lender. An illustrative example is provided by the European Central Bank (2021):

"National central banks of EU (European Union) Member States may only lend their SDRs to the IMF if this is compatible with the monetary financing prohibition included in the Treaty on the Functioning of the European Union. Retaining the reserve asset status of the resulting claims is paramount. This requires that the claims remain highly liquid and of high credit quality. The direct financing of multilateral development banks by national central banks of EU Member States through SDR channeling is not compatible with the monetary financing prohibition."

The liquidity property of an asset means that it "...can be bought, sold for foreign currency with minimum cost and time, and without unduly affecting the value of the asset—that is there needs to be a liquid and deep market for these assets and no major restrictions impeding such transactions." (IMF, 2015).

<sup>20</sup> SIDS is an acronym referring to Small Island Developing States, which are a group of developing countries that are small island countries which share similar sustainable development challenges such as their vulnerability to natural disasters or rising sea levels.

As explained by Lazard (2022), liquidity and credit-risk are not absolute but rather state-contingent concepts. In fact, central banks keep a wide array of reserve assets with different degrees of liquidity and credit quality.

In practice, in existing financing arrangements such as the Poverty and Reduction Growth Trust Fund (PRGTF), the liquidity property of SDRs is guaranteed through an encashment regime. This allows SDR lenders, mainly developed countries, to request early repayment of their outstanding claims in case of balance of payments/reserve difficulties (IMF, 2016). However, these developed countries are least likely to experience balance of payments difficulties relative to developing countries. In particular, the European Union, Japan, and the United States issue reserve currencies and as a result would not need to resort to the application of an encashment regimen to solve balance of payments or reserve difficulties.

## E. State-contingent debt instruments: GDP and income-linked bonds<sup>21</sup>

Chapters II through IV center on state-contingent debt instruments (SCDIs). Chapter II provides an overview of state-contingent debt instruments as insurance against future binding liquidity constraints and sovereign debt crisis in Latin America. Chapter II also focusses on state contingent convertible bonds (S-CoCos). GDP-linked bonds and the use of Hurricane clauses are analyzed in more depth in chapters III and IV.

SCDIs link the capacity of a country to service its debt obligations to the evolution of its economic performance. These instruments provide an insurance mechanism in bad times against fiscal liquidity crunches thus reducing the probability of debt default and debt restructuring.

When a country faces a contingency that affects its capacity to pay its external debt obligations it is confronted with two alternative policy choices. The first consists in paying its total debt obligations. If as a result, the country is unable to generate adequate tax revenues to meet public spending, and the scope for domestic borrowing or domestic financing is limited, adjusting primary spending in response to rising debt service may close the current fiscal gap. However, this may entail significant costs in terms of foregone social spending and growth. The second choice consists in restructuring its debt profile. While debt restructuring can be beneficial in the medium and long-run, it tends to be seen by private investors as a *de facto* debt default which can impose significant costs on an economy including preventing future market access for a prolonged period.

SCDIs were designed to improve liquidity and sustainability for indebted governments in times of economic downturns very often produced by exogenous shocks. These instruments enable debtors to share their exposure to risk with creditors. The risk-sharing would be defined, *ex ante*, in the clauses and conditions of issue of the sovereign bond. This would make explicit the commitment of debtor and creditor to share the burden of adjustment allowing markets to incorporate these risk-sharing elements into the price of the debt. In addition, by tying the debt service payments of new or restructured debt contracts to future outcomes, state-contingent clauses would help to improve debt management and expand fiscal space thus reducing the likelihood of sovereign defaults.

SCDIs can be broadly divided into two categories. The first one includes debt instruments featuring continuous adjustment of debt service payments. This is exemplified by a GDP-linked bond, where payments are indexed to the behaviour of nominal or real GDP.

The second category refers to debt instruments involving discrete adjustment. This refers for instance, to instruments with natural disaster clauses where debt service relief is triggered by a predefined natural disaster event, or bonds that would automatically extend in repayment maturity when a country has lost market access or when it receives emergency liquidity assistance from the official multilateral sector (for example in the face of a shock to exports). This would include Sovereign Contingent Convertible bonds, Disaster-linked Bonds, and also Hurricane-linked Clauses.

<sup>21</sup> See Chapters II, III, and IV by Vera Azaf (2022), Hernández (2022) and Seerattan (2022).

## 1. GDP-linked bonds

GDP-linked bonds are a countercyclical instrument linking the capacity of a country to fulfill its debt obligations to the evolution of its economic performance as captured the Gross Domestic Product (GDP). Indexing securities to GDP performance is an insurance mechanism, that seeks to avoid the occurrence of fiscal liquidity constraints, debt distress or solvency crises episodes.

There are different variants in the design of GDP-linked bonds depending on whether: (i) the indexation is applied to the annual interest rate paid on a bond (coupon) or the principal or both; and (ii) whether the indexation is based on the GDP (nominal) level or its rate of growth. The description below presents the case of a GDP-linked bond in the case of indexing the annual interest payments to the rate of growth of GDP.

The design of the GDP-linked bond consists in specifying the return on the bond as a function of the yield on a conventional bond with the same maturity as that of the GDP linked bond ( $r$ ) plus the expected average rate of GDP growth over the lifetime of the bonds relative to base year (or trend growth) ( $\dot{g}_{GDP}$ ) and an GDP (*Risk premium*). That is,

$$(1) \text{ Total return of a GDP – linked bond} = f(r + \dot{g}_{GDP} + \text{GDP Risk premium}).$$

The risk premium compensates investors for risk of holding a GDP-linked bond relative to a conventional bond. This risk refers to the smaller cash flow received by an investor when the growth of GDP is below that of the base year or trend growth.

The benefits of these bonds are that they can improve fiscal sustainability due to the reduction in debt service costs and credit spreads. The use of these instruments also increases the space for countercyclical fiscal policy space. Holders of conventional bonds also benefit from these instruments thereby strengthening the international monetary and financial system by reducing default risk. In the case of the creditor a GDP linked bond provides a broader, and more stable source of income.

Contrarily lack of liquid markets for a new financial instrument, lack of markets to hedge GDP risk and difficulties in pricing can undermine the feasibility of GDP linked bonds. GDP-linked bonds may not be considered a useful instrument if the investor is unable to corroborate the macroeconomic data due to unreliable national accounting statistics.

A key issue in the implementation of GDP-linked bond is the pricing of the GDP premium. Since there are few historical precedents and no established market for GDP-linked index bonds the pricing of the GDP premium is subject to a high level of uncertainty. This is reflected in the wide range of estimates for the GDP premium. Moreover, there is no standard methodology for estimating the GDP premium, so that different methodologies can yield different estimates. The existing uncertainty may be an obstacle in finding common ground between the issuer (the government) and the investor which have differing interests in determining the GDP premium. The premium will also be affected by risk related to exchange rate movements.

Most of the available studies on the use of GDP-linked bonds focus on developed countries. Some of the main findings include the following:

- The benefits of GDP-linked bonds in reducing default risk is larger for countries with lower credit rating (Benford et al., 2016).
- The benefits of GDP-linked bonds are larger for countries with a more volatile GDP (Ibid and Barr et al, 2014).
- The benefits of GDP-linked bonds are larger for countries that have a more constrained monetary policy (ibid).
- An analysis for the European Union (Bonfim and Pereira, 2018) show that GDP-linked bonds reduce interest rates payments during sovereign crisis providing greater fiscal space. At the same time interest payments increase during growth periods.
- An analysis for emerging and advanced economies shows that GDP-linked bonds increases the correlation between the primary balance and GDP growth (Bonfim and Pereira, 2018).

The issuance of GDP-linked bonds is limited to a few countries. The list of countries that have issued bonds with GDP-indexed features include Bulgaria (1994), Bosnia and Herzegovina (1997), Singapore (2011), Argentina (2005) and Greece (2012).<sup>22</sup> The most recent experiment is that of Italy.

## 2. Income-linked bonds

Chapter III argues that national income rather than GDP is the most relevant measure to gauge a small open economy's performance. National income takes into consideration all the relevant external determining factors such as the terms-of-trade effects, and remittances that are not included in the computation of the Gross Domestic Product (GDP). Also income-linked bonds can provide more reassurance to foreign investors as they include more exogenous elements than GDP-linked bonds (terms-of-trade and remittances).

This type of bond is highly relevant these for countries dependent on remittances and on external trade. In Latin America and the Caribbean, Mexico, Honduras, Costa Rica, Jamaica and Nicaragua are cases of countries with a high export coefficient. The smaller economies of the region including El Salvador, Nicaragua, Honduras, Guatemala, Dominican Republic, and the Caribbean are not only highly open to trade but are also dependent on remittances.

## 3. State contingent convertible bonds

State contingent convertible bonds (S-CoCos) is another contingent debt instrument (like GDP linked bonds) that is considered in the literature. These bonds allow payment standstill (either in interest and or principal)/maturity extension when some indicator(s) breaches a given threshold.

The design of the bond must define four elements. These are: the trigger for maturity extension, the length of the maturity extension; the scope of the bonds that are covered; coupon payments; and number of maturity extensions.

The trigger must be defined in advance. There are different triggers found in the literature (i) extensions in maturity repayment when a country receives official sector emergency liquidity assistance; (ii) face value haircuts and automatic maturity extensions are triggered when pre-defined debt to GDP ratio thresholds are breached; (iii) automatic maturity extension if export revenues fall below a pre-defined level. The maturity extension must long enough to allow the government to overcome its liquidity problems.

Regarding the scope of the bonds covered, it is recommended including all sovereign and sovereign-guaranteed bonds. Interest payments would depend on the type of state contingent bond. If only a maturity extension is considered, then the coupon payments should continue as stipulated. Finally, multiple maturity extensions should be excluded.

State contingent convertible bonds provide short-term breathing space as this financial instrument addresses liquidity crises. As in the case of GDP-linked bonds they also improve burden-sharing of private sector creditors. Moreover, they reduce the size of official sector support.

## 4. Disaster-linked and hurricane-linked clauses

A disaster-linked and Hurricane-linked clause is designed to provide cash flow relief at the crucial period after a natural disaster event, just when financing needs are high and new sources of funding may be limited. The suspension of principal and/or interest payments will then be tied to those indicators reaching pre-defined thresholds. This deferral is at the option of the issuer.

The Caribbean region is highly exposed to natural disasters, especially hurricanes. The frequency and intensity of these events have increased overtime Catastrophic events as hurricanes can caused damages estimated at more than 100% of the GDP in many Caribbean countries. Natural disasters are detrimental to long-term growth and capacity accumulation and results in higher levels of indebtedness.

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<sup>22</sup> See Hernández (2021).

Hurricanes in the Caribbean also have a long-lasting negative impact on tourism which is the mainstay industry of the Caribbean. The recovery from these shocks is consequently very hard for these countries and large portion of the losses from Hurricanes are uninsured. Efforts to help in these events will make a huge difference in their development.

Hurricane clauses give countries them a legally binding and automatic option to defer debt payments in the event of a qualifying natural disaster. Built-in debt relief can help governments absorb some of the financial and economic costs of natural disasters.

The rationale for the introduction of hurricane clauses into debt contracts is founded on the following elements:

- Liquidity Relief: easing of fiscal constrains in the event of disaster, provides immediate relief as opposed to mechanisms that take some time to implement and it is used at the discretion of the issuer giving the affected country greater control over the financial response to the crisis event.
- A built-in mechanism to deal with pre-existing unsustainable debt: the prevention of default in the wake of a crisis event and ensuring debt sustainability in difficult circumstances outside of the control of the impacted country. The deferral embedded in the hurricane clause avoids costs associated with a formal debt restructuring process in the aftermath of a natural disaster which also reduces the likelihood of a disorderly default. Combination of high vulnerability to natural disasters and low capacity to respond due to high debt levels and the related underinvestment in climate resilient infrastructure.
- International financial architecture for sovereign debt: development financing has in the past not taken account of the special vulnerabilities of Caribbean economies. HCs can potentially help to deal with these unique vulnerabilities in a way that facilitate the achievement of SDGs but also assist with debt sustainability.

In practice Hurricane Clauses have been used in two cases of debt restructuring in the Caribbean: Grenada (2013-2015) and Barbados (2018-2020). One of the lessons learned from these cases include the careful calibration of the size of the trigger used to determine the use of a Hurricane Clause.

Another important issue is the range of events that would qualify as a natural disaster. One of the recommendations is to implement a Hurricane Clause along with other types of policy measures, including a credible medium-term macroeconomic framework. Furthermore, countries should have at their disposal other instruments, given the wide damage imposed by natural disasters and, most important, count with the backing of an international financial institutions throughout the process. Finally, the use of Hurricane clauses involves a trade-off between the relief granted by the temporary suspension of debt service obligations and the capitalized payments to be made following the period of temporary suspension of debt service payments.

## 5. Sustainable bonds<sup>23</sup>

An option to improve the sustainability of the debt profile of emerging market and developing economies is to tap the green, social and sustainability linked bond market to finance project related to the achievement of the Sustainable Development Goals (SDGs). This issue is addressed in Chapter V.

The chapter analyzes and describes the functioning of this market at the global and for different emerging market and developing economies with a focus on Latin America and the Caribbean. More specifically it analyses the policy and regulatory drives of sustainable bond-linked issues highlighting the importance of regulations mandating pension funds in key markets in Latin America.

In 2020, the green, social, sustainability and sustainability-linked bonds were above US\$ 600 billion dollars and reached US\$ 775 billion in the first nine months of 2021. More than half of these issues (US \$382 billion) were aligned with the UN's Sustainable Development Goals.

<sup>23</sup> See Kerrigan (2022).



Of this amount 63.6% of green, social, sustainability and sustainability-linked bonds issuances were aligned with the Sustainable Development Goals. The five most covered SDGs amounted to over 50% and include: Goal 3 (Good health and well-being), Goal 11 (Sustainable cities and communities), Goal 7 (Affordable and clean energy), Goal 13 (Climate action), Goal 9 (Industry innovation and infrastructure). The largest increase was for Goal 3, which saw an increase from 4.36% to 16.34%.<sup>24</sup>

Available data for Latin America and the Caribbean shows that between January-September 2021, green, social, sustainability and sustainability-linked bonds issues totaled US\$ 39 billion (31.5% of the total international bond issuance for Latin America and the Caribbean for this period).

The chapter also provides a description of challenges involved in issuing sustainable bonds. These include the monitoring of risks, how to develop taxonomies to support further market growth, and how prevent the use of the proceeds of these bonds for financial rather than for social and economic development. In addition, the chapter underscores the importance of strong and solid institutions for the proper functioning of the sustainable-linked bond market.

## F. Credit Agencies and a proposal for Multilateral Credit Agency

### 1. Purpose and importance of Credit Rating Agencies (CRAs)

A credit rating agency (CRA) is a company that assigns credit ratings. Credit ratings are a method of valuation of a debtor's ability to pay back debt by making timely principal and interest payments and the likelihood of default. CRAs are supposed to fill the market gap of credit information, providing investors with most relevant information that would make the market more effective and efficient. Credit rating agencies not only resolve the information asymmetry between debt issuers and investors but also shape to a great extent the conditions under which countries access funding in international capital markets.

Credit rating agencies (CRAs) are an important component of the financing for development architecture. As a result, the analysis and evaluation of their role cannot be separated from that of the global financing for development architecture, especially since international capital markets have gained importance as a financing source for developing economies.

Credit rating agencies are generally attributed three traditional functions. First, they provide an objective measure of the credit risk of a debt issuer and to resolve the fundamental information asymmetry between debt issuers and investors. The riskiness of investing in a security is determined by the likelihood that the debt issuer (say a sovereign nation) will fail to make timely interest payments on the debt.

Second, they provide a means of comparison across all issues of embedded credit risk and provide a consistent global rating scale to help build a portfolio. This is essential for the investor.

Third, they provide market participants with a common standard or language to refer to credit risk. In this sense, at least theoretically, CRAs' work involves levelling the playing field and making agents invest on an equal basis. By generating information and providing the basis for rational investment decisions, CRAs are also supposed to reduce procyclicality and volatility.

Credit rating agencies have significant influence over market movements. These have become overtime highly influential and shape, to a large extent, the conditions under which countries can access private capital markets. As a result, credit rating agencies not only can affect the value of assets and of collaterals but also volatility and financial stability.

### 2. Credit Rating Agencies (CRAs): criticisms and challenges

The current credit rating environment faces five important challenges: (i) the time horizon problem; (ii) the CRAs' track record; (iii) the existing conflict between the private and public interest; (iv) the consequences of herd behaviour and market sentiment; and (v) the failure of ratings to guide public policy.

<sup>24</sup> UN Women (2021).

### 3. The time horizon problem

CRAs ratings are based on time periods ranging between 3 to 5 years. This is problematic because it provides insufficient information to the type of investors who are focused on longer-term horizons, such as pension funds, hedge funds, and insurance companies. As a result, within the current credit environment, the CRAs' target audience is merely a subsegment of professional investors with a more short-term oriented, speculative profile, leaving aside investors with longer time horizons who must rely on in-house evaluation or other sources of information to evaluate credit risk and the probability of default.

The time horizon problem has more of a negative effect on the credit ratings of emerging market and developing economies than on developed economies. The former group of countries rely on longer-term projects for their economic and social development whose positive effects on the valuation of credit do not enter in the credit assessment of CRAs.

### 4. CRAs track record

The empirical evidence shows that CRAs have a mediocre track record as shown by the credit rating assessments during the Asian financial crisis of 1997–1998, the Enron scandal of 2001, the global financial crisis of 2008, and the European sovereign debt crisis of 2011. The credit rating assessments were unable to reflect the imbalances that triggered these crises episodes could have mislead investors. This type of failures contributes to increasing systemic risk and financial instability.

### 5. The existing conflict between the private and public interest

The issuer-pays model is the primary business model adopted by CRAs. According to the issuer-pays business model, CRAs are paid directly by the countries or companies that issue debt in the international capital markets. This provides an incentive for CRAs to be accommodative in its credit assessment with the issuer as it is the primary source of revenues for CRAs. If CRAs perceive the threat of losing revenues if their ratings are not accommodative to debt issuers, their credit assessment may fail to represent the actual credit risk. The existing evidence also indicates that market concentration within the credit rating market is an influential factor in the downgrading of credit risk and providing negative credit outlooks.

### 6. The consequences of herd behaviour and market sentiment

Most of CRAs assessments are based on micro rather than macroeconomic dynamics which has led to the absence of a systemic theory of business or financial cycle linked to the CRAs short-termism and procyclicality.

From a macroeconomic perspective, CRAs' focus on short-term horizons and pro cyclicity contributes to generating market sentiment and financial volatility. Additionally, the market power of the "big three" CRAs, together with their short-term horizons can contribute to generate herding behaviour as CRAs act collectively without centralized direction.

From a developing country perspective, the link between rating agencies, procyclical behavior, and market sentiment is reflected in the evolution of capital flows. As shown in empirical exercises (Mohapatra and Ratha, 2020) credit ratings have an impact in directing capital flows. If ratings are procyclical and this affects the direction of capital flows and thus the triggering and transmission mechanisms, and the fluctuations and intensity of the business cycle. Also credit ratings paly an important role in endogenizing the business cycle (Kohler and Stockhammer, 2022).

The impact of CRAs on emerging markets and developing economies tends to be procyclical, increasing borrowing costs during domestic and international turmoil. The procyclical effects operate mainly through change in warnings and revisions; the prevailing legal environment; and the repercussion of passive investment funds.

Empirical evidence shows that sovereign rating lag market prices—that is, when CRAs adjust their ratings, market participants have already priced in the rating change in the security value. According to this interpretation, investing is based on investor's own analysis, and credit rating evaluations would have only a marginal effect on their decisions. In fact, CRAs' risk assessments, and credit warnings and revisions increase the cost of borrowing and thus the demand for external borrowing.

The legal framework within investors operate is another critical channel through which ratings impact emerging market and developing economies. Regulatory frameworks do not allow investing below specific ratings. For instance, if ratings are below Baa3 or BBB, an asset in question is defined as a non-investment grade security, also known as a sub-investment grade/high yield bond. Thus, when CRAs assign a downgrade below the investment grade, a market selloff reaction may occur, hurting further the already distressed finances of the issuer. If the issuer is a government, the selloff may have cascading effects on the country's macro-financial stability, with potential capital flights, currency overshooting, fiscal imbalances, and balance of payments difficulties.

Finally, the structure of the investment industry has also to be considered as investment funds that apply passive investment strategies have acquired substantial relevance in the last decades - mutual funds and exchange traded funds represent roughly 41% of the market share. As a result, when ratings change, the value of the index to which they are linked changes as well, and the wealth of investors—often households—is also affected.

## 7. The failure of ratings to guide public policy

CRAs failure to guide public policy can be exemplified with the 2011-2012 Euro crisis. In 2010 the fear of excessive sovereign indebtedness led lenders to demand higher interest rates from those Eurozone states with high debt and deficit levels making it harder for these countries to finance their budget deficits when faced with overall low economic growth.

The inevitability of a crisis was reflected in rising spreads on sovereign bond yields between the affected peripheral member states of Greece, Ireland, Portugal, Spain, Italy, and the more developed countries of the Euro Zone, and especially Germany. The European Central Bank (ECB) intervened to calm credit markets and reduce the spread through a bond-buying program.

Initially, the ECB purchased member state government bonds on the basis, of valuations determined by CRA credit ratings. But as soon as CRAs downgraded other southern European countries, the ECB had to shift its policy stance as a rating-oriented intervention would have amplified the crisis, spreading it to other economies and provoking a contagion effect. Ultimately, the ECB changed its policy, showing how ratings are not a good guide for policymakers. Indeed, CRAs do not consider the social consequences and contagion effects of downgrades, an issue which is highly relevant to emerging market and developing countries as they are strongly reliant on international credit.

## 8. Some policy recommendations to improve the functioning of CRAs

Policy recommendations to improve the functioning of CRAs include the recognition that they are not only data-driven but also include subjective valuations. In this sense, an important recommendation would be to implement a legal framework in which the discretionary component from CRAs analysts would be disclosed and improve transparency by separating how much is judgment and how much is data-driven for each rating.

The policy should aim at a model-based rating that relies on technology for processing abundant available data. To achieve a model-based rating, however, more competitiveness in the market is required as CRAs are a long-standing oligopoly and don't have the incentive to change their business model and bring information in. Fostering competitiveness among credit ratings is crucial, even though it is difficult. It is complex to increase competition because reputation is critical, and it is hard for a new incumbent to gain market share. As long as the market has not accepted them, it will continue operating with an oligopolistic regime.

Increasing the dialogue between CRAs and the public sector would also be beneficial in coordination and avoiding misinterpretation of norms and dispositions. An example is the recent Debt Service Suspension Initiative (DSSI) that, from May 2020 to December 2021, suspended \$13 billion in debt-service payments owed by participating countries to their creditors.

The way CRAs reacted to DSSI suggests their misinterpretation of what DSSI meant. Indeed, despite the announcement of the DSSI for relief purposes, credit rating agencies did not view private creditor participation in the initiative as a rating neutral event. As a result, many countries have been reluctant to participate in the DSSI for fear of a credit downgrade, which could ultimately impair their ability to access capital markets.

### 9. A new perspective: a Multilateral Credit Rating Agency (MCRA)

Credit rating agencies must be designed to serve the public purpose and global public goods rather than private interests. This basic argument can justify the establishment of a MCRA to counterbalance the power of private credit rating agencies. A MCRA should have two main objectives. The first is to improve and stabilize credit risk assessments of government debt. The second is to facilitate the achievement of the sustainable development goals (SDGs).

A first step to achieve the first objective is to improve the transparency of the methodology used to assess the credit worthiness of national governments. As things stand, private CRAs publish their methodologies online but do not provide a complete public disclosure of the way they rate government debt issues. The undisclosed details of the credit rating methodologies of CRAs serve as a means to distinguish themselves for their competitor and to increase profitability. Not surprisingly, there are no empirical studies that validate CRAs' methods.

The improvement in transparency should be complemented with a rating methodology that contemplates longer time horizons to evaluate the performance of sovereign debt which is particularly relevant in the case of emerging and developing countries. The extension in the time horizons for evaluating credit risk could be implemented through fan charts and scenario analysis.

Improving credit risk assessment of government indebtedness involves undertaking a granular analysis of the socio and economic factors underlining debt repayments as well as a collaborative effort with other relevant institutions to establish adequate prudential oversight mechanisms as well as definite accountability mechanisms.

Regarding the second objective, a MCRA should include the degree of achievement in the SDGs in the metrics used to gauge for EMDE government ratings, particularly those related to social and climate change issues. Indeed, the sustainability of EMDE government debt relates not only to fiscal and financial matters but also to their progress in achieving the SDGs, which is contingent on how climate change unfolds.

Other aspects that are addressed in Chapter VI are the funding of the MCRA, the need to avoid regulatory capture and the conflicts of interest that characterize private credit rating agencies.

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# I. Special Drawing Rights: advantages, limitations, and innovative uses<sup>1</sup>

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## Introduction

Special Drawing Rights (SDRs) were created by the International Monetary Fund (IMF) in 1969 at a time of international reserve scarcity to supplement the reserve assets of IMF member countries. SDRs are not money per se but rather a potential claim on freely usable currencies of member countries. SDRs can be traded for these currencies at a variable but very low rate of interest. SDRs are a source of liquidity that can be particularly useful to small and financially constrained economies. In times of financial distress, SDRs offer a source of finance that is significantly cheaper than those available through the international capital market. Nations can use SDRs for a wide range of operations including: accumulating international reserves; payments of loans and financial obligations with the IMF and its members; and bolstering their fiscal budget in times of need.

When an allocation takes place, countries receive SDRs in proportion to their IMF quota which is largely determined by their GDP. This means that the lion's share of the assets (roughly 64%) are allocated to developed countries. For large economies like the United States, China or the United Kingdom, countries with national currencies that serve as an international reserve asset, the influx of new SDRs is of low significance relative to their total reserves. In advanced economies these assets seldom account for more than 5% of their total international reserves. SDRs can also be held by certain designated official entities termed prescribed holders, like multilateral development banks and international/regional monetary institutions.

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<sup>1</sup> This document is based partly on ECLAC (2021).

<sup>2</sup> ECLAC.

Since their inception, there have been five allocations of SDRs. The largest allocation took place in 2021 as the COVID pandemic placed a particular strain on international liquidity. “This new SDR allocation featured three core objectives: 1/ offer additional reserve assets to countries with fragile balance of payments; 2/ relax countries’ budget constraints during the COVID pandemic, for instance to purchase vaccines; and 3/ help countries address longer-term climate challenges and digital transformation” (Lazard, 2022). Despite these intentions, only about one third of the new SDRs allocated were assigned to developing countries, the ones most gravely in need of international reserves. Since then, several large economies through the G20 have pledged to recycle their new SDRs to low- and vulnerable middle-income economies.

Three options stand out as possible ways in which these new assets could be recycled to countries in need. SDRs could be channeled to the Poverty Reduction and Growth Trust (PRGT) or the Resilience and Sustainability Trust (RST), both of which operate under the management of the IMF. These trusts do not hold SDRs directly but rather facilitate subsidized loans to countries in need while ensuring the asset’s high liquidity and zero risk properties through an encashment regime. The PRGT and RST model could be used by prescribed holders such as multilateral development banks, provided they maintain a similar encashment mechanism. A third option consists of allowing prescribed holders to use SDRs as leverage for loans from the financial market. This would require solving the issue of whether SDRs could remain on the recipient’s balance sheet while maintaining its properties as a reserve asset.

Amidst these options, the SDRs’ prescribed properties of being a zero risk and highly liquid asset remain the major arguments against reallocation between countries and the use of them as capital to leverage resources. In practice, the use of encashment regimes guarantees the contingent liquidity of the asset. Considering that SDRs make up a marginal portion of developed countries’ reserves and that several of these large economies issue reserve currencies, the financial stability of potential lender is unlikely to be compromised. The willingness of developed economies to follow through with the promises of facilitating their SDR reserves will largely determine the degree to which the IMF’s three objectives regarding the most recent allocation will be fulfilled.

The remainder of this chapter is organized as follows. Section I outlines SDRs’ advantages and shortcomings. Section II describes the mechanisms by which SDRs could be recycled to countries in need. Section III concludes with a brief discussion of the inherent contradictions in the use of SDRs.

## A. Special Drawing Rights (SDRs) and their limitations

SDRs can be held and used only by participants in the SDR department,<sup>3</sup> by the IMF through its General Resources Account (GRA), and by the fifteen existing prescribed SDR holders.<sup>4</sup> Latin America and the Caribbean have two prescribed holders: the Latin American Reserve Fund (FLAR) and the Eastern Caribbean Central Bank (ECCB). SDRs are not money in the traditional sense of the term. Rather, they are a claim on freely convertible currency. That is those currencies that play a pivotal role in international trade and financial transactions: the United States dollar, the British Pound, the Euro, the Japanese Yen, and the Chinese Renminbi.

<sup>3</sup> All IMF members are also members of the SDR department.

<sup>4</sup> Prescribed holders include three central banks: European Central Bank, Bank of Central African States, Central Bank of West African States; two intergovernmental monetary institutions: Bank for International Settlements, and the Arab Monetary Fund; and eight development finance institutions: African Development Bank, African Development Fund, Asian Development Bank, International Bank for Reconstruction and Development and the International Development Association, Islamic Development Bank, Nordic Investment Bank, and International Fund for Agricultural Development. <https://www.imf.org/en/About/FAQ/special-drawing-right>. August 21, 2021.



## 1. SDRs and Their Advantages

Despite their limitations, SDRs have several advantages over other liquidity facilities provided by the IMF. First, SDRs can be granted on an automatic basis to the members of the IMF SDR department. Their issue does not need any backing of any asset whatsoever and they are created literally at the 'stroke of a pen'.

Second, SDRs are a loan without any obligation to repay the principal. Third, the use of SDRs, that is the exchange of SDRs for freely convertible currencies entails the payment of a concessional interest rate, currently set at 0.005%.

Fourth, the holdings of SDRs increases international reserves and thus can contribute to maintain external financial stability and improve a country's risk perception.

Fifth, SDRs do not have a prescribed use and have proven to be a versatile and flexible financial instrument that can be used for several purposes other than that of accumulating international reserves. These include official-debt repayment, debt restructuring and fiscal expenditure (see table I.1 below).

**Table I.1**  
Fiscal use of the 2021 SDR allocation in Latin America and the Caribbean  
(Millions of dollars)

IMF Member	2021 SDR allocation	Fiscal use	Fiscal uses (Percentages of allocation)
Antigua and Barbuda	27	27	100
Argentina	4 351	8 554	197
Colombia	2 791	2 743	98
Ecuador	952	840	88
Guyana	248	242	98
Haiti	224	110	49
Honduras	341	336	99
Mexico	12 167	7	58
Panama	514	506	98
Paraguay	275	270	98

Source: Prepared by the authors based on Arauz et al. (2022) & IMF (2021a).

## 2. The inherent limitations and contradictions of SDRs

SDRs were created at a time when the biggest problem at the international level was the actual and perceived scarcity of international reserves. The SDR was created with two objectives. The first was to transform the SDR into the main international reserve asset. The second consisted in the use of the SDR to manage aggregate demand to avoid situations of inflation and deflation and to ensure the full use of existing resources.

The SDR has never lived up to its promise. SDRs account for roughly 4% of the total stock of international reserves which is minimal when compared with the 64% that is held in United States dollars. Also, the SDR is not used often as means to settle official transactions. It performs the function of unit of account for minor operations within the private sector (see Introduction to this volume).

The use of SDRs is limited by restrictive provisions which include the fact that they cannot be used by the private sector other than as a unit of account and by strict regulations regarding its issuance. Any issue of SDRs up to 100% of the quota of all IMF members (which represents roughly US\$ 650 billion dollars) requires the approval of 85% of the IMF's executive board members which implies that it must count with the approval of the United States Congress.

SDRs have never been issued on a recurrent basis. There have been four general SDR allocations (9.2 SDR billion in 1970-72; 12.1 SDR billion in 1979-1981; 161.2 billion in 2009; 465.5 SDR billion in 2021). Despite the increase in the value of the SDR issues over time their amount remains small in comparison to the growth in global financial assets especially since the 1990s.

Also, they do not have a “life on their own”: they are an unconditional right to obtain hard currencies and they are complex instruments, and not a transfer of net wealth. For example, they come with an obligation to send them back to the IMF should its members vote to cancel them (at an 85% supermajority)” (Lazard, 2022).

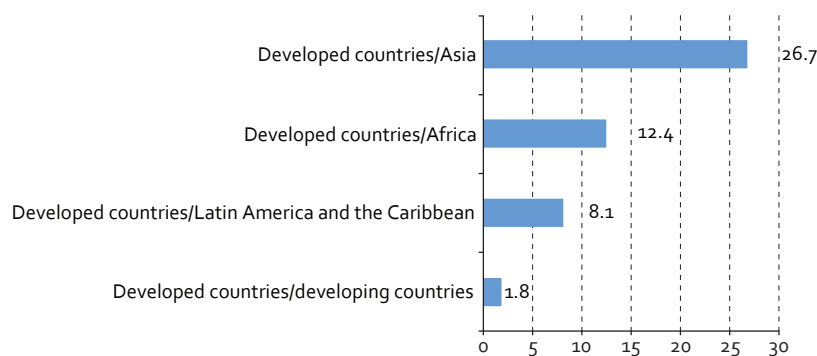
Furthermore, SDR issuance tends to favour developed country since country shares are determined by the IMF quota system which relies to a large extent on GDP. Developed countries have without exception received the bulk of the SDR. In 2021, developed countries received 64.4% of the allocation of SDR and developing countries the remaining 35.6%. Figure I.1 exemplifies this point by showing the General allocation of SDRs (August 2021) of developed countries relative to developing countries and to selected developing regions.

Yet at the same time, developed countries have a much lower use of SDRs than developing countries. The available evidence shows that the SDR mean utilization rates as a proportion of IMF quota reached 6% for developed countries and 20% for developing countries. Also, the SDR utilization gap tends to increase during crises as shown by the example of the Global Financial Crisis and the COVID-19 Pandemic.

The low usage of SDRs by developed countries can be explained by simple fact that most developed countries issue international reserve currencies and thus do not need SDR, either to boost their reserves, or to obtain liquidity by exchanging SDR for freely convertible currencies which is the exactly the case of developing countries. Thus, the countries that need SDRs the most are the ones that receive the smaller share.

Moreover, developed countries have the policy space and autonomy to undertake expansionary and full employment policies without excessive regard to their financial conditions and exchange rate parities. The opposite is the norm for developing countries. As shown in table I.2 a significant number of developing economies have non-floating exchange rate regimes. The opposite is the case of high-income countries.

**Figure I.1**  
General allocation of SDRs (August 2021) of developed countries relative to developing countries and to selected developing regions



Source: Prepared by the authors, on the basis of International Monetary Fund (IMF), “IMF Finances”, Washington, D.C. [online] <https://www.imf.org/external/np/fin/tad/query.aspx>.

Quantitative easing policies in the United States, the Euro Zone and Japan have increased their assets central bank assets by more than 3.5 times (US\$14.5 in November 2019 compared with US\$4 trillion before the Global Financial Crisis).

Developing countries including those of Latin America and the Caribbean face important restrictions at the financial and real economy levels, including most importantly the external constraint, to achieve the full use of their productive potential.

This has important social and economic costs. This asymmetry implies that counter cyclical policy is always an available policy option for developed countries (even if they do not take full advantage of such a prerogative, especially with regards to fiscal policy). In contrast, in the case of developing countries it is a policy option under very specific and limited circumstances.

**Table I.2**  
General allocation of SDR classified by type of exchange rate regime and income category

Exchange rate regime/ income categories	High-income	Upper middle-income	Lower middle-income	Low-income
Floating	391 162	71 607	31 393	1 329
In percentage of total	62	11	5	0
Non-floating	33 590	61 868	32 177	7 235
In percentage of total	5	10	5	1

Source: Prepared by the authors based on Lazard (2022).

Another facet of this situation is the asymmetry of adjustment between debtor and creditor countries. Latin America and the Caribbean are historical witnesses to this malaise. Indeed, the contractionary bias built into debtor countries typical short-term adjustment policy stance has remained a pervasive weakness of the global financial architecture and a stumbling block to global growth and full employment, as well as to the development of developing countries.

When developing countries are debtors the adjustment is compulsory. The onus of adjustment is always placed on the debtor country, which is generally the weaker and the smaller economy. Also, the economic and social strains required by the restoration of equilibrium tends to be out of proportion to the burden of the debt. When developed countries are the debtors (the United States prior to the Global Financial Crisis) they are not forced to adjust. The adjustment is voluntary.

In summary, the adjustment is always 'forced in the direction most disruptive to social and economic order and growth, and to throw the burden on the countries least able to support it, making the poor and poorer and preventing the development of the whole economy.'<sup>5</sup>

## B. The recycling of SDRs

The above analysis provides the basis to justify the recycling of SDRs from developed to developing countries. In October 2021, the G20 pledged to recycle \$100 billion worth of SDRs from members to vulnerable countries. To date, pledges appear to amount to about \$59.5 billion, not including \$21 billion from the United States, which failed to get congressional approval (Plant 2022; Seban et al, 2022) (table I.2).

**Table I.3**  
SDR allocation and pledges for recycling by country

Country	SDR Allocation (Billions of dollars)	Pledged (Billions of dollars)	Pledged (Percentages)
Australia	8.32	1.66	20
Canada	13.95	3.63	26
China	38.57	15.20	34

<sup>5</sup> See Keynes (1980).

Country	SDR Allocation (Billions of dollars)	Pledged (Billions of dollars)	Pledged (Percentages)
France	25.50	7.65	30
Germany	33.70	9.94	29
Italy	19.06	3.81	20
Japan	38.99	7.80	20
Netherlands	11.05	2.90	26
Saudi Arabia	12.65	0.66	5
South Korea	10.86	0.59	5
Spain	12.06	3.41	28
United Kingdom	25.50	5.10	20
Total	250.22	60.36	24

Source: Prepared by the authors based on Plant (2022) and Sebany et al. (2022).

## 1. Recycling SDRs through the Poverty Reduction and Growth Trust Fund

There are currently two on-lending mechanisms through which developed countries recycle SDRs to developing countries: the Poverty Reduction and Growth Trust (PRGT) and the Resilience and Sustainability Trust (RST).

The PRGT is an instrument of the IMF that provides concessional support to low- and middle-income countries that are deemed to be in debt distress. Thirty-four out of a total of fifty low-income countries (representing 68% of the total) are PRGT-eligible countries. Ten upper middle-income countries in debt distress are also PRGT-eligible countries (Dominica, Grenada, Guyana, Maldives, Marshall Islands, Samoa, St Lucia, St. Vincent and the Grenadines, Tonga and Tuvalu).<sup>6</sup>

The PRGT financial architecture consists of *Subsidy*, *Loan*, and *Reserve* accounts. The loans borrowed from countries at market interest rates are lent out through the Loan account to borrowers at low rates, often subsidized from the Subsidy accounts. The Subsidy account largely finance the subsidy costs through its balances, while the Reserve account provides collateral to lenders since its funds can be used to pay back loans in the case of late payment. Also, the investment revenue obtained from this account may be used to cover the costs of the subsidies. The PRGT is not an SDR-prescribed holder even though it receives SDRs from contributing countries. When loans are provided under the bilateral agreements, the lender earns SDR interest rate on the SDR-denominated loans.

In response to the pandemic, and as part of the fast-track loan mobilization effort, the PRGT provided US\$ 24 billion in funding to PRGT-eligible countries, out of which 63% was financed with lending of SDRs.<sup>7</sup>

There are two benefits of channelling SDRs through the PRGT. First, the lending country's assets are protected through the IMF's policy conditionalities and the Reserve Account. The Reserve Account provides collateral to lenders since its funds can be used to meet obligations in the event of delayed payments or default by PRGT borrowers. The Reserve Account was originally financed by the profits of gold sales in the late 1970s, reflows of the Trust Fund and Structural Adjustment Facility (SAF) repayments, as well as investment returns on balances held in it. The policy conditionalities provide another layer of safeguards by strengthening a country's macroeconomic fundamentals, as stated in the IMF's guidelines embedded in the PRGT. The PRGT loan resources including in the form of SDRs come from bilateral agreements with IMF members which earn an interest based on the prevailing SDR rate (Andrews, 2021a).

<sup>6</sup> See IMF (2020). In all there are 69 countries eligible for PRGT funding (IMF, 2021a). Guyana has met the PRGT graduation criteria and is set to graduate from PRGT status.

<sup>7</sup> See IMF (2021b). The developed countries that through bilateral agreements provided funding through SDRs include Japan, France, United Kingdom, Italy, Australia, and the Netherlands. The use of PRGF was facilitated by the increase in the annual access limit in the PRGT from 100 to 150 percent of quota. More recently the IMF (July 2021c) approved: (i) a 45 percent increase in the normal limits on access to concessional financing; (ii) the elimination of hard limits on access for the poorest countries and (iii) a two-stage funding strategy for the PRGT consisting in securing SDR 2.8 billion in subsidy resources and an additional SDR 12.6 billion in loan resources. The SDR 12.6 billion could be provided by loaning of SDRs from developed countries.

Secondly, PRGT eligible countries currently pay no interest on borrowed funds even though the IMF secures these loans at prevailing SDR interest rates. The difference is financed through the PRGT's Subsidy account which is funded by bilateral contributions from members and, the Fund's own resources, and returns from the investment of their balances.

Thus, based on its current configuration, reallocating SDRs through the PRGT would benefit both lenders and the borrowers. The lenders would have their assets secured and earn interest, while borrowers would be able access loans at no costs. However, increased lending through the PRGT requires corresponding increases in the Subsidy and Reserve accounts to subsidize the loans and to safeguard lenders from the possibility of default. These resources will have to be in the form of grants or earned income not loans.

Furthermore, reallocating SDRs using the PRGT platform would currently only benefit PRGT-eligible countries thereby excluding middle and low-income countries that are not PRGT-eligible but have urgent financial needs. Currently, only 39 countries, which represent 72 per cent of African countries, are listed as PRGT-eligible countries.

The PRGT has three important drawbacks. First, PRGT funding is subject to negotiated IMF programs which are subject to conditionality. Second, all SDR on-lending by developed countries is subject to an encashment regime. The encashment regime consists of a bilateral agreement between the lender country and the PRGT, whereby the PRGT commits itself to return the SDR in case the country in question is faced with balance-of-payments difficulties. As stated in the PRGT report for 2020, the encashment regime refers to "the right to seek early repayment of outstanding claims on the Trust in case of balance of payments and reserve needs and authorizes drawings by the Trustee to fund such encashment requests of other participating creditors to any of the Loan Accounts of the Trust" (IMF, October 2020, p. 5).

Third, the loan resources of the PRGT are small. According to the IMF, in 2020 which was an unusual year in terms of funding requirements "the PRGT lending commitments were projected to reach SDR 21 billion during the pandemic period under a Baseline scenario, more than four times the historical average on an annualized basis" (IMF 2021a, p. 2).

## **2. Recycling SDRs through the Resilience and Sustainability Trust**

The second option consists of channelling the SDRs through the Resilience and Sustainability Trust (RST). The RST, which is managed by the IMF, was established on April 13<sup>th</sup> 2022 and became operational on May 1<sup>st</sup>. The capital of the RST was set at SDR 33 billion or US\$ 45 billion dollars.

The mandate of the RST is to help "...low-income and vulnerable middle-income countries build resilience to external shocks and ensure sustainable growth, contributing to their longer-term balance of payments stability. It complements the IMF's existing lending toolkit by providing longer-term affordable financing to address longer-term structural challenges, including climate change and pandemic preparedness" (IMF, 2022a). RST-eligible countries include all low-income countries, all developing and vulnerable small states, and lower middle-income countries. Loan resources have a cap of 150% of quota or SDR 1 billion depending on whichever is lower. Loans are provided with a 20-year maturity period and 10 year and a half grace period a rate of interest slightly above the SDR three-month rate.

The RST governance and financial structure like that of the PRGT. This means that loans are provided with conditionalities, and that it is subject to an encashment regime. Barbados and Costa Rica have accessed funding (equivalent to US\$ 183 and 710 million dollars respectively) from the RST (IMF, 2022b; Shalal and Lawder, 2022).

## **3. Recycling SDRs through multilateral development banks**

A third option that has been put on the table to recycle SDRs is through multilateral development banks (MDBs). MDBs are considered natural candidates for the recycling of SDRs since they support development and supply global public goods in line with the SDGs. They also provide financing at affordable or concessional rates, and act countercyclically. Moreover, some MDBs are already prescribed holders of SDRs which would facilitate recycling of SDRs through these institutions.

SDRs cannot be donated for two reasons. First, a donation is equivalent to a liability by the donating country as, in this case, interest on allocations is not offset by interest earned on holdings. Also, the donation of SDRs precludes their use as international reserves which 'violates the principles set out by the G20 and G7 for the recycling of SDRs' (Mansour, A., & Sembene, 2021).

However, SDRs can be on-lent to prescribed holders. To maintain the SDR property of an international reserve asset, the approach would have to resemble that followed by the PRGT or the RST. That is, it would have to include some type of encashment regime. The PRGT makes the encashment regime operational by maintaining a liquidity buffer equal to 20% of the amounts committed by lenders participating in the encashment regime. Similarly, the RST includes a 20% encashment buffer in its loan account.

As explained by the IMF (2022b, p. 42): "loan account (LA) contributors' commitments will include an encashment buffer available for drawings in the event that another contributor requests early repayment of its LA claims by representing that its balance of payments or reserve position justify it". Besides requiring risk mitigation measures and ensuring the liquidity of the asset, lending countries may also require a cap on the length of the loan. As things stand, the maximum maturity of the loans is established at 10 and 20 years for the PRGT and the RST (Andrews, 2021b).

An alternative use of SDRs is to provide additional resources to leverage operations, rather than substituting for existing sources of funding as in the case of direct on-lending. The use of SDRs to leverage resources would have to solve the problematic issue of whether this instrument could remain on the recipient's balance sheet without undermining its properties as a reserve asset: low risk and high liquidity.

When countries (normally high income who don't use them) lend their SDRs to the IMF, they want to be sure that IMF maintains the asset's characteristics. That same encashability must stay true in hands of the MDB. That is a hard thing to do. At the same time, rating agencies which look at the capital structure of the MDB, must be convinced that this SDRs are in fact capital. So there exist a tension between what donors want, and what MDBs need regarding capital. This is not only a technical problem, but a political one. There are reserve currencies for 14.7 trillion dollars in central banks' balance sheet to face the crisis, which might be exchanged for SDRs. It's going to take political will to move central banks and technicians of the world to figure the way this work.

Another important issue is whether multilateral development banks are sufficiently capitalized and in fact do not need SDRs to leverage additional resources. The consensus seems to indicate that multilateral development banks and some regional development banks have obtained significant capital increases which allowed them to significantly increase their finance in 2020. The World Bank Group claims to have provided the largest financial support in fiscal year 2021 (July 1, 2020-June 30, 2021) to fight the pandemic equivalent to over US\$ 157 billion dollars, and that this was made possible by the 2018 IBRD and IFC General Capital Increases and the IDA19 Replenishment.<sup>8</sup> In 2018, the World Bank Group approved an increase of US\$ 13 billion dollars for both the IBRD and the IFC and a US\$ 52.6 billion dollar increase in callable capital for the IBRD.

For its part, in 2020 the IDB provided the largest financial support to Latin America and the Caribbean. Between the end of 2019 and that of 2021, the IDB's balance sheet expanded to reach US\$ 15 billion dollars and its board of governors mandated a capital increase to benefit the investment arm of the IDB (IDB invest). For its part, the Latin American Development Bank (CAF) approved a capital increase of US\$ 7 billion dollars, the largest in its history and the Central American Bank for Economic Integration approved a 40% increase in its capital base during the pandemic.

There are other issues that constraint the lending capacity of development banks that are perhaps more pressing than the use of SDRs. These include a financial model based on high credit ratings, strict lending criteria and conservative management of how they leverage their equity.

<sup>8</sup> See Mansour, A., & Sembene (2021) and Fleiss (2021).

At the IDB, as at the World Bank, the available capital could also be used more effectively by reducing the equity-to-loan ratio to a level on par with that of commercial banks. Multilateral development banks take a conservative approach to equity levels: major banks have an equity-to-loan ratio of between 20% and 60%, which is higher than that of most commercial banks (10%–15%) (Humphrey, 2020). In other words, multilateral development banks hold US\$ 2–US\$ 6 in equity for every US\$ 10 in outstanding loans, whereas commercial banks hold only US\$ 1–US\$ 1.50 per US\$ 10 in outstanding loans. The equity-to-loan ratios of the World Bank and IDB stand at 22.6% and 38.2%, respectively.<sup>9</sup>

A recent study focused on the World Bank, the Asian Development Bank, the Inter-American Development Bank, and the African Development Bank shows that by adopting more flexible criteria for lending and increasing their leverage, these banks could collectively triple their lending capacity from US\$ 415 billion to US\$ 1.3 trillion. The findings showed that the increase in leverage and risk would have minimal effect on these banks' credit ratings. In July 2021, G20 drafted terms of reference for an independent review of the capital adequacy frameworks of multilateral development banks (Settimo (2019), Maasdoorp (2021), G20 (2021) and ECA/ECLAC (2021)).

Some of these considerations have led to the proposal of An Action Plan to reform Multilateral Development Bank Capital Adequacy. The plan recognizes that credit rating agencies have 'considerable influence in determining risk tolerance de facto embedding rating agency methodologies into internal policies, and that credit rating agencies should refine their methodology to better reflect the reality of development banks.' It also proposes a more efficient and flexible use of callable capital (G20, 2022).

## C. Conclusion

SDRs were initially created to aid the international financial system by providing liquidity to IMF member countries. They were intended to function as the central asset for regulating international aggregate demand and as the main way of controlling world reserves. As shown by the use given by countries to the most recent allocation of SDRs, they remain a highly versatile tool that is nonetheless constrained by the restrictions placed on its properties and on the number of entities allowed to hold them.

The asset is largely unknown to the private financial market, not being permissible for trade, and only serving as unit of account in specific and minor transactions. It is of little economic relevance to developed countries, where it receives only sporadic use. The highest potential for the asset remains in the relief it can provide to highly constrained economies that are having difficulties in accessing financial markets. Allocations in proportion to country quotas is insufficient, as it disproportionately benefits nations that make a low use of SDRs rather than those in need who use them readily.

Following the most recent allocation in 2021, there have been requests and pledges in favour of reallocating SDRs to low- and vulnerable middle-income economies. The use of an encashment mechanism like the one used by the PRGT and the RST is a viable option to provide international liquidity without significantly affecting the asset's characteristics. Recycling SDRs through these trusts or through prescribed holders using similar mechanisms is a potential path forward to fulfill the reallocation. SDRs could also be channelled to multilateral development banks and be used as capital to leverage loans from the financial market, however this would entail a large change to the way SDRs currently function.

The fact that as a reserve asset holdings and transaction of SDRs must be highly liquid and present no risks is the main argument against recycling SDRs between countries, for including liquidity buffers in the PRGT and the RST and for opposing its use as equity and capital to leverage resources.

In practice the asset reserve nature of the SDR is guaranteed through an encashment regime as exemplified by the PRGT and the RST. This implies that the lending country can under balance of payments

<sup>9</sup> Equity includes paid-in capital and accumulated reserves. Loans include loans, guarantees and capital investments for development purposes.

problems reclaim its SDRs. The encashment regime guarantees contingent liquidity rather than absolute liquidity. Moreover, this scenario is unlikely since the lending countries are often the countries that issue a reserve currency. In essence, it does not make economic sense for lending countries to hold SDRs since they contribute very little to the financial stability of these economies. This is perhaps the reason why the SDRs in the United States form part of the Exchange Equalization Account which is under the authority of the executive power and not under that of the Federal Reserve.

A revision of the SDRs properties and restrictions is required for the asset to achieve its full potential as a tool for international liquidity and financial stress relief. Allowing the asset to be traded in the public financial market would facilitate the leveraging of resources for post-COVID recovery. For this to be possible, a fundamental shift on the way SDRs are presently defined and the rules that govern them is necessary.

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## II. State-contingent debt instruments as insurance against future sovereign debt crises in Latin American

*Leonardo Vera Azaf*

### Background and introduction

The unexpected and still unfolding COVID-19 crisis has triggered an economic and social collapse of historic proportions in Latin America and the Caribbean, a region that is projected to return to pre-crisis levels of economic activity in two to three years from now (UN, 2021). However, at the time the pandemic disrupted economic activities in Latin America and the Caribbean, many countries were already engaged in a struggle against severe economic difficulties. Data from the United Nations' Economic Commission for Latin America and the Caribbean (ECLAC, 2021a) indicates that between 2014 and 2019 the region grew only 0.3%. Moreover, according to ILO (2021), when the pandemic started, informal labor in the region accounted for 56% of the employed work force. This stagnant growth evolution along with a precarious labor market, weak investment and limited macroeconomic policy space made the region highly vulnerable to a global shock.

The Covid-19 started to hit the region in March 2020. With the associated external shock, the domestic lockdowns, and the containment policies to face the pandemic, the Latin American and Caribbean region registered the sharpest economic contraction in GDP (-7.7%) on historical record, as well as an impressive fall in investment growth (-20%). These last estimations made by ECLAC (2021b) indicate that although COVID-19 affected all countries in the region, it did so to varying degrees depending on the containment policies they were adopting, producing a negative impact on aggregate supply with a knock-on effect on aggregate demand.

Table II.1 shows that ECLAC estimates growth of 6.2% for the region in 2021 and forecasting 2.1% for 2022, which will be insufficient to regain the level of output recorded in 2019. The growth estimate for 2021 reflects the low base of comparison resulting from the 2020 slump, and the positive effects of

stronger growth worldwide. But for 2022 an average growth rate of 2.1% represents a slowdown from the previous year's rebound. The point is that weak growth dynamics prior to the crisis may not change, since the structural problems (low productivity, high informality, unemployment, inequality, and poverty) that weighed on the region's growth before the pandemic have worsened; and they will hamper the recovery of economic activity and labor markets beyond the growth rebound in 2021. Indeed, there are reasons to think that in terms of per capita income, the region remains on course for a lost decade.

**Table II.1**  
**Latin America and the Caribbean: GDP growth rate between 2017 and 2020 and projections for 2021 and 2022**  
*(Percentages)*

	2017	2018	2019	2020	2021	2017–2021	2022
Latin America and the Caribbean	1.3	1.1	0.1	-7.7	6.2	0.2	1.8
Latin America	1.3	1	0.1	-7.7	6.3	0.2	1.5
The Caribbean	0.2	1.5	0.5	-7.9	1.2	-0.9	4.7

Source: ECLAC (2021b).

Despite the differences between countries, both the external shock as well as the lockdowns have also had a substantial effect on earnings in the labor market. By its very nature, the labor market in most countries of the region leaves workers vulnerable to these shocks. Poor social security and inadequate or non-existent social safety nets mean that income losses quickly led to poverty or death. The International Labor Organization (ILO) (2021) recently warned that the Latin American and Caribbean region lost 26 million jobs as a result of the pandemic and started 2021 with a complex employment landscape aggravated by structural problems in the labor market, the waves of contagion and slow vaccination processes that make the prospects for recovery in labor markets more uncertain. Data from ILOstat indicates that informality among youths may have reached 68.5% by the end of 2021.

Poor labor market performance led very rapidly to an increase in poverty. For instance, according to a recent report by the World Bank (2021), despite the offset from the temporary social transfer program applied in Brazil, an estimated 20 million people would fall into poverty during 2020, with another 1.4 million increase due to population growth. The pandemic has claimed nearly 1.5 million lives in economies already troubled by sluggish growth and despite having only 8.4% of the world's population, the region accounts for nearly 20% of confirmed cases of COVID-19 and about 30% of deaths worldwide (ECLAC-PAHO, 2021).

Moreover, the COVID-19 pandemic has been a critical test for the already overburdened and mostly underfunded public healthcare systems of Latin America. In a region that suffers from severe inequalities and poor social protection, public healthcare systems are the only source of medical care for a large sector of the population who work in the informal economy or are unemployed. But in practice the system does not grant a universal coverage and suffers from anemic primary care and staffing crisis, and hospitals are inadequate. State-run hospitals and clinics have been in many places overstressed by continuous demand for treatment of vector-borne diseases and community-acquired infections as well as high rates of non-communicable diseases and this have limited the ability to respond to the challenges of the pandemic.

This demand for public health services is just one example of how important it is, amid these types of economic stress, to have sufficient policy space to meet the most urgent needs of these countries and not compromise their development prospects. Exceptional transitory income and credit support measures, such as cash transfers to households and specific loan facilities to the productive units, constitute further examples of key importance.

The effects of the pandemic and the policies implemented in response have increased the financial needs of the countries of the region. In the short run, resources are needed to support the attention to vulnerable groups, including to low-income segments and to older persons, but also to offset the detrimental effects of containment policies on economic activity and employment. In the medium and long run, as policy priorities shift from addressing the urgency to building forward better, a financing for development agenda must support an active and countercyclical policy stance aimed at increasing employment and sustaining adequate growth. Within this context, expanding public capital expenditures and outlays on productive transformation and greening the economy are key to ignite the recovery efforts.

The rolling out of large stimulus packages, and falling government revenues, have strained public finances worldwide. The UN (2021) estimates that in almost one in five developing and transition economies, the government deficit is projected to reach double digits as a percentage of GDP in 2020. A slower recovery of growth will only further exacerbate fiscal deficits. As discussed below, this rapid growth of financing needs have exacerbated debt burden risks across the region, pushing public debt to historical high levels, which in turn may jeopardize the recovery and countries' capacity to build forward better. According to ECLAC (2021a) the Latin America and Caribbean region is already the most indebted region of the developing world and currently allocates more than half of the exports of goods and services to the payment of the external debt service. For the region, development momentum can be lost if priority is given to servicing external debt at current conditions by raising taxes and/or cutting back on public spending.

Future debt crises cannot be ruled out while the external debt and the debt service-to-exports ratio remains high in most countries of the region. The dramatic impact of the current crisis on liquidity and debt-sustainability across the development world have required an immediate response. Early in the pandemic, the IMF had already provided debt service relief to its poorest and most vulnerable members through grants from the Catastrophe Containment and Relief Trust (CCRT). However, under this initiative only one country in the region (Haiti) has been eligible.

The Common Framework for Debt Treatment beyond the Debt Service Suspension Initiative (DSSI), the Common Framework, is an initiative endorsed by the G20 together with the Paris Club of official creditors to support low-income countries with unsustainable debt, by extending the provision of debt relief to all the DSSI-eligible countries. Its goal is to facilitate on a case-by-case basis a timely and orderly debt restructuring of bilateral official debts with members of the G20. However, to date the extent of this initiative has been limited, with only a few countries requesting debt relief under the Common Framework.

Traditional debt relief initiatives, such as the joint IMF–World Bank's Heavily Indebted Poor Countries (HIPC) Initiative has focused almost exclusively on lower-income countries. Yet currently over 75 per cent of the world's poor live in countries with a per capita GDP above US\$1,185, so they aren't eligible for concessionary finance. This is precisely the case of most Latin American and Caribbean countries and yet these states don't have the fiscal or monetary space to address the pandemic and its sequels or even the sequels of natural disaster to protect their most vulnerable and poor.

Beyond these initiatives, the international architecture to manage debt crises effectively is mostly missing. Existing forums are fragmented, which makes negotiations difficult. Many, such as the International Monetary Fund (IMF), are dominated by creditors. But as the world gradually recovers from the current crisis, catch-up growth for Latin America and the Caribbean will remain vulnerable partially due to the risk of a premature phase out of current fiscal support measures and continuing debt service obligations.

Despite debt downgrades, the Covid -19 crisis was accompanied by unusually low interest rates, which have helped maintain market access regardless of increasing debt ratios (Sturzenegger, 2020). However, a sudden capital stop remains a big threat and even though flows have returned to some countries after an initial sharp retrenchment, this limited short run availability does not mean that a problem may not be brewing.<sup>1</sup>

<sup>1</sup> Sturzenegger (2020) points out that throughout 2020 Colombia and Brazil placed debt at a 3% interest rate, and Honduras and El Salvador at around 5%.

The extensive literature on financial stress and sovereign defaults (see, for instance, Manasse and Roubini 2009; and Das, Papaioannou and Trebesch, 2012) indicates that most defaults and restructuring episodes are triggered by one or more of the following factors: a worsening of the terms of trade; an increase in international borrowing costs (e.g., due to tighter monetary policy in creditor countries); consistently poor macroeconomic policies that accentuate vulnerabilities; a crisis in a systemic country that causes contagion across goods and financial markets, and shifts in market sentiment.

When markets perceive a government as less likely to repay in the future, this can rapidly raise its borrowing costs and, therefore, the likelihood of default. Under extreme circumstances, a sudden change in investor perceptions may even act as a default trigger. The structure of the debt portfolio can also impact the likelihood and timing of default and debt negotiation. Factors that determine the debt profile (e.g., currency composition, fixed vs. floating interest rate, maturity, and creditor composition) may have implications for liquidity, as well as solvency conditions and, therefore, the decision to restructure.

Once sovereigns become over-leveraged and unable to roll over debts, governments are forced to default or to take drastic actions that may impede recovery from the crisis. Very often taxpayers, rather than willing investors, are forced to become the final bearers of risk.

Unfortunately, an unbalanced situation between debtors and creditors during restructuring, find creditors in a position to make their interests prevail. This leads them to force through an 'insufficient restructuring,' that temporarily alleviates liquidity in the short term but that may have negative implications in the long term. When a restructuring is insufficient to bring back debt sustainability, debtors often have to undergo further restructurings.

Sovereigns do not buy insurance and instead use the resources of the state to address whatever calamity befalls their citizens. Potentially new insurance schemes must involve risk sharing with the markets. Risk-sharing with the markets is a constructive way forward in a context of system-wide risk reduction. Among proposals for resolving the built-in conundrum of sovereign debt in a durable and predictable way, the possibility of change in repayment terms so that they can be built into the contract rather than being the outcome of renegotiation has gained momentum. This is precisely what can be achieved by the design and issuance of state-contingent financial instruments as insurance mechanisms.

State-contingent debt instruments (SCDIs) are designed to provide automatic, market-based protection against pre-specified shocks. This can insure sovereigns against adverse shocks, often by reducing debt service requirements during difficult economic times. This risk-sharing would be defined, ex-ante, in the clauses and conditions of the sovereign bond, thereby improving the predictability around burden-sharing and allowing markets to incorporate these risk-sharing elements into the price of the debt.

Depending on their nature and design, such instruments would also reduce default risk, the likelihood of debt restructurings and the need for pro-cyclical fiscal policy. Some of these instruments could even attenuate overspending during a boom by limiting a sovereigns' ability to spend windfall income during good times. Examples of such instruments can range from the narrowly specific commodity-linked bond (for instance, linked to the behavior of commodity prices) to the broadly general GDP-linked instruments, where principal and interest payments are linked to economic growth rates.<sup>2</sup> In addition, there are natural disaster-linked or pandemic bonds, where some form of debt relief is provided in the event of a pre-defined disaster. A third example would be sovereign contingent convertible bonds ('Sovereign CoCos'), which envisage a maturity extension under pre-defined triggers.

<sup>2</sup> Although commodity-indexed debt may be as good an instrument for insurance and risk sharing as GDP-indexed debt, in this paper we focus on the latter types of indexation since we are interested in studying the potential for introducing indexation on loans that could find the largest possible application and not be confined to specific export producers as is the case with commodity-price indexation.

SCDIs can be seen today as an alternative to conventional sovereign long-term debt which can guard sovereigns against refinancing risks but not against the impact on repayment capacity of say, a sharp adverse macroeconomic, a financial shock or a natural disaster. This risk-sharing would be defined, *ex ante*, in the clauses and conditions of the sovereign bond, thereby improving the predictability around burden-sharing and allowing markets to incorporate these risk-sharing elements into the price of the debt.

This chapter evaluates and analyzes the use of SCDIs to support policy responses and strategies for Latin America and the Caribbean with the main objective of preserving the policy space necessary to both weather the immediate economic impacts and build forward better. The chapter builds on a growing body of research examining how state-contingent borrowing can help governments better manage their debt commitments and contribute to improved welfare outcomes.

We introduce and evaluate several state-contingent bonds designed to improve debt crisis resolution and prevention. The chapter discusses the advantages and disadvantages of these instruments, looks at how debtors and investors might benefit, and evaluates possible ways of addressing the operationalization challenges identified in the literature. Changes to sovereign debt contracts introducing state-contingent clauses would help to improve debt management and fiscal space and reduce the likelihood of sovereign defaults.

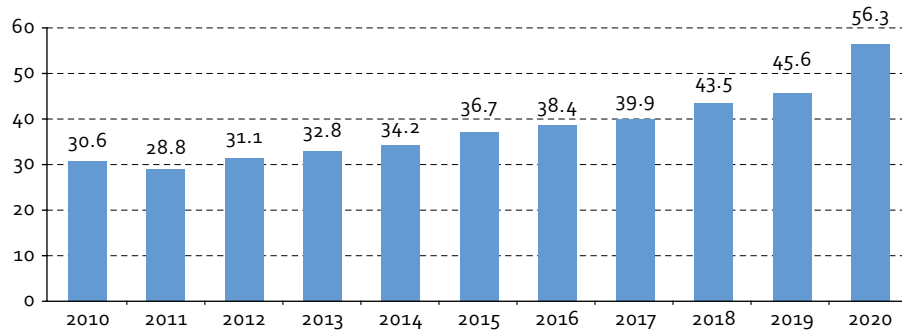
For the LAC region a proper mix of SCDIs and conventional bonds would be welcome, but in addition a proper mix between sovereign contingent convertible and GDP-link bonds could be beneficial since they complement each other. While contingent convertible bonds (such as Sovereign CoCos or Disaster-linked bonds) provide stabilization and immediate relief during a liquidity crisis, GDP-linked bonds can more effectively deal with solvency issues. The chapter also provides guidance and some recommendations regarding the way LAC countries can address some of the challenges that hinder market liquidity, and discusses ways in which multilateral institutions can contribute to the development of a market for such securities.

The structure of this paper is as follows. The next section briefly reviews the debt overhang problem that affects many countries in the LAC region. Section 3 presents background information of State-contingent Debt Instruments (SCDIs), the main families of instruments and experiences. Section 4 discusses the benefits and challenges of GDP-linked bonds. Section 5 deals with Sovereign CoCos, their benefits and main challenges. Section 6 summarizes some lessons from the experience of bonds that contain hurricane clauses. Section 7 examines the pricing question and the several risks involved in SCDIs. Section 8 discusses the importance of having robust and standard contracts and brings a proposal and practical toolbox for prevention and crisis resolution. Section 9 concludes.

## **A. Latin America and Caribbean: debt burden and external support**

According to ECLAC (2021a), without exception and during the pandemic, all countries in the Latin American region have experienced a deterioration in their fiscal situation and an increase in the general government debt levels. ECLAC estimates that as of end-2020, gross central government debt represented 56.3% of GDP—10.7 percentage points above the 45.6% recorded in 2019 (see figure II.1). Moreover, the debt of the general government at the regional level is expected to rise from 68.9% in 2019 to 79.3% of GDP in 2020 (ECLAC, 2021b). Thus, Latin America and the Caribbean has become the most indebted region in the developing world and the region with the highest external debt service relative to exports of goods and services (59%). Also, around half of the region's countries are on Fitch Ratings' negative watch list for credit ratings downgrades.

**Figure II.1**  
**Debt in selected countries of Latin America, 2010-2020**  
*(Percentages of GDP)*

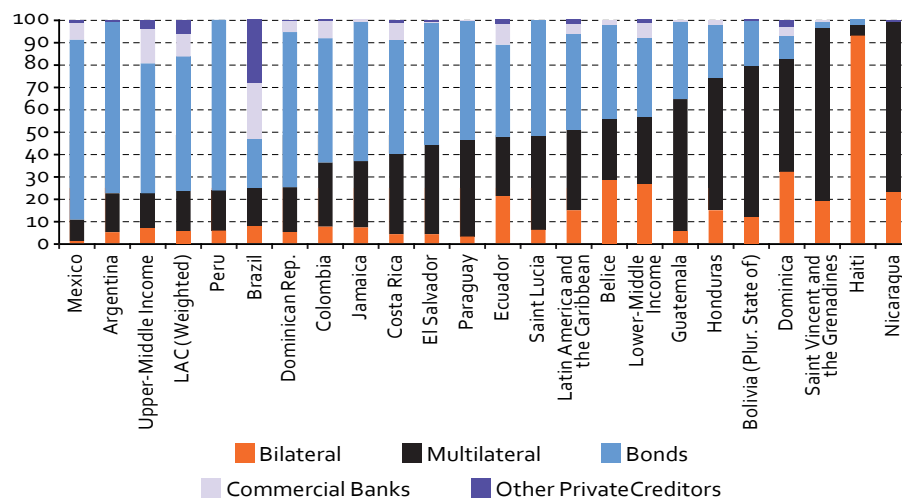


Source: ECLAC (2021).

Figure II.1 also shows that debt levels have been on the rise since 2012 in Latin America and the Caribbean. It is certainly true that compared to advanced economies, the level of sovereign debt to GDP appears low. However, aggregates do not reflect important differences between individual countries. Even with moderate debt to GDP ratios, many developing countries often face higher borrowing costs and need to mobilize foreign currency to service external debt, which is why debt servicing costs are crucial to analyze debt sustainability. Some countries are already dedicating a very large share of government revenues towards debt servicing.

The sources of external finance vary across countries. Whereas some countries with market access favor issuing debt in international markets, loans with official creditors constitute a major source of external financing and in some cases the most important one for several countries. Figure II.2 clearly shows that for most countries in Central America and the Caribbean at least half of the external obligations were of bilateral or multilateral nature.

**Figure II.2**  
**External public debt balances by creditor in selected countries of Latin America and the Caribbean, 2018**



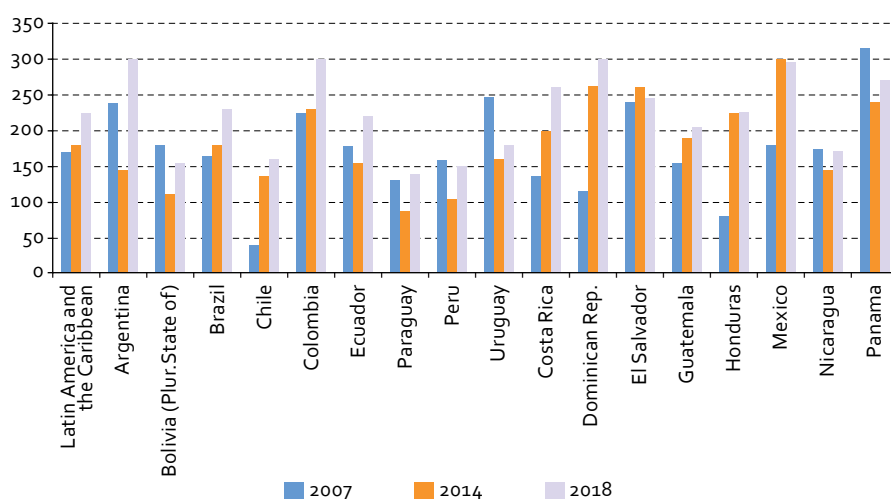
Source: OECD (2020).



Higher indebtedness, coupled with the prospect of higher interest rates suggest that debt service will absorb more and more public resources in the region, reducing the funds available to finance the achievement of the SDGs. Considering the increasingly limited fiscal space and the increasing amount of revenue required to meet the multiple developmental challenges, global coordination of public debt management must be a priority looking forward.

The profound fiscal impacts of the crisis are triggering debt distress in a growing number of countries. Debt burdens that either were already unsustainable prior to the COVID-19 crisis or that are now threatening to generate liquidity shortages or to become unsustainable under the impact of this shock, severely limit the ability of many countries to invest in the recovery, and impinge upon the prospects of long-term goals such as the SDGs and climate action.

**Figure II.3**  
Debt-to-tax ratio (gross public debt) in selected countries  
of Latin America and the Caribbean, 2007, 2014, 2018



Source: OECD (2020).

Sovereign debt can undermine the sustainable development of a country in two different ways. First, debt crises can provoke economic recessions and humanitarian crises. Second, debt overhang can force governments to dedicate a very large share of their revenues to debt services at the expense of development oriented public investments.<sup>3</sup> The reduction of public expenses sometimes forces countries to undertake cuts in social services, affecting the poor who rely on publicly provided services more than others. In the absence of debt restructuring mechanisms, debt distressed countries are usually forced to make such cuts to avoid default.

## B. State-contingent debt instruments: background and recent experiences

At present, when facing a contingency that affects their capacity to service sovereign debt, most governments can either choose to pay in full or seek to restructure their debt obligations. This binary decision can have significant costs and benefits on each side. For instance, in highly indebted countries in which governments are unable to generate adequate tax revenues to meet the demand for public spending and where the scope for domestic borrowing or inflationary financing is limited, adjusting primary spending (i.e. non-interest) in response to rising debt service may close the current fiscal gap, but may generate an undesirable level of public spending and may trigger a perverse dynamics leading to “self-fulfilling solvency traps”.

<sup>3</sup> Debt overhang describes a situation in which a country has not lost access to capital markets and is still able to face its obligations. However, to do so requires resources so vast that its capacity to invest in its development is dramatically reduced.

On the other hand, a default and eventual restructuring will help tackle debt overhang problems and ease fiscal management but can prevent future market access for a prolonged period and can severely damage future fiscal finance and the domestic economy.

Given the uncertainty and spillover costs associated with debt stress and restructuring, significant gains could be realized by both the debtor and creditors from a more predictable and orderly system.

The research on sovereign debt has recently focused on identifying mechanisms that could improve liquidity as well as debt sustainability for sovereigns in times of economic downturns, often produced by an exogenous shock. In this context, debt instruments that link capacity to service debt to economic performance and that provide some form of debtor relief in bad times have received considerable attention. They are indeed a way to share some risks between an issuer and its creditors. Thus, sovereign bonds can be made state-contingent to increase risk-sharing with private sector creditors and improve crisis prevention and resolution. This risk-sharing would be defined, *ex ante*, in the clauses and conditions of the sovereign bond, thereby improving the predictability around burden-sharing and allowing markets to incorporate these risk-sharing elements into the price of the debt. This is precisely the main idea behind the design and implementation of sovereign state-contingent debt instruments (SCDI).

SCDIs are instruments that either link contractual debt service obligations to a pre-defined state variable (for example, GDP, exports, or commodity prices) or are designed to provide additional creditor compensation in good times and/or provide some form of debtor relief in bad times, such as the occurrence of a natural disaster. Consequently, SCDIs can be broadly divided into two categories: debt instruments featuring continuous adjustment of debt service payments (for instance, a GDP-linked bond, where payments are indexed to nominal GDP), and those involving discrete adjustment, (for instance, instruments with natural disaster clauses where debt service relief is triggered by a predefined natural disaster event, such as a hurricane of given intensity or where the maturity or grace period extends in the face of a shock to exports, as in the case of some official bilateral loans).

By tying the debt service payments of restructured debt contracts to future outcomes, SCDIs may help avoid protracted disputes about current valuations and facilitate quicker agreements between creditors and debtors, thus allowing countries to restore debt sustainability and facilitating their return to market access.

The idea has been around for some time and even though market development has been limited so far, selected examples of debt instruments with state-contingent features can be very useful to understand their complexity and offer invaluable lessons for design and broader uptake.

Early attempts of general evaluations of SCDIs in the economic literature focused on the theoretical advantages for the issuer. For instance, Froot, Scharfstein, and Stein (1989) maintained that linking debt payments to the issuer's GDP performance would cushion the impact of negative growth shocks on the ability to service debt. Shiller (1993) argued that the use of GDP-linked debt would allow a sovereign to buy insurance against growth uncertainty, and, thus, help smooth the revenue loss from adverse economic performance. Obstfeld and Peri (1989) and Borensztein and Mauro (2002) suggested that government would be able to reduce their idiosyncratic GDP risks by issuing GDP-linked warrants, a derivative security, the payments of which are linked to a sovereign's GDP performance.

Despite their analytical appeal, however, the take-up of SCDIs has been low, with issuance mostly limited to debt restructuring contexts. In these restructuring events, SCDIs have tended to be designed and structured in one of two ways: (i) As instruments that provide only upside payouts to creditors under positive scenarios (e.g. warrants) or (ii) as instruments that provide downside protection to borrowers under negative scenarios (for instance, hurricane clauses).

Limited take-up partly reflects the liquidity/novelty premia demanded on new instruments, but also concerns regarding data accuracy, first-issuer moral hazard, as well as political economy and transition issues. Discussions in turn has focused on how these barriers can be surmounted to develop a market and on how to assess the operational viability of such instruments.

Against this backdrop, in this section we attempt to examine the conceptual and, practical issues that SCDIs raise, with a view to enabling the sound development of a market in these instruments. We provide a description of the variety of most instruments at play and take stock of the ongoing debate on each instrument, from both a conceptual and practical perspective.

### 1. GDP-linked bonds and warrants

The underlying idea behind GDP-linked securities is to link debt repayments to economic activity performance. Unlike other state-contingent debt mechanisms analyzed below, which are designed to improve debt crisis resolution processes and only come into effect in the event of debt distress episodes (e.g. problems of liquidity, default, etc.), indexing securities to GDP performance constitutes more of an ex-ante and preventive mechanism, that seeks to avoid this type of debt distress episodes from happening in the first place.

GDP-linked bonds can be structured in many ways. For example, principal and/or coupon payments could be linked to GDP. In the first case (coupon-indexed) they are called “floaters.” In the second case (principal-indexed) they are known as “linkers”. There are other variants depending on the measure of GDP that can be nominal or real.

Authors such as Missale and Bacchiocchi (2012) argue that the choice as to whether to use nominal or real GDP values should be determined by the currency in which these securities are denominated. They argue that, if denominated in foreign currency, debt should be indexed to real GDP measures, (so as to avoid the double charge of paying for inflation and exchange rate movements). On the other hand, if securities are denominated in local currency, nominal GDP measures should be used to insure the borrower against unexpected deflationary dynamics that could put upward pressure on debt-to-GDP ratios, whilst also removing inflationary temptations and protecting foreign lenders against depreciation of the exchange rate. In practice, however, bonds that are indexed to GDP nominal values have been used with foreign denominated GDP-linked securities.

The concept could be more attractive with institutional investors such as insurers, sovereign wealth funds, and pension funds which may have appetite for bonds designed to be held over a number of business cycles. Despite some early experiences,<sup>4</sup> GDP-linked instruments have only been issued by governments as part of debt restructuring processes and in the form of GDP-linked ‘warrants’, which contain an element of indexation to GDP—providing holders with a higher coupon if GDP exceeds some threshold level—but without symmetric payout.

For example, securities with some similarities to GDP-linked bonds were issued by several countries as part of the Brady restructuring process that started in 1989,<sup>5</sup> as well as by Argentina in 2005, by Greece in 2012 and, most recently, by Ukraine in 2015 during their restructuring processes. In each case, governments issued these securities offering higher returns in the event of a faster-than-expected recovery, thereby encouraging investors to accept a ‘haircut’ on their existing debt claims. However, no sovereign has yet issued a GDP-linked bond with returns that vary symmetrically, falling with lower GDP and rising with higher GDP.

Notwithstanding the theoretical benefits of GDP-linked Warrants, their potentially catalytic role in sovereign debt restructurings remains constrained by design and implementation challenges. Cohen et al. (2020) identify three major barriers to their successful implementation: Investor preferences, valuation uncertainty and lack of liquidity, and unclear payout calculations (many times due to moral hazard problems).

It is argued, for instance, that institutional investors and fixed-income mutual funds generally prefer “plain vanilla” fixed-income securities with standard debt contract terms, as these are easy to understand

<sup>4</sup> As early as the 1970s, Mexico issued several bonds indexed to oil prices.

<sup>5</sup> Warrants were offered to investors as part of the Brady restructuring process for Mexico, Nigeria, Uruguay, and Venezuela.

and price, and are much more liquid than innovative instruments. Moreover, such instruments are viewed as exotic derivative instruments with very limited secondary market liquidity. The lack of standardization of warrant payment structures and reference variables, initial low market value, and illiquidity make these instruments less desirable to investors. Finally, analysts have argued that it is possible to envisage that such securities could generate measurement issues and moral hazard problems. Contract design in some instances includes unclear payout calculations if warrants indeed reduce the issuer government's incentive to undertake growth-oriented policies.<sup>6</sup>

In practice warrants vary considerably in their complexity and design (Bank of England, 2015). GDP warrants have often turned out to be poorly designed, overly complex in terms of payment formula, and as a result have been difficult to price. Indeed, warrants have been attractive only to niche investors (Bank of England, 2015) and these investors have historically discounted these instruments severely in sovereign debt restructurings due to their lack of standardization, illiquidity, and idiosyncratic risk profiles (Cohen et al., 2020).

### (a) Experiences

Some significant and contentious restructuring processes have used warrants to compensate for deep haircuts. As part of Brady Plan restructurings in the 1980s and 1990s, several countries exchanged bonds that included GDP detachable warrants that increased their coupon payments when GDP exceeded some predetermined threshold.<sup>7</sup> At the time these GDP-linked debt instruments were designed in part to appeal to those commercial banks involved in the debt restructurings who felt that their concessions, in terms of debt relief, to the sovereign borrowers should be only temporary, and that they should be repaid when the sovereigns' financial health improved (Buchheit, 1991).<sup>8</sup> Argentina, Greece and Ukraine have all issued similar instruments in their more recent restructurings.

Argentina defaulted on US\$82 billion of sovereign debt in December 2001, after three years of negative growth. The episode ended in a devaluation of the peso and the abandonment of its hard peg against the US dollar in early 2002. After failed initial negotiations with creditors in June 2004, the Argentine authorities made a proposal, which was accepted by 76% of holders of the defaulted debt in June 2005.

The warrants were issued in different currencies, jurisdictions, and varieties for a total notional amount of US\$62 billion in 2005 (76% of the US\$82 billion of eligible debt). The exchange included 30-year 'GDP warrants' that were attached, for a period of 180 days. Investors detached the coupons which they then began to trade independently. They had no principal and instead acted as series of standalone, state-contingent coupons.

Argentina's warrants annually pay 5 percent of excess cash flows, defined as the difference between actual GDP and threshold GDP in nominal terms, when the following trigger conditions are satisfied: (i) actual GDP, expressed in constant peso terms as of the reference date, exceeds threshold GDP, and (ii) the annual growth rates of actual GDP, expressed in constant peso terms as of the reference date, exceed 3 percent. Total cumulative payments made on the GDP warrant should not exceed the payment cap for that security of 48 cents per dollar of notional amount. Argentina's GDP-linked warrants are detachable from the plain vanilla bond and have been traded separately since the end of November 2005.

One important issue in the case of Argentina was that the design of the instrument was too complicated, with coupon payments depending on both growth and the level of GDP compared with a 'base case' or expected trend that the government set at the outset, for the rate of real GDP growth, and on the evolution of the exchange rate relative to the GDP deflator. In addition, there was also a lifetime cap. The payment structure, as a result, was not only complex but the coupon amounts were divorced from the state of the economy. In the event, the path of GDP exceeded the 'base case' by

<sup>6</sup> However, since GDP is the sum of efforts made by many economic agents, it is unlikely to be solely under control of the government.

<sup>7</sup> In the Brady packages for oil-exporting countries, such as Mexico, Venezuela, and Nigeria, creditors were offered warrants linked to the price of oil (which was closely linked to their ability to repay hard currency debt), while non-oil-exporting countries offered warrants linked to GDP or revenues of key state owned enterprises.

<sup>8</sup> The cases of Bulgaria, Bosnia and Herzegovina, and Singapore are briefly surveyed by Miyajima (2006).

a long way, implying that Argentina had to make high payments even in years when the economy was performing only moderately. There was also the problem of data continuity with the example of Argentina changing the base year for GDP calculation in 2013. After this, the bond documentation was far from comprehensive and gave rise to different interpretations on which GDP methodology to adopt for the coupon calculation.

On the bright side, Argentinian GDP-linked warrants managed to find some liquidity, despite their complexity, suggesting that novelty premiums will not necessarily hinder the effectiveness of future attempts.

The Argentinean experience shows that GDP-linked warrants might have been an instrument too complex to find a large acceptance and have been used only as sweeteners for debt restructurings in distress countries. Nonetheless the experience provides lessons relevant for the design of GDP-linked bonds: The payment structure has to be simple in order to find acceptance by investors and not create obstacles to the creation of a liquid secondary market. Most of all, the indexation should hold true to its premise of providing fiscal space by making debt service pro-cyclical, conversely, the premise to contractually specifying a temporarily interest payment relief in times of economic distress.

## 2. Sovereign Contingent Convertible bonds

Sovereign Contingent Convertible bonds (Sovereign-CoCos) are state contingent debt instruments that stipulate a suspension of debt payments when, for instance, the government has lost market access. Proposals of sovereign CoCos are motivated in part by the rapid growth in the issuance of bank CoCos after the financial crisis of 2007-2009. Building on the 'Universal Debt Rollover Option with a Penalty' (UDROP) proposal by Buiters and Sibert (1999), Sovereign CoCos were strongly advocated by Weber, Ulbrich and Wendorff (2011) in the context of euro-area bonds.<sup>9</sup>

Bank CoCos convert debt into equity in the event of predetermined contingencies and have a specific strike price that, once breached, can convert the bond into equity or stock. Under Basel III, European banks were allowed to meet a fraction of their Tier 1 capital requirement with hybrid debt-capital instruments, such as bank CoCos. Indeed, bank CoCos represented one third of new securities issuances by the largest European financial institutions between July 2013 and August 2014 (Avdjiev et al., 2015).

In the case of sovereign CoCos, bonds would automatically extend in repayment maturity when a country, for instance, has lost market access or when the country receives emergency liquidity assistance from the official sector.<sup>10</sup> Therefore, once the trigger clause is activated the entire amortization profile of the sovereign would shift into the future. Contractually speaking activation of the maturity extension would not require approval by the existing bondholders. If the entire debt stock of a country were to contain these clauses, the entire amortization profile of the sovereign would shift into the future when a crisis occurred and official sector emergency assistance is provided. Thus, the details of this automatic private sector bail-in would be defined ex ante in the bond's legal documentation. Calomiris and Kahn (1991) stress that an appropriate trigger must be accurate, timely, and comprehensive in its valuation of the issuing entity and should be defined so that it can be implemented in a predictable way.

Barkbu, Eichengreen, and Mody (2011) suggest the debt-to-GDP ratio as trigger. But the debt-to-GDP ratio by itself is not a definite and appropriate sign of trouble since there are no absolute rules to determine when the ratio is too high. After all, the sustainable level debt varies from country to country. The same value of ratio could be sustainable for one country whereas a heavy burden for another country. Consiglio and Zenios (2018) argue that market data indicating a sovereign's probability of default such as credit default swaps (CDS) spreads may be useful. CDS spreads are timely and comprehensive as they aggregate the views of multiple market participants and incorporate information about a sovereign's contingent liabilities. But sovereign CDS markets tend to be small and illiquid, or not available for all countries.

<sup>9</sup> Other variants of this idea include Barkbu, Eichengreen and Mody (2011) and Mody (2013).

<sup>10</sup> Brooke et al. (2013) correctly point out that some types of IMF program assistance should not be used as triggers for S-CoCos clauses. For instance, long-term concessional poverty reduction programs, IMF Flexible Credit Line (FCL) and the Precautionary Liquidity Line (PLL), should be exempt since they are not provided for immediate balance of payments need or sovereign debt crisis.

A common conceptual design highlights the principal (but not coupon) payments postponed for the length of the maturity extension. The standstill can be a pre-specified grace period or for as long the threshold is breached. Broke et al. (2013) assert that the maturity extension needs to be long enough to overcome the sovereign's liquidity problems so that it can provide policy space to put in place required adjustment policies. However, it should not be that long that it unduly penalizes creditors. Broke et al. (2013) also suggests that the length of the maturity extension should match that of typical official sector support programs such as an IMF programs, which typically last three years. Longer standstills increase the discount of the Sovereign CoCo. A maturity-extending trigger clause would allow then a reprofiling of debt payments that does not constitute a credit event.

There is no doubt that extendible bonds provide liquidity relief, but the case for solvency support cannot be fully substantiated. In cases where a sovereign is hit by a shock that undermines debt sustainability, this instrument provides no reduction in principal or coupon payments though certainly would buy time for an orderly restructuring. Furthermore, if the sovereign elected for a 'knock-in option' structure, the decision to trigger the option could adversely affect the pricing of conventional bonds, if it were interpreted as a signal of solvency risks.

### 3. Disaster-linked bonds and hurricane-linked clauses

The inability of vulnerable governments to service international debts is often triggered by unexpected exogenous shocks. The literature has highlighted the fundamental role of macroeconomic and financial shocks in shaping sovereign risk. However, non-economic shocks, such as extreme weather and natural disasters in general, though equally important deserve more attention. An inspection of recent default episodes in middle- and low-income countries shows that extreme weather has sometimes played a prominent role. This is especially true for small agricultural producing countries as well as tourist-dependent regions, where extreme weather events are particularly disruptive to the economy and affect a vast portion of the territory.

Moldova, Suriname, and Ecuador offer three clear examples of the nexus between sovereign risk and extreme weather in agriculture-dependent countries. Moldova and Suriname defaulted in 1992 and 1998 respectively following severe droughts that weakened the production of agricultural export goods. Ecuador, a primary export-dependent economy defaulted in 1997 just a few months after floods caused major power shortages.

The more recent case of Grenada is also emblematic (Asonuma et al., 2017). Between 1999 and 2002, Grenada's fiscal position deteriorated sharply, and the debt-to-GDP ratio increased from about 35% to 80%. Grenada's weak fiscal position ultimately became unsustainable when hurricane Ivan hit the island in September 2004, causing damages estimated at \$900 million, equivalent to about 150% of Grenada's GDP. Tourism and agriculture, the two major sources of export earnings, were especially hit forcing the government of Grenada to restructure its debt.

Extreme weather appears especially salient, for instance, in light of the key role played by natural disasters in recent default episodes in Caribbean countries (Grenada 2004, Antigua and Barbuda 2004 and 2009, and to some extent Barbados 2018) and not to mention the ongoing debate that extreme weather has had around climate-change adaptation strategies.

In particular, the increasing frequency and intensity of natural disasters, such as hurricanes and tropical storms, has led some analyst and policy makers to go beyond market solutions, such as insurance through catastrophe bonds, and advocate in favor of "disaster clauses", that allow for a temporary debt moratorium when countries are hit by natural disasters.

Given the frequency and destruction caused by these extreme weather events, some Caribbean countries have recently been exploring climate-resilient debt instruments and other innovative means to build financial resilience. One such way has been the introduction of a hurricane or similar disaster-linked clauses in their loan agreements. Such clauses may be increasingly relevant given growing risks due to climate change and other environmental concerns, and their use could potentially be expanded to larger countries and broader sets of shock criteria (including public health disasters).

The hurricane clause is designed to provide cash flow relief at the crucial period after a natural disaster event, just when financing needs are high and new sources of funding may be limited. By embedding hurricane-linked clauses in debt contracts, countries can tap into extended maturity periods in the event of a natural disaster. This would allow a disaster-hit country to defer either interest payments or principal or both for a defined period. Theory as well as the short practical experience show that investors might be willing to accept them, but probably only at the cost of higher interest payments.

Disaster-linked or hurricane-linked clauses require first that the issuer and investors agree on quantifiable and externally verifiable indicators of economic shock. The suspension of principal and/or interest payments would then be tied to those indicators reaching certain pre-defined thresholds. But this deferral is at the option of the issuer, providing a degree of flexibility to suspend payments for a prescribed period of time.

The choice of the trigger is very important. A primary concern is that the trigger is not designed in such a way that it places one party in a financial disadvantage. In the case of Grenada, the negotiations with Taiwan (one of Grenada's bondholders) considered both indexed and parametric triggers—both triggers regarded as difficult to manipulate by the borrower as they were amenable to objective, independent and quantifiable measurement. Parametric triggers make payments based on the natural hazard rather than on the actual losses determined by an insurer and claimed by the borrower. The parameter may be wind-speed in the case of a hurricane, ground acceleration or intensity in the event of an earthquake or some other objective and appropriate natural disaster benchmark. The clause would be triggered if the actual event parameters exceeded the pre-established threshold parameters. In contrast to parametric triggers, the parametric index triggers make payments based on both the intensity of an event as well as on the losses incurred as determined by catastrophe modelling software.

The clauses could help pre-empt the need to restructure by reducing debt service burdens at times when sovereign finances are tightest, allowing the sovereign's economy time to rebound from the shock before they need to resume debt service. Moreover, the cash that would otherwise be used towards debt service could be used by the country towards rescue, relief, and rebuilding efforts in the wake of a natural disaster. Further, the ability of the issuer to make the deferral eliminates the need to seek affirmative bondholder consent and reduces the risk of a disorderly default, thereby avoiding the costs associated with a formal restructuring process.

According to Acevedo (2016) the Caribbean region regularly incurred in damage to housing, crops, and infrastructure due to extreme weather events. Estimates indicate that the economic impact of natural disasters weighs more heavily on these small economies; where the average annual cost of disaster damage is about six times higher (2.4 percent of GDP) compared to 0.4 percent of GDP for larger states.

In 2015, Grenada became the first country that inserted a clause that stipulated an immediate, if temporary, debt moratorium if the economy were struck by another natural disaster. Three years later, in 2018, Barbados inserted a hurricane clause into its restructured domestic debt. Thus far, these clauses have been inserted only in restructured debt, rather than through traditional bond sales.

Hurricane clauses are less dramatic than other recent innovations introduced and standardized in the market for bonds and some investors might be willing to accept them, but probably only at the cost of higher interest payments. This has become apparent in the case of Barbados, where international bondholders appear to have cooled on the idea of introducing hurricane clauses and had to be incentivized through higher interest payments. The limited experience with these instruments make these bonds with natural disasters-link clauses more difficult to value than a plain vanilla financial instrument and this may be one the main issues that will determine their success in the future.

**(a) Experiences**

**(i) Mexico**

Mexico is vulnerable to several natural hazards, including hurricanes, large earthquakes, floods, and volcanic eruptions. When such natural disasters occurred in the past, the government had to shift budgetary resources away from planned public infrastructure expenses into reconstruction efforts. To avoid this problem, in 1996 the government created a fund for natural disasters —FONDEN— to which it transfers budgetary funds for disaster relief and reconstruction efforts. The fund has developed an institutional framework for disaster preparedness involving risk assessment, risk reduction, the promotion of a culture of prevention, and insurance.

With this institutional framework, Mexico was the first sovereign to issued standalone catastrophe-linked (CAT) bonds in 2006. The US\$ 160 million CAT bond, which matured in May 2009, was designed, and issued to provide FONDEN financing in the event of an earthquake. The coupon was LIBOR-based. The bond had a parametric trigger, defined as an earthquake with a certain magnitude and depth occurring in any of three pre-defined geographical zones in Mexico.

CAT bonds are a standardized method of transferring insurance risk to the capital markets. The proceeds from the sale of the bond are invested in near risk-free assets to generate money market returns, which combined with an insurance company's premium, allow the bond to pay a substantial spread over money market returns as a quarterly coupon to the investor. If no insurance events occur the investor enjoys the enhanced coupon for the term of the bond, typically three years, and receives the principal back at maturity. If one of the designated events occurs, for instance an earthquake in a pre-defined geographical zone as in the case of Mexico, then the all or part of the principal would be forgiven and the insurance company would use this money to pay their claimholders, whereas the investor's coupon payments cease or are reduced.

The 2006 bond was structured in two tranches for different regions; both were rated BB+ by S&P. The bond matured in 2009 without being triggered. Mexico returned to the CAT bond market using the World Bank's MultiCat platform twice, with the 2009 issued MultiCat Mexico 2009 Ltd. and then the 2012 cat bond that eventually paid out for the government following hurricane Patricia. More recently, Mexico utilized the World Bank's IBRD Capital-At-Risk Notes Program for a 2017 issuance that was triggered by the Chiapas earthquake, and then most recently for a 2018 issuance which is now soon to mature. Mexico's latest and sixth catastrophe bond issuance was completed in March 2020, a \$485 million CAT bond that provides the country with a four-year source of parametric earthquake and hurricane insurance protection.

The relatively limited adoption of CAT bonds to transfer insurance risk to the capital markets is due to the following two reasons: first, the costs of CAT bond issuance are significantly higher than for a traditional reinsurance contract, and are not economically viable for small principal amounts. Second, the number of investors willing to buy CAT bonds is still limited, mostly due to lack of familiarity with catastrophe risk.

**(ii) Grenada**

Grenada pioneered an innovative 'hurricane clause' in its bonds that is gaining approval from multilateral agencies such as the IMF and the IADB to the International Capital Markets Association (a trade body). In 2015, eleven years after Hurricane Ivan devastated the country and ten years after a comprehensive but insufficient debt restructuring exercise triggered by Ivan, the island state undertook a second comprehensive restructuring of its public debt. The agreements secured by Grenada were noteworthy, not only for the degree of debt relief that they achieved, but also for their precedent-setting inclusion of hurricane clauses.

In this latest debt restructuring, Grenada offered a bond exchange and the willingness to receive all tenders of the EC\$ 2025 Bonds. Grenada took a proactive step and adopted the inaugural natural disaster clause in its new U.S. dollar bonds due 2030. The clause inserted stipulated an immediate, if temporary, debt



moratorium if the country were struck by another natural disaster. The move, endorsed by the influential Paris Club of governmental creditors, held out the promise of vital financial relief at times of distress.<sup>11</sup>

Over the period December 2014 to November 2015, debts amounting to US\$318 million (one-third of Grenada's total public debt) were restructured with three creditors. These included, the Export-Import Bank (the Eximbank) of Taiwan, holders of Grenada's previously restructured 2025 sovereign bond, and Grenada's Paris Club creditors. Their provisions differed markedly, with the Eximbank's deal most closely aligned to Grenada's request. Using a discount rate of 13.9 percent Asonuma et al. (2017) estimate that the net present value of the haircut in this deal was 50.3 percent on average.

The natural disaster clause included in the bond exchange allows Grenada to defer the principal and interest payment due on the next semi-annual payment date if it experiences a tropical cyclone causing between U.S.\$ 15 million and U.S.\$ 30 million in losses, and to defer the principal and interest payments due on the next two semi-annual payment dates if it experiences a tropical cyclone causing U.S.\$ 30 million or more in losses.

The determinations of both what constitutes a qualifying tropical cyclone and the dollar amount of loss experienced are tied to Grenada's parametric insurance policy from the Caribbean Catastrophe Risk Insurance Facility, a risk pool that provides coverage for catastrophic hurricanes, earthquakes, and excess rainfall events to Caribbean and Central American countries.<sup>12</sup>

Grenada saw the primary benefits as: immediate cash relief and fiscal space in the event of a disaster; avoidance of a payment default; and the prevention of further debt restructuring.

### **(iii) Barbados**

In August 2018, the authorities in Barbados rolled out the Barbados Economic Recovery and Transformation program. This economic reform program also provided the macroeconomic framework for the IMF's Extended Fund Facility support program. One of the key elements of the program included a comprehensive debt restructuring, including both domestic and external debt. After several rounds of negotiations, the government reached a deal with the external creditor committee in October 2019, consisting of a 26 percent haircut, issuance of new long-term debt with 10-year maturity and 6.5 percent interest, and a \$40 million repayment plan between 2019-2021. Moreover, the Government was able to successfully negotiate natural disaster clauses in its restructured government bonds. In this case, the new 2029 bond allows for capitalization of interest and postponement of scheduled amortization falling due over a two-year period, following the incidence of a major natural disaster (Anthony et al., 2020). In the same fashion as Grenada, the trigger for a natural disaster event would be a payout above a prearranged threshold by the Caribbean Catastrophe Risk Insurance Facility under the authorities' catastrophe insurance policy.

The Barbados' events are wider than those proposed by Grenada in that they include events related to earthquakes and rainfall as well as hurricanes. The minimum claim threshold specified is US\$ 5 million, in the case of an earthquake or rainfall event, and US\$ 7.5 million in the case of hurricane. Following an event of this magnitude, Barbados may elect to defer for two years any principal or interest payments which would otherwise fall due in the two-year period from the effectiveness of that election. Deferred principal and interest, which is capitalized, continue to accrue interest and are, at the end of the two-year deferral period, added to all remaining principal instalments on a pro rata basis. As a result, Barbados would have a debt service moratorium for two years and the repayment of the deferred amounts would be spread over the remaining term of the bonds. The deferral option cannot be used more than three times nor within the last two years of the term of the 2029 bonds.

<sup>11</sup> Before restructuring, Grenada and the IMF had reached agreement on program parameters that included debt restructuring and the importance of restoring fiscal substantiality while creating supportive conditions for high-quality growth.

<sup>12</sup> Grenada is a member of the Caribbean Catastrophic Risk Insurance Facility and has purchased insurance on its 2030 and Exim Bank of Taiwan bonds against the risks of tropical cyclone, earthquake, and excess rainfall. The event is triggered based on parametric measures. If the insurance is triggered, as determined by the CCRIF, the hurricane clause in the bond contract is also triggered.

**(b) An initiative by the IADB**

The IADB is planning to include through its Flexible Financing Facility a “hurricane clause” that allows borrowing countries to defer principal payments on eligible loans for two years after an eligible event. The option would be available on both new and existing loans. No borrowers have used hurricane clauses in primary bond markets, but the IADB’s initiative could be the first step.

In its 2019–2023 Country Strategy with Barbados, which envisions up to US\$300 million in investment lending, the IDB Group proposes the use of its contingent credit facility instrument to respond to a natural disaster emergency. The facility mechanism allows for a rapid transfer of funds to cover immediate financing needs that may arise following a natural disaster until other sources of funding are available. In 2018, both The Bahamas and Jamaica signed agreements with the IDB to access this contingent facility, while Suriname signed a similar agreement in March 2019.

## **C. The benefits and challenges of GDP-linked and Contingent Convertible bonds**

### **1. Benefits**

GDP-linked bonds offer benefits not only for the parties, both the issuer and the investors but also for the broader economy through the positive externalities they generate.

The most important benefit that the literature attributes to a government that issues GDP-linked bonds is its effect on debt sustainability. In particular, the government’s burden of servicing its debt would be lessened during an economic downturn. More generally, the government’s ratio of debt to GDP would be more stable than if it had borrowed using conventional bonds, holding all else constant. This is because the interest burden on GDP-linked debt would be positively related to economic growth, so any additional borrowing to cover debt-servicing costs would be lower during downturns and higher during upturns.

However, it is important to point out that if investors demand too high a premium to compensate them for the GDP risk they are taking on, the issuer could be worse off than if they had issued state contingent debt with a lower premium.

In addition to making a given level of debt more sustainable, GDP-linked bonds reduce the credit spread on the government’s remaining conventional debt and it could also allow governments to increase their debt without putting at risk their ability to pay during periods of economic weakness. Previous studies have suggested that the use of GDP-linked bonds could increase the level of debt that a government can sustainably service as a share of GDP by up to 100 percentage points (Barr, Bush and Pienkowski 2014), which is equivalent to raising the sovereign’s maximum sustainable debt threshold.

Like any countercyclical tool, GDP-linked bonds can help attenuate boom-bust cycles in public spending by requiring the sovereign to allocate a lower share of revenue to debt service in ‘bad times’ and larger share of revenue to debt service in ‘good times.’ This could be particularly useful for sovereigns that struggle to pay-down debt (or build rainy day buffers) in such times and particularly attractive for governments of emerging market and developing country economies, which may otherwise face pressure to cut expenditures during a recession in order to restore market confidence. Barro (2003) has also argued that it allows governments to smooth taxation over the economic cycle.

GDP-linked bonds could benefit holders of the issuing government’s conventional bonds, as GDP-linked bonds might reduce a government’s default risk (Chamon and Mauro, 2005). A large proportion of GDP-linked bonds may reduce the government’s default risk, including the default risk of its conventional bonds, which brings down the costs of their overall debt portfolio. The improvement in

debt sustainability could also benefit other economies since sovereign defaults often lead to contagion and turbulence in foreign financial markets more generally.

To investors, these instruments may be attractive also because they offer an opportunity to claw back the losses incurred in the restructuring—much like an ‘equity kicker’ acquired through an option to purchase shares following corporate debt restructurings. They have arguably facilitated debt exchanges that might otherwise have taken longer to agree on.

GDP-linked bonds could have important benefits for the international monetary and financial system if the large dead-weight costs associated with disorderly and protracted debt restructurings could be avoided.<sup>33</sup> Furthermore, by reducing default risk, capital flows and therefore risk-sharing could, in theory, increase (Bai and Zhang, 2012). With private creditors playing a greater role in risk-sharing, this should also reduce the need for international bailouts of sovereigns and so reduce moral hazard.

Another attractive feature of GDP-linked bonds is that they complement other existing initiatives to reform and strengthen the international monetary and financial system. Indeed, GDP-linked and in general state contingent debt instruments are consistent with the revealed preference for contract-based, market solutions to prevent and resolve sovereign debt crises.

Within an optimizing framework several recent studies have investigated the welfare implications of GDP-linked debt. All of them conclude that GDP-linked debt can raise national welfare. Durdu (2009) studies the effects of one-period income-indexed debt on consumption and welfare and corroborates welfare gains. Hatchondo and Martinez (2012) introduce income-indexed bonds into a model of strategic sovereign default and find that welfare gains may be significant. Onder (2016) shows how welfare gains from issuing GDP-linked debt depend on the nature of the indexation scheme for the debt.

## 2. Main challenges

In practice, however, there are several factors that may discourage governments from issuing GDP-linked bonds or dissuade investors from purchasing them. These can broadly be grouped into problems associated with moral hazard, adverse selection and developing a market for a new product.

It has been argued that, by increasing debt repayments (in case GDP growth is higher than normal) such bonds might reduce debtors’ incentives to grow. But as remarked by Griffith-Jones and Hertova (2013) this concern is exaggerated “as it does not make political sense for governments to ever want to limit or underreport growth”. Benford et al. (2016) have suggested the introduction of a clause in the instrument’s contract which outlines a set of ‘put events’, one of which could be the issuer ceasing to meet IMF data quality standards, which would trigger early redemption. Another commonly cited concern is that GDP is difficult to measure, with estimates that are prone to revision and rebasing. But these concerns are surmountable.

Despite the known long-term, system-wide benefits that both issuers and investors can derive from adopting this type of financing, a main challenge that GDP-linked debt face is the absence of fully developed markets in which these securities can be traded. The absence of such markets reduces the liquidity of such debt instruments, making them riskier for potential investors and a more expensive financing option for sovereign issuers, who may have to pay an additional risk premium.

Revisions can be allowed for in part by linking repayments to lagged data which incorporate one or two revisions. However, it could be problematic to link repayments to substantially revised data (as in the case of both the Argentine and Greek warrants payment) since the fear is that such a long lag in payment may imply a pro-cyclical effect rather than the intended or expected counter cyclical effect.

<sup>33</sup> Benjamin and Wright (2009), find that average default takes almost 8 years to resolve and leaves the sovereign country more highly indebted than when it entered default. Guzman and Lombardi (2018) show that 49–60% of the sovereign debt restructuring episodes since 1970 have been followed by another default or restructuring within 3–7 years, suggesting the existence of insufficient relief in sovereign debt restructuring processes which would explain serial defaults.

In the case of rebasing and changes in the method of calculation some scholars and analysts have suggested that to deal with these problems governments or outside agencies could keep separate GDP series based on the traditional method (so that payments are based on a 'notional' series rather than the one following the latest methodology).

Issuance and acceptance of GDP-linked bonds is also hampered by a collective action problem. This is also called the 'first mover problem.' The first country to introduce these instruments is likely to have to pay the greatest premium. The more countries that issue, the lower the premium and the greater the diversification benefits to potential investors. Here the best strategy is a simultaneous issuance by a group of credible sovereigns.

Several co-ordination and technical issues have been seen as hindering issuance and acceptance of such an instrument. For example, concerns about the timeliness and reliability of GDP statistics are often raised, as well as the challenges of creating a liquid market for any new financial instrument.

There is a political economy problem that may explain why governments that expect to lose elections and also expect bad times in the near future may have little incentive to buy protection that benefits their successor. In essence they see that when everything goes well, they must pay more, while in bad times their successor gains relief.

GDP-linked bonds can be structured in many ways. For example, principal and/or coupon payments could be linked to GDP, or the measure of GDP could be real or nominal. However, regardless of their precise form, the benefits and challenges associated with issuing GDP-linked bonds are likely to be broadly similar.

GDP-linked bonds are primarily aimed at reducing the likelihood of solvency crises by ensuring that over the lifetime of the bond its repayment terms are tied to capacity to repay. At the margin, they may also help to address the liquidity issues that might arise when a sovereign loses access to sovereign bond markets. By reducing the likelihood of sovereign crises the bonds help support market access. And by providing for debt-relief on the principle of maturing debt and on regular coupon payments they can help to reduce a sovereign's immediate borrowing needs.

However, GDP-linked bonds do not completely remove liquidity risks associated with maturing debt. Other instruments, such as sovereign CoCos that automatically extend in maturity following a trigger event, are more closely targeted at tackling liquidity crises.

## **D. The benefits and challenges of Sovereign Contingent Convertible bonds**

### **1. Benefits**

In principle, sovereign CoCos could improve existing market arrangements (Consiglio and Zenios, 2018, Benford et al. 2016) by: serving as automatic stabilizers, forestalling default during a crisis, generating market discipline for debtors, dealing with creditor moral hazard problems, providing speedy response to crises, and reducing the required size of official sector emergency loans.

During a sovereign debt crisis, conventional fiscal strategies leave limited scope to provide needed fiscal support. In contrast, a standstill on debt payments lowers primary surplus needs and creates space for fiscal intervention. Since the official sector does not need to pay out existing bond holders, more money is available for a gradual and less costly economic adjustment path.

While sovereign CoCos do not address insolvency situations, they could address liquidity crises. Consiglio and Zenios (2018) and Brooke et al. (2013) argue that a standstill gives space so that a liquidity crisis does not evolve into an insolvency situation. Hence sovereign CoCos give the

sovereign space to put public finances in order. In addition, there is a consensus that given the ex-post inefficiencies associated with the lack of a system for discharge of sovereigns' unsustainable debt burdens, there is value in decreasing the ex-ante probability of default, and sovereign CoCos could contribute towards this goal.

Sovereign CoCos price ex-ante the risk of future payment standstills thus making the costs immediately visible. With risk sharing between creditors and debtors, the interest charged on sovereign CoCos will increase as the risk of a crisis increases, and this will be an early warning signal for standard bonds as well, disciplining the sovereign.

Creditor and debtor moral hazard problems can arise if there is an expectation of official liquidity support once downside risks materialize. While there are often good reasons for such support, it can have the adverse consequence of encouraging excessive risk taking by the sovereign borrower and its private sector creditors, although the evidence is mixed (Brooke et al., 2013). Sovereign CoCos address debtor moral hazard. If creditors could no longer anticipate full repayment by the official sector in times of crisis, this would reduce the incentive to lend incautiously to sovereigns.

Consiglio and Zenios (2018) indicate that once a default has occurred it takes on average almost 8 years to resolve, and "this delay destroys value for both creditors and debtor". Since the core of sovereign Cocos is the contingent standstill, triggering is automatic and costly delays are avoided.

As already pointed out, the market presence of SCDIs significantly alters burden-sharing between private creditors and debtors, and the activation of Sovereign CoCos are not the exception. Once a S-CoCo is activated the maturity extension ensures that the official sector liquidity assistance would not have to cover debt amortization payments, and this will reduce the required size of official sector emergency loans.

## 2. Main challenges

Several challenges can be identified in launching sovereign CoCos. Conglio and Zenios (2018) state that the instruments could be potentially destabilizing "if they cause flight to safety as the threshold is approached". Indeed, market participants could give rise to a self-fulfilling crisis by fleeing from a potential standstill as the spreads increase.

Hatchondo et al. (2017) argue that sovereign CoCos may also increase the cost of borrowing because Convertible Contingent bonds may weaken market discipline and thus induce higher debt levels, and because lenders dislike reprofiling triggered by global liquidity shocks. However, they also show that together with conditionality or a debt limit that compensate for the loss of market discipline, Sovereign CoCos can reduce sovereign spreads without damaging the government's ability to borrow during periods of low liquidity. Moreover, they show that S-CoCos reduce the frequency of sovereign defaults triggered by liquidity shocks and increase consumption in periods of low global liquidity.

## E. Lessons from hurricane clauses

The main point regarding the previous experiences with hurricane clauses employed in the case Grenada and Barbados is not only whether these countries benefited from a particular set of circumstances that allowed them to insert disaster-link clauses in debt contracts, but whether such provisions can be replicated with substantial improvements by other economies vulnerable to natural disasters when restructuring their debt or negotiating new agreements.

Successful replication of natural disaster-link clauses requires the identification of the conditions that are necessary for a mutually beneficial exchange between the sovereign and investors. Issuers and investors' expectations on the expected return of the SCDI diverge, because of diverging expectations about the evolution of the state variable. If the sovereign believes that an SCDI will be associated with

lower average payouts than investors expect—say for example, because the state variable will perform worse—the sovereign will be willing to offer bond characteristics that are more generous to the investor, and a trade would be more likely.

Debt restructurings present an important opportunity for natural disaster clauses to provide future downside protection to sovereign debtors. However, such clauses would likely be useful in future new issuances as they provide valuable insurance at low-cost against exogenous shocks in ways that are not easily replicable through private contracts. Of course, there are many obstacles to implement hurricane-linked clauses in debt contracts and that is the reason why some financial experts are skeptical that hurricane clauses will take-off or offer much relief if they do.

On the negative side, Mallucci (2020) argues that disaster clauses may induce governments to engage in “gambling for debt-servicing suspension” behavior. Thus, knowing that debt payments will be suspended in the event of a natural disaster, governments may expand borrowings.

The choice of trigger is an important aspect to consider by both issuers and investors in the case of Disaster-linked clauses. In the case of Grenada, bondholders decided to rely on the Caribbean Catastrophe Risk Insurance Facility’s parametric index as the trigger for the hurricane clause in their agreements. This meant that the intensity of an event as well as on the expected losses incurred provided the guidelines to determine the need of cash flow relief.

Drawing on Barbados and Grenada’s experience also, countries contemplating including a hurricane or similar disaster-linked clause in their loan agreements should consider assessing whether their debt portfolio compositions are amenable to including hurricane clauses, and whether such clauses would cover a large enough proportion of their country’s debt to deliver adequate fiscal space in the event of a natural disaster. Moreover, the country should determine a trigger and dataset for measuring the type and intensity of a disaster, and the extent of damage caused, that can be independently and reliably verified.

Multilateral engagement could be also important. A considerable amount of technical assistance could be required. In the context of the financing assurances assessments mandated for a multilateral program, debt sustainability analysis and medium-term financing and cash flow forecasts will be helpful for both debtors and investors. In the context of a process of restructuring, this will ensure that the restructuring and the inclusion of disaster-linked clauses will have positive material impact on future debt sustainability. Furthermore, it would be convenient to keep close contact with the country’s restructuring negotiators to ensure consistency in financing assumptions and to confirm that the restructuring terms are in line with authorities’ program parameters. Finally, support of multilateral agencies regarding the terms of the new debt contracts could provide valuable investor confidence.

The hurricane-clause in a debt contract is a liquidity relief instrument introducing a debt moratorium. It does not reduce the stock of debt. For a catastrophic event such as the hurricanes that have caused damages estimated at more than 100 percent of GDP in many Caribbean countries, the cash flow relief from the hurricane clause cannot be expected to match the potential financing needs. In that case an instrument such as a catastrophe bond or insurance would be more appropriate.

## F. Pricing and risk

One concern of private investors is the lack of agreement over the pricing of a SCDI. As a result, even if an investor perceives great value in the SCDI, it may be reluctant to pay that amount for fears it will need to sell it and future buyers will not value it under the same assumptions. In the case of GDP-linked bonds a critical factor in issuance is the likely size of the GDP risk premium. If there is no intersection between what issuers are willing to pay and what investors expect to receive, then there will be no market for these bonds.

GDP-linked bonds are not currently traded in secondary markets. Although there is no generally accepted principle for pricing sovereign bonds, the investor base that normally participates in sovereign debt markets is very familiar with trading (and pricing) 'plain vanilla' bonds.<sup>14</sup> Hence, a natural question for analysts is that of comparative pricing: how does the price of a GDP linked bond differ from a plain vanilla one issued by the same issuer? There are some studies published recently following this approach. Kruse, Meitner, and Schröder (2005) and Miyajima (2006) showed that, without expectation errors on future GDP, differences in their performance compared to straight or plain vanilla bonds should stem from risk premia associated with factors such as liquidity or uncertainty. Miyajima (2006) uses the capital asset pricing model to calculate the size of the indexation premium, finding it to be low.

Ruban, Poon and Vonatsos (2008) point out that major drawback of this strand of research is the underlying implicit assumption that the GDP-linked bond will not change the default likelihood of the whole sovereign debt. Yet one of the main theoretical arguments in favor of GDP linked bonds is that their use may reduce the probability of costly formal default. Chamon and Mauro (2005) introduce the risk of default and show that with the introduction of GDP indexation the average price of the country's debt increases, while the likelihood of default falls.

Despite this relatively few attempts to develop a pricing framework for GDP linked bonds, the lack of a pricing model is not necessarily an obstacle to issuing GDP-linked bonds. After all stocks and options were traded before Black, Scholes and Merton developed their formulas. Of course, availability of such models will encourage the development of a market (Borensztein and Mauro., 2004; Griffith-Jones and Sharma, 2005).

An initial premium to compensate investors for uncertainties about a contingent debt instrument and how it might perform due to its newness is called 'novelty risk'. Although the size of this premium might decline rapidly, it is likely to be more persistent if the structure of the instrument is complex, valuation is difficult, statistical agencies are not trusted or risk aversion is high—all factors that contributed to Argentina's GDP warrants being charged a high novelty premium (Costa, Chamon and Ricci, 2008). Indeed, when GDP warrants were issued by Argentina as part of its 2005 debt restructuring, the premium on these instruments, after taking out default risk, were estimated to be as wide as 1200 basis points at issuance, and to have declined to a still high 600 bps. This can be interpreted as a premium that investors demand because they are not familiar with the instruments.

In the case of GDP-linked bonds, in exchange for taking on the risk of holding an asset with uncertain payoff, investors would probably want to be paid a premium (a 'GDP risk premium') over the risk-free rate. The magnitude of such a premium is likely to depend on whether there is an international and diversified market in GDP-linked bonds. Indeed, foreign investors, if their income is not closely correlated with the GDP of the issuing country, might require only a small premium.

Previous studies have estimated that the benefits of issuing GDP-linked bonds are likely to outweigh the costs if the growth risk premium is less than 200–350 basis points (Barr et al 2014; Blanchard et al 2016). While this suggests that governments would benefit from issuing GDP-linked bonds, there is considerable uncertainty surrounding the estimates of the growth risk premium. Benford et al. (2016) report a few academic studies that do attempt to calculate the GDP risk premium giving estimates ranging from 35 to 150 basis.

The default risk premium on GDP-linked bonds could be systematically lower than on conventional debt. This should be the case because, when growth falls, the issuer should be better able to stay current on its GDP-linked bonds because of the repayments due on it having fallen. However, a key benefit of GDP-linked bonds is that by making the debt to GDP ratio much less volatile, this reduces the probability of unsustainable debt dynamics, and so lowers default risk of all government debt—conventional as well as GDP-linked. How much lower is difficult to gauge, but the more GDP-linked debt that is issued and the larger the initial debt to GDP ratio (and so the closer a country is to the point of debt becoming unsustainable), the larger the likely fall.

<sup>14</sup> A plain vanilla bond is the most basic version of a bond, and it contains a fixed coupon yield and coupon period; a fixed maturity date; and a fixed denomination.

Liquidity describes the ease with which an investor can trade large quantities of a security quickly, at low cost, and without altering the security's price. Understanding the relationship between a security's return and market liquidity is especially important during financial stress when market liquidity becomes scarce. During a period of stress market participants tend to value liquidity more highly and shift into more liquid sovereign bonds in so-called "flights to liquidity". Liquidity is highly prized by asset managers who want to be able to liquidate positions and adjust portfolios at short notice but is of less concern to pension funds and sovereign-wealth funds who prefer to hold assets to maturity. Both GDP-linked bonds and Sovereign CoCos are exposed to liquidity premium, for trading in illiquid markets in the early launching stages.

## **G. A proposal and practical toolbox for prevention and crisis resolution**

There are several challenges to making contingent debt part of the financing toolbox of sovereigns for prevention and crisis resolution. Indeed, all the benefits of SCDIs can only be realized if investors are willing to buy these instruments at a price acceptable to the sovereign. This section looks at how careful instrument design, supported by plain sailing (standard) contracts and a robust international coordination, might help overcome the barriers.

It is certainly true that restructurings offer a unique opportunity for the introduction of SCDIs into a sovereign's debt portfolio. In a restructuring scenario, SCDIs can be implemented across the entire renegotiated debt stock with the consent of existing creditors, thereby eliminating the "first-mover" problem which lowers their appeal in the context of new issuance.

But in the context of new issuance, a mix that provides system-wide risk reduction and sustainable insurance mechanisms would be optimal. Both attributes are needed for an insurance market to function properly, making the complementary use of Contingent Convertible bonds and GDP-linked bonds desirable. Through a discrete intervention, instruments such as Sovereign CoCos provide liquidity relief and stabilization during a crisis, while GDP-linked bonds provide continuous smoothing.

The proposed formulation of Sovereign CoCos is primarily designed to help tackle sovereign liquidity crises (although dealing with liquidity problems alleviates the risk of liquidity turning into insolvency crisis). GDP-linked bonds provide a natural complement to Sovereign CoCos, as these provide not only a form of recession insurance but also help to reduce the likelihood of solvency crises. Indeed, GDP-linked bonds not only provide more fiscal space in times of crisis but reduce the likelihood of solvency crises since they reduce the size of increases in sovereign debt related to contractions in GDP and raise the maximum sustainable debt level of the sovereign (Barr et al., 2014). However, the potential of these instruments will materialize only if they capture a significant share of the sovereign debt market.

It is necessary to distinguish between potential SCDIs issuances in normal and in debt restructuring times, since it implies different benefits for issuers (Benford et al., 2016). During normal times they would help in alleviating liquidity problems and preventing solvency crises. For their part, during normal times GDP-linked bonds offer additional fiscal space in downturns, another way of deleveraging from high debt levels, and a way of preventing solvency crises. These benefits are likely to be largest when debt levels are already high relative to GDP and there is a non-trivial probability of debt reaching an unsustainable trajectory. In restructurings, GDP-linked bonds can help by backloading debt repayments when recovery is fully underway and help governments insure themselves against subsequent negative growth shocks and having to restructure again.

It should be possible to address these concerns through careful design of the instruments and their contractual arrangements. Though specific circumstances of individual countries will be important for a right instrument design, there are large advantages to keeping to just a few benchmark designs. Of course, further work on the optimal form of SCDIs would be needed if this idea is to be advanced.



In the case of sovereign CoCos the maturity extension needs to be long enough to overcome the sovereign's liquidity problems and provide fiscal space to put in place required adjustment policies, but not so long that it unduly penalizes creditors. If a maturity extension is triggered, coupon payments for each bond will continue at their original level and frequency.

Another important feature in the design of a sovereign CoCo is the definition of the trigger. Triggers can be based on a mechanical rule or supervisors' discretion. Parties should contractually choose an indicator that automatically extends in repayment maturity when a country receives official sector assistance, or the sovereign has lost market access.

Both sovereign CoCos and bonds with catastrophe-linked clauses are discrete instruments and provide 'accident insurance' against extreme or catastrophic events. In the case of countries in the region where a well-documented history of natural disasters exists and where evidence of frequency, intensity and damage impact of the disaster is registered, bonds may contemplate including hurricane or similar disaster-linked clauses.

The hurricane clauses of Grenada and Barbados provide only a one-year moratorium. Countries will need to consider whether a moratorium period of one year is adequate and whether future hurricane provisions should seek to extend the moratorium period. A longer moratorium period would increase the number of payments eligible to be deferred and therefore would afford countries more cash relief. This could help to avoid a debt restructuring by providing more adequate relief under the provision, but the longer the moratorium period the higher the premium charged will be.

The country or even the parties should determine a trigger or the triggers and dataset for measuring the type and intensity of a disaster and the extent of damage caused, that can be independently and reliably verified. A key consideration is whether the provision should be restricted to hurricanes only or expanded to include other natural disasters such as earthquakes, floods, excess rainfall, or other natural disasters. The design should ensure that the clause only applies to catastrophic events in which the probabilities of occurrence are very low and where the possibility of an imminent debt default is most likely due to the severity of the event. A parametric index trigger as the one used in the agreement between Grenada and its bondholders may be convenient since it ties the cash flow relief that may result from the hurricane clause to the probable maximum loss of an event that occurs once in every 25 years.

With respect to GDP-linked bonds, the over-riding goal is to create an instrument the market is familiar with. Experience with GDP-linked warrants points to the desirability of much simpler instruments. Based on the experience of inflation-linked bonds market, it would make sense to standardize it as much as possible.

The two aforementioned canonical designs of GDP-linked bonds the so-called "linker" and the "floater" may be considered. Both designs offer their advantages, but still have some limitations.

Broadly speaking the "linker" may be described as a local currency-denominated bond where principal and coupon are both indexed to nominal GDP, with fully symmetrical payout profile with no caps, floors or thresholds, and a payment formula modelled on inflation-linked bonds. This structure where both the principal and the coupon are indexed to the level of GDP is the most effective at stabilizing the debt ratio, is closest to that of inflation linked bonds (which investors are already familiar with) and does not require the payment floors that growth-indexed structures do, and which may complicate pricing. GDP-linked bonds denominated in local currency also provide the issuer with insurance against exchange rate shocks which could otherwise reduce or cancel out the debt-stabilizing benefits of indexing to GDP. Local currency debt eliminates currency mismatches and in general those countries with already deep local currency bond markets may find it easiest to issue local currency GDP-linked bonds. However, not all countries, for instance, in Latin America and the Caribbean exhibit deep local currency bond markets and there may be some instances where investors prefer to receive GDP-linked bonds that settle in a foreign currency.

Moreover, and in favor of the “floater” design, a real GDP growth-linked may be more appropriate for Emerging Markets and Low-Income Countries, both because incentives to manipulate real GDP down may be less; and also because of the negative correlation between real GDP and the deflator observed in stress episodes in these countries, which could lead to pro-cyclically high payouts on nominal GDP-linked bonds (see IMF, 2017).

Table II.2 summarizes the design proposal of these SCDIs.

**Table II.2**  
Ideal design features of state-contingent debt instruments

	GDP-linked bond		Sovereign CoCo	Hurricane clauses
	Linker	Floater		
Event	Deviations of the effective nominal GDP from its target value.	Deviations of the effective growth rate from its target value.	Liquidity problems that push the sovereign to receive emergency liquidity from the official sector.	Hurricane, earthquake, excess rainfall insured under CCRIF Parametric Insurance Contract.
Currency	Local currency	Foreign currency	Local or Foreign currency	Unspecified
State/ Trigger variable	Level of Nominal GDP.	Real GDP growth.	When the sovereign receives emergency liquidity from the official sector. In practice, this will be when the sovereign draws upon credit from the IMF or another bilateral/regional facility.	An institution such as CCRIF SPC modelled losses exceeding a threshold in dollars.
Debt affected	Principal linked to GDP. Coupon varies somewhat, as it is a fixed percentage of this principal.	Coupon linked to the growth of GDP, but with a floor of zero. Principal is fixed. Coupon may vary a lot, but could be capped.	Principal (but not coupon) payments postponed for the length of the maturity extension.	Principal and accrued interest due on the deferral dates.
Payment moratorium	N/A	N/A	Length of the maturity extension should match that of typical official sector support programmes. The typical length of an IMF programme is around three years.	Up to 6 months or one payment date (if CCRIF SPC payout is in certain range). Up to 12 months or two payment dates (if CCRIF SPC payout is greater than a second threshold).
Length of maturity	The London Term Sheet envisages it would be long-term in maturity, with a lifespan of 10 to 20 years, enough to cover more than one business cycle.	The London Term Sheet envisages it would be long-term in maturity, with a lifespan of 10 to 20 years, enough to cover more than one business cycle.		15 years
Repayment terms	If nominal GDP exceeds the target, the principal increases from the baseline.	If real GDP growth exceeds the target, the coupon increases from the baseline.	Principal repayable in equal periodic installments over the remaining term of the loan.	Principal deferred and accrued interest deferred and capitalized both repayable in equal periodic installments over the remaining term of the loan.
Maximum numbers of triggers	Unspecified	Unspecified	The maturity extension clause can only be activated once.	Three (3)

Source: Prepared by author.

A major challenge still being worked through is the premium over conventional sovereign bonds that governments must pay investors as compensation for taking on the exposures inherent for instance in GDP-linked bonds, sovereign CoCos or bonds with catastrophe clauses. The premium will differ depending on the final terms and issuer. In the case of GDP-linked bonds, analyst talk about a range that can go between 20bps and 100bps (Myles, 2016).

Issuance and acceptance of SCDIs is also hampered by a collective action problem. The first country to introduce these instruments is likely to have to pay the greatest premium. The more countries that issue, the lower the premium and the greater the diversification benefits to potential investors. One way to overcome this collective action problem, as Brooke et al (2013) suggest, would be for a group of interested sovereigns to co-ordinate their issuance, enhancing the development of market infrastructure and standards. Sufficiently large issuance would lower the liquidity premium.

Standardized contracts can also help address liquidity concerns. Standardization of the instrument's commercial and legal terms would be important for reducing the first-mover problem and progress has already been made with the drafting of a common indicative term sheet for GDP-linked bonds.<sup>15</sup> Concerted efforts by governments, in both advanced and developing countries, creditors and multilateral financial institutions to push for the creation state contingent securities markets will also contribute to deal with the size of the market and liquidity problems. This would overcome first-mover disadvantage, encourage the development of standardized products and pricing models, and create liquid markets with depth.

One area of opportunity for further multilateral involvement is that access to all or some IMF facilities should be conditional on the issuance of new SCDIs, or on the remaining debt held by investors being swapped with SCDIs. Such a scheme would certainly contribute to limiting the moral hazard attached to IMF financing and help the development of GDP-linked bonds and sovereign CoCos.

Similar incentives could be provided by international official institutions such as the IMF if they incorporate the idea of SCDIs when doing its baseline projections of debt sustainability, to see how that would change if the sovereign had included GDP-linked bonds for instance in its debt portfolio. Amending its debt sustainability framework, the IMF can make clear, for example through stress testing, the benefits offered by GDP-linked, or other forms of stage-contingent debt, and this may significantly reduce the premium. However, these initiatives would primarily deal with the refinancing of the existing debt and would, therefore, be closer to the solutions that have already been developed by Greece, Russia and Ukraine rather than a decisive step towards the development of a large market.

Alternatively, official creditors could introduce state-contingent features into their lending (or even underwrite or guarantee SCDIs). Official sector lenders can also serve as potential buyers, since they already provide substantial support to sovereigns, and they have long horizons that allow them to absorb volatile returns. Further still, a major sovereign or regional institution could undertake a 'test issuance' of an SCDI to lead the way for others.

There is no reason to limit GDP debt indexation to private market participants. Principles of GDP-linked bonds and maturity extension clauses can be adopted by bilateral creditors as much as by multilateral agencies. This approach presents several advantages which might help circumvent some of the difficulties so far experienced in extending in practice the use of SCDIs in sovereign bonds issuances. Proposals by Tabova (2005) to extend the GDP indexation framework to concessional loans to LDCs by the International Development Association (IDA), and a similar proposal by Missale and Bacchiocchi (2012) to adopt GDP-indexation, contingent convertible debt and catastrophe clauses for all multilateral loans, are examples to be considered.

There are at least three main reasons for considering the benefits and adoption of SCDIs for all developing countries' external lending with official creditors, whether bilateral or multilateral, concessional or non-concessional (UNDP, 2015).

<sup>15</sup> A model of the term sheet published by the Bank of England can be found at <https://www.bankofengland.co.uk/-/media/boe/files/events/2015/november/gdp-linked-bonds-london-term-sheet-2.pdf>.

First, for many developing countries loans with official creditors constitute a major source of external financing, in some cases the most important one. Argentina and Ecuador are recent examples of countries in South America with an increasing share of external financing that comes from official creditors. In this sense, applying principles of SCDIs to this type of lending could avoid the build-up of excessive IMF or other multilateral exposure, which is “super-senior” due to its de facto preferred creditor status. Hence, this type of lending applying principles of SCDIs reduces the risk of countries receiving financial assistance becoming unable to repay official creditors.

Second, given the limited interest that market operators have so far shown in SCDIs, reaching out to official creditors might prove to be a more effective avenue for advocating for this type of financial innovation with a smaller number of counterparts: essentially international financial and development institutions, including regional agencies and multilateral banks, and sovereign governments.

Thirdly, official creditors presumably operate with a longer time horizon and, therefore, can factor in the long-term benefits that can be derived from this type of debt financing, especially in terms of reducing the risk of sovereign defaults and restructurings. Further, most, if not all, of these official creditors, also have an agenda for international development and may see in the adoption of GDP-linked lending as well as of maturity extension clauses a way of supporting global efforts to increase and improve the quality of liquidity relief and development finance.

There is not much experience in the use of SCDIs by official creditors in ‘normal’ times. A preliminary experience with a form of pandemic bonds was carried out by the World Bank in 2017. Unlike with a “hurricane” clause, which offers liquidity relief, this pandemic catastrophe bond is a type of insurance-linked security which pays insurance (bond principal) only if a catastrophe (pandemic) protected by the bond occurs. It offers highly attractive yields to investors at the risk of losing the principal payment amount and provides a quick payout to the borrower when the catastrophe occurs. As reported by Cohen et al. (2020) the bond, however, suffered from several challenges: insured event trigger complexity; high coupon rate; and limited payout. Apparently, these deficiencies have contributed to the World Bank’s recent decision to discontinue issuing these instruments.

## H. Conclusions

Even before the COVID-19 crisis, Latin America and the Caribbean already faced a period of stagnant growth with a precarious labor market, low investment, and limited macroeconomic policy space to mitigate exogenous shocks. Thus, the COVID-19 pandemic arrived at a time of economic weakness in the region and in circumstances in which spontaneous market forces alone lack the capacity to generate a strong recovery from the shock. Both domestic and foreign direct investment is falling and with ever greater social demands, increasing debt levels, and difficulties in reversing recent expenditure increases, governments must implement policies yielding higher growth and development as the health crisis subsides. To do this, governments need to continue to borrow and invest.

Despite the current high level of government debt globally and the mounting risk of major and costly government debt crises in low- and middle-income countries, little has been done to render investors more responsible and to limit the impact of economic stress on the ability of a sovereign to repay its debt. This chapter has argued that one important avenue to do so is to develop State-Contingent Debt Instruments. If adequately designed and priced, these debt instruments can align investors and borrowers’ incentives and give an “equity-like” exposure to the issuing countries. Overall, SCDIs would be beneficial for economic and financial stability and can complement other existing initiatives to reform and strengthen the international monetary and financial system. Not to mention that by improving solvency they would alleviate the economic cost of a debt restructuring.

The chapter reviewed SCDIs with a focus on those that link capacity to service debt to economic performance and to those that provide some form of temporary payment standstill in bad times. We have

analyzed what the literature considers their potential benefits as well as their more problematic practical issues pertaining risk assessment, the components of the risk premium, and the pricing of such bonds. Work on resolving practical issues is ongoing and involves several initiatives and participants including central banks, multilateral agencies, and potential investors.

With respect to bonds that link capacity to service debt to economic performance, we strongly support the idea of symmetric GDP-linked bonds. The most important benefit that the literature attributes to GDP-linked bonds is its effect on debt sustainability. It is not only that the government's burden of servicing its debt would be lessened during an economic downturn, but more generally, the government's ratio of debt to GDP would be more stable because the interest burden on GDP-linked debt would be positively related to economic growth, so any additional borrowing to cover debt-servicing costs would be lower during downturns and higher during upturns. Moreover, these instruments would be beneficial thanks mostly to their power to allow higher debt limits without putting at risk the ability to pay and to increase the scope for countercyclical fiscal policy. GDP-linked bonds could also benefit holders of the issuing government's conventional bonds, as they might reduce a government's default risk. For the international monetary and financial system GDP-linked bonds could have important benefits if the large dead-weight costs associated with disorderly and protracted debt restructurings could be avoided.

In the case of state contingent debt instruments that stipulate a suspension of debt payments such as sovereign CoCos, by providing liquidity relief the instrument would buy time for an orderly restructuring of payments. Sovereign CoCos have the potential for improving economic and financial stability. By providing a temporary payment standstill, sovereign CoCos allow gradual and less costly economic adjustment during crises. Moreover, once a sovereign CoCo is activated the maturity extension ensures that the official sector liquidity assistance would not have to cover debt amortization payments, and this will reduce the required size of official sector emergency loans. In addition, sovereign CoCos may also address debtor moral hazard behavior and reduce the incentive to lend incautiously to sovereigns when creditors could no longer anticipate full repayment by the official sector in times of crisis. Introducing distress contingencies into sovereign debt contracts has also the potential of forestalling defaults and avoiding costly delays when a crisis occurs.

To date, sovereigns have not used SCDIs as a regular instrument of budget financing. In contrast to normal times, SCDIs have become a much common component of sovereign debt restructurings. During restructurings, GDP-linked bonds can help by backloading debt repayments when recovery is fully underway and help governments insure themselves against subsequent negative growth shocks and having to restructure again. In the context of new issuance, it would be optimal to achieve a mix that provide system-wide risk reduction and sustainable insurance mechanisms. Both attributes are needed for an insurance market to function properly. It is in this sense that we propose the introduction contingent convertible bonds (such as Sovereign CoCos or Disaster-linked bonds), and GDP-linked bonds as complementary types of state-contingent bonds.

A major challenge still being worked through is the premium over conventional sovereign bonds that governments must pay investors to compensate them for taking on the exposures inherent in GDP-linked bonds, sovereign CoCos or bonds with catastrophe clauses. There are various types of risk that affect the premium: Liquidity risk, novelty risk, growth risk, default risk. The idea is to find a good balance with a sufficiently low premium to make the instruments attractive to both governments and investors.

The more countries that issue SCDIs, the lower the premium and the greater the diversification benefits to potential investors. But there is a first-mover disadvantage and one way to overcome this collective action problem would be for a group of interested sovereigns to co-ordinate their issuance. Concerted efforts by governments (in both advanced and developing countries) and multilateral financial institutions to push for the creation of state contingent securities markets will contribute to deal with the size of the market and liquidity problems.

Standardization of the instrument's commercial and legal terms can also help mitigate illiquidity. Clearly there are numerous ways in which SCDIs could be designed. Simple design proposal of contractual terms that may be adopted for each instrument were presented, but further work on the optimal form of SCDIs terms would be needed if this idea is to be advanced.

There are several ways through which multilateral development banks and multilateral institutions could help develop the market for SCDIs. For instance, in the context of debt restructurings, concerted efforts by governments, creditors and multilateral financial institutions to push for the creation state contingent securities markets would contribute to deal with the size of the market and liquidity problems. Another possibility of more multilateral involving is that access to all or some IMF and development bank financial facilities would be conditional on the issuance of new SCDIs or on the remaining debt held by investors being swapped with SCDIs.

Moreover, multilateral institutions and creditors could introduce state-contingent features into their lending, or even underwrite or guarantee SCDIs. The introduction of SCDIs by Multilateral Development Banks could become a realistic project whose chances of success are worth investigating. By reducing the likelihood that debtor countries run into repayment difficulties and eventually file for debt relief, SCDIs may also benefit multilateral lenders. Official sector lenders can also serve as potential buyers, since they already provide substantial support to sovereigns, and they have long horizons that allow them to absorb volatile returns. A major sovereign or regional institution could undertake a 'test issuance' of an SCDI to lead the way for others.

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## Abbreviations and Acronyms

ATSM	Affine Term Structure Model
B-CoCos	Bank-Contingent Convertible Bonds
BERT	Barbados Economic Recovery and Transformation
CAPM	Capital Asset Pricing Model
CAS	Collective Action Clauses
CAT	Catastrophe Bond issued by Mexico
CCRIF	Caribbean Catastrophe Insurance Risk Facility
CCRIF SPC	Caribbean Catastrophe Insurance Risk Facility - Segregated Portfolio Company
CCRT	Catastrophe Containment and Relief Trust
CDS	Credit Default Swap
CoCos	Contingent Convertible Bonds
DSSI	Debt Service Suspension Initiative
ECLAC	Economic Commission for Latin America and the Caribbean
EFF	Extended Fund Facility
FACE	Fund to Alleviate COVID-19 Economics
FCL	Flexible Credit Line
GLWs	GDP-Linked Warrants
GDP	Gross Domestic Product
IADB	Inter-American Development Bank
IDA	International Development Association
ILO	International Labour Organization
IMF	International Monetary Fund
LAC	Latin American Countries
PAHO	Pan American Health Organization
PLL	Precautionary Liquidity Line
PRGT	Poverty Reduction and Growth Trust
SCDIs	State-contingent Debt Instruments
S-CoCos	Sovereign-Contingent Convertible Bonds
SDGs	Sustainable Development Goals
S&P GSCI	Standard & Poor's Goldman Sachs Commodity Index
SDRs	Special Drawing Rights
UDROP	Universal Debt Rollover Option with a Penalty
UN	United Nations
UNDP	United Nations Development Programme
VRI	Value Recovery Instruments



### III. Income-linked bonds

*Fausto Hernández*

#### Introduction

Traditional sovereign debt has been used for a long time. The benefit of accessing to these international markets is that the country can smooth national consumption over time. The main disadvantage is that repayment is a rigid commitment; hence countries face difficulties to honor the debt service when an adverse event occurs. That is, countries, especially developing ones, can hardly avoid the pain of pro-cyclical adjustment.

Curiously, on a modern scale King Philip II, who ruled Spain between 1556 and 1598, was the first monarch to borrow from international markets, and many of these “loans were explicitly contingent on observable events; others featured options allowing either the king or the bankers to reschedule disbursements and repayments at will, hence allowing the parties to modify cash flows in response to unforeseen circumstances” (Drelichman and Voth, 2013). Philip II of Spain and his Genoese bankers developed a system that dealt with adverse shocks much more effectively than modern-day debt markets, according to these authors.

However, Drelichman and Voth (2013) recognize that Philip II’s system cannot simply be copied. And yet, it seems odd that so little experimentation has gone into better risk-sharing arrangements: oil importers could issue debt with coupons varying inversely with oil prices (this came sometime in the mid-1980s); or alternatively, automatic maturity extensions could be written into sovereign bond covenants in case risk premia hit a certain pre-defined level, reducing the risk of roll-over crises. Drelichman and Voth do not propose any particular solution or financial instrument; they are simply pointing out that it seems odd that, for all of the financial sophistication of today’s markets, sixteenth-century financiers came up with more creative ways to make borrowing safe and effective than today’s market players.

Another old example is the issuance of the first ever inflation-linked bond in 1780 by the State of Massachusetts, then called a ‘Depreciation Note’, indexing the return to a basket of goods including corn, beef, wool and leather (Benford et al 2016). Brazil, Chile and Mexico designed and introduced

inflation-linked bonds during the second half of the XX Century. Even the US took these as examples to issue again an inflation-linked instrument, the Treasury Inflation-Protected Securities, or TIPS. The principal of a TIPS increases with inflation and decreases with deflation, as measured by the Consumer Price Index. When TIPS matures, bondholders are paid the adjusted principal or original principal, whichever is greater.

Nevertheless, since the external debt crisis of the 1980s and more recently, the great financial crisis of 2008-09, there has been some attempts to link the obligation to pay to an indicator of the ability to pay. The handful of cases that exist are mostly part of restructuring packages negotiated in the aftermath of defaults, such as the prominent GDP-indexed bonds of Argentina and Greece. It is argued that these instruments substantially reduce the risk of defaults (Kletzer, Newbery and Wright 1992; Borensztein and Mauro 2002; Borensztein et al. 2004).

This section describes these instruments to understand how they work, what is needed for their success and what are their advantages and disadvantages.

## A. Rationale for state-contingent bonds

Countries face economic adverse events periodically (that is, they are subject to business cycles) which in turn pose problems on the country's fiscal stances; hence different instruments that seek buffering these negative effects have been designed over time. One of the most common and effective tools that was introduced recently was a set of fiscal rules, in particular, a salient one is the so-called *structural budget balance rule*.

The structural budget balance is the government's actual fiscal position purged of the estimated budgetary consequences of the business cycle and is designed in part to provide an indication of the medium-term orientation of fiscal policy (this definition is adopted by different organizations, including ECLAC, IMF, OECD). The implementation of such a rule is complex and varies from country to country. However, as it is a stabilization tool, this implies saving resources during boom times to finance the fiscal deficit present in a counter-cyclical strategy either with debt or funds coming from stabilization funds, designed explicitly for this purpose.

Nevertheless, when the debt ratio is high, the debt service may also soar, independent to the existence of the structural budget balance clause. This is normally the case for developing countries. In particular, this is true for Latin America and the Caribbean (LAC) ones, the most indebted region in the developing world (79% of GDP); this region actually pays the highest external debt service (59% of exports of goods and services). In addition, some economies in the region (at some point, Argentina in the early 2000s, Brazil in the late 1990s and México during the tequila crisis of 1995, among others) have made extensive use of the international capital market with long-maturity periods but with interest rate costs that are above their historical trend growth which could not only harden their liquidity constraints but could also set the stage for future situations of insolvency.

For this reason, a complementary policy is the introduction of alternative financial instruments, which may help to lower the effects of the adverse economic shocks, namely, the contingent sovereign debt. This type of debt is basically a loan which service is linked to an observable indicator, such as GDP, national income, exports, among many others. The concept is analogous for most of those variables, though the prospects for success may vary for different reasons.

It is important to pinpoint that emerging markets and developing economies, have less flexibility to utilize other traditional macroeconomic tools to implement as countercyclical policies, as they do not necessarily have automatic stabilizers nor access to international credit markets at times of economic distress, nor a well-financed stabilization Fund.

In sum, the LAC countries could benefit from the introduction of contingent sovereign debt so that they can face economic downturns more effectively and less painful. To facilitate the analysis, we temporarily use the GDP as the underlying variable, as the concept is analogous to most economic performance indicators. In addition, GDP-linked security is, by now, the most widely used. Later we introduce the idea of GNI-linked bonds (ILB, henceforth). We will show that these may be better suited for some countries in Latin America and the Caribe.

### 1. Definition

The GDP-linked bond is a financial instrument that links either principal or interest payments (or both) to GDP growth. Hence when the economy is in ascending phase the interest payments rise, and conversely, when the economy slows down or it is in a crisis, the service of the debt is reduced or even suspended (depending upon its design). These are especially useful for emerging countries which frequently write off foreign currency denominated debt.

On the other hand, these bonds provide the investors with a better way of taking the risk on a country's growth prospects. Because there is a modest correlation between GDP growth and the returns of equity, stock markets do not provide the possibility of taking such a risk, while these linked bonds allow for that risk-taking position.

As known, a *plain vanilla* bond contains mainly two elements, namely, the face value (principal) and the coupon (which implicitly yields the coupon rate). In a contingent bond, either or both, the principal and the coupon may be indexed to a variable, such as the GDP or GNI.

Shiller (1993)'s original proposal on contingent debt suggests that both the principal and coupon payments should be indexed to the level of nominal GDP. In turn, Borensztein and Mauro (2004) propose indexing only the coupon to the real GDP growth and fix the principal to par value.

### 2. Advantages

In principle, linking the debt service to an economic performance indicator, GDP or GNI, brings a stabilization of the debt ratio (debt over GDP or GNI) over time. This is so because the need to refinance or rollover existing debt diminishes. At the same time, with indexed debt, its service is reduced during the economic distress, a fact that facilitates using the resources to finance pro-growth activities. This inherent feature provides many benefits to both the issuing country and the investors.

The first benefit is for both counterparts. Given that the ratio of debt to GDP (or GNI) stabilizes, the probability of default goes down, and hence the likelihood of a debt crisis. When a debt crisis occurs countries lose access to future credits, and may even receive trade sanctions, which send the economy to a vicious circle (such as the 1980s external debt type) causing unemployment and at the end an increase in poverty level.

Paradoxically, when a debt crisis occurs, this is the time when countries need to contract fresh debt to face the economic downturn. Thus, the linked security provides a better environment to launch an appropriate counter-cyclical program. The financing, we reiterate, may come from the debt service holdings, which in turn lower the necessity of contracting additional debt. This is in sharp contrast to the historical experience of emerging markets, which are often forced to follow pro-cyclical fiscal policies during periods of slow growth to maintain access to external credit markets. GDP-indexed bonds reduce the need for procyclical policies, by acting as an 'automatic-stabilizer' type mechanism (Blanchard et al. 2016, Benford et al. 2016).

Therefore, the need for an immediate fiscal reform may be delayed or even avoided, depending upon several events. Social expenditures and infrastructure programs may be kept on. This implies in developing countries containing the increase in poverty levels, and social disruptions.

Finally, in principle and especially for developing countries, they could help establish consistent legal standards to facilitate bond pricing, develop options to improve the reliability of growth statistics, and coordinate issuance by several countries in order to create a liquid market more quickly.

From the investors side, the linked bond provides an additional instrument to invest in, so they may diversify risk. Citizens from different countries may take advantage from the fact that economic performance in the world is not perfectly correlated, hence the instrument may help diversification.

In addition, stock indices and economic performance are not perfectly correlated, so a position on the growth of the country is possible. Besides, developing countries, especially the small ones, do not necessarily have a developed and strong stock market. The instrument provides the possibility for investors to take a position on future growth of a small-developing country.

Moreover, as the probability of default is lower, the investors invest in a lower-risk instrument (Borensztein and Mauro, 2004).

### 3. Problems and challenges

As described, in principle GDP-linked bonds may present a good number of benefits. If so, why the market for growth-indexed bonds has not developed if it could have such substantial benefits?

This is because there are still some challenges that need to be addressed. Most of these come from deficient securities design or because they do not work when there are weak institutions in the issuing countries. For this reason, here we briefly list some of the main challenges and disadvantages. Most of these come from the experiences that different countries have had when implementing them. This list will be better understood in the next section when we present an exam of the main experiences.

First, there are concerns about data reliability, as many developing and emerging economies have weak institutions, which include deficiently designed institutes of statistics (in charge of estimation of economic variables). Sometimes these institutes are not independent from the executive branch; this fact may tempt the executive leader to influence the estimation of the variables, so they obtain certain results. Some other cases, the institutes simply suffer from lack of funding. Finally, in a few cases even low level of human capital has also been a problem (Griffith-Jones and Sharma, 2011).

A second obstacle, related to the previous one, is a typical moral hazard problem, as countries may have the incentive to misreport figures on economic performance or inflation rate. Depending upon the situation, the benefit of doing so is paying a lower amount of debt service; or, even sending the signal that the country is doing well, at the cost of paying higher debt service, as we will see it happened in one of the experiences below. This will depend on the politicians' political objectives. One may prefer to pay higher interest payments because it pays more politically. Others (or the same politician in other political context) may prefer to economize resources. In other words, the possibility of one-sided manipulation deters investors and makes it difficult to sustain a well-functioning market (Benford et al, 2016).

An additional data related challenge is related to the revisions of national account methodologies and changes of base year. The practical issues associated with GDP or GNI data revision remain a formidable obstacle to the broad issuance and acceptance of these instruments (Cecchetti and Schoenholtz, 2017). One of the experiences below showed some skepticism about the methodology change that took place during the life of the warrant.<sup>1</sup>

The other crucial challenge is about the financial security's design. This is relevant because the investors' interest highly depends on a sound design that takes care of the main concerns.

<sup>1</sup> Warrants are a derivative that give the right, but not the obligation, to buy or sell a security—most commonly an equity—at a certain price before expiration. The price at which the underlying security can be bought or sold is referred to as the exercise price or strike price. The instrument is not standardized as a typical option (see Hull 2011).

We have just mention one important investors' concern, namely, the data problem. Nevertheless, other concerns include pricing, liquidity, appropriate legal framework. For example, the difficulty in successfully introducing new financial instruments, in addition to the examples of inflation-indexed bonds and credit-default swaps, is the use of collective action clauses (CACs) in U.S.-law bond contracts.

CACs are present in the US law. The definition of a collective action clause (CAC) is the one that allows bondholders to agree on debt restructuring even when some bondholders are against restructuring as long as majority agrees. This means that even if issuing country does not want to restructure the contingent debt, if majority of bondholders obtain the legal authorization, they may do so. This has been considered a potential obstacle for contingent debt.

Investors also expressed concern and claimed that they would only purchase bonds with these clauses if they received a premium (Griffith-Jones and Sharma, 2011). This one depends highly on good pricing. Investors' appetite is almost always there. They will be attracted should a security is well-designed so that it acts as an equity-like exposure to a country's economic performance.

If valuing this type of security works properly then hedging risks should be easier. Therefore, by designing a simple, clear, and appropriate linked security, the pricing should be much easier.

From these elements it is possible to summarize the challenges as in Council of Economic Advisers (2004):<sup>2</sup>

- Draft a sample bond contract to clarify exactly how certain potential concerns could be addressed.
- Provide concrete alternatives to ensure reliable and accurate GDP statistics.
- Explore options to help jump-start a liquid market for growth-indexed bonds.
- Encourage involvement by the Multilateral Organizations. These may serve as advisers on designing autonomous National Institutes of Statistics; or alternatively, as monitors to check them.
- The most important consideration for governments is to adopt sound macro- and microeconomic policies. Financial innovation cannot compensate for inconsistent and unsustainable economic policies.

In addition, Schröder et al (2014) provide guides for introduction based on surveys. These are consistent with that of the Council (2004). These authors carried out a survey to determine features and conditions for a successful introduction of indexed bonds. These bonds should have a simple structure (easy to understand and to price) if they are to be accepted by the capital market.

Moreover, they argue that high total volume of issues to guarantee a liquid secondary market (at least 500 million euros or US dollars).

However, Roch and Roldan (2021), based on a Eaton and Gersovitz (1981) sovereign model, argue that lenders distort probabilities by assigning higher likelihood to those states where the bond promises lower repayments. This washes out the advantage of lower default risk. This explains the modest use of contingent debt, despite the benefits it brings about. Cohen et. al (2020) argue that investors have typically steeply discounted these "equity-like" instruments given their nonstandard designs, illiquidity, and idiosyncratic risk profiles; hence they have often provided poor value for their cost to borrowers.

However, Cohen et. al (2020) reckon that designing better SCDI contracts will also raise their appeal; future SCDIs should increase the use of standardized terms to promote liquidity and avoid historical shortcomings such as measurement issues, lagging indicators, and uncapped payouts.

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<sup>2</sup> See also Hatchondo and Martínez (2012).

The conjuncture also provides an opportunity to consider the issuance of exchange bonds with payouts that vary with both good and bad times. The post-COVID outlook is one that leaves sovereign debtors exposed to heightened uncertainty on both the upside and downside, and even seemingly conservative baselines may prove to have been optimistic.

Accordingly, “symmetric” instruments —with coupons linked to a variable (for example, commodity prices) that is outside the control of the issuing sovereign (hence avoiding measurement and manipulation risks)— should be explored. In this study we explore this element by indexing the bond to GNI, which, we argue, is subject to outside verification in their main variables, for some countries, such as the Central American and Caribbean ones.

#### 4. Related bonds

As previously mentioned, linked instruments have existed for a long time. In the modern era we do have three prime examples. The first is the inflation-indexed bonds which are the most closely related example and show the difficulty in introducing new financial instruments. However, they have been functioning well in LAC, such as Brazil, Chile and México, among others. There is a liquid market and investors’ appetite have been quite extensive. Undoubtedly, the data on inflation needed to be reliable. These countries have done a good job in strengthening the institutes in charge of estimating statistics.

Two other existing instruments sharing certain characteristics of growth-indexed bonds are commodity-linked bonds and catastrophe-insurance contracts. These instruments can also play an important role in reducing country vulnerabilities and stabilizing budgets. One potential benefit of these two instruments over growth-indexed bonds is that the sovereign has less ability to affect the information about the relevant variable determining the bond payments (such as a commodity price).

Commodity-linked bonds are less promising than growth-indexed bonds for emerging markets, however, since most emerging markets have fairly diversified production and exports, so there is often no natural commodity price to link to bond payments, except for some small countries.<sup>3</sup> Furthermore, indexing to exports is a way to include the commodities as less developed countries that rely on a single commodity often sell this commodity abroad. So exports may be a better candidate.

#### 5. An example: Mexican debt service during the pandemics

This section sketches the importance of including in the country debt portfolio an economic —performance— linked bond. The purpose of the example is to emphasize the value of issuing such a security.

The year 2020 was one of the hardest for most countries, as the pandemics hit the economy. For that year México’s debt service reached 3% of GDP. Many experts and national and international organizations recommended to launch a recovery plan that involved aid (workers included) to micro and small firms, among other measures.<sup>4</sup> The costs associated to most economic recovery proposals reached figures around 3 to 4% GDP. México is one of the very few countries that did not launch such an anti-cyclical program.

Had México issued (say three years before) GDP/GNI linked bonds, part of the debt service could have been used in financing the recovery package that could have helped buffer the increase in the unemployment rate. This was not the case, and Mexico could not implement any recovery package. The result was an abrupt reduction in the rate of growth (around 8%) of GDP, one of the largest negative figures in the region. Still, the country honored the debt service for this year (see figure III.1), which reached 3% of GDP.

<sup>3</sup> Still, some countries’ public finances largely rely on the revenues coming from these commodities. For example, Mexico on oil revenues and Chile on Copper revenues.

<sup>4</sup> Notably, the proposals were made by Levy (2020) and CEEY (2020), among many others. These suggested a relief package which consisted among other elements, in extending credits to micro and small firms, release temporarily the social security contributions, and the payment of salaries of the micro and small firms for up to six months.

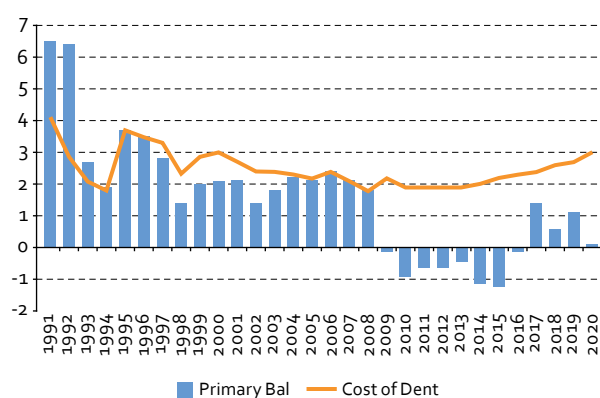


Hence, the importance of having had a contingent sovereign debt is highlighted.<sup>5</sup> Should one third<sup>6</sup> of total indebtedness would have been indexed to GDP, more than one third<sup>7</sup> of the 3% of GDP spent on servicing the debt would have been put on hold. These resources could have been used to finance in part the suggested anti-cyclical program.

This example is only provided to illustrate the usefulness of the instrument. We do not mean that this example is a formal one. The basic idea is for their coupons payments to be indexed to nominal GDP, and in so doing allow both the burden of servicing interest payments and repayments of principal to adjust with the sovereign's ability to pay.

No sovereign in the world has yet issued a GDP-linked bond with full risk-sharing between sovereigns and their creditors, with returns that vary symmetrically, falling with lower GDP and rising with higher GDP.

**Figure III.1**  
Mexico's financial primary balance vs Debt Service,  
1991-2020  
(Percentage of GDP)



Source: SHCP.

Next, we proceed to briefly present the available empirical evidence and source-cases (countries that have issued GDP-linked bonds) that exemplify the applicability of GDP-linked bonds and the lessons learned. This section would then use the empirical analysis to evaluate the case for income-linked bonds.

## B. Selected source-cases

The history of contingent sovereign debt is old. Still, there are only a few known cases such as those part of the Brady Plan (Bosnia Herzegovina, Bulgaria and Costa Rica) and the recent examples of Argentina, Greece and Portugal. However, Pina (2020) argues that there are many more cases apart from these well-known ones.

Table III.1 presents a complete list of such instruments developed by Pina (2020). As it may be seen, there are at least 30 countries which have issued a type of contingent-sovereign security (34 issues). These financial instruments are issued on different variables; some of them contingent on exports, others are indexed to commodities, whereas others are contingent on the occurrence of natural disasters. Finally, about 30% of all issues are indexed to GDP.

<sup>5</sup> This is not judging or analyzing whether the Mexican response was adequate or not. We only illustrate the importance of the contingent sovereign debt.

<sup>6</sup> This percentage is arbitrary, and more rigorous analysis is needed to determine, if any, the optimal total debt proportion to be indexed to an economic performance variable.

<sup>7</sup> This is more than one third due to the fact that indexed-bonds pay a higher premium. Thus, they may account for more than one third of the debt service.

**Table III.1**  
**Selected examples of contingent-sovereign securities**

Sovereign	Debt instrument and linkage	Type
Algeria	Oil-linked loan	Loan
Argentina	Real GDP growth linked warrants	Warrants
Bolivia (Plurinational State of)	Bond linked to the price of tin	Bond
Bosnia and Herzegovina	GDP Performance Bonds	Warrants
Bulgaria	Additional Interest Paid linked to GDP	Warrants
Burkina Faso, Mali, Mozambique, Senegal & Tanzania	AFD countercyclical loans linked to Exports	Loan
Confederate States of America	Cotton Bonds	Bond
Costa Rica	Value Recovery Rights linked to GDP	Warrants
France	Pinay Bond linked to gold	Bond
France	Pinay Bond linked to industrial production	Bond
France	Rente Giscard linked to Gold	Bond
Greece	GDP-Warrant linked to Real GDP	Warrants
Grenada	Bond Hurricane Clause	Bond
Grenada	Citizenship by Investment revenues linked bond	Bond
Various Countries	Petrocaribe Bonds linked to oil	Loan
Honduras	GDP-Linked Bonds	Warrants
India	Oil-linked bonds	Bond
India	Gold Bonds	Bond
Ivory Coast	GDP-Linked Bonds	Warrants
Malaysia	Citibank Loan	Loan
Mexico	Petrobonos linked to oil	Bond
Mexico	Value Recovery Rights linked to oil	Warrants
Mexico	CatMex linked to earthquakes	Bond
Mexico	Multicat linked to earthquakes and Hurricanes	Bond
Nigeria	Payment Adjustment Warrant linked to oil	Warrants
Papua New Guinea	Metallgesellschaft loan linked to copper	Loan
Peru, Colombia, Chile, Mexico	IBRD Cat Bonds CAR 116-120 linked to earthquakes	Bond
Portugal	Treasury Certificates linked to real GDP growth	Bond
Singapore	New Singapore shares, Economic Restructuring Shares linked to GDP growth	Share
Turkey	Revenue Indexed Bond	Bond
Ukraine	Warrants linked to real GDP	Warrants
Uruguay	Value Recovery Rights linked to terms of trade	Warrants
Uruguay	Nominal wage linked bond	Bond
Venezuela (Bolivarian Republic of)	Oil-indexed payment obligation	Warrants

Source: Pina 2020.

In terms of type of instrument, Pina (2020) found bonds, warrants, and loans. Bonds and warrants are traditionally issued to the public, while loans are issued to official or private lenders, usually banks. Warrants have been usually linked to a traditional “plain vanilla bond” but, in some cases, they have been detachable.<sup>8</sup>

<sup>8</sup> This instrument Works in a similar way a convertible bond. In a contingent liability like the one we are studying, the plain vanilla bond, after six months of issuing date, a “coupon” may be detachable and be sold as an independent instrument. The value of this is the one contingent on economic performance.

The main difference between a bond and a warrant is that warrants are designed in a way that may lead to an increase in payments to investors, but never a decrease. In other words, the contingency is only on the upside. Unsurprisingly, warrants are traditionally issued as a type of reward in debt restructuring deals.

Some other features highlighted by Pina (2020) database is that most of them are issued in foreign currency, whereas only 20% in local currency; the unweighted average maturity tends to be long run, mostly with a maturity between 10 and 20 years. Seventy percent of the whole sample has been activated, that is, the payment has been made. This is an important feature because it suggests that probability of not getting paid because of the contingency, is less than 30%.

In sum, only 34 indexed-securities have been issued in contemporary history of sovereign credit markets. Out of these only 12 have been written in the form of warrants. Next, we review the main and most representative of these derivative instruments.

### 1. Country case experiences with contingent sovereign securities

This section briefly examines the features of the main cases listed above.

#### a) Bulgaria

Miyajima (2006) uses the 2004 Bear Stearns Sovereign Eastern Europe Report to briefly describe the cases of Bulgaria and Bosnia-Herzegovina. The Bulgarian GDP-linked bond is a warrant which payment is triggered if both of the following conditions are met:

- (i) Its GDP reaches 125% of its 1993 level, and
- (ii) the rate of yearly growth is positive.

According to those reports (Bear Sterns) when both conditions are met, 50% of the GDP rates of growth are paid on underlying plain vanilla bonds, in addition to the plain vanilla coupons.

The determination for the bond ending up “in-the- money” need an important input, namely, the GDP rate of growth estimation. The bond prospectus is ambiguous on the source of data to obtain the GDP level, referring only to World Tables published by World Bank. As known, this international organization publishes several yearly reports; the Bulgarian prospectus is not clear about which one to use. Miyajima (2006) finds that around this date the World Bank Tables included four different estimations of GDP, and the document did not specify which one to take as a reference for calculation.

Moreover, World Tables were replaced by World Development Indicators which collected data at constant and current prices and in USD and Bulgarian Leva. With four different indicators, the Bulgarian government had the incentive to choose the one that better accommodated its budget. And this is what happened. The Bulgarian authorities used constant-value local currency units to avoid triggering the service of contingent debt payment. Had they utilized current-value, payments would have been triggered.

Finally, the other questionable element that has been identified is that the bond was callable. This means that the issuer may call the bond whenever it desires. Normally a government calls a bond when the conditions of the market (mainly interest rates) suggest that the issuing country may save debt service resources through an exchange of bonds.<sup>9</sup>

Miyajima argues that this feature was inconsistent with the *raison d'être* of the bond -reduce the proportion of the contingent debt, hence reducing the insurance against growth slowdowns, and the benefit for investors to enjoy higher returns in the good times.

<sup>9</sup> Suppose a bond is now paying a 10% of coupon rate. Suddenly the market drives down the interest rate on similar bonds, say at 8%. The country calls the 10% coupon rate and issues a 8% coupon rate bond.

Two main lessons arise from the Bulgarian case. First, the source of data should be precise (apart of the accuracy problem) in terms of currency (local or foreign), value (nominal or constant prices), time horizon, among others. Second, the callable clause should be studied further. A call premium could resolve this obstacle.

#### b) **Bosnia-Herzegovina (BH)**

The BH GDP-linked bond matured in 2017 and was issued in 1993. This was a warrant, which payment was triggered if both of the following conditions were met:

- (i) Its GDP level reaching a predetermined target and, more importantly, remaining at such level for two consecutive years: 125% of its 1993 level, and
- (ii) GDP per capita surpassing the USD\$2,800 in 1997 prices, adjusted using German CPI.

As it may be appreciated from reading the conditions above, it seems a poor security design. Moreover, as in many developing economies, the informal sector was large and, at issuance, was not considered in official data statistics. Therefore, the GDP misrepresented its true level. The GDP figures were estimated by the central bank, in a possible conflict of interest.

On the other hand, as the second condition was in per capita terms, and the population statistics were obtained by a third institution, which by that time was questioned about their capabilities to provide reliable numbers. This was an additional source of data problem.

Finally, the price of the warrants was rarely published; thus trading activity was scarce.

The lesson from the BH case is that the source of data should be clear and precise, and obtained by an independent body. This could be solved in different ways, which will be discussed in section 3.

#### c) **Singapore**

This country issued an equity<sup>10</sup>, as opposed to most contingent sovereign debt issued in the past. That is, this security was not issued as a result of a debt restructuring. In this sense this was by that time an innovative instrument. The share had the purpose to benefit low-income population in case the economy was in a healthy path of growth.

The Singaporean government issued this share in 2001, which dividends were linked to GDP growth. This posed a negligible conflict of interest between the issuer and the holder. Shares were not tradable nor transferable and were supposed to be exchanged only for cash with the government.

The government issued two series of shares, the New Singapore Shares, and the Economic Restructuring Shares. The first one was issued during the economic slowdown and earned annual dividends (as in a *preferred stock*) which were estimated at 3% plus the real GDP growth rate of the preceding calendar year. The second, was introduced to subsidize the low-income population after the increase of the rate of Value Added Tax. Both were a 5-year preferred stock. Unlike a regular equity, which does not expire, these shares were limited with an expiration date after 5 years of the IPO.

The flaw of the security is that the solution was highly pro-cyclical. In general, this could be solved by government credit to the recipients right at the GDP slowdown.

#### d) **Argentina**

The Argentinian case has become the “textbook” illustration of a GDP-linked bond. It has been extensively studied (Borensztein and Mauro, 2002; 2004; Miyajima, 2006; Costa et al, 2008; Cao, 2012; among others). This is so because it is one that has been traded regularly over time, and partly corrected the problems of the previous “Brady” cases. Many lessons have been learned from its design and implementation. For this reason, we spend some more space in examining this case. To better understand this bond, we begin by providing some background on the Argentinian crisis of 2001.

<sup>10</sup> As opposed to a bond, an equity has no face value per se.

At the end of 2001 Argentina announced a moratorium on its outstanding debt and a few months later, in 2002, it abandoned the currency board regime which maintained the peso pegged to the dollar, making that economy virtually a dollarized one. The economic turmoil ended in a bank-run crisis that forced the Argentinian government to freeze bank deposits. Inflation rate soared and the peso depreciated abruptly.

As a result, the debt to GDP ratio went from 48% in 2001 to 147.2% in 2002, a fact that led to a debt rescheduling (table III.2). The debt renegotiation started in 2003, which lasted over 2 years as nearly 50% of the outstanding total public debt was in default (81.8 billion USD) (see Costa et al, 2008).

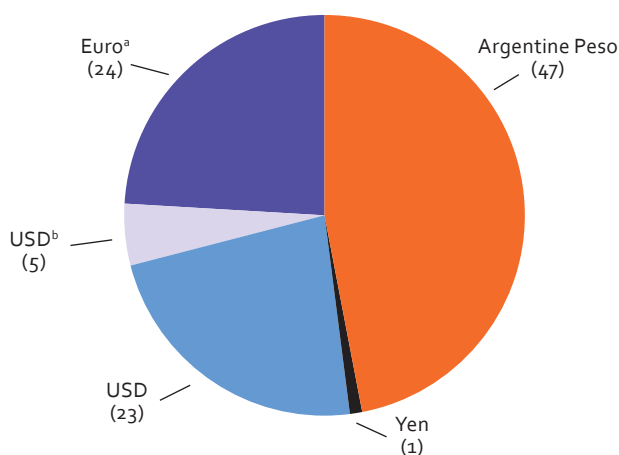
**Table III.2**  
**Argentina: selected macroeconomic indicators, 1998-2008**

Argentina											
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
GDP (billions of pesos, constant)	500.7	483.7	479.9	458.7	408.8	445.4	485.1	528.0	570.5	621.9	647.1
GDP growth	3.9	-3.4	-0.8	-4.4	-10.9	9.0	8.9	8.8	8.0	9.0	4.1
Primary fiscal balance (percentage of GDP)	0.5	-0.7	0.2	-1.5	0.2	3.2	5.2	5.1	3.3	2.6	1.9
Public debt (percentage of GDP)	34.1	38.9	40.8	48.0	147.2	125.1	117.8	80.2	70.8	62.1	53.8

Source: World Bank Database.

The exchange finalized in the mid-2005 with the participation of 76% of the bondholders. According to Costa et al (2008) the participating creditors swapped their claims with a 43% cut, that is, they accepted a 57% of original face value. The newly developed bonds included three varieties, namely, a par, a discount, and a quasi-par one. All of these had a pre-determined interest rate, varying over time, and issued in four different currencies: Argentinian peso, US dollar, Euro and Yen (see figure III.3).

**Figure III.2**  
**Argentina: GDP bonds currency distribution**  
(Percentages)



Source: Prepared by author.

<sup>a</sup> Under British Law.

<sup>b</sup> Under Argentinean Law.

As it may be observed from figure III.2, 47% of the GDP bonds were denominated in Argentinian pesos; 23% in USD dollars; 24% in Euros (British law was chosen to regulate these); 5% in USD but under the Argentinian law; and only 1% was denominated in yens.

In sum, the inclusion of a GDP warrant in the Argentinian debt restructuring package came after a five-year de facto default (2001-2005). The main features of the warrant are the following (See Borensztein and Mauro, 2004 and Prospectus Supplement, 2004).

- The warrant provides the holder with a payment if the following three conditions are met in a given year:
  - (i) Actual real GDP exceeds base case GDP,
  - (ii) real annual growth results greater than the growth implied by the base case GDP, and
  - (iii) the cumulative amount of past payments made on GDP warrant do not exceed the payment cap -0.48 per unit of security (in the issuing currency).
- Payments are calculated as a 5% of the difference between the actual growth and the base case growth of GDP, multiplied by unit of currency coefficient.
- Trading of the GDP warrant is denominated in pesos, but interest payments were paid in currencies of corresponding underlying bonds.
- Payments are made one year after the reference year and cannot be negative.
- Each new bond issued under the restructuring had a GDP-linked warrant detachable after November 29, 2005, which could be traded independently.

It is important to pinpoint that in the case of the conditions in (i) were all met, the total payment on all warrants is a fraction of the excess GDP in the reference year (the difference between actual GDP and baseline GDP). Payments were made on December 15 of the year following the reference year (first one took place in 2006).

Now, with respect to the performance of the bond, after 2003 Argentina experienced an impressive economic recovery thanks to a surge in agricultural and natural resource commodity prices, as this nation is top in producing soybeans, maize and wheat (see table above). This rate of growth facilitated the debt rescheduling based on economic performance.

However, inflation was still a problem. As known Argentina has had a long history of inflationary pressures over time. For this reason, this indicator is closely monitored by international markets. And by this time these were skeptical about the performance of the Argentine bureau Instituto Nacional de Estadísticas y Censos (INDEC) which inflation estimates were somehow questionable to save costs on inflation-linked domestic government bonds, as these represented 47% of total contingent debt (see Cao, 2012).

Paradoxically, artificially lowering inflation increased real GDP, a fact that favored foreign denominated contingent debt, as warrants premium increased. Hence the payout increased as seen in table III.3 below, from 0.62 in 2005 to 4.38% in 2010.

Ubide and Levy (2015) have argued that Argentina's inflation and national accounts statistics have been dubious by that time. Inflation has been significantly understated for political reasons (low inflation is "good"), but real GDP growth has been overstated (slow growth is "bad"). Thus, short-term political incentives to exaggerate growth have led Argentina to overpay on its debt. It paid the 2008 coupon, although later revisions to national accounts data showed that its trigger, the real growth rate in 2007, had not exceeded the threshold.

Still, the cap on Argentine warrants, however, may be reached much earlier than at maturity because each year's payment is not individually capped and is proportional to the cumulative discrepancy between the actual Argentine GDP and a specified base-case path. Real Argentine GDP has been growing much faster than anyone expected at the time of the debt exchange, and the payout on the warrants has, as a result, been very high during that period.

**Table III.3**  
**Argentina's GDP warrant payout**

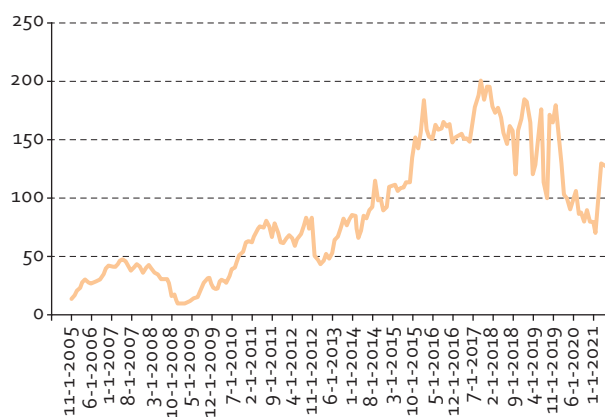
Accrual start date	Rate (Percentage) <sup>a</sup>
Nov 1, 2005	0.62
Dec 15, 2006	1.32
Dec 15, 2007	2.28
Dec 15, 2008	3.17
Dec 15, 2009	0.00
Dec 15, 2010	4.38

Source: Prepared by author.

<sup>a</sup> Rounded to two decimals.

However, lags in payments meant that some payments were due while Argentina was experiencing a recession, which created public pressure not to pay. An important issue was that the base year to compute GDP was changed in March 2014, from 1993 to 2004, which reduced the estimated growth in 2013 to 3 percent, almost half of what was initially forecasted, and just below the trigger for warrant payment. Aurelius, a hedge fund, filed a suit in January 2019, New York, for missed payments in 2013, arguing that there had been a statistical manipulation in the change of the base year. Although the case is still in court (as of December 2020), this litigation risk appears to have shunned interest in the Argentine GDP warrants and poses an important challenge for these assets elsewhere. Still, figure III.3 presents the trading history of this warrant. As it can be seen, it still trades and has been trading with cuts as a result of the pandemic. The main problem investors faced was related to data accuracy, which was manipulated as part of a political strategic behavior.

**Figure III.3**  
**Trading history of Argentina's GDP-linked bond,**  
**January 2005- January 2021**  
(Adjusted closing price in US\$)



Source: Bloomberg.

### e) Greece

Once more, the Greek warrant was part of a debt rescheduling as many other indexed securities.

As a result of the great financial crisis, this country experienced deep difficulties in honoring its debt service. By 2009 the level of indebtedness surpassed their level of annual GDP and the budget deficit reached 13% of GDP, more than four times the EU's 3% limit. In addition, Greek pension system was expensive, as pension payments had absorbed 17.5% of GDP, higher than in any other EU country. Public pensions were 9% underfunded, compared to 3% for other nations. (Zettelmeyer, Trebesch, Gulati, 2013).

Because of this situation, Greece entered a long and difficult process of renegotiation with creditors, mostly German and French banks. This process involved a partial bailout and heavy and painful austerity measures (that caused political problems in that country). The stabilization program included a debt renegotiation program which in turn involved the issuing of GDP-linked warrants.

The exchange offer to holders of Greek government debt was a package of several securities (Cao, 2012):

- 31.5% in a basket of new Greek external debt with a step-up coupon and 11- to 30-year maturity,
- a GDP-linked warrant,
- 15% of the face value of old bonds in short-dated European Financial Stabilization Facility (EFSF) bonds of up to two-year maturity (the "sweetener"), and
- short-dated EFSF bills that pay in full the accrued interest.

Regarding the 31.5% GDP-linked securities, it is important to note that these securities were issued for the official creditors (i.e., European Countries) to hold, and were not market traded instruments. Calculated as a percentage of the same notional as the New Bonds (31.5%), these securities pay interest provided both nominal GDP is greater than a reference level and real GDP growth is greater than a reference level. They have a final maturity of 2042, with the principal reducing by about 5% per year starting in 2024. The interest rate is capped at 1% and calculated as follows:

- Payment is made equal to
  - GDP index percentage \* notional if nominal GDP  $\geq$  reference nominal GDP rate
  - Zero if nominal GDP < reference nominal GDP rate

where GDP index percentage =  $\max \{0, \min \{1, 1.5 * (\text{real GDP rate} - \text{reference real GDP rate})\}\}$ .

Reference levels for nominal GDP and real GDP growth are in table III.4 below. The bonds are callable at the option of Greece after 1 January 2020 at market levels, they contain standard collective class actions clauses (CACs) and are issued under English law. The threshold GDP growth rate is set between 2.25% and 2.90% for the reference years 2014-2020 and is equal to 2% in 2021-2041.

According to Credit Suisse "the experience with Argentine GDP warrants suggests that the Greek GDP warrants are unlikely to trade anywhere near the value that reflects the consensus view on Greek real GDP growth, at least in the beginning".

While the total payment on Greek warrants is capped at 18.6% of notional value, the cumulative payments on Argentine warrants are capped at 48% of their nominal amount. The high returns achieved by holders of Argentine warrants (see above) were supposed to translate into investor interest in the Greek GDP warrants. The Greek warrant structure is less complicated than that of the Argentine warrants and they are easier to model. Therefore, over time, these instruments may trade closer to their 'fair value' than the Argentine securities.



**Table III.4**  
**Greece: GDP levels and growth thresholds for the warrants**

Reference year	Minimal nominal GDP level	Nominal annual growth needed to reach this level <sup>a</sup>	Real GDP growth threshold
2014	210.1014	-1.20%	2.35%
2015	217.9036	0.00%	2.90%
2016	226.3532	0.80%	2.85%
2017	235.7155	1.30%	2.80%
2018	245.4696	1.70%	2.60%
2019	255.8822	2.00%	2.50%
2020	266.4703	2.30%	2.25%
2020-2041	266.4703	2.00%	2.00%

Source: Credit Suisse, Invitation Memorandum 2011.

<sup>a</sup> Annual growth between 2012 and the Reference Year to achieve the Minimal Nominal GDP level. For the 2011 base year we use the Eurostat estimate for Greece's GDP of 217,828bn. Warrants are paying excess real GDP growth over the base-case (Real GDP Growth Threshold in the table), provided that nominal GDP is higher than a specified level (Minimal Nominal GDP level in EUR bn).

Nevertheless, the value of the Argentinian and Greek growth-linked warrants (GLWs) experienced an opposite fate, determined in the first place by the change in GDP that happened in the first years following the default and restructuring of debt: while Argentinian economy quickly recovered, triggering initially a high payment almost every year (see previous section), the Greek one did not, making its GLW akin to a far out-of-the-money call option on its GDP.

Ubide and Levy (2015) argue that even though the Greek bond was not issued as a market-traded bond but as a GDP-indexed loan to an official creditor, valuation was still a relevant matter. And add: "That risk aversion may well be lower for an official creditor, but valuation should still be the relevant concern and could become an obstacle if the idea turns into a real exchange proposal. The loans to Greece are large and have fiscal implications for the creditor countries. In the Argentine case the warrant was detached so that it could trade independently and the bond could be easier to price separately. How would GDP-indexed bonds be valued and booked by a European government, or the ESM?"

Credit Suisse argues that given the significantly bleaker economic backdrop in Greece in 2012 compared to Argentina in 2005, investors assigned very little value to these warrants.

Major improvements include an independent audit of GDP numbers and the choice of overseas monitoring. Unfortunately, in the Greek case, it was a poor economic performance what made the warrants trade poorly.

#### f) **Ukraine**

Ukraine has also issued GDP warrants as part of debt restructurings recently. In the Ukrainian case, payouts are capped between 2021 and 2025 at 1 percent of the overall nominal GDP, but not afterward, until 2040. Recent economic performance suggests that the cap will be reached, raising the question of whether these bonds represent a looming fiscal risk once the cap is withdrawn.

#### g) **Portugal<sup>11</sup>**

As many European nations, Portugal's strategy to deal with the international economic crisis that began in 2008 affected the country's economy and social situation. Between 2008 and 2013 Portugal adopted three different approaches to the crisis, each of which was implemented by a different government. The first approach focused on the sustainability of the financial sector. The second shifted the focus to

<sup>11</sup> See Pina (2020).

mitigating the adverse economic and social impact of the crisis. And the third approach concentrated on fiscal adjustment. Since 2008 Portugal has had two center-left governments, formed by the Socialist Party, and one center-right coalition government. These governments implemented policies agreed with the EU and later with the troika of the European Commission (EC), the European Central Bank (ECB) and the International Monetary Fund (IMF). Meanwhile public debt skyrocketed those years, despite of signs of economic recovery and some success in reducing the public deficit. The debt relief strategy was somehow different in Portugal (Pedroso, 2014). Nevertheless, it involved some GDP-linked securities, though these *were not issued as part of a debt restructuring*. Furthermore, these certificates target domestic savers.

Portugal wrote off two GDP-linked treasury certificates. Initially, in 2013, with a maturity of 5 years then, in 2017, with a maturity of 7 years, both certificates being redeemable after one year. The instrument is nontradeable and can be subscribed continuously. They include a fixed base interest rate, which raises over time, and additional payments linked to real GDP growth. Payments are not updated due to revisions of GDP statistics.

These certificates were innovative and did not experience major issues. They represented 6.7% of total government debt in May 2019, about €17 billion. The indexation was always activated, and additional payments linked to GDP have been sizable as real GDP growth has exceeded expectations since 2014 (up to 2019).

Pina (2020) documents that in the 2013 edition, the coupon in the final two years was linked to 80% of the average real GDP growth in the last four quarters known in the month before the date of interest payment. The government announced a reduction in base interest rates in mid-January 2015, taking effect at the end of that month, without specifying the details on the new rates. This prospective decrease in interest rates led to a surge in subscriptions in January 2015.

The 2017 edition further decreased base rates and, starting in year two, included variable payments indexed to 40% of the average real GDP growth in the last four quarters known in the month before the date of interest payment. Both instruments include a coupon floor equal to zero. The 2017 edition also includes a cap of 1.2 percentage points on additional interest payments related to real GDP growth. Payments are not corrected due to statistical revisions.

The recent experience in Portugal with debt linked to real GDP growth shows that it is possible to implement statecontingent government debt in an advanced economy. These certificates saw substantial demand, and there have not been any issues regarding their payment. Expost, they may have been more expensive for the Portuguese government compared to alternative financing options, but they insured the government against shocks to real GDP growth and increased the domestic market for public debt.

From the buyers' point of view, the relatively generous base interest rates and the substantial GDP growth numbers have contributed to the popularity and substantial demand for these debt instruments.

**Table III.5**  
**Summary of the selected source cases**

Country	Duration	Reason to issue	Type	Instrument	Payment triggered if	Pitfalls	Lesson learnt
Argentina	2005-current	Debt restructuring	Warrant	Real GDP growth linked warrants	(i) Actual real GDP exceeds base case GDP; (ii) Real annual growth results greater than the growth implied by the base case GDP; (iii) The cumulative number of past payments made on GDP warrant do not exceed the payment cap per unit of security (in the issuing currency)	<ul style="list-style-type: none"> <li>• Inflation has been significantly understated for political reasons (low inflation is "good"), but real GDP growth has been overstated (slow growth is "bad")</li> <li>• Incentives to exaggerate growth have led Argentina to overpay on its debt</li> </ul>	<ul style="list-style-type: none"> <li>• Absence of independent statistical agency is inefficient</li> <li>• Change in the base year for GDP calculation to avoid payments might be seen as suspicious and led to legal controversy with private investors</li> </ul>
Bulgaria	2004	Debt restructuring	Warrant	Additional Interest Payment (AID) linked to GDP	(i) Its GDP reaches 125% of its 1993 level, and ii) The rate of yearly growth is positive	<ul style="list-style-type: none"> <li>• The prospectus was ambiguous on the source of data to obtain the GDP level</li> <li>• The bond was callable and limited the possibility for investors to enjoy higher returns during expansionary phases</li> </ul>	Callable options are not fully compatible with the nature of GDP-linked securities and might undermine investors' appetite for the security
Bosnia-Herzegovina (BH)	1993-2017	Debt restructuring	Warrant	GDP Performance Bond	(i) GDP level reaching 125% of its 1993 level and, remaining at such level for two consecutive years; (ii) GDP per capita surpassing the USD\$2,800 in 1997 prices, adjusted using German CPI	<ul style="list-style-type: none"> <li>• GDP figures were estimated by the central bank, in a possible conflict of interest</li> <li>• Data reliability on the population statistics</li> <li>• The price of the warrants was rarely published; thus, trading activity was scarce</li> </ul>	Data should be clear and precise, and obtained by an independent body
Singapore	2001-2006	Help the low-income population and subsidize it after the increase of VAT	Share	2 Preferred stocks: the New Singapore Shares (NSS) and the Economic Restructuring Shares (ERS) linked to GDP	Annual dividends (as in a preferred stock) were estimated at 3% plus the real GDP growth rate of the preceding calendar year	The security is that the solution was highly pro-cyclical	Alternative financing is effective if work in a countercyclical manner

Country	Duration	Reason to issue	Type	Instrument	Payment triggered if	Pitfalls	Lesson learnt
Greece	2012-2042	Debt Restructuring	Warrant	GDP-warrant linked to real GDP	Payment equal to: (a) GDP index percentage * notional if nominal GDP >= reference nominal GDP rate, where GDP index percentage = $\max\{0, \min\{1, 1.5 * (\text{real GDP rate} - \text{reference real GDP rate})\}\}$ (b) 0, if nominal GDP < reference nominal GDP rate NOTA	The Greek GDP did not recover, making its GLW akin to a far out-of-the-money call option on its GDP	Warrants traded poorly due to weak economic recovery after the crisis
Portugal	2013-2018/ 2017-2024	Deal with 2008 economic crisis	Bond	Treasury Certificates linked to real GDP growth	(i) 2014 certificate: the coupon in the final two years was linked to 80% of the average real GDP growth in the last four quarters known in the month before the date of interest payment; (ii) 2017 certificate payments: indexed to 40% of the average real GDP growth and also included a cap of 1.2% on additional interest payments related to real GDP growth	These certificates saw substantial demand, and there have not been any issues regarding their payment	
Ukraine		Debt restructuring	Warrant	Warrant linked to GDP	Payouts are capped between 2021 and 2025 at 1 percent of the overall nominal GDP, but not afterward, until 2040	Recent economic performance suggests that the cap will be hit, raising the question of whether these bonds represent a looming fiscal risk once the cap is withdrawn	

Source: Pina (2020).

## C. The benefits of linking bonds to real national disposable income

The benefits of linked bonds (LB) are vast, at least theoretically. Yet there are a number of challenges that have to be addressed to introduce this class of securities successfully. As argued earlier most flaws do not come from the nature of LBs. They come either from inadequate bond design or from weak institutional settings in the issuing countries, which allows strategic political behavior.

One of the main concerns was related to data accuracy. As reviewed, this may be caused by different reasons. First, in developing countries the institutions in charge of generating and estimating statistics are not always autonomous, and sometimes there are more than one institution generating relevant data such as estimation of GDP or GNI, on the one hand, or inflation, on the other. In some developing nations these two sets of information are dissociated. Typically, in LAC the central bank estimates national accounts and a different organization (which may include the National Institutes of Statistics or even the Finance Ministry) calculates the inflation; this varies from country to country, however. An obvious solution to this problem is to better design an autonomous institution that formally obtains the responsibility of producing and estimating relevant economic information. This would increase the probability of success of introducing contingent debt.

Second, in some less developed countries the statistics are seen as an accessory, thus the institutions are not well funded. Because of this, it is said that institutions cannot hire capable human capital. The cacophonous solution is to increase the funding of the institutions. Moreover, multilateral organizations may help to train the public officials and to advise in improving the methodologies of estimation.

In short, should a government want to issue a LB, the market would need a binding commitment to comply with these two conditions.

Finally, the problem of political strategic behavior was mainly found in the Argentinian case. As pointed out earlier, Ubide and Levy (2015) argue that Argentina's inflation and national accounts statistics have been dubious especially during the first years after having issued the warrant. In particular, these authors reckon that inflation has been significantly understated for political reasons (low inflation is "good"), but real GDP growth has been overstated (slow growth is "bad"). Thus, short-term political incentives to exaggerate growth have led Argentina to overpay on its debt. It paid the 2008 coupon, although later revisions to national accounts data showed that its trigger, the real growth rate in 2007, had not exceeded the threshold.

Undoubtedly that this is an implementation problem (i.e. it does not come from the nature of linked bonds). It is true that developing countries present weak democracies and institutions, and the solution of these obstacles are beyond a commitment with the multilateral organizations or the international credit markets. However, as we just underlined a well-funded autonomous statistics institute, which in addition may receive the advice from multilateral organizations, may help.

Yet there is no way to guarantee that the strategic behavior will not take place. Ubide and Levy-Yeyati (2015) are very skeptical about these type of bonds because of this reason. However, one needs to remind that that is the very nature of all types of sovereign debt, as Eaton and Gersovitz (1981) seminal paper show.

In effect, economists acknowledged the presence of default risk arising from the absence of legal enforcement long ago (Eaton and Gersovitz, 1981; Sachs and Cohen, 1982; Sachs, 1989; Kletzer, 1984). For these authors a country would default if the costs associated to default are lower than the benefit of doing so in a dynamic setting.

Nevertheless, it is not clear what the cost is for defaulting countries. Eaton and Gersovitz (1981) argued that the main cost is the loss of future access to international credit markets. However, history has shown that most defaulting countries have regained that access relatively quick (Eichengreen and Portes, 1986; and Lindert and Morton, 1989).

What is more, African countries transferred in 2018 2% of their GNI to creditors, whereas Latin American and the Caribbean transferred on average 3% of their GNI in 2018 to creditors, according to data drawn from world bank data base. This fact raises the paradox in sovereign loan markets that even though a creditor usually lacks the ability to seize much of debtor's assets if it defaults, creditors do make loans and debtors often repay them.<sup>12</sup>

Thus, Ubide and Levy-Yeyati (2015) skepticism applies for all type of sovereign debt. In this sense well-designed linked bonds may well be attractive to investors who try to take a risk on countries economic performance. Hedging this risk could be a challenge but is quite possible if we can get the right design.

Here we argue that some elements of national accounts are harder to be manipulated by a government as they may be verifiable through other sources. This is the case of the Gross National Income (GNI) or at least some of its components.

It is true that GNI and GDP are highly correlated. As an illustration see figure III.4A, B, C, D and E. However, the components may be subject to different verifications. Even as obvious as it may seem, it is useful to look at chart 1 below which provides a visual of what is and is not included in GDP and GNI. As it may be seen there are two elements that can be calculated through sources different from the official statistics. These two sources are net exports (NX) and Remittances and may be estimated through foreign statistics.

NX are defined as exports minus imports; the first represent the buyer country's imports, whereas the latter represent the seller country's exports. Hence, NX may be double checked to verify that these have not been manipulated by the host country. For example, the top five U.S. export markets to the Western Hemisphere for 2019 were: Canada (\$292.6 billion), Mexico (\$256.6 billion), Brazil (\$42.9 billion), Chile (\$15.7 billion), and Colombia (\$14.7 billion). These figures should be the imports from the US for these countries. And, the top five import suppliers from Western Hemisphere for 2019 were: Mexico (\$357.8 billion), Canada (\$319.4 billion), Brazil (30.8 billion), Colombia (\$14.2 billion), and Chile (\$10.4 billion). Again, these represent exports to the US from these countries. In short, trade can be estimated from statistics coming from trade partners.<sup>13</sup>

Remittances is the other element that may be subject to external verification. The foreign financial system does report all this information by country. Thus, it can be estimated from outside sources. For example, as a result of the fiscal stimulus approved by the US Congress, remittances peaked aided by stimulus checks from the administration of U.S. President Joe Biden.

**Table III.6**  
**Components of GDP, GNI and GNP**

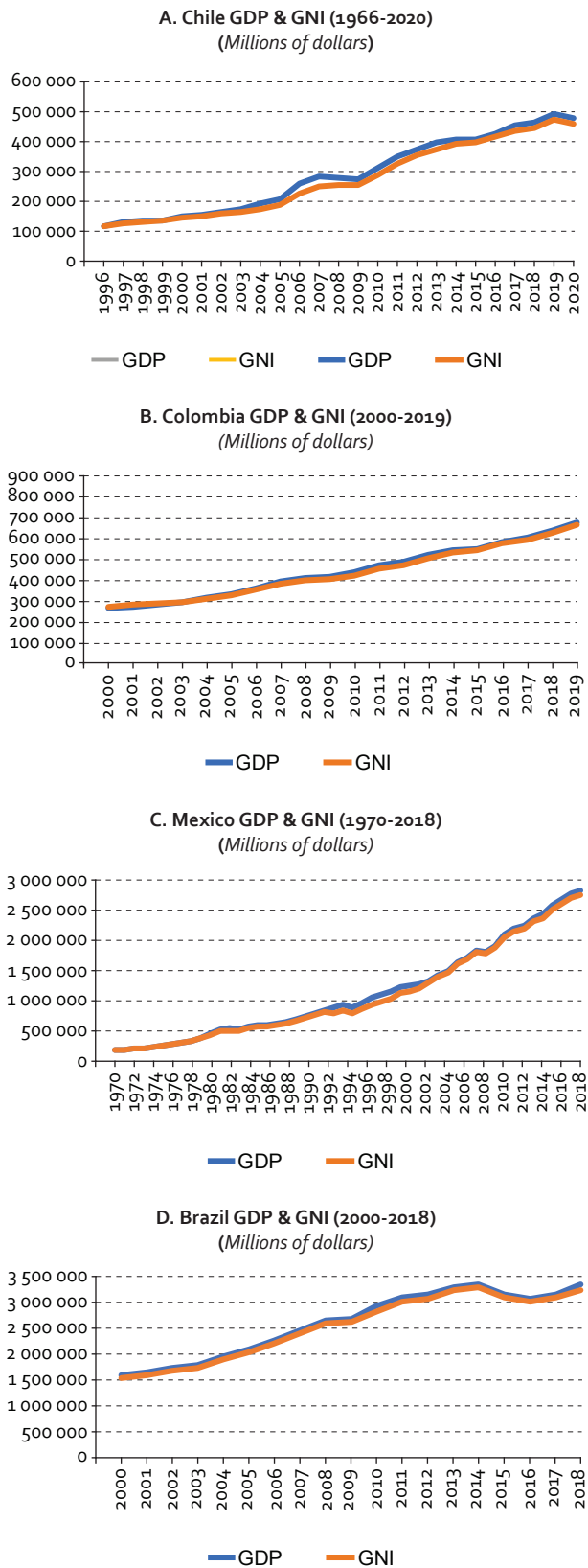
Income earned by	GDP	GNI	GNP
Residents in country	C+I+G+X	C+I+G+X	C+I+G+X
Foreigners in country	Includes	Includes if spent in country	Excludes all
Residents out of country	Excludes	Includes if remitted back	Includes all
Foreigners out of country	Excludes	Excludes	Excludes

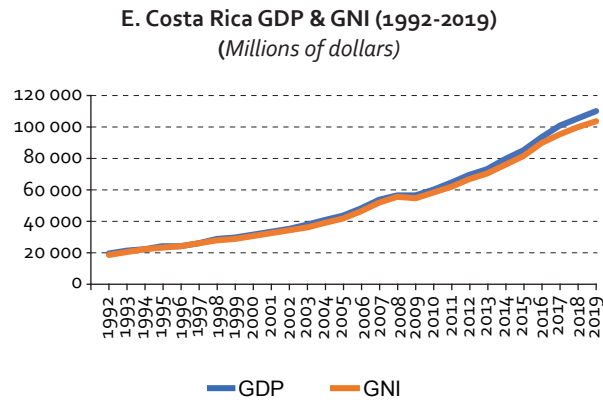
Source: Prepared by the author.

<sup>12</sup> This raises the question as to what incentive a sovereign borrower has to repay the debt. Bulow and Roggoff (1989) and Krugman (1985) argue that the main reason to repay debt is the loss of access to trade. Hernández-Trillo (1995) provides empirical evidence that this is the most likely explanation.

<sup>13</sup> USTR (2022).

**Figure III.4**  
Evolution of GDP and GNI for selected economies

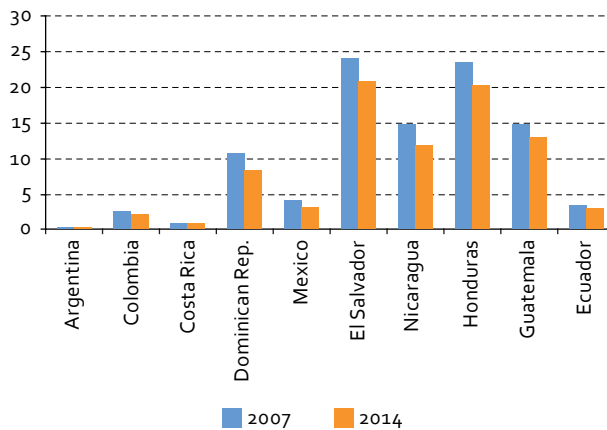




Source: World Bank Database.

When a given country is open, NX may be more associated to the trade partners cycle, and because of this reason, in some countries these variables account for a relatively high proportion of the GNI. Let us begin with remittances. Figure III.5 presents the Remittances as a proportion of GNI for some LAC selected countries. We placed especial interest in nations which traditionally are net recipients. As it may be observed El Salvador, Guatemala, Honduras, and Nicaragua are highlighted. These Central American countries' GNI/GDP is highly dependent on remittances reaching between 15 and 25% of the national income. The Dominican Republic's proportion is around 10%. México, Colombia and Ecuador is about 3%, 2.2% and 2.9% of their GNI, respectively (figure III.5).

**Figure III.5**  
Remittances as percentage of GNI for selected Latin American countries, 5-year average and 2020

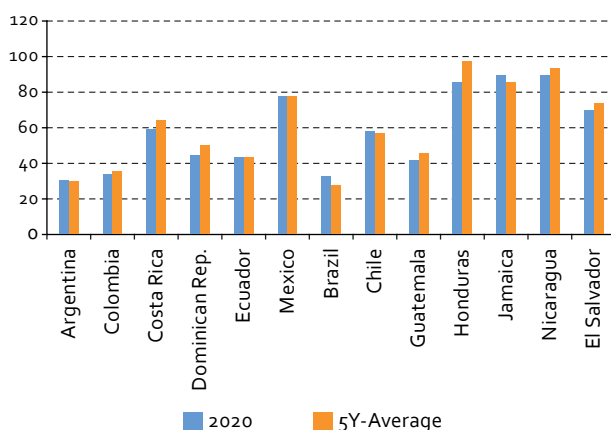


Source: World Bank Database.

Let us now look at the exports as a proportion of GNI. Figure III.6 presents this indicator for selected LAC countries. In general, one could say that LAC region is open to trade. Argentina, Colombia, and Brazil are the least open to trade countries. In the opposite extreme Mexico, Costa Rica, Chile, Honduras, Jamaica, and Nicaragua present high proportions of (X/GNI) ratio. The figure is beyond the 30% and in the case of México and Nicaragua reaches 40%.



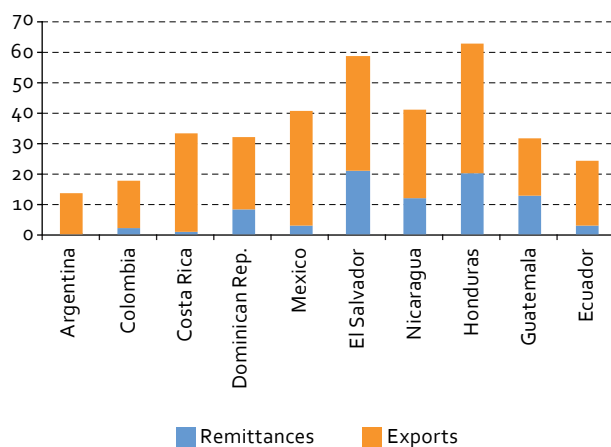
**Figure III.6**  
Exports of goods and services as percentage of GNI for selected Latin American countries, 5-year average and 2020



Source: World Bank Database.

When remittances and exports are added up, we can see that for El Salvador and Honduras these two variables represent 60% of their GNI. For México and Nicaragua, the same indicators jointly reach more than 40%. A third group of countries present a 30% proportion, namely, Costa Rica, Dominican Republic, and Guatemala. Finally, Argentina (and Brazil, not included in the figure) and Colombia exhibit a number around the 10% of GDP. We recognize that imports should be considered in the picture (see figure III.7).

**Figure III.7**  
Exports of goods and services and remittances as percentage of GNI for selected Latin American countries, 5-year average and 2020



Source: World Bank Database.

In summary, the GNI may be verifiable relatively well for some countries open to trade-cum-net receivers of remittances. Because of this GNI-linked bonds may be introduced in these group of countries, especially Central American countries. México is clearly in this group. An additional advantage of the latter is that its National Statistics Institute (INEGI) and its central bank (in charge of reporting remittances) are independent from the executive branch.

Yet, an institutional feature that would increase the probability of success of GNI linked bonds is the independence from the executive branch of the institutes or central banks in charge of generating national accounts estimates and the rate of inflation. This varies from country to country (see table III.7). This is

not a necessary condition, but facilitates the introduction, as markets would perceive lower possibility of manipulating the statistics. The only four countries that comply with both autonomous institutions, are Chile, Costa Rica, México and Paraguay (we exclude Venezuela from the analysis). Thus, multilateral organization may encourage countries to reform their bodies in charge of generating information.

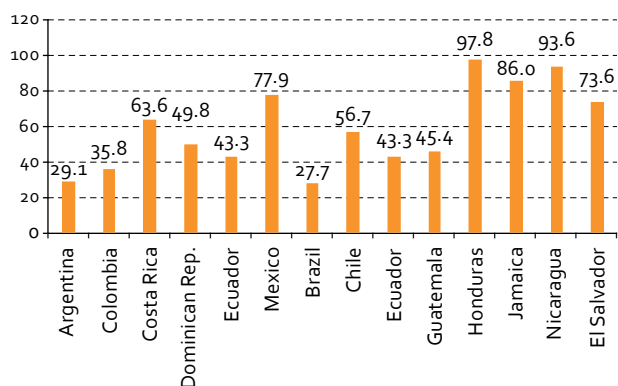
**Table III.7**  
Independence in the generation of national statistics for Latin American and Caribbean economies

Country	Central Bank	Statistic Institute
Argentina	Independent	Dependent
Aruba	Dependent	Dependent
Bahamas	Dependent	Dependent
Barbados	Dependent	Dependent
Belize	Dependent	Dependent
Bolivia (Plurinational State of)	Dependent	Dependent
Brazil	Independent	Dependent
Cayman Islands	Independent	Dependent
Chile	Independent	Independent
Colombia	Independent	Dependent
Costa Rica	Independent	Independent
Cuba	Independent	Dependent
Curaçao and St Maarten	Independent	Independent
Dominic Republic	Independent	Dependent
Ecuador	Independent	Dependent
El Salvador	Independent	Dependent
Guatemala	Independent	Dependent
Guyana	Independent	Dependent
Haiti	Dependent	Independent
Honduras	Dependent	Independent
Jamaica	Independent	Dependent
Mexico	Independent	Independent
Nicaragua	Dependent	Independent
Paraguay	Independent	Independent
Peru	Independent	Dependent
Surinam	Independent	Dependent
Trinidad y Tobago	Dependent	Dependent
Uruguay	Independent	Dependent
Venezuela (Bolivarian Republic of)	Independent	Independent

Source: Prepared by author.

It is true that for some countries such as Argentina and Brazil, the proportion of GNI to be verifiable, is relatively small. The degree of openness, defined as  $(X+M)/GNI$ , is also a way to capture how important trade is to the country. As discussed earlier, those opened countries tend to default less, because the cost of doing so is the loss of access to international trade. Hence, those with a degree of openness higher than 50% may be candidates for issuing GNI-linked bonds. Among these, we can find Costa Rica, Dominican Republic, México, Chile, Honduras, Jamaica, Nicaragua and El Salvador (see figure III. 8).

**Figure III.8**  
**Trade openness for selected Latin American economies**  
*(Percentage of GNI)*



Source: World Bank Database.

In contrast, there are countries that in relative terms are not that opened to trade. The two prime examples are Argentina and Brazil, whose degree of openness to trade is less than 30 percent, the lowest in the region. This does not necessarily mean that these relatively closed countries may not be able to issue GNI-linked bonds. What this means is that verification of national account figures must be done through other ways.

In particular, the existence of independent autonomous institutions in charge of generating the main national account indicators might be a condition to be able to issue such a bond. Yet, there is always a possibility that such institutions may be endangered when democracy is weak. Nevertheless, this pre-condition diminishes the probability of misreporting the actual GNI or GDP.

One way to determine whether a country is a better candidate for issuing GNI bonds, given that they are open to trade and are net receivers of remittances, is verifying that GNI is cointegrated to X and Remittances. This would imply a long-term relation between the two sets of variables. If so, one can say that GNI is highly verifiable through X and R. Thus, good candidates to issue GNI linked bonds. To illustrate we ran cointegration tests for the following selected countries Argentina, Brazil, Colombia, Costa Rica, Dominican Republic, Guatemala, El Salvador, Honduras and Mexico.

Results of cointegration are presented in appendix. Based on the Phillips-Ouliaris test, it is concluded that for all selected countries there exists a long run cointegration relationship between exports and GNI. However, for the cointegration between remittances and GNI, Argentina and Brazil do not present statistical evidence of a long run relationship as we cannot find evidence of cointegration between those two variables. For the remaining countries, Colombia, Costa Rica, Dominican Republic, Guatemala, El Salvador, Honduras and Mexico the Engle-Granger and Phillips-Ouliaris tests support evidence of cointegration.

With respect to the terms of trade, TOT, defined as the price of one country's exports in terms of the other (say the price of wine in terms of cheese)<sup>14</sup> we found that six out of eight countries (Argentina and Brazil, the exceptions) report the presence of a long run cointegration relationship between terms of trade and exports. The estimated sign is positive: long term improvement in the terms of trade is associated with higher exports, reflecting the highly probability of the region to experience similar co-movements in both variables.

<sup>14</sup> Terms of Trade (TOT) = (Index of Export Prices / Index of Import Prices) \* 100.

Estimates also suggest there exists cointegration between remittances and terms of trade in all countries but Argentina and Dominican Republic. In this case the relationship appears to be positive as higher terms of trade might be associated with higher remittances.

In summary, for countries where the trade is important and remittances represent some proportion of GNI, a GNI linked bond may in principle be attractive to investors, as they can easily verify the accuracy of the data. Next we outline the features of such bonds.

## D. GNI-linked bond

As we have argued, GNI-linked bonds (ILB) are like GDP-linked bonds and their design may take a myriad of forms. The contingent bonds may link the interest rate only, or alternatively both principal and interest rates as in Shiller (1993). We consider here a bond which only links the interest rate to GNI performance, because its valuation is simpler, a feature that may facilitate its introduction.

As said most contingent debt has been introduced as part of a debt-restructuring process. This fact has *facilitated* the acceptance of some of the existing issues (recall Portugal and Singapore are an exception to this). Nevertheless, under “normal” economic conditions the bonds should be better designed, and an attempt should be made to have a liquid market. In other words, the linked bonds should not only be “sweeteners” of a debt-restructuring process; if properly designed, they should be liquid bonds that provide the investors additional instruments to invest in, so they may diversify risk. In turn, countries may use them as an additional instrument to stabilize the economy when needed (during economic downturns).

As an illustration we use some features of the Argentine warrant to portray the GNI-linked bond, even though they were designed under pressure coming from harsh economic conditions. In this sense, the bond includes a free, detachable warrant which can be traded in the market independently and only has positive payments. That is, the linked-bond provides the holder with a payment if the three following conditions are met: (i) actual real GNI exceeds baseline real GNI in the reference year (see below for definition); (ii) rate of growth in actual real GNI exceeds rate of growth in baseline real GNI in reference year; and, (iii) the cumulative amount of past payments do not exceed, if defined, a payment cap (in the Argentinian case this was a set at 0.48 per unit of security). Hence, if payment cap is not set, then only two preconditions should be met to have a positive payment amount.

We must stress that the total payment is a fraction of the excess GNI in the reference year (actual GNI minus baseline GNI). In the Argentinian case this fraction was set at 5%; clearly this amount may be set differently. We stick to this percentage in our example. We next outline the components of the GNI-linked bond.

### 1. Features and components of the GNI-linked bond

As known a plain vanilla bond pays off a par (or face) value at expiration and a series of coupons commonly paid twice a year during the life of the instrument. The final payment at maturity includes the coupon and face value amounts. It is important to point out that the coupons are normally detachable and in fact they may be sold independently. In our case the par (face) value of the GNI-linked bond remains constant<sup>15</sup>; the coupons are detachable, and their returns are contingent on GNI performance. So, the bond’s valuation is just the sum of present value of contingent coupons plus the present value of par value. The key element for pricing the bond is then the estimation of the value of the -detachable- contingent coupon value.

To determine the amount coupon pays, several features must be stipulated. First, the currency must be specified in the prospectus. This may be set in national currency or any other major currency such as Euro or USD, among others. Second, the reference year should be the previous year in which payments occur (i.e. the year on the basis of which payments are calculated); this feature implies that coupon payments would be made once a year.<sup>16</sup>

<sup>15</sup> In Shiller’s proposal, this portion is also contingent on economic performance.

<sup>16</sup> In contrast to a traditional, plain vanilla, bond, which makes payments twice a year.

Third, a baseline real GNI ought to be defined. There are different approaches to do it; for simplicity we propose here that the baseline should be the potential rate of GNI, which is an estimate of the value of the output that the economy *would have* produced if labor and capital had been employed at their maximum sustainable rates—that is, rates that are consistent with steady growth and stable inflation. This estimate is not trivial. However, it could be based on the estimation of the potential made under the structural fiscal rules in the region.

Fourth, it must be clear that a unit of debt represents the proportion that one [GNI]-linked security with a notional amount of one unit of currency bears to the aggregate eligible amount of all eligible securities outstanding (Costa et al 2008, from Argentinian Debt Prospectus). In other words, this may be interpreted as the share of the excess GNI that the holder one unit of each security of currency is entitled to.

Finally, the payment amount must be specified. In the Argentinian and Greek cases, a percentage of the difference between the actual growth and the baseline growth of GNI, was set at 0.05, or 5%. We propose this percentage, as we considered that markets have already accepted it in those cases.

Given these features, the GNI-linked coupon would be the following in case the three (or two if no payment cap) conditions are met:

$$C_{\text{gni}} = 0.05(\text{real GNI growth rate} - \text{baseline GNI growth rate}) \times (1/\text{size of debt}).$$

For valuation purposes the Coupon would look like:

$$C_t = \begin{cases} \left( \frac{0.05(Y_t - y_t^b \pi_t^d)}{e_t} \right) \times \frac{1}{D_t} & \text{for any } g_t > \bar{g}, \\ 0 & \text{for any } g_t < \bar{g} \end{cases}$$

where

$C_{t+1}$ : Coupon payment at time t+1

$Y_t$ : Nominal GNI in period t

$y_t^b$ : Real GNI in baseline case for t

$\pi_t^d$ : GDP deflator in period t

$e_t$ : Exchange rate (Local\$/ Foreign \$)

$D_t$ : size of debt

$g_t$ : rate of growth of GNI

$\bar{g}$ : Baseline rate of growth of GNI

Then, the value of the bond, B, would be defined as follows:

$$B_{t-1}^{GNI} = \sum_{t=1}^T \frac{C_t}{(1+i)^t} + \frac{FV_T}{(1+i)^T},$$

where i is the discount rate, FV the face value of the bond, C is the coupon. The valuation is out of the scope of this document. However, this has been widely estimated: Costa et al (2008) and Miyajima (2006) have developed solid pricing methodologies, which can easily be extended to our case.

Then, the payment structure of the ILB would be:

$$\text{Payment amount on GNI linked Bond} = \begin{cases} > 0 \dots \dots \dots \text{iff } (g_t - \bar{g}) \leq 0 \\ = 0 \dots \dots \dots \text{iff } (g_t - \bar{g}) \leq 0 \end{cases}$$

However, a piece is missing for the success of ILB. This is the indexation premium, which is estimated next.

## 2. Indexation premium

ILB are expected to be one instrument in a multi-security portfolio. Thus, for holding ILB in their portfolios, investors require a premium over the risk-free rate. This as opposed to as a stand-alone product (Miyajima, 2006; Borenzstein and Mauro, 2004). Then an estimate must be obtained.

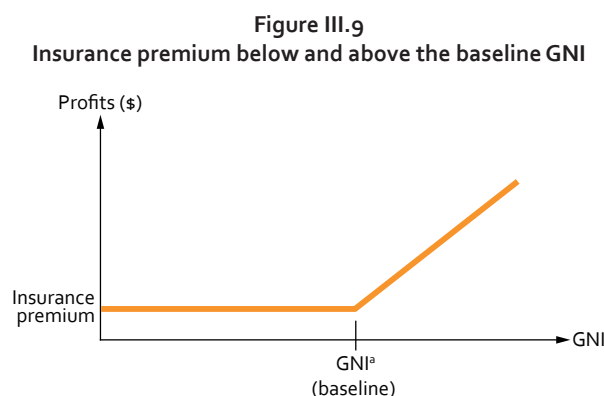
Should this premium be high relative to the value of the bond, then this would not be attractive.<sup>17</sup> To appreciate the financial viability of the ILB it is important to calculate it. In addition, we assume a low correlation between the return of the ILB and the return of the other instruments of the investors' portfolio. The *ex-post* return on the instrument is determined by the difference between  $g_t$  and  $\bar{g}$  (coupon) plus an indexation premium.

$$i_t = \rho + \phi (g_t - \bar{g})$$

where  $\rho$  the indexation premium,  $\phi$  is the extent to which total debt is indexed to GNI;  $\bar{g}$  is the potential GNI rate of growth, and  $g_t$  the actual GNI rate of growth.

Note that the nature of each coupon may be seen as an *option* that gives the right to exercise it if the coupon if  $GNI_t > \overline{GNI}$ . Hence, the option looks as a caplet<sup>18</sup> as the forward price is already known (the baseline rate of growth). Graph 9 draws the horizontal axis the GNI level and the possible profits coming from the level of GNI. The baseline is drawn arbitrarily for illustration purposes.

As it may be appreciated, if  $GNI_t$  is greater than  $\overline{GNI}$  then there is a profit (the difference, adjusted by the percentage set in the prospect). On the contrary, if  $\overline{GNI} > GNI_t$  return on ILB is only the indexation premium. We presented here the case where indexed premium is present. There are other contingent bonds, which do not contain this premium explicitly.



Source: Prepared by author.

<sup>a</sup> Baseline real GNI.

To value this caplet or indexation premium, an extension of the Black and Scholes option pricing model is frequently used. This is the Black futures option model use for European derivative instruments. Assumptions behind the model are standard. Forwards follow a lognormal distribution with a constant volatility. The model is defined as follows, where  $f_0$  is the forward price and  $X$ , the strike price.<sup>19</sup>

<sup>17</sup> Miyajima (2006) argues that the premium is expected to be low if the return to ILB is not highly correlated with the return to the investors' existing portfolio, because by its very nature ILB would reduce the volatility of the portfolio. This would allow pricing the ILB as a stand-alone product.

<sup>18</sup> Caplets are interest rate options designed to "cap" the risk of rising rates. The typical use of a caplet is to limit the costs of rising interest rates for those corporations or governments that must pay a floating rate of interest on bonds they have issued. However, as with all derivatives, commercial speculators may trade caplets for short-term gains.

<sup>19</sup> For details see R. Stafford Johnson (2010). *Bond Evaluation, Selection, and Management*, Second Edition by Copyright © Johnson.

$$c_0 = [f_0 N(d_1) - XN(d_2)] e^{-R_f T}$$

$$p_0 = [X(1 - N(d_2)) - f_0(1 - N(d_1))] e^{-R_f T}$$

$$d_1 = \frac{\ln\left(\frac{f_0}{X}\right) + \left(\frac{\sigma_f^2}{2}\right)T}{\sigma_f \sqrt{T}}$$

$$d_2 = d_1 - \sigma_f \sqrt{T}$$

where,

$c_0$ : price of a call option

$p_0$ : price of a put option

$\sigma_f^2$  = variance of the logarithmic return of future prices =  $V(\ln(f_n/f_0))$

T = time to expiration expressed as a proportion of a year

$R_f$  = continuously compounded annual risk-free rate [if simple annual rate is R, the continuously compounded rate is  $\ln(1+R)$ ]

$N(d)$  = cumulative normal probability; this probability can be looked up in a standard normal probability table or by using the following formula:

$$N(d) = 1 - n(d), \text{ for } d < 0$$

$$N(d) = n(d), \text{ for } d > 0$$

To illustrate this, we next provide an example for selected countries, according to their actual rates of growth. Assumptions are as follow:

- The baseline real GNI rate of growth for each country is presented in table III.7, which is the 30-Y potential rate of growth of each economy. In our example, and for illustration purposes only, we set that rate of growth as the last 30-year average.
- Volatility of the rate of growth of GNI for the last 30 years.
- The risk-free rate is the sovereign yield of the highest maturity, preferable 30Y. However, many countries have not issued such a 30Y bond yet. We use the highest possible maturity span.<sup>20</sup>
- The forward price for the reference real GNI is set at 100. Then the strike price is the annual real GNI rate of growth, for each country according to table III.7. Then strike is  $100 +$  (the latter in table III.7 is labeled as GNI trend).
- Notional Value (non-indexed) is assumed at 100 USD, the par value of a plain vanilla bond. Maturity is 30Y.

**Table III.8**  
Selected financial indicators for selected Latin American economies used in the valuation exercise

	El Salvador	Guatemala	Honduras	Argentina	Brazil	Mexico
GNI trend	0.021	0.035	0.032	0.025	0.022	0.021
GNI volatility	0.028	0.015	0.035	0.068	0.030	0.037
Coefficient of variation of GNI	1.347	0.419	1.102	2.741	1.334	1.762
GDP trend	0.022	0.035	0.033	0.022	0.024	0.021
GDP volatility	0.023	0.016	0.031	0.065	0.029	0.032
Coefficient of variation of GDP	1.076	0.458	0.951	2.945	1.190	1.522
Interest rates	0.0575	0.0487	0.0625	0.46	0.1064	0.0798
Maturity of T bond	4Y	15Y	5Y	7Y	10Y	30Y

Source: PREDik Data-Driven (2022).

<sup>20</sup> World Government Bonds. (2022) Country Comparisons.

For the valuation we use a popular online software<sup>21</sup>, and set all the information as follows for all the countries. Results for all countries are in shown in table III.8.

Observe in table III.8 that price of caplet (option) for Mexico is \$5.795 and the present value of a 30Y Warrant is \$65.36 (considering \$5.795 for 30Y), which suggests that GNI option is valued at 3.27% of notional value and is calculated as the product of the PV (\$65.36) times the payment proportion set by the prospectus we proposed (0.05). Each caplet is worth 0.29% (which according to our assumptions, the payment amount is 0.05 times the caplet, \$5.795) of the underlying notional amount. This caplet may be interpreted as the yearly indexation premium on the interest rate. The results for all selected countries are presented in table III.9 below.

**Table III.9**  
Indexation premium results for selected Latin American countries

	Mexico	Brazil	Argentina	Honduras	Guatemala	El Salvador
Caplet price	5.795	8.091	35.65	3.393	1.544	3.713
Discount factor	0.926097	0.926097	0.926097	0.926097	0.926097	0.926097
Discounted caplet	5.366735	7.493054	33.01537	3.142249	1.429894	3.4386
VP	65.36215	91.25887	402.0985	8.010743	17.41487	41.87915
Delta	0.9485	0.998	0.998	0.816	0.833	0.907
VP*0.05	3.268108	4.562944	20.10492	0.400537	0.870743	2.093957
Cap price*0.05						

Source: PREDik Data-Driven (2022).

Observe that for the Mexican case the indexation premium is about 0.29% of notional value and for Brazil this figure reaches 0.40%. For the three Central American Countries the indexation premium is rather small. 0.17%, 0.08% and 0.18% for Honduras, Guatemala and El Salvador. Argentina is the only country where the premium is high as it is 1.79%.

Using the CAPM, Borenzstein and Mauro (2002) and Miyajima (2006) have estimated that the indexation premium. The first authors obtained a figure about 0.4%. Both estimates (the latter and ours) are reasonable low and attractive for investors, except for Argentina, perhaps.

One further aspect to highlight in the methodology employed here, as opposed to CAPM one, is that the delta of the option is normally interpreted as the probability of exercising the option<sup>22</sup>. The delta is presented in table III.8. Note that for México and Brazil that probability is quite high (95% and 99%). For the Central American countries, the delta is 81%, 83% and 90% (Honduras, Guatemala and El Salvador, respectively). This means that probability that investors will receive yearly interest payments is high. Naturally, it is in economic downturns that they have the risk of not collecting the coupon.

Finally, it is worth carrying out the estimation of the indexation premium using the same methodology for GDP-linked bonds, as opposed to ILB. The data used is also presented in table III.7. Results are in table III.9. Note that growth rates and volatilities are statistically not different for both variables GNI and GDP (Table III.10). For this reason, indexed-premiums for a GDP-linked bond are also statistically the same as that for the ILB.

<sup>21</sup> This may be obtained manually, or using any financial software, including EXCEL Risk Calculator. There are also different online calculators. An example is <https://www.optionseducation.org/toolsoptionquotes/optionscalculator> or this other [https://www.hkex.com.hk/eng/sorc/tools/calculator\\_stock\\_warrants.aspx](https://www.hkex.com.hk/eng/sorc/tools/calculator_stock_warrants.aspx).

<sup>22</sup> It is the derivative of the Option with respect to the underlying asset.



**Table III.10**  
**Insurance premium results for GDP for selected countries of Latin America**

	Mexico	Brazil	Argentina	Honduras	Guatemala	El Salvador
Caplet price	5.771	7.937	35.293	3.283	1.581	3.658
Discount factor	0.92609743	0.90383225	0.68493151	0.94117647	0.95356155	0.94562648
Discounted caplet	5.34450824	7.17371656	24.1732877	3.08988235	1.50758081	3.45910165
VP	65.0914549	71.0037537	76.7230128	44.0063694	24.6681907	3.45910165
Delta	0.969	0.998	0.999	0.853	0.816	0.946
VP*0.05	3.25457275	3.55018769	3.83615064	2.20031847	1.23340953	0.17295508
Cap price*0.05	0.28855	0.39685	1.76465	0.16415	0.07905	0.1829

Source: PREDik Data-Driven (2022).

Therefore, the national debt service rate,  $R_t$ , for a representative country that have issue plain vanilla bonds and GNI linked bonds, may be written as:

$$R_t = \alpha r + (1 - \alpha)[\rho + \phi(g_t - \bar{g})].$$

Where  $r$  is the plain vanilla bond issue by the government with no indexation;  $\rho$  the indexation premium,  $\phi$  is the extent to which total debt is indexed to GNI.;  $\bar{g}$  is the potential GNI rate of growth, and  $g$  the actual GNI rate of growth;  $\alpha$  is the proportion on plain vanilla bonds.

However, it must be noted that this implies discontinuities as pointed out by Costa et al (2008). Since payments occur only if growth is above the baseline (in our example, 2%), an achievement of a slightly lower rate, say 1.99% implies no payments, whereas a rate of GNI growth of 2.1% would imply a relatively important amount of payment. And this discontinuity may be the source of moral hazard with respect to data accuracy. This is a challenge to be solved.

### 3. A heuristic simulation for the Mexican case

One important question that arises from the discussion is what would be, the advantage of issuing linked-bonds, in terms of lowering the burden of debt service during economic recessions. We use the Mexican case to illustrate the benefits of issuing some proportion of the federal government total debt.<sup>23</sup> Unfortunately, at this stage one can only estimate an approximate amount as the precise data to calculate an exact one is not available (including all details of every debt issue, both, internal and external). Still, this is not the purpose of the document. The general amount gives an idea of the benefits of linked bonds in terms of relief of debt service payments.

Hence, we only provide an idea of the amount it would represent in case of the occurrence of and adverse shock, such as that of the 2020 pandemics. As known, this year was the worst for the world economy in nearly 100 years. The Mexican economic growth plummeted 8.5% in 2020 (table III.11).

Still, Mexico honored the debt service, which reached nearly 3 percent of GDP, as it may be observed in table III.10. Note that in the Mexican case the service increased precisely during the harsh economic year, even though as a percentage of GDP total debt did not increase. With international rates constant, this means that risk premium soared.

<sup>23</sup> We exclude public enterprises from the analysis. In the Mexican case, these issue debt on international markets.

**Table III.11**  
**Mexico: debt service indicators as percentage of GDP**

	2015	2016	2017	2018	2019	2020
Total	2.2	2.3	2.4	2.6	2.7	2.9
Internal	1.6	1.6	1.7	1.8	1.9	2.0
External	0.6	0.7	0.7	0.8	0.8	0.9
Federal Government	1.7	1.8	1.9	2.0	2.1	2.4
Internal	1.4	1.5	1.6	1.7	1.8	2.1
External	0.3	0.4	0.3	0.3	0.3	0.4
State Enterprises	0.5	0.5	0.6	0.6	0.6	0.5
Internal	0.2	0.1	0.1	0.2	0.1	0.0
External	0.3	0.4	0.4	0.5	0.5	0.6

Source: SHCP.

Note that most interest payments are concentrated internally. For the federal government case 87.5% of interest payments were applied on internal debt. In turn, state enterprises (CFE and Pemex) relied completely in foreign debt.

We concentrate in federal government as the state enterprises can issue linked bonds on, say, oil prices. In fact, this has been done from time to time since the late 1980s, as we review in this document.

Having said this, and as we pointed out earlier, Mexico was one the very few countries that extended a relief plan without recurring to net indebtedness; hence, the relief was short of the resources needed to provide an appropriate counter-cyclical policy to impede the loss of formal and informal jobs.

Had the Mexican treasury issued income-linked bonds as part of debt policy, the service of debt would have been lower. Thus, these resources could have been used to fund the relief plan.

To obtain that amount some assumptions need to be made. In addition, these need to be made because of the lack of detailed information. First, the implicit rate of interest is obtained from interest payments and the federal government total debt stock. This may be a strong assumption as the Mexican government regularly issues zero-coupon bonds, and the issues are made through time, with different maturities and coupon rates. Second, issues are made in different currencies; and finally, we assume, ad-hoc, 30 and 50% of linked debt.

Results are presented in table III.12 and III.13. Table III.12 presents the results for 30% indexation of total debt, whereas table III.13 is for 50% of indexation of total debt. Note that we present the observed interest payments made by the federal government, then in the following row we include these plus the option value. The third row includes the real value; from this information we obtain the total present value for the 2011-2019, when the option is not exercised as there has not been any adverse shock; The number in red for 2020 is the amount that is saved by exercising the option. The final figure comes from the comparison of the amount saved by exercising the option to the PV of option value (2011-2019), that is, we obtain the net benefit in MX pesos. This is 0.66% of GDP and 1.10% of GDP for the 30 and 50% indexation alternatives. Observe that should the indexation be 50% of total federal government debt, the net amount available for an anti-cyclical program would have been 1.1% of GDP. This is an important amount in times of turmoil and crisis.

**Table III.12**  
**Mexico: valuation exercise with an indexation rate of 30% of total federal government debt**

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Interest payments	225 091.50	243 613.98	256 593.47	280 116.99	311 281.26	349 557.07	373 936.87	428 929.74	474 283.06	522 262.78
Interest payments + option price	225 744.27	244 320.46	257 337.59	280 929.33	312 183.98	350 570.79	375 021.29	430 173.63	475 658.48	365 583.95
Option value	652.77	706.48	744.12	812.34	902.72	1 013.72	1 084.42	1 243.90	1 375.42	-156 678.83
PV option value	652.77	682.59	694.64	732.68	786.66	853.52	882.17	977.69	1 044.51	-114 960.11
Total PV option value	7 307.25									
Net benefit	-107 652.87									

Source: SHCP.

**Table III.13**  
**Mexico: valuation exercise with an indexation rate of 50% of total federal government debt**

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Interest payments	225 091.5	243 613.9	256 593.4	280 116.9	311 281.2	349 557.0	373 936.9	428 929.9	474 283.1	522 262.8
Interest payments plus option price	225 744.2	244 320.5	257 337.6	280 929.3	312 184.0	350 570.8	375 021.3	430 173.6	475 658.5	261 131.39
Option value	652.77	706.48	744.12	812.34	902.72	1 013.72	1 084.42	1 243.90	1 375.42	-261 131.39
PV option value	652.77	682.59	694.64	732.68	786.66	853.52	882.17	977.69	1 044.51	-191 600.19
Total PV option value	7 307.25									
Net benefit	198 907.4									

Source: SHCP.

## E. Final remarks

In summary, this document argues that linked bonds may work well if well-designed. In addition, the success of the introduction of these instruments may increase if institutions in the issuing countries are strong. Those in charge of estimating inflation and national account figures.

The study also argues that even with some shortcomings in the institutional settings, those countries in which trade and remittances are important, ILB may work well as the statistics can be verified through third parties, particularly trade partners. Data accuracy should be of less concern.

In addition, to increase the interest of investors this contingent bonds may include in the return an indexation premium, which can be calculated as a caplet (price of a call option). Moreover, this methodology also estimates the probability of exercising such an option. This is call in the option literature is named the Delta, which measures the sensitivity of the call option with respect to the underlying asset. It is commonly interpreted as the probability of exercising the call. In our case, this is the probability that the payment amount will be positive.

### 1. Role of multilateral organizations

The design of this GNI-linked bond can be made with the participation of multilateral organizations, such as the International Monetary Fund, the regional Development Banks (IADB) and technically supported by organizations such as ECLAC and UNCTAD.

Furthermore, as an initial step, one or more of these organizations (namely, those who may extend loans) may be the holders of the GNI-linked bond and in this way they may prove the feasibility of the instrument. Eventually a market may develop.

Cohen et al (2020) assert that official sector, or Multilateral institutions, promotion of SCDIs—including endorsement of standardized term sheets, enhanced data provisioning, and recognition of their benefits in debt sustainability— could also be catalytic.

### 2. Caveats

It is also evident that ILB are not necessarily suitable for all countries. As seen earlier, relatively closed to trade countries and very small receivers of family remittances, may face more difficulties in introducing GNI-linked bonds. This is so because the verification of data accuracy may be more difficult.

Still, establishing investor confidence in these instruments will require a better approach to the obstacles posed by data revisions and changes in methodology. This seems an excellent challenge for economists and finance practitioners alike (Cecchetti and Schoenholtz 2017).

### 3. Alternatives

There are some other alternatives to be subject to study. During the 1980s external debt crisis there was evidence that it is in the best interest of creditors that debtor country does not default and the way to avoid this was not necessarily forcing the payment immediately. Instead, the debt contract may include clauses that suspend temporarily the payments. Alternatively, the contract may include some principal reductions in the principal, in an attempt to have a more equal sharing of the losses associated with an economy collapse. Mian and Sufi (2012) support this idea for the private housing market.

This last alternative may make more sense for the developing world and may be activated when the recession comes from international markets. This was the moral hazard implicit in these contracts and it may be avoided. Those authors argue that the excessive lending was not only the result of irresponsible behavior by the countries and in their case the homeowners.

The temporary suspension of debt service in case an international markets crisis would come at a cost. There may well be an indexation premium. This can easily be accounted for in the debt prospectus of the countries- (Bolton et al. 2020).

Linked bonds on other verifiable variables are also an alternative. These variables may include commodities, exports, or even remittances only. The argument is similar to that made here in previous sections.

#### 4. Considerations for a successful introduction

A carefully prepared pioneer ILB issue should be launched. If successful, this prototype would facilitate subsequent issue by other countries (Schröder et al, 2014).<sup>24</sup> Most studies point out that a favorable macroeconomic situation of the issuer country and the world economy is a pre-condition.

A stable track record of the issuer country in political and economic terms (could be partially substituted by a public guarantee) may help a lot. This combined with the existence of a rating on the instrument.

Finally, here we have argued that it should be encourage a subscription of the issuer country to the IMF's Special Data Dissemination Standard, or other multilateral organization, even if these do not extend loans. It is important to stress that countries which are not eligible for multilateral or regional banks credits are definitely not GNI-linked bond candidates.

### F. Conclusions

- Should Latin American countries have had linked bonds, these would have been able for financing part of an anti-cyclical program. As known, countries face economic adverse events periodically (that is, they are subject to business cycles) which in turn pose problems on the country's fiscal stances; hence different instruments that seek buffering these negative effects have been designed over time. One of the most common and effective tools that was introduced recently was a set of fiscal rules, in particular, a salient one is the so-called *structural budget balance rule*.
- A *complementary policy* to that structural balance is the introduction of alternative financial instruments, which may help to lower the effects of the adverse economic shocks, namely, the contingent sovereign debt. This type of debt is basically a loan which service is linked to an observable indicator, such as GDP, national income, exports, among many others. The concept is analogous for most of those variables, though the prospects for success may vary for different reasons.
- The study argues that LAC countries could benefit from the introduction of contingent sovereign debt so that they can face economic downturns more effectively and less painfully.
- We review some cases that have attempted to introduce these types of bonds, namely Argentina and Greece. However, GDP linked bonds have not worked well because of difficulties of obtaining verifiable figures of GDP. There are concerns about data reliability, as many developing and emerging economies have weak institutions, which include deficiently designed institutes of statistics (in charge of estimation of economic variables). Sometimes these institutes are not independent from the executive branch; this fact may tempt the executive leader to influence the estimation of the variables, so they obtain certain results. Some other cases, the institutes simply suffer from lack of funding. Finally, in a few cases even low level of human capital has also been a problem.
- Here we argue that for some opened economies the issuance of GNI linked-bonds may be an appropriate alternative as those problems may be overcome.
- The GNI-linked bond is a financial instrument that links either principal or interest payments (or both) to GNI growth. Hence when the economy is in ascending phase the interest payments rise, and conversely, when the economy slows down or is in a crisis, the service of the debt is reduced or even suspended (depending upon its design). These are especially useful for emerging countries which frequently write off foreign currency denominated debt.

<sup>24</sup> See the score card, Campbell and Shiller (1996).

- In summary, the GNI may be verifiable relatively well for some countries open to trade-cum-net receivers of remittances. Because of this GNI-linked bonds may be introduced in these group of countries, especially Central American countries. México is clearly in this group. An additional advantage of the latter is that its National Statistics Institute (INEGI) and its central bank (in charge of reporting remittances) are independent from the executive branch.
- Yet, an institutional feature that would increase the probability of success of GNI linked bonds is the independence from the executive branch of the institutes or central banks in charge of generating national accounts estimates and the rate of inflation. This varies from country to country. This is not a necessary condition, but facilitates the introduction, as markets would perceive lower possibility of manipulating the statistics. The only four countries that comply with both autonomous institutions, are Chile, Costa Rica, México and Paraguay (we exclude Venezuela from the analysis).
- Thus, multilateral organization may encourage countries to reform their bodies in charge of generating information.
- From these elements it is possible to summarize the challenges as in Council of Economic Advisers (2004)<sup>25</sup>:
  - Draft a sample bond contract to clarify exactly how certain potential concerns could be addressed.
  - Provide concrete alternatives to ensure reliable and accurate GDP statistics.
  - Explore options to help jump-start a liquid market for growth-indexed bonds.
  - Encourage involvement by the Multilateral Organizations. These may serve as advisers on designing autonomous National Institutes of Statistics; or alternatively, as monitors to check them.
  - The most important consideration for governments is to adopt sound macro- and microeconomic policies. Financial innovation cannot compensate for inconsistent and unsustainable economic policies.
  - One of the main concerns was related to data accuracy. As reviewed, this may be caused by different reasons. First, in developing countries the institutions in charge of generating and estimating statistics are not always autonomous, and sometimes there are more than one institution generating relevant data such as estimation of GDP or GNI, on the one hand, or inflation, on the other. In some developing nations these two sets of information are dissociated. Typically, in LAC the central bank estimates national accounts and a different organization (which may include the National Institutes of Statistics or even the Finance Ministry) calculates the inflation; this varies from country to country, however. An obvious solution to this problem is to better design an autonomous institution that formally obtains the responsibility of producing and estimating relevant economic information. This would increase the probability of success of introducing contingent debt.
  - Second, in some less developed countries the statistics are seen as an accessory, thus the institutions are not well funded. Because of this, it is said that institutions cannot hire capable human capital. The cacophonous solution is to increase the funding of the institutions. Moreover, multilateral organizations may help to train the public officials and to advise in improving the methodologies of estimation.
  - In short, should a government want to issue a LB, the market would need a binding commitment to comply with these two conditions.

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<sup>25</sup> See also Hatchondo and Martínez (2012).

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**Annex III.A1**  
**Cointegration Tests: (Exports-GNI) and (Remittances-GNI),**  
**Argentina, Brasil, Colombia, Costa Rica, Dominican Republic,**  
**Guatemala, El Salvador, Honduras and Mexico**

**A. Procedure**

- Cointegration test is performed following Engel and Granger and Phillips-Ouliaris methodology.
- We used the GNI, exports and remittances at constant price for 2010.
- Data frequency is annual, from 1960 to 2020. However, some countries data is available for shorter time.
- We first define the order of integration of remittances, exports, and GNI for all countries following the canonical Augmented Dickey-Fueller (ADF) methodology. Results are available in the Annex. A p value greater than 0.05 states that the series has a unit root.
- ADF test suggest that for all countries the three variables under scrutiny are I(1).
- We then estimate a model where GNI is regressed on remittances and a constant. For some cases, a trend may be also included to capture the upward trajectory in the variables. Estimations also include country-specific dummy to account for specific crisis / outliers in the series.
- We repeat the same exercise for the relation between GNI and exports. In this case, the regression for countries such as Mexico, Honduras, and Dominican Republic, also includes the GNI for the United States due to the close commercial relationship between the two countries.
- Notice that some T-statistics for coefficients in the Export-GNI regressions are high due to the high correlations between the two series. However, given the objective of our it not a source of concern. Indeed, we aim to test the long run correlation between series rather than calculate any forecast. This problem is avoided in the Remittances-GNI estimates.

**Table III.A1**  
**Estimates for Exports-GNI cointegration Test**

	Argentina	Brazil	Colombia	Costa Rica	Dominican Republic	Guatemala	Honduras	Mexico
Log (X)	0.44	0.44	0.65	0.65	0.41	1.1	0.43	0.24
SD	(18.69)	(21.68)	(29.15)	(4.96)	(7.44)	(31.58)	(7.44)	(5.59)
C	15.66	16.72	10.48	-0.94	37.33	-0.91	1.73	8.14
SD	(27.67)	(32.41)	(19.92)	(-2.85)	(7.95)	(-1.16)	(0.37)	(3.76)
Dummy	0.32		0.15	0.17	0.1	0.26	0.1	0.18
SD	(4.07)		(2.51)	(4.03)	(3.74)	(4.58)	(3.77)	(3.51)
Trend					0.052			
SD					(11.01)			
Log (GNI U.S.)					-0.82		0.37	0.43
SD					(-5.29)		(2.78)	
Observations	59	51	52	60	48	59	48	49
<b>Engle-Granger Test</b>								<b>(4.00)</b>
tau-statistic	0.02	0.08	0.05	0.09	0.04	0.04	0.13	0.06
z-statistic	0.02	0.18	0.06	0.07	0.03	0.02	0.03	0.11
<b>Phillips-Ouliaris Test</b>								
tau-statistic	0.02	0.05	0.05	0.09	0.04	0.03	0.07	0.05
z-statistic	0.02	0.09	0.06	0.07	0.04	0.02	0.09	0.1

Source: Author's own estimates on the basis of official data.

Note: Engle-Granger and Phillips-Ouliaris Test Ho: unit root. A p-value >0.05 indicates stationarity in residual —thus cointegration— at 95% confidence. SD= standard deviation.

**Table III.A2**  
Estimates for Remittances-GNI cointegration Test

	Argentina	Brazil	Colombia	Costa Rica	Dominican Republic	Guatemala	Honduras	Mexico
Log (Rem)	0.45	0.45	0.58		0.24	0.29	0.38	0.57
SD	(4.86)	(5.55)	(17.18)		(2.41)	(5.14)	(12.44)	(14.27)
C	17.74	18.02	13.21		16.86	15.84	15.92	13.99
SD	(10.28)	(10.64)	(18.98)		(10.34)	(16.77)	(-24.82)	(15.26)
Dummy	1.62	1.44	0.69		0.46	0.25	1.48	-0.56
SD	(2.94)	(2.46)	(3.69)		(2.95)	(4.14)	(5.66)	(-2.56)
Trend					0.05	0.02		
SD					(3.92)	(3.92)		
Observations	42	39	49		50	44	59	41
<b>Engle-Granger Test</b>								
tau-statistic	0.36	0.56	0.05		0.12	0.04	0.04	0.01
z-statistic	0.38	0.55	0.06		0.13	0.12	0.02	0.03
<b>Phillips-Ouliaris Test</b>								
tau-statistic	0.32	0.52	0.05		0.09	0.03	0.03	0.01
z-statistic	0.35	0.5	0.06		0.09	0.04	0.02	0.01

Source: Author's own estimates on the basis of official data.

Note: Engle-Granger and Phillips-Ouliaris Test  $H_0: \exists$  unit root. A p-value  $> 0.05$  indicates stationarity in residual —thus cointegration— at 95% confidence. SD= standard deviation.

**Table III.A3**  
Estimates for Exports-TOT cointegration Test

	Argentina	Brazil	Colombia	Costa Rica	Dominican Republic	El Salvador	Guatemala	Mexico
Log (TOT)	-1.109	-1.291	0.459	0.844	2.155	1.701	1.02	1.257
SD	(-4.23)	(-7.77)	(3.80)	(4.366)	(22.14)	(7.51)	(11.67)	(9.09)
C	26.983	27.31	17.675	14.33	14.196	10.92	16.62	18.25
SD	(25.69)	(38.46)	(20.82)	(16.29)	(45.58)	(9.39)	(41.39)	(32.02)
Dummy1	-0.256	0.118	0.066		0.098	0.104	0.102	0.12
SD	(-3.69)	(4.29)	(4.36)		(10.08)	(3.33)	(5.69)	(27.67)
Dummy2	0.221				0.072			
SD	-3.87				-6.39			
t	0.061	0.125	0.184	0.162	-0.078	0.068	0.036	0.049
	(15.99)	(17.06)	(9.19)	(14.18)	(-8.32)	(27.11)	(53.53)	(27.66)
$t^{\wedge}2$		-0.0006	-0.0017	-0.001	0.0001			
		(-6.97)	(-6.54)	(-8.29)	(11.59)			
Observations	36	34	33	32	32	31	35	31
Jarque-Bera (p-value)	0.43	0.37	0.73	0.67	0.69	0.47	0.45	0.65
<b>Engle-Granger Test</b>								
tau-statistic	0.06	0.51	0.05	0.5	0.62	0.68	0	0.41
z-statistic	0.05	0.57	0.06	0.6	0.61	0.72	0	0.42
<b>Phillips-Ouliaris Test</b>								

	Argentina	Brazil	Colombia	Costa Rica	Dominican Republic	El Salvador	Guatemala	Mexico
tau-statistic	0.06	0.45	0.03	0.46	0.52	0.58	0	0.31
z-statistic	0.06	0.5	0.06	0.56	0.48	0.61	0	0.28

Source: Author's own estimates on the basis of official data.

**Table III.A4**  
Estimates for Remittances-TOT cointegration Test

	Argentina	Brazil	Colombia	Costa Rica	Dominican Republic	El Salvador	Honduras	Mexico
Log (TOT)	5.548	-0.271	0.451	-1.37	1.303	0.752	0.928	1.29
SD	(2.77)	(-0.53)	(1.83)	(-6.59)	(6.94)	(3.97)	(0.54)	(1.739)
C	-17.56	9.212	10.62	11.72	9.172	8.509	7.293	12.542
SD	(-1.56)	(4.47)	(7.14)	(12.56)	(14.82)	(9.74)	(0.89)	(5.69)
Dummy1	0.74	1.445	0.675	0.834		0.2	1.438	0.424
SD	(3.65)	(13.95)	(15.74)	(35.47)		(3.52)	(4.17)	(8.41)
Dummy2		0.893	0.409	0.377		0.269	0.969	0.373
SD		-9.826	-7.82	-15.02		-8.56	-3.99	-8.41
$t$	0.51	0.54	0.338	0.516	0.199	0.339	0.2	0.142
	(3.42)	(19.12)	(10.13)	(44.69)	(12.35)	(33.08)	(20.25)	(2.39)
$t^2$	-0.005	-0.005	-0.003	-0.004	-0.001	-0.002		-0.0007
	(-2.61)	(-15.31)	(-6.40)	(-31.27)	(-6.83)	(-20.09)		(-1.13)
Observations	32	39	35	34	36	38	33	33
Jarque-Bera (p-value)	0.06	0.49	0.31	0.56	0.53	0.42	0.32	0.9
<b>Engle-Granger Test</b>								
tau-statistic	0.9	0.01	0.07	0.03	0.51	0.28	0	0.07
z-statistic	0.95	0	0.05	0.07	0.58	0.02	0	0.07
<b>Phillips-Ouliaris Test</b>								
tau-statistic	0.84	0	0.05	0.03	0.46	0.05	0	0.07
z-statistic	0.89	0.01	0.02	0.07	0.54	0.05	0	0.08

Source: Author's own estimates on the basis of official data.

## B. Results interpretation

- From table III.A1 we can conclude that for all countries there exists a long run cointegration relationship between exports and GNI.
- From table III.A2 we can infer that for Argentina and Brazil there is not statistical evidence of a long run cointegration relationship between GNI and Remittances. For the remaining countries, however, the evidence from Engle-Granger Test and Phillips-Ouliaris Test support finds evidence of cointegration.

**Table III.A5**  
**Unit Root Test Results for Log (Remittances).**  
 All variables are stationary in first difference, while in level the ADF test  
 shows they are integrated of first order, I(1), Null Hypothesis: the variable has a unit root

<b>At level</b>			Argentina	Brazil	Colombia	Honduras	Dominican Republic	Costa Rica	Guatemala	Mexico
With constant	t-Statistic		-0.6556	-1.2461	-1.1726	-1.0685	-1.2283	-1.5156	-1.0970	-3.4694
	<i>Prob.</i>		0.8468 no	0.6459 no	0.6792 no	0.7203 no	0.6551 no	0.5163 no	0.7085 no	0.0140 **
With constant and trend	t-Statistic		-1.6936	-1.9628	-2.3128	-1.4152	-2.2092	-1.1593	-2.6357	-1.3188
	<i>Prob.</i>		0.7365 no	0.6049 no	0.4195 no	0.8432 no	0.4742 no	0.9062 no	0.2674 no	0.8683 no
Without constant and trend	t-Statistic		1.6355	0.8876	2.3233	2.8260	3.2491	2.1996	0.8030	4.9764
	<i>Prob.</i>		0.9733 no	0.8967 no	0.9945 no	0.9985 no	0.9996 no	0.9924 no	0.8823 no	1.0000 no
<b>At First Difference</b>										
With constant	t-Statistic		-5.8470	-4.9631	-6.9311	-6.7416	-8.7828	-7.5256	-7.1580	-17.4122
	<i>Prob.</i>		0.0000 ***	0.0002 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***
With constant and trend	t-Statistic		-5.7854	-2.5114	-6.9633	-6.7927	-9.1488	-7.6896	-14.9320	-16.6551
	<i>Prob.</i>		0.0001 ***	0.3213 no	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***
Without constant and trend	t-Statistic		-5.6647	-4.8617	-6.2132	-5.6542	-6.6714	-6.6813	-7.0826	-3.0145
	<i>Prob.</i>		0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0035 ***

Source: Author's own estimates on the basis of official data.

Note: a: (\*) Significant at the 10%; (\*\*) Significant at the 5%; (\*\*\*) Significant at the 1% and (no) Not Significant. b: Lag Length based on SIC. c: Probability based on MacKinnon (1996) one-sided p-values.

**Table III.A6**  
**Unit Root Test Results for Log (GNI).**  
 All variables are stationary in first difference, while in level the ADF test  
 shows they are integrated of first order, I(1), Null Hypothesis: the variable has a unit root

<b>At level</b>			Argentina	Brazil	Colombia	Honduras	Dominican Republic	Costa Rica	Guatemala	Mexico
With constant	t-Statistic		-2.5986	-1.7599	-1.3076	-1.6283	-1.1437	-0.6800	-0.7430	-2.3707
	<i>Prob.</i>		0.1001 no	0.3940 no	0.6205 no	0.4620 no	0.6928 no	0.8436 no	0.8274 no	0.1545 no
With constant and trend	t-Statistic		-3.2579	-1.2680	-1.5526	-1.6205	-2.2685	-3.0099	-3.8171	0.7644
	<i>Prob.</i>		0.0855 *	0.8808 no	0.7996 no	0.7729 no	0.4440 no	0.1383 no	0.0228 **	0.9626 no
Without constant and trend	t-Statistic		1.6006	1.7717	2.4742	2.7582	3.8542	4.9144	6.7302	3.0860
	<i>Prob.</i>		0.9717 no	0.9797 no	0.9964 no	0.9983 no	0.9999 no	1.0000 no	1.0000 no	0.9993 no
<b>At first difference</b>										
With constant	t-Statistic		-6.8922	-4.9654	-4.9335	-4.9446	-8.3929	-6.3544	-5.8213	-6.5184
	<i>Prob.</i>		0.0000 ***	0.0002 ***	0.0001 ***	0.0001 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***
With constant and trend	t-Statistic		-6.9826	-5.1106	-5.0378	-5.1036	-8.4512	-6.3331	-5.8066	-7.1212
	<i>Prob.</i>		0.0000 ***	0.0010 ***	0.0006 ***	0.0005 ***	0.0000 ***	0.0000 ***	0.0001 ***	0.0000 ***
Without constant and trend	t-Statistic		-6.6922	-4.7421	-4.0290	-3.7789	-6.6336	-4.8353	-1.7607	-5.1203
	<i>Prob.</i>		0.0000 ***	0.0000 ***	0.0001 ***	0.0003 ***	0.0000 ***	0.0000 ***	0.0744 *	0.0000 ***

Source: Author's own estimates on the basis of official data.

Note: a: (\*) Significant at the 10%; (\*\*) Significant at the 5%; (\*\*\*) Significant at the 1% and (no) Not Significant. b: Lag Length based on SIC. c: Probability based on MacKinnon (1996) one-sided p-values.

**Table III.A7**  
**Unit Root Test Results for Log (Exports of goods and services).**  
**All variables are stationary in first difference, while in level the ADF test**  
**shows they are integrated of first order, I(1), Null Hypothesis: the variable has a unit root**

<b>At level</b>		<b>Argentina</b>	<b>Brazil</b>	<b>Colombia</b>	<b>Costa Rica</b>	<b>Dominican Republic</b>	<b>El Salvador</b>	<b>Guatemala</b>	<b>Honduras</b>	<b>Mexico</b>
With constant	t-Statistic	-0.4282	1.6168	0.1369	1.9347	-0.7697	-0.3958	0.0685	-0.9219	2.0244
	Prob.	0.8971	0.9994	0.9660	0.9998	0.8202	0.9023	0.9606	0.7747	0.9999
		no	no	no	no	no	no	no	no	no
With constant and trend	t-Statistic	-1.7189	-1.8848	-1.9626	-1.4148	-2.6800	-1.7396	-1.4055	-2.4553	-1.4527
	Prob.	0.7306	0.6500	0.6093	0.8467	0.2484	0.7200	0.8495	0.3485	0.8347
		no	no	no	no	no	no	no	no	no
Without constant and trend	t-Statistic	1.4845	4.4338	-2.3655	4.5510	0.8482	1.2986	3.3445	1.3519	4.5825
	Prob.	0.9647	1.0000	0.0188	1.0000	0.8911	0.9493	0.9997	0.9543	1.0000
		no	no	no	no	no	no	no	no	no
<b>At first difference</b>										
With constant	t-Statistic	-6.1529	-6.1929	-3.6119	-3.9720	-4.1504	-6.1112	-6.1077	-6.1470	-5.4841
	Prob.	0.0000	0.0000	0.0083	0.0029	0.0017	0.0000	0.0000	0.0000	0.0000
		***	***	***	***	***	***	***	***	***
With constant and trend	t-Statistic	-6.0026	-6.5914	-3.2848	-4.0957	-3.8552	-5.9721	-6.0379	-5.9948	-5.9725
	Prob.	0.0000	0.0000	0.0083	0.0029	0.0017	0.0000	0.0000	0.0000	0.0000
		***	***	*	**	**	***	***	***	***
Without constant and trend	t-Statistic	-5.6795	-4.9152	-3.2642	-3.3135	-4.0316	-5.7130	-5.1743	-5.7115	-4.4689
	Prob.	0.0000	0.0000	0.0015	0.0013	0.0001	0.0000	0.0000	0.0000	0.0000
		***	***	***	***	***	***	***	***	***

Source: Author's own estimates on the basis of official data.

Note: a: (\*) Significant at the 10%; (\*\*) Significant at the 5%; (\*\*\*) Significant at the 1% and (no) Not Significant. b: Lag Length based on SIC. c: Probability based on MacKinnon (1996) one-sided p-values.

**Table III.A8**  
**Unit Root Test Results for Log (Terms-of-trade).**  
**All variables are stationary in first difference, while in level the ADF test**  
**shows they are integrated of first order, I(1),**  
**Null Hypothesis: the variable has a unit root**

<b>At level</b>		<b>Argentina</b>	<b>Brazil</b>	<b>Colombia</b>	<b>Costa Rica</b>	<b>Dominican republic</b>	<b>EL Salvador</b>	<b>Guatemala</b>	<b>Honduras</b>	<b>Mexico</b>
With constant	t-Statistic	-1.8789	-1.4349	-1.4354	-2.6281	-1.9338	-1.7224	-5.1989	-1.6931	-1.6102
	Prob.	0.3384	0.5553	0.5548	0.0961	0.3140	0.4124	0.0002	0.4263	0.4680
		no	no	no	*	no	no	***	no	no
With constant and trend	t-Statistic	-3.7301	-3.6507	-2.2521	-2.6775	-2.5364	-2.2223	-5.6065	-2.2432	-2.2922
	Prob.	0.0319	0.0393	0.4486	0.2509	0.3100	0.4645	0.0004	0.4526	0.4281
		**	**	no	no	no	no	***	no	no
Without constant and trend	t-Statistic	-0.6145	0.3125	0.0680	-0.3369	-0.0214	-1.1570	0.2299	-0.1394	0.0455
	Prob.	0.4447	0.7710	0.6986	0.5573	0.6695	0.2212	0.7461	0.6289	0.6914
		no	no	no	no	no	no	no	no	no
<b>At first difference</b>										
With constant	t-Statistic	-4.7937	-6.3706	-4.7988	-7.2217	-7.7016	-6.2166	-5.2157	-5.3042	-6.6902
	Prob.	0.0004	0.0000	0.0004	0.0000	0.0000	0.0000	0.0001	0.0001	0.0000
		***	***	***	***	***	***	***	***	***
With constant and trend	t-Statistic	-5.0674	-6.2771	-4.7307	-7.1341	-7.6434	-6.1271	-5.5328	-5.3949	-6.6770
	Prob.	0.0011	0.0000	0.0027	0.0000	0.0000	0.0001	0.0003	0.0005	0.0000
		***	***	***	***	***	***	***	***	***
Without constant and trend	t-Statistic	-4.8584	-6.3728	-4.8366	-7.3278	-7.8079	-6.2009	-5.1417	-5.3856	-6.7869
	Prob.	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		***	***	***	***	***	***	***	***	***

Source: Author's own estimates on the basis of official data.

Note: a: (\*) Significant at the 10%; (\*\*) Significant at the 5%; (\*\*\*) Significant at the 1% and (no) Not Significant. b: Lag Length based on SIC. c: Probability based on MacKinnon (1996) one-sided p-val





## IV. Hurricane clauses in debt contracts in the context of unsustainable debt in Barbados and Grenada

*Dave Seerattan*

### Introduction

Over the last 35 years, sovereign bond issuers have begun adopting collective action clauses (CACs) in their bond agreements. In 2014, these efforts resulted in the adoption of a model CAC by the International Capital Markets Association (ICMA). The international financial community has supported the use of CACs and this seems to have normalized their use with the IMF reporting that approximately 88 per cent of sovereign bond issuances over the period 2014–2018 included them. These developments can make debt restructurings more orderly and efficient which can reduce the associated economic costs. Many sovereigns are, however, still not proactive in using these clauses to deal with emerging debt problems. In this context and with the onset of the COVID 19 pandemic, the G20 has proposed a common framework for debt restructuring which includes clauses that facilitate automatic suspension of principal and interest in the event of clearly defined shocks. These clauses have been used in cases where countries are highly exposed to natural disasters and are referred to as natural disasters or hurricane clauses.

Many small developing states are vulnerable to natural disasters that can have large socioeconomic costs. The negative impact of these events is expected to increase over time because of climate change. In this context, it would be prudent to act now to upgrade these countries' preparedness to natural disasters, to mitigate their impact, and speed up the recovery from these events. Unfortunately, in most countries that are vulnerable to natural disasters, there is underinvestment in resilience-building initiatives due to capacity constraints, large upfront costs, and limited fiscal space. This is compounded by the fact that multilateral mechanisms to assist these countries are underdeveloped. Development financing options have in the past not formally addressed the natural disaster risks to which these countries are exposed. The increasing focus on using novel approaches such as hurricane clauses and other collective action approaches in debt contracts can potentially help to remove some important obstacles to the developmental process in small open developing countries.

This chapter is a policy-oriented study on hurricane clauses and their applicability to Caribbean countries in the context of the aftermath of the COVID-19 pandemic. The study will explore the following issues:

- The rationale for the application of hurricane clauses;
- The experiences of Grenada and Barbados with the application of hurricane clauses highlighting the context in which they were applied, how hurricane clauses were applied and their impact on debt reduction;
- Lessons learned regarding their strengths, weaknesses, and applicability to other countries.

The COVID-19 pandemic is truly unprecedented in modern times both in terms of scale and in terms of the steps that have been taken to deal with the crisis. According to Agustin Carstens, general manager of the Bank for International Settlements, “Never before has the global economy been deliberately put into an induced coma” (Carstens, 2020). This recession was, therefore, not only due to the direct impact of the virus, but also because of explicit policy choices that have been made to protect lives. Importantly, the unique nature of this crisis has also manifested itself through intense risk aversion in several sectors. This presents a major challenge to policymakers since attempts at stimulus or restoring stability may not get the needed traction in terms of action by consumers and businesses.

Caribbean economies were significantly constrained by pre-existing economic vulnerabilities before the onset of the COVID 19 pandemic in the first quarter of 2020. The unprecedented shock from the pandemic accentuated these vulnerabilities and has the potential to set the region back a generation in terms of its development goals. The estimates for growth in Caribbean Community (CARICOM) countries in 2020 are all lower than the global average except for Guyana (see table 1). The projected regional average for economic growth (excluding Guyana) is -6.1%, recovering to 4.8% in 2021. This is if the global economy experiences a V-shaped recovery in response to the pandemic, an increasingly elusive prospect. Also noteworthy is that service-based economies, such as Barbados and Grenada, experienced a deeper recession in 2020 because of the dependence of those jurisdictions on the severely affected tourism industry.

**Table IV.1**  
**CARICOM economic growth, 2019-2021**

Country	2015	2016	2017	2018	2019	2020	2021
Antigua and Barbuda					5.3	-10.0	8.0
The Bahamas					1.8	-8.3	6.7
Barbados					-0.1	-7.6	7.1
Belize					0.3	-12.0	7.6
Dominica					9.2	-4.7	3.4
Grenada					3.1	-8.0	6.1
Haiti					-1.2	-4.0	1.2
Jamaica					1.0	-5.6	3.5
St. Kitts and Nevis					2.9	-8.1	8.6
St. Lucia					1.7	-8.5	6.9
St. Vincent and the Grenadines					0.4	-4.5	5.4
Service-based Economies (SBEs)					2.2	-7.4	5.9
Guyana					4.7	52.8	6.3
Suriname					2.3	-4.9	4.9
Trinidad and Tobago					0.0	-4.5	2.6
Commodity-based Economies (CBEs)					2.3	14.4	4.6
CARICOM					2.3	3.5	5.2
CBEs without Guyana					1.1	-4.7	3.8
CARICOM without Guyana					1.7	-6.1	4.8

Source: IMF WEO April 2020.

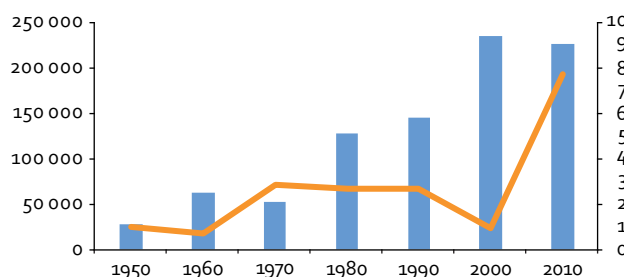
Additionally, the region had pre-existing vulnerabilities. The region is exposed to frequent natural disasters which cause huge dislocations in their productive capacity given their small landmasses. This is compounded by the fact that they face structural weaknesses such as high import intensity, low levels of international competitiveness, high dependence on external sources of development finance, high exposure to commodity price shocks, limited fiscal space, underdeveloped financial systems, problems with debt sustainability, low levels of economic diversification and weak economic growth. This combination of high vulnerability and low resilience has been a significant factor impeding the development of the Caribbean.

## A. The rationale for hurricane clauses in debt contracts

The small open economies of the Caribbean are vulnerable to natural disasters due to their geographic location and small land size. This has always been a key impediment to growth and development in the region. The impact rate for natural disasters in the Caribbean over the period 1990 to 2019 was 26.2%, one of the highest in the world (Seerattan, 2022). Indeed, some countries have been impacted more than once a year. For example, in 2005 Haiti was impacted by five hurricanes. The level of damage to the productive capacity of these economies also tends to be higher because of their small landmasses, resulting in the impact of a hurricane generally being felt over the entire country. According to Barnichon (2009), the destruction caused by the category 3 hurricane that struck Grenada in 2004, was estimated at US\$800 million or 200% of Grenada's GDP.

The average natural disaster events and average numbers of people affected per disaster also seem to be on the rise in the region (figure IV.1). This is in keeping with expectations that climate change will lead to an increase in the frequency and intensity of these events.

Figure IV.1  
The incidence and impact of natural disaster in the Caribbean, 1990-2016



Source: Author on the basis of official data. Data taken from EM-DAT database.

Note: Natural disasters are defined to include events such as geophysical (earthquakes, volcanic activity, mass movement), meteorological (extreme temperature, fogs, storms), hydrological (floods, landslides, wave action), climatological (drought, wildfire) and biological (epidemic, insect infestation). Additionally, events are only included if they involve at least 10 or more people reported killed, 100 or more people reported affected, a declaration of a state of emergency or a call for international assistance (Ötler and Loyola 2017).

Bars represent number of natural disasters (right-hand axis) and the continuous line the number of people affected by natural disasters (left-hand line).

Natural disasters tend to be relatively more costly in the Caribbean with damages estimated at US\$19.6 billion in constant 2009 prices for the Caribbean over the period 1990 to 2016, approximately 40.6 per cent of the global average for that period (Ötler and Loyola 2017). This is of course a significant underestimate because the EM-DAT database only has information on damages for approximately 57.41 per cent of the natural disasters they record for the Caribbean.

There are some additional socioeconomic features of Caribbean countries that lend themselves to greater vulnerability. Internationally, the growing number of female headship of households (FHH) has led to considerable policy research on the link between poverty, gender inequality, and child welfare. A United Nations (2017) study estimates that the proportion of FHHs to be approximately 34% in Latin America

<sup>1</sup> The comparable global figure is approximately 66 percent.

and the Caribbean. In the Caribbean, the available data suggests that female-headed households are likely to be between 33.3 to 45.6 per cent of households.

The factors driving this trend include weak conjugal bonds, the prevalence of visiting relationships and having children before they adopt residential union. Some women become household heads as an adaptive response to conditions such as high rates of male unemployment, increasing female labor participation rates and high rates of male emigration. FHHs are likely to be poorer and more vulnerable as women tend to have less access to productive resources such as land, capital, and credit. They also tend to receive lower average wages relative to men performing the same jobs. Various studies have established the central role women and mothers play in Caribbean society at large (Stuart 1996, Bose-Duker, Henry and Strobl 2021).

Disadvantages specific to FHHs combine to make these households economically vulnerable to climate-related shocks. FHHs are therefore likely to be more severely impacted by natural disasters. The prevalence of FHHs in the Caribbean accentuates the negative economic fallout from the region's vulnerability to natural disasters. In this context, the policy response to natural disasters must pay attention to these gender dynamics and hurricane clauses can be an instrument that can help FHHs by freeing up liquidity from debt payments to backstop efforts to aid this vulnerable group in the aftermath of a natural disaster.

Moreover, Caribbean countries have significantly underinvested in infrastructure, including infrastructure that is resilient to natural disasters. This has resulted in a situation where these highly open economies not only face more frequent shocks but their capacity to respond to these shocks is compromised by structural weaknesses including high and unsustainable debt.

In this environment, if the international development financing systems do not take account of the unique vulnerabilities of Caribbean countries, they are not only less likely to achieve their development objectives but can put at risk their socio-economic viability. Debt contracts that do not take account of the frequency and magnitude of these shocks, especially natural disaster shocks, are not likely to achieve lasting improvements in development and debt sustainability. Hurricane clauses in debt contracts are one such instrument to mitigate against the unique vulnerabilities that Caribbean countries face.

Hurricane clauses included in the debt contract gives the issuer a legally binding option to defer debt payments in the event of a qualifying natural disaster. The built-in debt relief that this affords issuers helps sovereigns to absorb some of the financial and economic costs of a natural disaster. These arrangements allow for the deferral of principal and interest payments, as well as the built-in ability to transition to debt restructuring in the event of a hurricane or other natural disaster. This instrument could of course be potentially extended to include events such as the COVID-19 pandemic and significant financial and economic crises, especially those in which the region is powerless to cause or mitigate on its own.

The rationale for these arrangements is based on:

- The increasing frequency and intensity of natural disasters in the Caribbean;
- Hurricanes in the Caribbean tends to generate disproportionately high macroeconomic and social costs;
- Hurricanes in the Caribbean have a significantly negative and often long-lasting impact on the dominant tourism industry;
- A large portion of the losses from Hurricanes are uninsured in the Caribbean;
- The need to provide liquidity relief and the easing of fiscal constraints in the event of a disaster;
- Provides immediate relief as opposed to mechanisms that take some time to implement;
- It is used at the discretion of the issuer giving the affected country greater control over the financial response to the crisis event;
- The prevention of default in the wake of a crisis event;

- The promotion of debt sustainability in difficult circumstances outside of the control of the impacted country;
- Protects creditors as well by reducing the risk of a disorderly default;
- The deferral embedded in the hurricane clause avoids costs associated with a formal debt restructuring process in the aftermath of a natural disaster which also reduces the likelihood of a disorderly default.

In the cases of Barbados and Grenada, the debt overhangs in these countries were not only defined as unsustainable but these countries are also very susceptible to hurricanes.

## B. The experience with hurricane clauses in the Caribbean

Hurricane clauses have been a very recent addition to bond contracts in the Caribbean. Specifically, these clauses were only included in the bond agreements of countries such as Grenada and Barbados over the periods 2013-2015 and 2018-2020 respectively. This was a rational response to a combination of the fact that these countries were highly exposed to natural disasters, particularly hurricanes (Otker and Loyola 2017) and the fact that both of them have huge challenges in the area of debt sustainability. In what follows we look more closely at the experience of Barbados and Grenada, two Caribbean countries that have recently undergone debt restructuring exercises which included the introduction of hurricane clauses in new debt agreements.

### 1. Barbados

A hurricane clause was introduced as a component of the debt restructuring exercise in Barbados which was conducted over the period 2018 to 2020. The debt restructuring program was introduced in the context of very difficult economic conditions. This was partly due to the legacy of another devastating shock—the 2007/2008 international financial crisis. The debt restructuring exercise was also being done in the aftermath of a very active hurricane season in 2017.

#### (a) Context of the 2018-2020 debt restructuring exercise

Barbados, like many other Caribbean countries, have been challenged by the high debt/low growth nexus for many years. This dynamic has been caused by persistent fiscal and balance of payment deficits over long periods driven by weak international competitiveness, underdeveloped debt management systems, transfers to inefficient state enterprises, inefficient consumption-based public expenditures, the bailout of financial institutions and fiscal outlays in the aftermath of natural disasters.

These developments have increased the level of debt and the related uncertainty and public under-investment in public infrastructure and human capital development, leading to weak consumer and business confidence, and eventually chronically low economic growth. This has also increased the level of economic volatility in a situation where volatility is already a significant structural challenge because of the region's high level of exposure to shocks in international commodities, tourism and financial markets. This volatility feeds back into uncertainty leading to a vicious cycle of increasing debt and lower growth.

The only long-term solution to this vicious cycle is a synchronised set of policy interventions to lower debt, deal with structural problems driving vulnerability and more innovative approaches to development financing that address the unique challenges that Caribbean countries face (Jahan 2013; McIntyre and Ogawa 2013; Amo-Yartey and Turner-Jones 2014 and Munevar 2018).

In the pre-2018 debt restructuring period in Barbados, the economic situation had become dire. The structural challenges mentioned above, and policy mistakes had led to a situation where growth was chronically low, the government's financial position was very weak, the external accounts had been in deficit for some time, foreign exchange reserves were very low and the probability of the country defaulting on its debt obligations was very high (see table IV.2).

These developments were a direct consequence of the 2007/2008 international financial crisis. Over the period 2007 to 2017, the difficult international economic environment contributed to low growth which led in part to chronic balance of payments and fiscal deficits. During this period Barbados' public debt rose from approximately 77 per cent to 158 per cent of GDP. The credit rating for Barbados moved from investment grade (Standard and Poor's BBB+) to junk bond status over the period. The deteriorating credit ratings caused domestic financial institutions to decrease their holdings of long-term government debt in favor of short-term treasury bills, leading to gross financing needs increasing 35 percentage points (IMF 2018). Over the period, external financing declined significantly, and international reserves fell by US 603 million so by 2017 import cover was down to 1.52 months. This situation led to Barbados defaulting on its debt obligations to preserve international reserves in 2018, the beginning of the debt restructuring process in June 2018 and the request for IMF assistance and its approval under the Extended Fund facility (EFF) on October 1, 2018.

**Table IV.2**  
**Barbados: selected economic indicators, 2007-2017**

Year	Per capita GDP growth (Percentages)	Current account BOP (Percentages of GDP)	Current fiscal balance (Percentages of GDP)	Total debt (Percentages of GDP)	External reserves (Millions of dollars)	Import cover (Months)
2007	1.75	-0.23	-5.16	77.44	839.43	3.73
2008	0.25	-0.46	-4.94	83.38	738.53	3.09
2009	-5.47	-0.27	-7.43	100.01	871.15	4.19
2010	-2.64	-0.21	-8.37	108.16	833.54	3.96
2011	-0.97	-0.55	-4.06	112.64	812.60	3.61
2012	-0.71	-0.39	-7.84	123.67	839.72	3.65
2013	-1.61	-0.39	-9.96	135.16	680.96	2.81
2014	-0.31	-0.43	-7.36	139.25	632.26	2.46
2015	2.27	-0.29	-9.19	147.02	553.60	2.42
2016	2.31	-0.21	-5.53	149.45	431.76	1.69
2017	0.32	-0.19	-4.46	158.26	265.84	1.52
2018	-0.72	-0.20	-0.31	126.52	533.91	3.00
2019	-0.23	-0.16	3.71	126.78	772.12	4.20

Sources: World Bank, World Development Database; IMF World Economic Outlook Database.

**(b) The debt restructuring exercise and the hurricane clause**

the debt restructuring exercise that started on June 1, 2018, was the first in Barbados' history and was to continue for another three years. The debt restructuring addressed both domestic debt, the largest component of the debt overhang, and most of its external debt to commercial creditors (it did not restructure its bilateral debt which was a small component). The restructuring targeted debt amounting to approximately 147 per cent of GDP. It covered domestic debt such as treasury bills and overdrafts at commercial banks, central government debt to external commercial creditors, government-guaranteed state-owned enterprises debt, domestic expenditure arrears incurred by the central government, and external arrears that started accumulating after the external default. External debt from bilateral arrangements and multilateral external debt were not included.

The structure of the debt in 2017 before restructuring or default was that external debt comprised 20.9 per cent of the total while domestic debt accounted for 79.1 per cent. All the external debt was long term debt while 53.4 per cent of domestic debt was long term debt. State-owned enterprises accounted for 8.5 per cent of total debt and their debt was mostly domestic. This meant that the government had

relatively more leverage since most of the creditors were domestic agents. In this context, the debt restructuring exercise had more serious consequences for domestic agents who may have had to accept haircuts. This had implications for domestic financial institutions that were significantly exposed to the sovereign. In 2018, when Barbados defaulted, arrears were 7.5 per cent of total debt.

The timing of the announcement of the debt restructuring program was influenced by a large external debt payment due in June. The government defaulted on that payment to conserve international reserves. Negotiations with domestic and external creditors began at the same time but the priority was given to negotiations with domestic creditors because it was by far the largest component of total debt and negotiations were more time-sensitive because of the financial stability implications of those negotiations (Anthony, Impavidio and Van Selm 2020). This was the main reason for defaulting on debt to external creditors but continuing to pay interest on domestic debt while principal payments were rolled over.

In September 2018, the government adopted legislation that included a collective action clause in domestic debt agreements. Under this legislation, there was a 75 per cent benchmark which meant that if creditors holding 75 per cent of the total domestic debt agreed to the terms of the restructuring, then it was binding on all domestic creditors. This was a mechanism to facilitate buy-in by all domestic creditors in the government's debt restructuring program.

In terms of external debt, the government initially defaulted on a bilateral loan from Canada, but the government subsequently decided to resume payment six months later. It also decided not to restructure its bilateral debt obligations which were only 2 per cent of GDP. The remaining external debt comprised some Eurobonds and a loan structured by a major international bank with participation from third party creditors. The Eurobonds had a collective action clause at the 75 percent benchmark, but the loan did not. The loan also was on a flexible interest schedule tied to the country's credit rating which meant that interest costs increased significantly throughout the loan (Anthony, Impavidio and Van Selm 2020).

On October 1, 2019, the government and the creditor committee announced that agreement on the restructuring of the external private external debt. Creditors were to take a 26 per cent haircut on principal and accrued interest. The deal also included the issuance of a new debt instrument with a 10-year maturity, a 5-year grace period, a 6.5 per cent interest rate and, and US\$ 40 million repayments over the next three years. The deal had very high creditor participation, 93 per cent of Eurobonds and 100 per cent for the loan facility. Almost immediately Standard and Poor's upgraded Barbados' credit rating to speculative-grade B-, currently meeting debt obligations but vulnerable to negative shocks.

The debt restructuring included for the first time a hurricane clause. Most of the new domestic and external debt instruments included this clause. This clause would allow the government space in the event of a qualifying event to defer debt payments to better deal with the aftermath of a hurricane without being classified as defaulted. The clause allows for the deferral of interest and principal payment and the capitalization of deferred interest payments into principal for two years after a qualifying natural disaster. The deferred principal payments would be added to the capitalized interest for the 2 years. The new amortization schedule when payment resumes after two years would be based on the sum of the capitalized interest payments, the deferred principal payments and the remaining amortization. This sum would be allocated evenly over the remaining term of the debt.

For new domestic debt, a qualifying natural disaster would be one where it triggered a payment under the Catastrophe Risk Insurance Facility (CCRIF) of above US\$ 5 million. For the new external debt instrument, the trigger for the natural disaster clause is also linked to payouts under the CCRIF but it is differentiated based on the type of natural disaster. In particular, the trigger for a hurricane is a US\$7.5 million payout from the CCRIF while the trigger for earthquakes and excess rainfall/flooding is a US\$5 million payout from the CCRIF. The fact that this clause includes natural disasters other than hurricanes such as earthquakes and excess rainfall/flooding offers a greater level of protection.

There are important limits on the deferral option which could limit the benefits to the sovereign. It cannot be used more than three times within two years. In the case of the external debt, the sovereign

cannot seek a deferral in the last two years of the agreement because this will effectively extend the term of the debt agreement. Very importantly, there is a 15-day period within which if creditors holding more than 50 per cent of the outstanding principal want to stop the deferral right, they can do so. It is unlikely however that the deferral would be blocked by creditors because Barbados would struggle in the event of a significant natural disaster to meet debt payments based on the original terms of the new debt instruments. The blocking of the deferral right of the sovereign is also unlikely because the deferral protects against a disorderly debt restructuring which is not in the best interest of the creditors.

**(c) Impact of the hurricane clause on debt reduction**

the trigger for the activation of the hurricane clause is a payout from the CCRIF. Such an event occurred on October 19, 2018, when the CCRIF made a payout of US\$ 5.8 million to Barbados based on the excess rainfall criterion following the passage of tropical storm Kirk (see table IV.3).

Unfortunately, the agreement with domestic creditors was only consummated on November 19, 2018, while the external agreement was consummated on December 11, 2019, meaning that Barbados could not benefit from the hurricane clause because it was not yet finalized for the domestic or external debt agreements. In fact, in the period since then Barbados has made two other claims under the CCRIF for hurricane Elsa and excess rainfall related to that event but they did not rise to the US\$ 5 million benchmark required to trigger the hurricane clause (see table IV.3).

The sovereign debt dynamics in Barbados in the aftermath of the 2018/2019 debt restructuring have improved significantly. The hurricane clause component of the restructuring did not have a material impact on these developments because it was not triggered since being implemented. However, it still provides insurance against future natural disasters which is one of the factors determining the overall level of resilience for Barbados and its ability to avoid disorderly debt restructuring.

Given that the hurricane clause now applies to the majority of sovereign debt obligations (both domestic and external) in Barbados, one can simulate what would happen in case the hurricane clause was triggered. The new clause embedded in debt contracts implies potentially up to approximately US\$700 million in additional fiscal space for spending on rebuilding and recovery can now be available in the event of a qualifying natural disaster (Ho and Fontana, 2021).

This is only a temporary respite, however, since after the two-year hiatus, if no other policy intervention is made to deal with debt challenges, the total debt outstanding is unlikely to change. This is because the hurricane clauses as presently structured only offer temporary liquidity relief, it does not offer new infusions of liquidity or debt forgiveness and is therefore unlikely to change the total debt outstanding. Countries may therefore have to source new capital inflows to deal adequately deal with the rebuilding and recovery effort because simply deferring debt payments may not release enough resources to backstop these efforts.

Importantly, it will also increase the size of amortizations after the 2-year period because the interest payments would have been capitalized and added to the deferred principal payments and the term of debt instruments under the present arrangements is not extended. The debt service burden after the 2-year period has expired, all things being equal, is therefore likely to increase, intensifying the challenges that the country faces in terms of meeting its debt obligations.

There are some noteworthy details that should be evaluated in this context. The natural disaster that would have qualified based on their payout from the CCRIF was only approximately only 25 per cent of all the natural disasters in the region over the period 2014 to 2021. The obvious implication is that one option may be to lower the US\$ 5 million threshold. The problem is that this would trigger the hurricane clause so often that private creditors may not want to finance Caribbean sovereigns at all, worsening development finance problems in the region. Other possible innovations to the hurricane clause to make it more relevant include expanding the categories of events to include pandemics and large international economic shocks.



**Table IV.3**  
**Caribbean Natural Disasters covering the period 2014-2021 and their pay out**

<b>Natural disaster</b>	<b>Country</b>	<b>Payout (Dollars)</b>
Tropical Cyclone Gonzalo, October, 2014	Anguilla – Excess Rainfall Policy	493 465
Trough System, 7-8 November, 2014	Anguilla	559 249
	St. Kitts and Nevis	1 055 408
Trough System, 21 November, 2014	Barbados	1 284 882
Tropical storm Erica, 27 August, 2015	Dominica – Excess Rainfall Policy	2 402 153
Tropical Cyclone Earl, August, 2016	Belize – Excess Rainfall Policy	261 073
Tropical Cyclone Matthew, September, 2016	Barbados	975 000
	Barbados – Excess Rainfall Policy	753 277
	St. Lucia – Excess rainfall Policy	3 781 788
	St. Vincent and the Grenadines – Excess Rainfall Policy	285 349
Tropical Cyclone Matthew, October, 2016	Haiti	20 388 067
	Haiti – Excess rainfall Policy	3 020 767
Tropical Cyclone Irma, September, 2017	St. Kitts and Nevis	2 294 603
	Anguilla	6 529 100
	Anguilla – Excess Rainfall Policy	158 823
	Antigua and Barbuda	6 794 875
	Turks and Caicos Islands	13 631 865
	Turks and Caicos – Excess Rainfall Policy	1 232 769
	The Bahamas – Excess rainfall Policy	163 598
Tropical Cyclone Maria, September, 2017	Dominica	19 294 800
	Dominica – Excess Rainfall Policy	1 054 022
	St. Lucia – Excess Rainfall Policy	671 013
	Turks and Caicos Islands	419 372
	Barbados – Excess Rainfall Policy	1 917 506
	St. Vincent and the Grenadines – Excess Rainfall Policy	247 257
Rainfall Event, October 18-20, 2017	Trinidad and Tobago – Excess Rainfall Policy	7 007 886
Tropical Storm Kirk, October, 2018	Barbados – Excess rainfall Policy	5 813 299
Rainfall Event, October 18-20, 2018	Trinidad and Tobago – Excess Rainfall Policy	2 534 550
Tropical Cyclone Dorian, September, 2019	The Bahamas – Tropical Cyclone	11 527 151
	The Bahamas – Excess Rainfall Policy	1 297 002
Tropical Cyclone Karen, October, 2019	Trinidad and Tobago – Excess Rainfall Policy	361 982
Tropical Cyclone Amanda/Cristobal May/June, 2020	Belize – Excess Rainfall Policy	203 136
Tropical Cyclone Laura, August, 2020	Haiti – Excess Rainfall Policy	7 163 958
Rainfall Event, August 31-September 2, 2020	Trinidad and Tobago – Excess Rainfall Policy	176 146
Tropical Cyclone Zeta/Eta, October/November, 2020	Jamaica – Excess Rainfall Policy	3 500 000
Tropical Cyclone Elsa, July, 2021	Barbados – Tropical Cyclone	1 345 500
	Barbados – Excess Rainfall Policy	1 124 424
Earthquake August 14, 2021	Haiti	39 953 272
Rainfall Event, August 18-20, 2021	Trinidad and Tobago – Excess Rainfall Policy	2 381 464

Source: CCRIF.

In this context, the hurricane clause used in isolation may not be as effective in mitigating the fallout from natural disasters. It is noteworthy that the introduction of the hurricane clause in Barbados was done in tandem with other debt restructuring elements, as well as the start of an IMF program. This IMF program included additional financing and a policy regime designed to restore debt sustainability.

The raft of policy interventions that were implemented at the same time makes it difficult to attribute the improvements in debt sustainability exclusively to one intervention. The most significant policy interventions seemed to have been the haircuts the government was able to achieve on both its domestic and external debt stocks from the debt restructuring exercise, as well as the fiscal consolidation measures to put the overall level of debt on a downward trajectory. The ownership of the Barbados Economic Recovery and Transformation (BERT) adjustment program developed in consultation with social partners was also critical to its success. This was buttressed by additional resources and policies from an IMF Extended Fund Facility (EFF) over that period (Anthony, Impavidio and Van Selm 2020).

Public debt declined significantly in the financial year 2019/2020 as fiscal consolidation efforts and debt restructuring contributed to the improvement. In particular, the government was running an overall fiscal surplus and debt restructuring initiatives had achieved significant haircuts on both domestic and external debt obligations. On the fiscal consolidation front, this was achieved on the expenditure side by the reform of state enterprises and cuts in the public sector wage bill. On the revenue side, the removal of distortionary taxes, reform of the corporate income tax regime and mergers and divestment. The government also looked to introduce a fiscal rule to help guide the fiscal consolidation efforts. Public pension reform is also planned to address the rising pension cost associated with an ageing population and institutional reforms to limit the extent of government borrowing from the Central Bank.

These measures together led to a lengthening of the maturity profile of public debt, a decline in gross financing needs and significant haircuts for both domestic and external creditors which led to net present value losses of approximately 44 and 43 per cent on average for external and domestic creditors respectively. The fact that domestic financial institutions were highly exposed to the sovereign meant that the significant haircuts had serious financial stability implications. However, stress tests of the financial sector revealed that the debt restructuring would not weaken financial stability.

## 2. Grenada

In Grenada, a hurricane clause was introduced as a part of the 2013-2015 debt restructuring. Grenada had gone through a similar exercise over the period 2004-2006 in the wake of Hurricane Ivan in 2004. That debt restructuring exercise did not produce lasting improvements in debt sustainability because it was not underpinned by a related and supporting medium-term fiscal policy framework.

The public debt to GDP ratio had moved from 79.6 per cent in 2003 to 94.7 per cent in 2004. As the debt restructuring exercise was implemented the level of indebtedness dropped to 87.3 per cent as the restructuring exercise began in 2005. The trend reversed in 2009 as the government increased spending in an attempt to deal with the fallout from the 2007/2008 international financial crisis. The level of indebtedness peaked in 2013 at 108.1 per cent of GDP forcing the government to start implementing another debt restructuring program. The fact that the 2004-2006 debt restructuring exercise was driven in part by the economic fallout from Hurricane Ivan informed the strategy for the later round of debt restructuring.

### (a) The context of the 2013-2015 debt restructuring programme

Grenada is a small upper middle-income Caribbean country that is highly dependent on tourism and is hampered by structural problems such as weak external and fiscal accounts, unsustainable debt, and under-developed financial markets. It is also vulnerable to natural disasters, particularly hurricanes because of its geographic location. Grenada is classed as 'extremely vulnerable' according to the Environmental Vulnerability Index compiled by the United Nations Environment Program. At the time of the implementation of the debt restructuring program, Grenada had been one of the most indebted countries in the region and in 2014 was ranked as one of the ten most indebted middle-income countries in the world (Robinson 2016).

In the period 1995 to 1999, Grenada was in a relatively comfortable economic situation. Per capita GDP growth averaged 5.4 per cent and debt averaged 40.6 per cent of GDP. Starting in the 2000s, however, a series of international shocks impeded Grenada's development. In particular, the 9/11 terrorist attack in 2001 was followed by the destruction caused by hurricanes Lili in 2002, and Ivan in 2004 and subsequently compounded by the international financial crisis in 2007/2008 and the CL Financial crisis in 2009.<sup>2</sup>

In the aftermath of the international financial crisis, the government of Grenada had pursued countercyclical fiscal policies to support the economy, but this strategy resulted in the accumulation of large fiscal imbalances. This was due in large part to the fact that in a small open economy the fiscal multipliers are very small, with a lot of leakages through the balance of payments because of high import intensity. Fiscal imbalances, therefore, expanded without a commensurate increase in economic growth.

**Table IV.4**  
Grenada: selected economic indicators, 2000-2017

Year	Per capita GDP growth (Percentages)	Current account BOP (Percentages of GDP)	Current fiscal balance (Percentages of GDP)	Total debt (Percentages of GDP)	External reserves (Millions of dollars)	Import cover (Months)
2000	4.48	n/a	-3.88	41.63	57.66	1.98
2001	-2.42	n/a	-6.32	44.61	63.94	2.36
2002	3.05	n/a	-14.57	79.09	87.84	3.26
2003	9.07	n/a	-5.67	79.56	83.23	2.73
2004	-0.97	n/a	-1.76	94.69	121.73	3.75
2005	12.94	n/a	-3.44	87.31	94.25	2.59
2006	-4.24	n/a	-8.28	92.92	99.96	2.70
2007	5.86	n/a	-10.14	89.06	110.57	2.70
2008	0.69	n/a	-7.20	83.91	105.34	2.52
2009	-6.91	n/a	-5.16	91.09	129.08	3.58
2010	-0.93	n/a	-2.80	96.94	119.15	3.35
2011	0.23	n/a	-3.92	100.69	120.71	3.35
2012	-1.75	n/a	-3.90	103.34	119.49	3.28
2013	1.67	n/a	-5.13	108.06	150.57	3.96
2014	6.62	-0.11	-4.00	101.76	169.95	3.46
2015	5.77	-0.13	-1.65	90.10	197.97	3.75
2016	3.11	-0.12	1.63	81.57	207.69	3.91
2017	3.87	-0.16	1.83	70.11	199.13	3.34
2018	3.60	-0.18	3.19	64.36	233.82	3.65
2019	1.41	-0.20	3.96	59.70	236.33	3.75

Sources: World Bank, World Development Database; IMF World Economic Outlook Database.

In this environment, the government's cash flow dried up as domestic financial institutions limited their lending to the government and as debt flow from multilateral banks dried up. In 2010, an IMF's loan under its Extended Credit Facility was derailed after the first review because the government continued to pursue expansionary fiscal policy. Economic growth, which was already subdued in the aftermath of Hurricane Ivan, was pushed over the edge by the international financial and the CL Financial crisis.

<sup>2</sup> CL Financial was a Trinidad and Tobago-based financial institution. Its collapse had spillover effects in all 15 CARICOM states except for Jamaica and Haiti, with exposures as high as 17 percent of GDP in the Eastern Caribbean (Monroe, 2011).

By 2012, therefore, a deep recession had taken root as the tourism and construction sectors collapsed, as indebtedness escalated to unsustainable levels and as the government faced serious liquidity problems. In September the government defaulted on its debt, providing the catalyst for the launch of the debt restructuring exercise. These shocks derailed the development trajectory of Grenada and combined with structural weaknesses related to its small size, resource constraints, a lack of diversification and policy mistakes resulted in public debt escalating to unsustainable levels (see table IV.4).

The one source of resilience was the fact that it was part of the Eastern Caribbean Currency Union, and this monetary union arrangement ensured a certain minimum level of monetary stability in the form of generally adequate levels of international reserves and the related import cover, as well as currency stability, despite the shocks it faced.

The frequency of these shocks suggests that the policy framework needed to be adjusted to make Grenada more resilient to these natural disaster shocks. These shocks not only damaged physical infrastructure but also public finances. In this context, Grenada joined the Caribbean Catastrophic Risk Insurance Facility (CCRIF) in 2007. Grenada also learned from the 2004-2006 debt restructuring exercise to avoid certain elements in the restructuring program, avoiding stepped-up coupons in debt agreements because this put them at the mercy of unanticipated shocks which seem to be increasingly more frequent.

Moreover, the debt sustainability analysis (DSA) framework utilized by multilateral banks put countries at risk of debt defaults because the assumptions built into the DSA did not account for natural disasters and other major shocks over which the country had little control. It is in this context, that Grenada insisted that a hurricane clause be included in all debt agreements related to this new round of debt restructuring. The hurricane clause would allow Grenada the fiscal space to pursue rebuilding and recovery while not increasing the probability of default or compromising debt sustainability. The clause would also reduce the probability of default and the related credit rating downgrade. The clause would provide a period of respite that would allow public finances to recover while maintaining its creditworthiness. This would also help borrowers and creditors to avoid lengthy and costly default and/or debt restructuring.

#### **(b) The 2013-2015 debt restructuring exercise and the hurricane clause**

the 2013-2015 debt restructuring did address liquidity issues like the 2004-2006 restructuring exercise, but on this occasion, it focused more on solvency issues. By the end of 2015, Grenada had managed to consummate agreement with creditors accounting for US\$ 318 million, equivalent to 33.3 per cent of their total debt stock. These creditors included Taiwan's Eximbank, the holders of its 2025 global bond, and Paris Club creditors. The 2025 bondholders comprised approximately 85% of the debt stock to be restructured in the 2013-2015 restructuring exercise. This group of creditors owned debt that was previously restructured in 2004-2006. In many respects the 2013-2015 debt restructuring exercise was a second chance to get the restructuring right and to fix the flaws in the 2004-2006 restructuring agreement.

The overarching objective of the debt restructuring exercise in 2013-2015 was to put the sovereign debt on a sustainable path. A key part of this overall strategy was to ensure that the country did not find itself again in a situation like 2004 when they were forced to restructure the debt because of a crisis precipitated by a natural disaster. In this context, the hurricane clause was one of the main components of the strategy to ensure long term debt sustainability. The primary benefits of this clause were to facilitate immediate liquidity relief and create fiscal space to finance rebuilding and recovery, as well as avoiding default and averting the need for repeated restructuring exercises.

By the end of November 2015, Grenada had concluded agreements with all three creditors (see table 5 for details). In stark contrast to the 2004-2006 agreement, it included a 50 per cent haircut. The remaining outstanding debt was to be paid over 15 years with a 3-year grace period. The new instruments included a fixed interest rate of 7 per cent rather than the step-up coupon arrangement in the 2004-2006 agreement. Moreover, it included a hurricane clause in the agreements as insurance against default and/or disorderly debt restructuring precipitated by hurricanes.

**Table IV.5**  
**Details of the 2013-2015 Grenada sovereign debt restructuring exercise**

1	Agreement details	Taiwan eximbank	2015 Bondholders		Paris club
2	Creditor	Official	Private		Official
3	Agreement date	December, 2014	November 12, 2015		November 19, 2015
4	Principal ( <i>Millions of dollars</i> )	36.6	193.5	68.1	8.0
5	Currency denomination	US Dollar	US Dollar	EC Dollar	US Dollar
6	Percentage of restructured debt	12	63.2	22.2	2.6
7	Tenor	15 years	15 years	15 years	ODA 20 years, NODA 15 years
8	Coupon	Fixed rate 7 percent	Fixed rate 7 percent	Fixed rate 7 percent	Fixed rate 7 percent
9	Haircut	47 percent upfront and 3 percent after IMF review	25 percent upfront and 25 percent after IMF review	25 percent upfront and 25 percent after IMF review	0 percent
10	Hurricane clause	Yes	Yes	Yes	Yes
10.1	<i>Events</i>	Hurricanes, earthquakes and floods	Hurricane	Hurricane	Hurricane
10.2	<i>Trigger</i>	CCRIF payout	CCRIF payout	CCRIF payout	Hurricane
10.3	<i>Deferral period</i>	12 months for payout greater than US\$15 million	6 months for payout ranging between US\$15-30 million 12 Months for a payout over US\$30 million	6 months for payout ranging between US\$15-30 million 12 Months for a payout over US\$30 million	Not defined
10.4	<i>Repayment</i>	Principal deferred plus interest deferred and capitalised and payable in semiannual instalments over the remaining term of the loan	Principal deferred plus interest deferred and capitalised and payable in semiannual instalments over the remaining term of the loan	Principal deferred plus interest deferred and capitalised and payable in semiannual instalments over the remaining term of the loan	Not defined
10.5	<i>Allowed deferrals</i>	3	3	3	Not defined
10.6	<i>Reporting</i>	Progress Report on recovery efforts	Progress Report on recovery efforts	Progress Report on recovery efforts	Not defined

Source: Robinson 2016.

The 50 per cent haircut was a very important component of the agreements. It generated a significant decline in the outstanding debt stock and created the fiscal space needed to invest in infrastructure and human development which was endangered by unsustainable debt. The coupon on the debt was now a fixed interest rate and not the step-up coupon arrangement put in place in the 2004-2006 debt restructuring. That arrangement had inadvertently built an interest rate shock into the arrangement which hampered the achievement of debt sustainability.

Importantly, the agreements included a hurricane clause that provided insurance in case of natural disasters. This was an important component of the agreement because a hurricane was the reason that the debt had to be restructured in the earlier period. Hurricanes were events that could significantly derail development efforts and damage debt sustainability. These events also seemed to be increasing in

frequency and intensity. To not address this risk in the agreement would have meant that the government was leaving itself exposed to other natural disasters which could again compromise debt sustainability in Grenada requiring another protracted round of debt restructuring.

### (c) The impact of debt restructuring on the debt burden

The impact of the latest round of debt restructuring on debt sustainability in Grenada has been materially different from earlier efforts. The haircuts that were negotiated led to a significant decline in debt service and put the overall debt burden on a sustainable downward trajectory. The IMF's (DSA) suggested that the 2013–15 debt restructuring exercise should result in a more durable performance on the debt sustainability front. Simulations indicate that the debt remains below the original level in all but the most extreme assumptions about growth and interest rates.

Moreover, even though the debt burden is expected to rise when economic growth falls below the refinancing interest rate, the principal haircut provides enough fiscal space to accommodate these reversals. The success of the program was facilitated by the fact that multilateral banks provided US\$57 million of new credit during the restructuring which provided much needed liquidity during that period. Additionally, the fiscal consolidation conducted as part of the IMF-financed homegrown structural adjustment program (HGSAP) was frontloaded in the first 2 years to boost the credibility of the government amongst the creditors.

The cash flow savings from the restructuring were approximately US\$8 million over the period 2016 to 2020. This debt restructuring plus the fiscal consolidation of approximately 8.5 per cent of GDP generated by a combination of the HGSAP and supported by the ECF was expected to reduce public debt to 60 per cent of GDP by the end of 2020. The actual debt in 2019 was 59.7 per cent of GDP so the reforms and policy adjustments had achieved their objective on this front before 2020. Unfortunately, the COVID 19 pandemic struck in 2020 and the debt is expected to increase to 70.6 per cent of GDP driven by the cost of unanticipated pandemic response measures.

The hurricane clause has not been triggered since their inclusion in the sovereign debt framework because Grenada has not been impacted by a natural disaster since then and therefore has not received a CCRIF payout. It does benefit, however, even if the clause is not triggered because country risk is, in theory, lower because they now have the insurance of the hurricane clause to minimize the probability of liquidity problems and default. Based on the specific parameters contained in the clause all debt payments could be suspended if the CCRIF payout meets the threshold. In this context, the liquidity benefit could be in the range of US\$50.8 million to US\$110.8 million based on data for total debt service payments in 2021.

## C. Conclusion: lessons learned and policy implications

There are many policy lessons to be learned from these two episodes of debt restructuring in the Caribbean. The region is on the frontlines of the battle concerning debt sustainability complicated by high exposure to natural disasters. There are therefore many policy implications that flow from this analysis for debt restructuring generally, but also for the use of hurricane clauses in small open countries vulnerable to natural disasters.

### 1. Debt restructuring lessons

One of the most important lessons is that a debt restructuring exercise should not be conducted in isolation. It must be underpinned and done in concert with the implementation of a credible medium-term macroeconomic framework. This helps increase the credibility of the government with creditors. In particular, the frontloading of fiscal consolidation measures has been shown to demonstrate how committed the government is to achieving debt sustainability. This, in turn, incentivizes the creditors to participate in the program. This is evident when we compare the more successful and sustained improvements wrought by the 2013-2015 (frontloaded) to the 2004-2006 (backloaded) debt restructuring programs in Grenada.

The debt restructuring program can only generate sustained improvement in debt sustainability if it is done in concert with related policies to address the underlying factors causing the debt crisis. This may include fundamental tax and expenditure reforms, institutional development to improve debt management and the rationalization of the state-owned enterprise sector to eliminate inefficiencies. In both Barbados and Grenada, debt restructuring was conducted alongside an economic adjustment program which helped reinforce the impact of these policies. The fiscal consolidation efforts helped sustain the downward trajectory in debt generated by the principal haircuts negotiated in the debt restructuring programs.

The crises in both cases were triggered by large external shocks. Debt contracts in the Caribbean should therefore always include clauses that allow suspension of debt payments in extreme situations. Also, the principal reductions (haircuts) were critical to the success of these programs. Grenada's debt stock was cut by more than 10 per cent of GDP which lowered debt service payments.

Multilateral liquidity is also key. In both cases, the IMF was involved and provided much-needed liquidity through the ECF. The IMF involvement also lends more credibility to the debt restructuring exercise.

The sovereign must also have very clear objectives. It must be sure whether it's a liquidity or solvency problem. If it's a liquidity problem, a simple adjustment to the payment schedule and related maturity transformation may solve the problem. If it's a solvency issue, however, negotiating haircuts, fiscal consolidation, structural policies to spur growth and development of its debt management system would be required to regain debt sustainability. The sovereign must also set very clear perimeters for debt restructuring so that stakeholders are clear which part of the debt stock is being restructured. The clear statement from both jurisdictions that they were not interested in restructuring debt from multilateral banks helped stakeholders to focus on those components and specific elements on which they needed consensus.

## 2. Hurricane clause best practices

One of the lessons that emerge from these two countries' experience with the use of hurricane clauses is that the use of professional debt advisors with experience in the use of hurricane clauses and dealing with creditors is very important to the success of the exercise. Both countries hired international advisory firms.

The clarity in defining the events which qualify as a trigger for the hurricane or natural disaster clause is key. At a minimum, they should cover not only hurricanes but earthquakes and floods. In retrospect, it should also cover pandemics given what has transpired after the consummation of these debt restructuring exercises. Unfortunately, the CCRIF does not yet cover pandemics so a clear trigger for the use of the clause would be difficult. Considerations should also be given to covering other natural disasters such as volcanos and tsunamis.

The trigger should also be carefully calibrated to ensure that it is set at a level that helps countries to cover destructive events while minimizing events that cause limited damage. To err on the side of including a lot of small events will not garner support from creditors and may result in creditors avoiding altogether jurisdictions that routinely use hurricane clauses with very low thresholds. In the cases of the two countries covered, it seems that the threshold for triggering the use of the clause in Grenada is too low. A CCRIF payout above US\$15 million has only happened twice in the last 7 years (see table IV.3)<sup>3</sup> and in both cases, the payout was to Haiti, which is a much larger country than Grenada. By comparison, the threshold for the hurricane clause in Barbados is US\$5 million for floods and earthquakes and US\$7.5 million for hurricanes and Barbados is a larger country than Grenada. This would suggest that Grenada needs to lower its threshold for new debt.

The use of collective action clauses to help garner consensus amongst creditors is an essential ingredient to successfully include and implement hurricane clauses. In both countries, CACs were instrumental in getting buy-in from creditors to create the critical mass of consensus needed to make the debt restructuring in general and the inclusion of the hurricane clause in particular successful.

<sup>3</sup> A CCRIF pay out exceeding US\$15 million only happened 4 times in 14 years.

There should be clearly articulated benchmarks and arrangements for the implementation of hurricane clauses. In the case of Grenada, concerning the Paris Club creditors, the qualifying criteria to use the hurricane clause is not defined (see table 5). The fact that important elements such as the deferral period, repayment arrangements, reporting and the trigger are not well-defined means that there is room for disagreement and conflict which may frustrate the seamlessness and speed with which this clause, which is one of its main advantages.

In the case of Grenada, the maximum deferral is limited to 1 year. This may be too short to allow the country to recover so the 2-year timeline used for Barbados may be a better arrangement. In addition, the fact that the clause can only be triggered for a maximum of three times may be a disadvantage for debt with longer maturity. For a debt instrument with a maturity of 20 years, a limit of 3 opportunities may be insufficient.

The deferral of debt payment that comes with the triggering of the hurricane clause may not create sufficient financial space for the country to adequately deal with the fallout from the event. In this context, new sources of liquidity may be needed to backstop the liquidity released by the hurricane clause. Augmenting the resources released by the hurricane clause with additional sources of development finance, ensuring sufficient fiscal space, augmenting international reserves, as well as ensuring the widespread holding of property insurance for both private and public entities would be prudent.

Also noteworthy, the cost of triggering the hurricane clause may be significant. The capitalization of interest arrears increases the debt level. The prorating of amortization coupled with short moratoriums can lead to onerous debt service payments when the deferral period ends. This could be ameliorated by extending the maturity of the debt instruments impacted, especially when repayment restarts close to the original maturity of the debt.

Lastly, international financial institutions can play an important role in the negotiation of hurricane clauses by endorsing the hurricane clause, providing independent debt sustainability analysis, supporting the country's medium-term adjustment program and debt restructuring.

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## V. Sustainable finance

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### Introduction

As in the case of other middle-income regions, the development of Latin America and the Caribbean has been hampered by long-standing structural problems. These include low investment and widening productivity gap relative to advanced economies, growing labor informality, and persistent unemployment, as well as high inequality and persistent poverty.

To these long-term challenges must be added Latin America and the Caribbean's exposure to changes in the environment which produce physical economic damage that affects all agents of an economy (households, the non-financial corporate sector, and governments) derived from the increase in the frequency and severity of natural disasters. These affect the performance of macroeconomic variables such as exports, financial flows, investment, productivity, inflation. Natural disasters also have very damaging social effects and can increase poverty levels, inequality and social and economic precariousness.

Confronting these challenges will require a great mobilization of resources and a logic of resource allocation to align finance with the objectives of the 2030 Agenda which implies finding ways to operate and mobilize resources according to sustainability criteria.

Environmental, social, and corporate governance criteria —and not just economic ones— must be an essential part of the guiding principles for the financing of productive development. The financial system could operate in a time frame, beyond short-term considerations, which allows for the proper internalization of externalities, incentivizing investment in sustainable businesses and therefore properly evaluating sustainability. This would allow investment efforts to be sufficient in areas crucial to sustainable development (such as poverty reduction or climate change).

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<sup>1</sup> Based on inputs provided by George Kerrigan and Ramón Lecuona.

Aligning finance with the objectives of the 2030 Agenda and finding ways to operate and mobilize resources according to the sustainability criteria (economic, social, and environmental) requires new innovative sources of financing such as environmental loans and green bonds that can provide stable and predictable financial flows at the national and international level. Also, blended finance, the combination of public and/or philanthropic concessional funds with private/commercial funds, is another innovative source of finance that can mobilize resources according to sustainability criteria.

Incentives for the adoption of sustainable frameworks and practices can have positive effects on the real sector sphere. The empirical evidence shows that the risk-adjusted rates of return-on-investment projects with sustainable finance criteria can exceed those of traditional portfolios. There is also evidence that the multiplier effect of investments with sustainable finance criteria can be high with a significant effect on employment and growth.<sup>2</sup>

This chapter provides a brief survey of environmental loans and green bonds issued globally, at the regional and sectoral levels with a focus on Latin America and the Caribbean. It also describes some of the incentives and obstacles to the development of the green loan and green bond market. It also examines the importance of the policy and regulatory drivers in the growth of the green bond market. Finally, the chapter focusses on blended finance including a detailed analysis of the potential of blended finance for productive development and the challenges it faces to scale up its operations.

## A. Green loans and green bonds

### 1. Environmental loans (green loans and loans linked to sustainability)

Environmental loans (or green credit) are loans, whose purpose is the improvement of the environment. Environmental loans date back to the early 2000s. However, until 2018 there was no specific regulatory framework to classify certain loans under an environmental criterion, which contrasted with green bonds that since 2014 had a framework (the principles of green bonds) to guide the classification of bond issuance.

The Green Loan Principles (GPBs) were published in 2018. This was followed by the Sustainability-Linked Loan Principles (SLLPs) in 2019. According to Nordea, the SLLPs are based on “four components, intended to motivate borrowers to: (i) Set relevant Sustainability Performance Targets (SPTs); (ii) Communicate sustainability objectives, as set out in the corporate social responsibility strategy and explain how objectives are in line with the proposed SPTs; (iii) Yearly reporting on the borrowers’ progress toward the SPTs; and (iv) Ensure external review of its performance against the SPTs”.<sup>3</sup>

That the principles of a green loan indicate, on the one hand that a green loan not only refers to a loan aimed at improving the environment but must also comply with four principles. These are: (i) the use of funds; (ii) the procedure for project evaluation and selection; (iii) the administration of the funds; and (iv) reports and updated information on the use of the funds including the projects (and their description) in which they have been used and their expected impact. The sustainability principles state that a lender must show a certain performance in terms of pre-determined criteria for the environment, social spheres, and good corporate governance.

The Green Loan Principles include among the categories of green projects: (i) renewable energy; (ii) clean transportation; (iii) energy efficiency; (iv) sustainable water and wastewater management; (v) pollution prevention and control; (vi) climate change adaptation; (vii) environmentally sustainable management of living natural resources and land use; (viii) terrestrial and aquatic biodiversity conservation; and (ix) green buildings.<sup>4</sup>

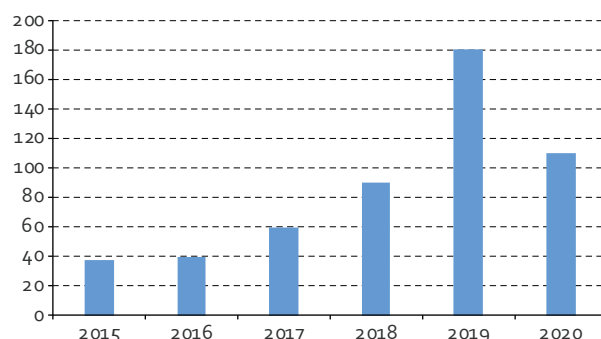
Available evidence for the period 2015-2020 shows that the volume of green and sustainability-linked loans has increased from US\$ 38 to 110 billion, reaching a peak of US\$ 180 billion in 2019 (figure V.1).

<sup>2</sup> Pollin (2012) shows that investment in clean energy creates three times as many jobs compared to investment in carbon energy.

<sup>3</sup> See Nordea (2019).

<sup>4</sup> Eversheds Sutherland (2020).

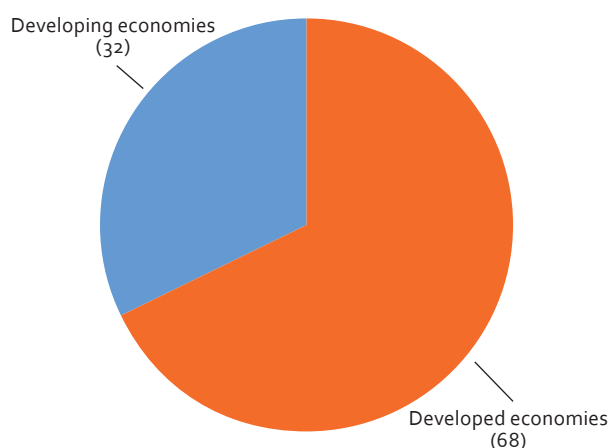
**Figure V.1**  
**Green and green-linked loans, 2015-2020**  
*(Billions of dollars)*



Source: Nordea (2021).

The decomposition between green and sustainability-linked loans shows that since 2019, the volume of sustainable-linked loans surpassed that of green loans. This is explained by the fact that, sustainable-linked bonds have a broader base of sectors that can benefit which do not strictly fall within the definition of green but that can contribute to reduce carbon emissions such as for example utilities and food and beverage. The top five sectors which benefit from 90% of green loans include renewable energy, power generation, utilities, real estate, and financial services (47%, 23%, 8%, 7% and 5% of the total). The top five sectors which benefit for sustainable-linked loans include utilities, transportation and logistics, chemicals, industrial, and food and beverage (14%, 9%, 7%, 6% and 5%).

**Figure V.2**  
**Distribution of green loan and sustainability-linked loans between developed and developing regions, 2020**  
*(Percentages)*



Source: On the basis of Nordea (2021).

At the geographical level, the distribution of green and sustainability-linked loans is skewed towards developed countries which represent 68% of the total. Within this grouping the European market accounts for 58% of the total. Sustainability-linked loans are not very common in Latin America. The Mexican cement producer CEMEX, has on record, issued the largest sustainability-linked loan (November 2021) totaling US\$ 3.25 billion dollars.<sup>5</sup>

<sup>5</sup> See, Philippi Prietocarrizosa (2022).

## 2. Green bond issuance

While green lending is the most dynamic segment of green finance, green bonds remain the main instrument used for sustainable finance.<sup>6</sup>

### (a) Green bond issuance at the global, regional, and national levels

Evidence available at the global level for the period 2011-2020, shows value of the issuance of green bonds increased from about US\$5 to \$220 billion, accounting for more than half of all sustainable debt issues (including the full range of green bonds, green loans, and sustainable-linked loans and social impact bonds). Europe has traditionally been the dominant issuer of green bonds and, in 2020, accounted for 55% of global green bond issues. However, its share fell to 41.7% in the second quarter of 2022 explained by the growth in green bond issues in the East Asia and Pacific region which represented 35.1% of the total global in the second quarter of 2022 and 21.7% in 2021 for the same quarter. In turn, the importance of the Asia-Pacific region in green bond issuance is completely explained by China.

The evidence for 2012-2020 shows that on a cumulative basis, East Asia and the Pacific accounted for 76% of the total green bond issuance and that without China its share drops to 5%. Latin America and the Caribbean is the second largest green bond issuer with 9.4% of the total dollar volume and comes in first place, if China is excluded from the sample (table V.1). Latin America is followed by Emerging Europe and Central Asia, South Asia, Middle and North Africa and Sub-Saharan Africa (6.3%, 5.2%, 1.9% and 1.1% of the total respectively).

Table V.2 shows the main issuers by country of green bonds in the developing world jointly with their share of the total for 2020. Within emerging market economies China is the largest issuer of green bonds with 45.4% of the total. China is also the third largest issuer of green bonds worldwide totaling US\$ 115 billion in 2020, after the United States and France (US\$ 138 and 120 billion respectively). Latin American countries, including Chile, Brazil and Mexico are among the leading issuers of green bonds with shares of 9.57%, 4.80% and 3.11% of the total.

At the sector level, renewable energy is the largest issuer of green bonds in emerging markets and developing economies accounting for 50% of total cumulative issues between 2015-2020 followed by the non-financial sector, and more specifically by power and utilities. In terms of uses renewable energy and transport account for 35% and 29% of total green bond issues.

**Table V.1**  
Emerging market cumulative green bond issuance by region: number of countries that issue bonds, number of issues and volume, 2012-2020

Region	Number of countries	Percentage of the total	Number of issuers	Percentage of the total	Volume (Billions of dollars)	Percentage of the total
East Asia and the Pacific	7	16.3	262	67.4	172.0	76.0
Europe and Central Asia	14	32.6	31	8.0	14.3	6.3
Latin America and the Caribbean	11	25.6	51	13.1	21.3	9.4
Middle East and North Africa	5	11.6	9	2.3	4.4	1.9
South Asia	1	2.3	22	5.7	11.8	5.2
Sub-Saharan Africa	5	11.6	14	3.6	2.6	1.1
<b>Total</b>	<b>43</b>	<b>100.0</b>	<b>389</b>	<b>100.0</b>	<b>226.4</b>	<b>100.0</b>

Source: Emerging market green bond report 2020.

<sup>6</sup> Climate Bond Initiative (2022).

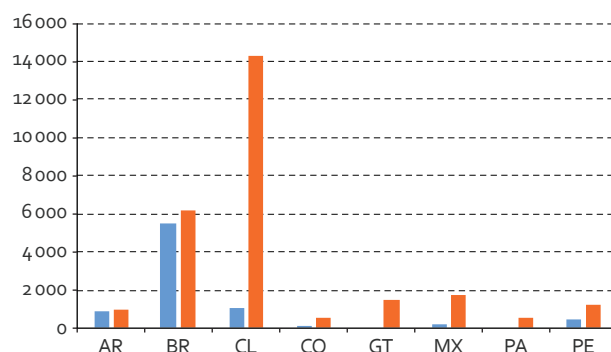
**Table V.2**  
**Emerging market green bond issuance by country 2020**

Country	Volume (Millions of dollars)	Share of the total
China	18 076	45.39
Chile	3 811	9.57
Czech Republic	2 509	6.30
Hungary	2 192	5.50
Brazil	1 913	4.80
Indonesia	1 860	4.67
Saudi Arabia	1 300	3.26
Mexico	1 239	3.11
Romania	1 041	2.61
Thailand	955	2.40
Philippines	919	2.31
India	916	2.30
Egypt	750	1.88
Russia	357	0.90
Panama	289	0.73
Poland	255	0.64
Uruguay	253	0.64
Georgia	250	0.63
Peru	200	0.50
South Africa	200	0.50
Colombia	159	0.40
Turkey	115	0.29
United Arab Emirates	97	0.24
Malaysia	61	0.15
Lithuania	53	0.13
Armenia	50	0.13
Kazakhstan	1	0.00
Total	39 821	100.0

Source: On the basis of emerging market green bond report (2020).

In the case of Latin America, the available empirical evidence for the period 2014-2021 across the different countries and sectors shows that green bond dollar volume expanded by from US\$1,508 to US\$9,944 million representing an increase of 560%. This significant growth was led by Chile, Brazil, Mexico, Peru, and Guatemala representing 53%, 23%, 6%, 5% and 5% of the total respectively (figure V.3).

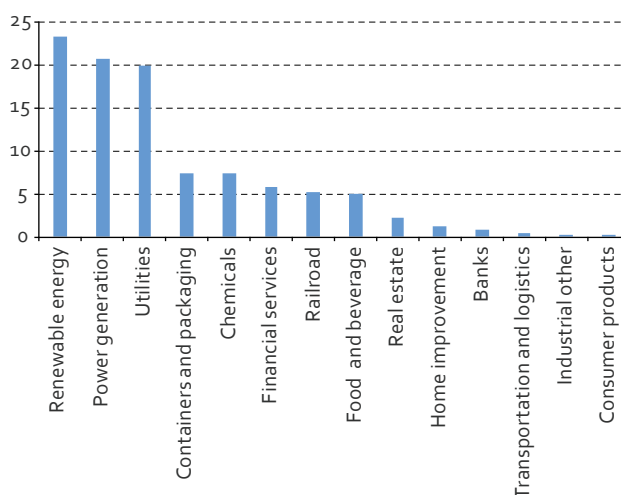
**Figure V.3**  
Latin America, green bonds issuance 2014-2021 by country  
(Millions of dollars)



Source: On the basis of Bloomberg (2022).

The analysis at the sectoral level available for the period 2019-2021 shows that renewable energy, power generation and utilities are the most important uses of green bonds accounting for 23.3%, 20.6% and 19.9% of the total (figure V.4).

**Figure V.4**  
Latin America, sectoral use of green bond issuance 2019-2021  
(Percentages of the total)



Source: On the basis of Bloomberg (2022).

#### (b) Incentives and disincentives to the issuance of green bonds

There are important incentives for the development of the green, social, and sustainable bond market for developing economies. The available projections shows that the green bond issuance in developing countries will increase from US\$ 39.8 billion in 2020 to over US\$ 110 billion in 2022.

One of the major incentives for the development of the green bond market includes higher returns relative to conventional emerging market bond indices. Also, in 2020 several countries committed themselves to zero net emissions by the year 2050 including Austria, Spain, Hungary, Ireland, the United States, Japan and South Korea among developed economies and, among developing economies, China (by 2060), South Africa, Argentina, Brazil, Colombia, Panama, and Nepal.



Another incentive are existing regulations mandating pension funds to invest in sustainable finance in some key markets including in some countries in Latin America which is driving sustainable investment in the region. The policy developments in Chile and Colombia have a specific focus on addressing climate risk. Some of the most important sustainable investment-sector specific regulatory or policy developments in the Latin American region include the regulation mandating pension funds in Chile, Colombia, and Mexico to integrate sustainable finance and climate risk in their investment process.

There have been also sporadic examples of industry collaboration on sustainable finance issues. For example, In September 2020, 80 institutional investors, insurance companies and investment funds issued a public declaration demanding that Mexican Stock Exchange (BMV) listed companies disclose sustainable finance information in a standardized and considered manner.<sup>7</sup>

The United Nations Environmental Finance Program (UNEP) has developed a series of activities to promote various green finance initiatives in the region such as the UNEP financing initiative (UNEP-FI). The signatories based in the Latin American and Caribbean (LAC) region are included in UNEP FI's Working Group for LAC, which comprises of more than 60 financial institutions based in the region. These financial institutions have committed to the Principles for Sustainable Insurance (PSI) and/or the Principles for Responsible Banking (PRB) as well as the UNEP Statement of Commitment on Sustainable Development. According to UNEP the Working Group provides LAC members of UNEP-FI with an adequate exchange platform and a forum for regional collaboration, knowledge-sharing efforts and discussions on region-specific sustainability priorities in the financial sector. UNEP FI has established a cross-sectoral network for capacity building in the region and works with a variety of supporting institutions which can be viewed in the specific country profiles section.

Nonetheless, there are important obstacles to their development and expansion. These include the lack of internationally recognized credit ratings affixed to emerging market green bonds which has been a limitation for investment because the ratings are key to assessing creditworthiness of bond issuers. Over half of the bonds without such ratings have been issued in China, where many issuers have relied on local credit rating agencies. In the past two years, however, an increasing percentage of issuers have obtained a credit rating from at least one major credit rating agency. Of the total number of green bond issues in 2020, 23 percent were rated as having investment grade and another 12 percent were rated as non-investment grade.

Another important obstacle is the use of green finance by companies to do "greenwashing". Greenwashing originates in part as a result of the fact that the definition of green bond implies that resources are somehow linked to an investment in sustainability projects (water, electricity, solar panels, etc.). However, the yield on green bonds is not tied to indicators that effectively measure the improvement in the company's environmental impact.

Green washing is reflected in the fact that green bonds are used in many cases to lower the cost of financing, rather than a real concern of the company for the environment. With the explosion of sustainable finance investment funds, investors are now willing to earn a lower return in order to have green label instruments, and therefore companies are easy to lower the cost of financing by declaring that a part of the debt issue is "green".

There are also limitations to enhancing the potential of green bonds since in some cases there are already legislative regulations that oblige certain productive activities to use the best technology to reduce the environmental impact. Thus in these cases the issuance of green bond becomes redundant.

Currently there are two strands of research to analyze the implications of green bond financing. First, researchers are examining the market pricing of green bonds and the impact of green bonds on

<sup>7</sup> Another example of an innovative sustainable finance product in the region includes a Mexican-denominated structured note linked corporate sustainability index developed by the Inter-American Development Bank (IDB). A portion of the revenues generated through the note will be channeled to the IDB to support sustainable development activities in the Latin America region. IDB (2019).

market participants. Second, researchers have shown interested in whether issuing green bonds increases the long-term value of a firm, despite the higher costs related to issuance (Cheong & Choi, 2020). Dorfleitner et al. (2021) study the pricing of green bonds and emphasize the existence of a premium over conventional bonds.

### 3. Blended finance

#### (a) Definitions and concepts

Although the concept and practice of *blended finance* has been around in the field of development finance for some fifteen years, there are no commonly accepted definitions or single application models. Blended finance is generally defined as a financing strategy mixing official and philanthropic resources for development purposes with others whose objective is profitability, whether private or public.

The modalities of blended finance are varied in terms of sources, actors, instruments, degrees of concessionality, risk sharing, and sectors targeted. Nonetheless, they have in common three elements: i) an orientation towards development objectives; ii) additionality; and iii) to promote the catalytic nature of official or philanthropic funds.

The relevant development objectives are identified with those of the United Nations Sustainable Development Goals (SDGs). According to the UN achieving the SDGs requires a mobilization of resources amounting to US\$ 4 trillion annually and that the funding gap in developing countries is equal to US\$ 2.5 trillions dollar per year.

For its part additionality refers to the fact that blended finance schemes should increase the mobilization of resources that, seeking market profitability, are oriented to development objectives. These are resources that, otherwise, would not be channeled to such social agenda. The use of public and philanthropic resources for investment could change the risk-return relationship, in order, to make the participation of private or public economic agents, with risk-return-liquidity restrictions, such as pension funds or other institutional investors, attractive. Finally, the catalytic role of blended finance has to do with creating the basis for the development of the blended finance market, by sector or geographic area. An effective catalytic process tries generates patterns of increasing mobilization of private resources per unit of official or philanthropic funds over time.

#### (b) An overview of the use of combined finance

The use of blended finance schemes has been growing steadily over the past few years with the participation of governments, multilateral development banks, grants, international development agencies, commercial banks, and large multinational corporations. According to the Global Network for Blended Finance (Convergence) that up until 2021 blended finance has mobilized roughly US\$ 171 billion dollars in capital towards sustainable development with more than 3,700 financial commitments. Most of these transactions (92%) were concluded between 2005 and 2019.<sup>8</sup>

The type of operations involved in blended finance has varied greatly and their amounts, structures and objectives depend on the contexts in which they were designed and implemented. Thus, according to Convergence records, transactions range from a minimum of US\$ 110,000 to a maximum of US\$8 billion dollars; the median per transaction between 2010 and 2018 reached US\$64 million dollars. In turn, the average value of the transaction grew significantly from \$130 million in 2010 to \$300 million dollars in 2018. Table V.3 shows the distribution of transactions between 2010 and 2018 by amount.

<sup>8</sup> See Convergence (2018; 2019; 2022).

**Table V.3**  
**Distribution of combined finance operations by dollar amount, 2010-2018**  
*(Millions of dollars and percentages of total)*

Amount	Share of total
Under 25	31%
25 a 100	32%
100 a 500	26%
Over 500	11%

Source: Own elaboration with data from Convergence (2022).

On the other hand, when classifying transactions by type of financial vehicle, the most common are those involving different types of funds (equity funds, debt funds, and funds-of-funds), with more than 40% of total combined finance transactions. They are followed by projects, mainly in infrastructure, with account for 27% of the total. Other types of financial vehicles include companies, publicly traded bonds/notes and facilities (27%, 8% and 8% of the total respectively).

In terms of the target sectors of blended finance transactions, energy and financial services stand out, which together concentrated more than half of the transactions carried out between 2016 and 2018. They are followed by agriculture and infrastructure with an aggregate share of almost a quarter for the same period. There is a perception that an effort needs to be made to push blended finance towards sectors that are further away in terms of profitability and market access, such as health or education, critical for development.

The available empirical evidence for 2019 shows that there are around 1,100 investors are participating in combined finance schemes, which are mainly international investors, and of which 50% are private, 38% are public and 12% belong to the philanthropic sector. At the regional levels Sub-Saharan Africa, and Asia, and Latin America account for the largest number of operations with combined finance (46%, 29% and 19% of the total).

The most widespread approaches or forms in the design and application of blended finance are: i) the granting of concessional funds by public or philanthropic sources to lower the cost of capital and provide protection to private investors; ii) the provision of guarantees or insurance through public or philanthropic institutions on softer terms than the market; iii) pre- or post-investment technical assistance financed on a grant basis to strengthen the commercial viability and impact of transactions; and iv) the preparation or design of operations financed on a grant basis with instruments such as concessional debt equity and technical assistance funds, and often in combination.

In general, the target or final beneficiaries of blended finance transactions are the target populations of development programs or the target populations that development projects seek to benefit, based on socioeconomic considerations. Around 68% of the operations are focused on low-income populations and small agricultural producers, entrepreneurs, and small businesses.

Although since its inception the use of blended finance schemes has grown steadily, this innovative financing mechanism is still far below its potential. Further coordination and adoption of basic principles among the relevant actors are needed as are the definition of tasks for the continuous improvement and expansion of blended finance. During 2019, five international working groups have been launched in critical areas of blended finance. These include implementation, mobilization of resources, transparency of operations, inclusive markets for blended finance, and impact. These involve the various stakeholders mentioned above, as well as others, such as research institutions and credit rating agencies. The application of blended finance cannot be rigid and must be adjusted to each context and relate to the specific realities and needs of each country, sector, and target population which it seeks to benefit.

**(c) Empirical evidence on the potential of blended finance**

**(i) Challenges in the collection and systematization of information on combined finance**

The collection and systematization of information on blended finances presents specific challenges that can be complex, since these are financial flows originating from very diverse sources: public, philanthropic, and private, with various legal and financial norms and formats that guide their use and implementation.

Various surveys conducted by the World Economic Forum, the Association of European Development Finance Institutions, and the Organization for Economic Cooperation and Development (OECD), among others, have helped to measure certain aspects of blended finance, but are limited in scope due to their thematic and time span covered.

The growing importance of finance for development has incentivized the development of statistical information on blended finance or proxies for blended finance which are essential for transparency and accountability. Two major statistical data sets that capture financial flows associated with blended finance are the OECD statistics on the amounts mobilized from the private sector by official development finance intervention. These statistics are not compiled with a specific focus on blended finance but provide an overview of the mobilization of private resources resulting from the use of development funds, from official institutions, without including philanthropic institutions and without specifically linking financing to the Sustainable Development Goals. The second is the Convergence database which the largest and most detailed on combined finance in the world. The following subsection summarizes the data on channeling of resources for development purposes found in the OECD and Convergence datasets.<sup>9</sup>

**(ii) Mobilization of private resources by OECD donor countries and official development institutions**

Since 2017, the OECD regularly collects and publishes data, some of which is included in its Private Sector Mobilized Amounts, on the leverage of private resources through development finance and, also conducts special surveys to evaluate new methodologies and close information gaps. Although the OECD data does not present a specific focus on blended finance, it provides a broad picture of the capacity of the leveraging of private resources by development funds.

According to the OECD, between 2012 and 2020 a cumulative US\$306 billion dollars were mobilized from the private sector for development purposes. An analysis by instrument for 2018-2020, shows that 38% flowed through direct investment in companies and SPVs, 26% through guarantees; 12% through credit loans; 11% through syndicated loans; and 8% through simple co-financing. The main beneficiary sectors include banking and business services, industry, mining and construction, and energy (US\$ 17.7, 10.5 and 9.0 billion dollars respectively). In energy, the instruments most used included guarantees and direct investment, with almost 80% of the amount mobilized. In financial services, guarantees and lines of credit also account for around 80% of the private resources mobilized.

Regional data for 2018-2020 shows that the majority of funds leveraged from private finance benefited Africa (US\$ 16.5 billion dollars and 34% of the total) and Asia (US\$ 13.4 billion dollars and 28% of the total). For its part, Latin America received US\$ 8.5 billion dollars representing 17% of the total, which was concentrated in Brazil, Argentina, Colombia, and Mexico (75% of the total). At the instrument level, for Latin America, guarantees, direct investment in companies and Special Purpose Vehicles (SPVs), and syndicated loans account for 32%, 32% and 19% of the total.

The available empirical data on the structure of private resource mobilization by type of provider institution shows that 72% of the funds were channeled by multilateral agencies and 28% through bilateral transactions (table V.4).

<sup>9</sup> See OECD (2018, 2019a, 2019b, 2022) and Convergence (2018; 2019; 2022).

**Table V.4**  
**Structure of private resource mobilization by type**  
**of provider institution 2017, share of total**

Institution	Participation
Bilateral	28%
United States	13%
France	5%
United Kingdom	2%
Germany	2%
Others	6%
Multilaterals	72%
IFC	15%
EIB	13%
MIGA	11%
IBRD/IDA	8%
EBRD	7%
AsDB	6%
Others	12%

Source: OECD, 2019a and 2019b.

**(iii) The mobilization capacity of the blended finance: the convergence dataset**

Unlike the OECD information presented in the previous subsection, which refers to total private funds leveraged through official development funds, this subsection provides an overview of specific data on blended finance using the Convergence database.

The database identifies around 500 finance operations representing a monetary flow totaling a little more than US\$ 140 billion dollars, as of 2018; 92% of which were committed since 2005. Latin America received 10% of the total.

As can be seen in table V.5, the amounts mobilized in the region have been increasing over time, to reach almost a US\$9 billion dollar in the 2016-2018 period. In contrast, the number of operations declined in this last period implying that the average value per transaction rose considerably.

**Table V.5**  
**Combined finance operations and funds mobilized in Latin America**  
**2000-2018, number of regional operations and total amounts mobilized**

Period	Number of regional operations	Total amount mobilized (Billions of dollars)
2000-2005	10	0.1
2006-2010	18	1.2
2011-2015	39	4.1
2016-2018	13	8.9

Source: Convergence (2022).

It is noteworthy to note that the capacity of concessional funds to mobilize other sources of finance is greater in Latin America than in other regions of the world. According to Convergence estimates, based on recent transactions, for every concessional dollar flowing through blended finance structures, 5.1 are channeled in Latin America, compared to a world average of four.

Other sources of information providing evidence of the mobilization capacity of blended finance in Latin America include the Inter-American Development Bank (IDB), which estimated that a with a

capital of US\$330 million, the region was able to mobilize US\$ 3.1 billion out of which US\$ 595 million dollar constituted IDB capital and more than US\$ 2 billion came from commercial investors. Nonetheless the use of blended finance in Latin America is very unevenly distributed to date as shown in table V.6. It is clear that this unequal distribution opens a great space for the expansion of the use of blended finance in Latin America, with large regional economies such as Brazil and Argentina having little or no exposure to these mechanisms.

**Table V.6**  
**Main users of blended finance in Latin America**  
**and number of accumulated transactions, 2019**

Country	Number of accumulated transactions
Mexico	32
Peru	20
Colombia	19
Nicaragua	18
Guatemala	18
El Salvador	14
Honduras	12
Ecuador	10
Costa Rica	9
Paraguay	9
Brazil	8

Source: Convergence (2019).

**(iv) *Contrasting the information of the OECD and Convergence datasets***

Contrasting the results obtained with the OECD and Convergence datasets reveals many aspects in common which underscores the complementarity of both. The common denominators include similar dollar amounts of the leveraging of private resources, the importance of guarantees, the destination of funds towards energy and financial services sectors, and the importance of Africa and Asia as recipients of blended finance. According to both sources the share of Latin America is roughly around 17%-19% of the total.

**(d) *Limiting factors in the expansion of combined finance***

**(i) *High levels of real or perceived risk***

The objective or real risk of investments tends to be higher in less developed countries than in advanced ones, due to economic as well as to political and social factors. These real risks are frequently exaggerated in investors' perceptions, due to insufficient reliable information, which is often lacking in less developed markets. This situation affects novel operations that require a high level of knowledge of the local context within which they are implemented and the participation of multiple actors, as is the case of blended finance. Some of the risks that tend to limit private participation in these transactions are described below.

- (i) **Macroeconomic risk.** Less developed countries are exposed to stronger and more frequent external shocks due to their less diversified economic structures. This situation is often compounded by fiscal and/or monetary policy errors, which generate high volatility in exchange rates, interest rates, relative prices and general economic activity. Such volatility affects the viability and profitability of investments and clouds planning horizons, severely limiting the undertaking of long-term projects.

- (ii) **Political risk.** Another source of risk in incipient democratic systems is the variability of the rules established by the authorities. Regulatory instability can be a source of significant alterations in investment flows and profitability. The risk of regulatory arbitrariness is particularly serious in socially sensitive sectors, which limits private interest in strategic areas. The fact that the State's capacity and/or willingness to establish clear, permanent, and equitably applied rules of the game for all market participants is weak, or perceived as weak by investors, is one of the most powerful detriments to the development of strategic sectors.
- (iii) **Corporate Governance Risk.** In developing economies, corporate governance is often highly centralized, information is opaque, and the culture of accountability is weak. Under these conditions, the participation of institutional investors is practically impossible, and the interest of donor, official or philanthropic institutions is very unlikely, despite the social necessity of a project or program.
- (iv) **Liquidity Risk.** Long-term investments, in socially and politically sensitive sectors, in less developed countries, naturally raise refinancing or exit concerns, limiting the general interest of investors and eliminating those with liquidity requirements, such as pension funds.
- (v) **Feasibility Risk.** Perhaps one of the most common limiting factors for the expansion of blended finance operations is the lack of properly identified, formulated and evaluated projects with clear feasibility and reasonable profitability. This makes it difficult for development institutions to find opportunities to structure blended transactions that can crown in private investors.

As can be seen in table V.7, some of the risk factors just discussed are relatively important in the larger economies of Latin America, although they may vary significantly from country to country. Thus, for example, table V.7 shows that macroeconomic risk is moderate in Mexico and Colombia, while it appears very high in the cases of Brazil and Argentina. In the field of political risk, indicators such as mechanisms to counterbalance public power, transparency and respect for property, tend to place the region below the 50% threshold at the global level. In turn, in the case of corporate governance, the regional performance looks better, especially in Colombia.

**Table V.7**  
Some factors affecting the risk of blended finance transactions;  
Latin American countries: 2019  
(Percentiles)

Factor	Brazil	Mexico	Argentina	Colombia
Macroeconomic stability	82	29	99	30
Mechanisms for the balance of public powers	38	47	65	70
Transparency	65	82	52	60
Property rights	65	52	67	55
Corporate governance	35	43	54	16

Source: Global Competitiveness Report 2019, World Economic Forum.

**(ii) High transaction costs**

A second limiting factor to the development of blended finance are high transactions costs. These are listed in this subsection.

- (i) **Long Learning Curves.** The cost of entry into unfamiliar and underdeveloped markets imposes a significant obstacle, which hampers the profitability and viability of investments. Undoubtedly, this factor affects low-income countries with less developed institutions and markets to a greater degree.

- (ii) **Small Size of Operations.** The costs of preparing, structuring, implementing, and monitoring projects and programs tend to be diluted as the scale of the projects and programs increases. Conversely, these costs tend to be proportionally very high in small operations. Thus, the profitability of blended finance transactions has benefited from the increase, over time, of their amounts. This factor also negatively affects low-income countries where transactions have lower than average amounts.
- (iii) **Long Implementation Periods.** Countries with inefficient and bureaucratic regulatory schemes impose unnecessary costs on investment projects, as they lengthen execution times and make procedures more expensive. Permits, construction licenses, slow and opaque legal systems, complicated tax structures, difficulties in registering property, among others, have a negative effect on the profitability of investments and discourage investor interest by delaying the start-up and maturity of operations.

As can be clearly seen in table V.8, the four major Latin American economies present an adverse panorama in terms of regulatory burdens, ease of tax compliance, licensing and permitting, and efficiency of the legal system. This situation tends to negatively affect capital formation from domestic sources. It is left to large investors to bear the excessive cost and risk burdens by demanding higher returns. For local investors, without diversification and with scarce resources, overcoming the adverse regulatory situation may simply become a very difficult, if not impossible task.

**Table V.8**  
**Some factors affecting transaction costs of combined finance operations;**  
**Latin American countries: 2019**  
*(Percentiles)*

Factor	Brazil	Mexico	Argentina	Colombia
Land registry	72	54	62	31
Tax payments	96	61	88	76
Construction permits	92	49	91	47
Regulatory burdens	100	82	89	87
Efficiency of the legal system	85	79	84	77

Source: Global Competitiveness Report 2019, World Economic Forum and Doing Business Report 2019, World Bank.

**(iii) *Inefficient, shallow and illiquid capital markets***

a third set of factors which limits the development of blended finance are underdeveloped capital markets. This subsection lists their characteristics and implications.

- (i) **Low Depth and Illiquidity.** The limited supply of funds in the capital markets of less developed countries and the illiquidity that generally characterizes them are very serious obstacles to new operations, such as those of blended finance. The high probability that investments will be tied up, or that exiting the investment will have to be made at a large loss, even in the case of viable and well-executed projects, is a very powerful disincentive.
- (ii) **Underdeveloped Financial Institutions.** It is common for institutions operating in the financial markets of less developed countries to lack a focus on innovation. In general, there are few intermediaries, public or private, with the capabilities to devise and implement high-impact development investments. This makes it very difficult to generate new products that can be replicated and disseminated in the markets. A common feature is the shortage of experienced investment managers with sufficiently large portfolios of good performance to convince institutional investors to participate in blended finance in low-income countries.



- (iii) **Communication Gaps between Private Investors and Development Institutions.** The ability to measure and communicate the impacts of programs and projects on the Sustainable Development Goals is crucial to make sense of the potential of blended finance. Clarity of impact is fundamental to attract donor institutions, to negotiate with recipient country governments and to arouse the interest of private investors. Such clarity is the result of professional capacity for impact assessment, and the basis for understanding, or adequate communication, between the different actors involved in blended finance. For this, it is essential to develop specialized technical bodies, both in the public and private spheres.

Table V.9 shows the intermediate development of Latin America's financial markets, with the exception, of Argentina, which after various stages of instability, shows a situation of disadvantage and deterioration. Small and Medium Sized Firms (SMEs) access to financing is certainly one of the weakest points of the LA region in financial matters; none of the four largest Latin American economies is located in 2019 in the first half of the world distribution of this variable, according to the World Economic Forum (2019), with Argentina in the last decile.

**Table V.9**  
**Selected indicators of financial market development and efficiency;**  
**Latin American countries: 2019**  
*(Percentiles)*

Indicator	Brazil	Mexico	Argentina	Colombia
Credit to the private sector	37	65	91	53
Availability of venture capital	52	41	84	50
Stock market capitalization	37	40	65	39
SME financing	73	60	94	52

Source: Global Competitiveness Report 2019, World Economic Forum.

**(iv) *Limited mandates to invest in high development impact sectors or markets***

a third set of factors which limits the development of blended finance are legal restrictions and institutional limitations which include limited mandates. Private investors often lack an explicit or sufficiently flexible mandate to place funds in high-impact development projects. This limits them from taking risks that are perceived to be too high, inducing them to turn to more common and seemingly less risky alternatives, such as those taken by most of their competitors. Thus, guidelines or mandates to invest in the achievement of the 2030 Development Goals would help overcome what is today an obstacle to institutional investors' participation in blended finance transactions.

**(e) *Final reflections on blended finance***

The promotion of blended finance requires the creation of an ecosystem that should facilitate the efficient connectivity and interrelation between a supply of attractive projects, to be developed within appropriate macroeconomic and regulatory frameworks, and a demand for investments with long-term capital availability. This connection will depend on the activity of intermediaries or facilitating agents such as banks and multilateral institutions or private philanthropic funds.

Currently, in each of these three parts of the ecosystem there are barriers that must be lowered to allow the scale of blended finance to grow. Action must be comprehensive, i.e., attacking all three fronts, since any "bottleneck" will limit the effectiveness of the system as a whole.

The implementation of these actions requires leadership from developed countries, investors, multilateral institutions, least developed countries, and philanthropic organizations. Without such leadership, it will be impossible to scale up significantly the combined financing and support for the achievement of the 2030 Goals.

Measuring the impact of combined finance operations on the Development Goals is a complex task due to the diversity of the operations in question, both sectorally and geographically, not to mention their differences in size and the level of development of the beneficiaries, which has not yet been fully achieved.

The Convergence dataset shows an exercise classifying the consistency of each of the blended finance transactions, which it recorded between 2013 and 2018 the SDGs. The results show that objective 17, Partnership to Achieve the Goals, is aligned with 99% of transactions, due to its generality. In contrast, very specific objectives, such as 14, Underwater Life, or 16, Peace, Justice and Strong Institutions, are aligned with only 2% and 1%, respectively of the finance transactions. In contrast, specific objectives located in sectors of high commercial interest, such as 9, Industry, innovation and infrastructure are aligned with 80% of transactions. Another important work linking blended finance and the SDGs is the one conducted by the OECD through its 2018 Blended Finance and Funds Survey. This survey presents data from 2016 and 2017 with results similar to those of the Convergence dataset.

The attempts by the OECD and Convergence datasets to link blended finance and Development Goals are undoubtedly a first step towards impact measurement. However, the development and testing of methodologies, which can be standardized and disseminated, will be a critical step in convincing actors who have so far been reluctant to participate in blended finance and in scaling up the use of this mechanism.

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## **Annex V.A1**

### **IFC Green Bond Program process**

IFC's Green Bond Program follows best market practice and complies with the Green Bond Principles.<sup>10</sup>

#### **A. Stage 1: use of proceeds**

Proceeds from IFC Green Bonds are allocated to a sub-portfolio that is linked to lending operations for climate-related projects ("Eligible Projects"). Only the loan portions of the projects are eligible for funding via Green Bond proceeds (equity investments and guarantees are ineligible).

Eligible Projects are selected from IFC's climate-related loan portfolio, which comprises projects that meet IFC Definitions and Metrics for Climate-Related Activities.

In a few cases of back-to-back financing, net proceeds from IFC Green Bonds are on lent by IFC directly to an individual Eligible Project.

Projects eligible for Green Bond financing include the following sectors:

- Energy efficiency (EE): investments in equipment, systems, and services, which result in a reduced use of energy per unit of product or service generated, such as waste heat recovery, cogeneration, building insulation, and energy loss reduction in transmission and distribution;
- Renewable energy (RE): investments in equipment, systems, and services, which enable the productive use of energy from renewable resources such as wind, hydro, solar, and geothermal production;
- Resource efficiency: investments to improve industrial processes, services, and products that enhance the conversion efficiency of manufacturing inputs (energy, water, raw materials) to saleable outputs, including reduction of impact at source; comply with IFC's Performance Standards for environmental and social issues and IFC's Corporate Governance Framework, and they have undergone a rigorous due diligence process. The Center for International Climate and Environmental Research at the University of Oslo has reviewed IFC's project evaluation and selection criteria. Its Second Opinion is published on IFC's website.

#### **B. Stage 2: management of proceeds**

All proceeds from IFC Green Bonds are set aside in a designated Green Cash Account and are invested in accordance with IFC's conservative liquidity policy until disbursement to Eligible Projects (except several cases when the proceeds are on-lent directly to an Eligible Project). The Green Cash Account tracks the difference between the balance of outstanding Green Bonds and outstanding Eligible Project loans. The Green Cash Account balance decreases as disbursements are made towards Eligible Projects or the Green bonds mature, and it increases as new Green bonds are issued or Eligible Projects are repaid. Disbursement requests for Eligible Projects take place in accordance with IFC's established policies and procedures, and they are often made over a period of time, depending on project milestones.

<sup>10</sup> See IFC (2019a; 2019b; 2022), ICMA (2021).

- Cleaner technology production: investments in manufacturing of components used in energy efficiency, renewable energy, or cleaner production, such as solar photovoltaics, manufacture of turbines, and building insulation materials;
- Financial intermediaries: lending to financial intermediaries with the requirement that IFC investments are on-lent to specific climate projects that fit IFC's green bond eligibility criteria; and
- Sustainable forestry.

### **C. Stage 3: evaluation and selection**

In addition to meeting the green bond eligibility criteria, all projects financed by IFC in some cases, the climate-related component of a project supported by Green Bonds may be a part of a larger investment.

In such cases, the Green Bond portfolio only finances the eligible portion of the project.

Monitoring projects includes regular reports by the investee company on project activities and performance throughout the lifetime of investment.

### **D. Stage 4: reporting**

IFC Green Bond Impact Report follows the Green Bond Principles' framework for reporting "Working Towards a Harmonized Framework for Green Bond Impact Reporting," which aims to ensure integrity of the market through increased transparency.

The report provides a list of projects that received funding from Green Bond proceeds and subject to confidentiality considerations.

It also provides a brief description of each project, the climate loan amount, and the expected environmental impact. The report only covers projects eligible for Green Bond financing.

## VI. A Multilateral Credit Rating Agency

*Susan K. Schroeder*

### Introduction

Many developing countries have been struggling under burdens of national debt for years. The Covid-19 pandemic presents an additional challenge because of the need for governments to spend to combat the ill effects on their populaces. Fiscal deficits and national debts have increased as a result. They spent a combined total of \$16 trillion in the year to April 2021 (IMF, 2021a). Debt to GDP ratios is rising as well. Globally, the debt to GDP ratio rose to 97.3% in 2020, from 83.2% in 2016; the ratio is expected to increase to 99.3% by 2026. Advanced countries' debt to GDP ratio rose from 105.5% in 2016 to 120.1% in 2020 and is expected to reach 121.1% by 2026. Emerging countries experienced an increase from 48.4% to 64.4% and are expected to reach 73.2% in 2026. Low-income countries debt/GDP rose to 49.5% from 39.8%; and is expected to decline to 45.7% by 2026 (higher than its 2019 figure of 44.3%). Fiscal deficits might moderate from their extremes, but they will remain negative for some time, implying sovereign debt burdens are here to stay.

Under the weight of increased debt burdens, national governments are considering dramatic shifts in budget strategies. These strategies will likely involve austerity measures to achieve sustainability. Rating agencies contribute to that pressure through changes in outlooks and ratings. Since the Covid-19 pandemic began, 21% of sovereigns have been downgraded by the three largest rating agencies: Standard & Poor's (S&P), Moody's and Fitch. In contrast, only 6% of advanced economies were downgraded. Emerging and developing countries have not been so lucky. 35% of sovereigns in the Latin American and Caribbean region were downgraded, and similarly for 24% in the Asia-Pacific region, 41% in the Sub-Saharan Africa and 25% of Middle East, North Africa and Middle Asia (Griffith-Jones and Kraemer 2021, Jones 2021a). It can take time for countries to regain pre-crisis conditions after downgrades, particularly for developing and emerging economies.

At first sight, ratings of sovereigns of developed economies seem to be treated more leniently than those of emerging markets and developing economies. The debt to GDP ratio of advanced economies increased more than the global average (17 percentage points versus 13 percentage points, respectively). The ratios for developing and low-income countries did not increase by this extent (10 percentage points and 5 percentage points, respectively), (ibid).

Could there be a methodological explanation for this observation of leniency? One of the objectives of this chapter is to discuss the possibility that sovereign ratings for emerging markets and developing economies (EMDEs) need longer time horizons underlying their assessments until they reach developed status, at which point their issues can compete for investors on a more even playing field with other developed countries. The lack of recognition of a different time horizon may explain, in part, the pro-cyclical behavior that sovereign ratings appear to exhibit at times and why EMDEs appear to be treated harshly.

A key question is how EMDEs can facilitate economic development, particularly sustainable development goals, under heavy debt loads and weak sovereign ratings. Countries' ability to borrow to implement much-needed programs is compromised. The context also enables conditions conducive to financial instability to take hold as sovereign debt issues or exposures perform a multitude of functions for a financial system, monetary policy, and the economy. Government bonds are not only important for sovereigns to achieve fiscal balance, but they are also important for bond markets since they set the standard by which other bonds are valued. Sovereign debt is generally believed to be the safest debt to hold for avoiding default risk, as a sovereign can print money to complete debt service commitments. Other debt instruments, such as municipal and corporate bonds are riskier than the sovereign debt as their issuers cannot print money and the purposes for funding are different. Increasing sovereign risk also weakens the creditworthiness of entities whose debt is rated relative to the sovereign.

Sovereign exposures facilitate asset management and implementation of monetary policy. Regulatory frameworks and liquidity standards treat sovereign debt favourably, encouraging their use to promote stability. When a sovereign is distressed, banks' balance sheets may weaken through their sovereign debt holdings. This implies their ability to access liquidity may become compromised if they rely on sovereign debt for collateral. Bank fragility can lead to credit rationing which slows economic activity and further deteriorates a sovereign's fiscal position. The sovereign does not have to be distressed for these channels to be activated; changes in the prospects of an economy or fiscal position are enough, (BIS, 2017). The sustainability of sovereign debt is an imperative for achieving the public good of financial stability.

Sovereign governments cannot assess their own creditworthiness because of conflict of interest. When sovereigns issue bonds they need a third-party assessment of their creditworthiness, encapsulated in a rating, to attract potential investors. Private credit rating agencies (CRAs) have filled this void as third parties who provide assessments on sovereigns' ability and willingness to service debt commitments. Their assessments constitute financial information. As financial information providers, they "are nothing more than extensions of media at large," (L.C. O'Neill 1999, S&P President and Chief Rating Officer, as cited by Langohr & Langohr (2008)). Their target audience, however, is a narrow one. "Our credit ratings are meant for professional investors. They are not meant for the retail level, for the man or woman on the street. The professional investor understands the ratings definitions and the ratings scales that are published," (Fitch President Ian Linnell, 2021). Presumably, as a result the orientation of risk ratings by CRAs appears to be more closely aligned to the time horizons of investors than the longer-term goals of sovereigns.

The rating agencies rate "through-the-cycle". That is, agencies supposedly look past immediate-term imbalances and focus on the general trajectory of the economy. They understand market economies are cyclical. 'Ratings need to be sufficiently cycle-neutral to bring about stability, but also sufficiently timely to bring enough accuracy to maintain investors' confidence that ratings reflect degrees of fundamental creditworthiness' (Langohr and Langohr 2008). However, events such as the Covid-19 pandemic are not part of a cycle and emerging markets and developing economies (EMDEs) are not developed economies. While credit ratings agencies maintain they account for these differences, the adjustments are not enough to compensate for the difference between the timelines of investors and for cycle-neutrality.

EMDEs face more complicated scenarios. To appeal to foreign investors, sovereign debt is often denominated in foreign currencies to reduce foreign exchange (FX) rate risk. Repayment becomes more complicated for these sovereigns. Their debt burdens in terms of domestic currency are influenced by exchange rate fluctuations. Exchange rate changes are prompted by changes in inflation rates, international interest rates, investor sentiment, concerns over foreign currency reserves, current account deficits, commodity prices, political stability, and so on. EMDEs debt service commitments evaluated in terms of the domestic currency are much more unstable. There are also impact on banks, where assets and liabilities can shift quickly with investor sentiment regarding policy changes. Bank assets can deteriorate if a central bank raises interest rates to thwart a currency devaluation. Sovereign debt of EMDEs is also riskier than that of developed countries because their economies are smaller and typically less diversified.

Being at lower stages of development, EMDEs are keen to build up their infrastructure. The appropriate timeline underlying traditional sovereign ratings methods needs consideration. Infrastructure investment carries a timeline of up to 30 years. Credit ratings prefer the shorter timelines, 3 to 5 years, so that ratings convey accurate information about present states of sovereigns to investors. The inherent tension between what investors and sovereigns expect from assessments of fundamentals of creditworthiness is starker for EMDEs. This suggests EMDEs need a dedicated ratings scale with longer-time horizons by which to assess their creditworthiness. The underlying cycle associated with a 3–5-year timeline is the inventory cycle, whereas a 10–30-year timeline suggests the infrastructure cycle as the proper basis for a sovereign risk assessment, at least for EMDEs.

A multilateral credit rating agency (MCRA) could create new approaches for assessing sovereign creditworthiness, for both EMDE's and developed economies, and for working out resolutions in a way that sustainable development goals can be actioned during an ecological transition. This is a complex and multifaceted challenge. To understand the challenge more fully, the functions (and malfunctions) of private rating agencies need to be revisited, along with their methods. Section 2 critically evaluates the functions and methods of private credit rating agencies. We focus on the big three—Moody's, S&P, and Fitch—as the market structure for ratings is dominated by these three agencies. Their domination poses risks for stability because of the similarity in their assessments. The methodological issues and domination suggest the need for a public entity to counterbalance and provide guidance and locate support for consistent debt servicing. The functions of a multilateral credit rating agency (MCRA) would include validation of approaches to sovereign creditworthiness and the development of improvements.

Besides the timeline issue, the methods share the feature that all goods and services produced for sale in the marketplace are treated as productive of new wealth. Not everyone agrees with this orientation. That is, some activities are productive of new wealth and other activities are not, possibly even consuming wealth. Some of the industries, moreover, could be instrumental in worsening inequality, financialization and dependence on speculative activities. This suggests industrial configuration is important for understanding the health of an economy and its ability to support social reproduction. The distinction carries implications for the interpretation of indicators of economic vitality, such as gross domestic product (GDP), and key indicators of sovereign debt sustainability, such as the debt to GDP ratio. This is important as EMDEs are likely to be more reliant on agriculture, mining, fishing, and forestry industries, and, as such, have greater exposure to fluctuations of commodities markets.

Knowledge of how climate change impacts the industries and the communities which depend on them will assist the design and implementation of sustainable development goals (SDGs). Section 3 discusses the MCRA's functions as they relate to their main objectives, engagement of stakeholders, an innovative institutional design that readily incorporates the influence of botanical regions, funding possibilities and governance structure. As sovereign exposures touch upon many aspects of productive activities, financial activities, fiscal and monetary policies, an MCRA will have a range of stakeholders, including the rating agencies themselves. As such, fascinating challenges emerge for it.

Challenges range from regulatory capture, funding, conflict of interest, and its engagement with stakeholders, such as sovereigns, the communities they serve and financial institutions. These are addressed in section 4. There is a one challenge, however, that the MCRA would be in a unique position to front: facilitate new solutions to achieve debt sustainability. One possibility is a wealth tax on gross, private assets. The size of the tax is set to promote repayment of net interest outlays, at least, in a consistent way; it can be adjusted to modify revenues as need. A solution such as this could make austerity policies a thing of the past. A sovereign risk assessment structure can be created and validated with the intention for use in regulations pertaining to sovereign issues. Section 5 concludes with additional policy suggestions.

### A. Characteristics of the credit rating industry

The rating industry has come a long way since Poor's *Manual of the Railroads of the United States* (1868), Moody's *Manual of Industrial and Corporation Securities* (1900), and Fitch's introduction of the lettered rating system in the 1920s. Today, rating agencies assess financial institutions (banking systems, finance companies, real estate finance, securities, and exchanges), funds and asset management (bond funds, money market funds), insurance companies, supranational organizations (multilateral lending organizations), structured finance, healthcare & healthcare providers, higher education, housing, utilities, transportation authorities, and sustainable finance.

The rating agencies act as gatekeepers to funding acquired from financial markets. Their assessments or "opinions" of creditworthiness of issuers and issues provide potential lenders/investors with information which is difficult to obtain. During their risk evaluations the rating agencies have access to information of borrowers which is not publicly available. The assessments incorporate that information into ratings relative to a scale. The ratings can be made public. As such, the agencies reduce asymmetric information and facilitate the flow of information between borrowers and lenders/investors. By disseminating ratings to the public, they enhance liquidity by increasing the pool of potential investors.

Because of their ability to discriminate ratings, they have been helpful for regulatory purposes, although explicit reference to their use has been weakened with regulatory changes in the wake of the Global Financial Crisis. Financial institutions, such as, insurance companies, pension funds and mutual funds that manage portfolios of assets hold investment-grade assets, generally, to account for the quality of their portfolios. Ratings help discern which instruments are investment grade and which are not. The differentiation is expressed by regions of their rating scales for long-term and short-term debt (see tables VI.1 and VI.2). Regulatory frameworks, such as The Basel Accords, classify assets for use to meet capital requirements. Under their risk-weighted approaches, sovereign debt is treated more favorably than others because of its liquidity.

**Table VI.1**  
Global *long-term* ratings for major three credit rating agencies

Descriptor	Moody's	S&P	Fitch
Investment grade			
Prime (extremely strong)	Aaa	AAA	AAA
High (very strong)	Aa1, Aa2, Aa3	AA+, AA, AA-	AA+, AA, AA-
Medium – upper (strong)	A1, A2, A3	A+, A, A-	A+, A, A-
Medium – lower (adequate)	Baa1, Baa2, Baa3	BBB+, BBB, BBB-	BBB+, BBB, BBB-
Non-investment grade			
Speculative	Ba1, Ba2, Ba3	BB+, BB, BB-	BB+, BB, BB-
Highly speculative	B1, B2, B3	B+, B, B-	B+, B, B-
Extremely speculative (vulnerable)	Caa1, Caa2, Caa3	CCC+, CCC, CCC-	CCC
Default			
Immanent (highly, extremely vulnerable)	Ca	CC, C	CC, C
Default	C	D, SD	RD, D

Source: Fitch (2021a); Moody's (2021); Standard & Poor's (2021); Van Gestel and Baensens (2009: 116).



**Table VI.2**  
Global *short-term* ratings for major three credit rating agencies

Descriptor	Moody's	S&P	Fitch
Investment grade			
Prime	P-1	A-1+	F1+
High	P-1	A-1+	F1+
Medium - upper	P-1, P-2	A-1, A-2	F1, F2
Medium - lower	P-2, P-3	A-2, A-3	F2, F3
Non-investment grade			
Speculative	Not prime	B	B
Highly speculative	Not prime	B	B
Extremely speculative	Not prime	C	C
Default			
Immanent	Not prime	C	C
Actual	Not prime	D (and SD for issuer)	RD, D

Source: Fitch (2021a), Moody's (2021), Standard and Poor's (2021).

Note: Short-term ratings pertain to issues with durations of approximately one year or less.

Investment grade ratings suggest a sovereign has the financial capacity to service its debt obligations. The prime ratings, the highest level attainable, further suggest financial capacity is so strong that unforeseen events are not likely to impact that. As one proceeds down the investment grade sections, financial capacity weakens, and events may have an impact (economic and financial conditions becomes less resilient to shocks). Non-investment grade ratings are speculative in nature. They entail much more risk with respect to financial capacity and ability to withstand unforeseen events. In this range, the most one can expect is a sovereign can service its commitments in the current context. Financial capacity becomes increasingly questionable as one proceeds down the scales. The C-ratings suggest heightened probability of default (at best) to default immanent (at worst). D is default. The numbers and signs (+, -) indicate graduations within the sections.

Ratings improve market efficiency by enabling prices of issues to reflect all publicly available information. The allocation of investment becomes more efficient as a result, and the cost of capital becomes more accurate. Ratings also act as benchmarks to validate the internal systems of financial institutions.

Sovereign ratings have been used as proxies for the health of an overall economy. A strong rating, for instance, is indicative of high-quality management of the economy and resilience to shocks. A weak rating reflects poor management and resilience to shocks. Ratings are meant to be through-the-cycle so that the cyclical (short-term) behavior of an economy will not influence the rating on sovereign debt unless the economy slumps so severely over a period that the structure of the economy begins to change.<sup>1</sup>

Sovereign exposures play complex roles in banking systems, financial markets, fiscal policy, monetary policy and, thus, the overall economy. Negative changes in sovereign risk can weaken banks' balance sheets, influence ratings of other entities, trigger a recession during which credit becomes rationed by quantity or price (interest rate), and lead to the implementation of austerity programs. Sovereign distress takes a range of forms: default or restructuring, currency re-denomination (actual or perceived), monetary policy of inflating away the debt, and sovereign downgrades. Rating agencies evaluate the probability of default and/or loss given default, considering that other forms of distress may impact the risk and loss.

<sup>1</sup> Rating agencies have begun to offer evaluations of country risk or the overall macroeconomic health of a country.

A host of concerns have dogged the ratings industry. They often emerge during moments where opinions deviate from actual outcomes. For instance, why were ratings of sovereign debt for Asian sovereigns so robust prior to the onset of the Asian crisis? Why were ratings of asset-backed securities overly optimistic in the lead up to the Global Financial Crisis? Why was Enron's corporate rating also robust prior to its collapse? The rating agencies are known to experience "blown calls". These episodes lead to concerns about the quality of assessments and whether they could be improved.

A key concern pertains to the lack of transparency of their methods and processes. While some information is available to the public on their websites, not every aspect is accessible. Their methods are proprietary and entail a lack of complete transparency to the public. When a divergence between assessments and actual outcomes occurs, it is difficult to perform a validation to ascertain and understand exactly what happened. A related issue is that validation, as part of due diligence, is performed within the agencies. There are firms that conduct due diligence, but these activities can be costly. This begs the question as to whether due diligence performed as well as it could be.

A related issue is the lack of accountability. As assessments are interpreted as opinions there is an element of free speech attached to them. In the United States, the Securities Act of 1933 has shielded the rating agencies for decades. This makes it difficult to establish liability when an opinion is inaccurate. It is also believed to remove the incentive to improve quality and rigorously perform due diligence on rating methods. That said, the quasi-immunity of CRAs is eroding.

There have been lawsuits filed against rating agencies for what appeared to be inaccurate assessments of risk. In 2018, S&P settled a class action lawsuit in Australia pertaining to collateralized debt obligations. The lawsuit involved two local governments and pension funds, citing "weakening of its risk assessment criteria to win business and turn out high ratings opaque debt products" (Westbrook 2018). S&P reportedly paid AU\$215 million. S&P reached a US\$125 million settlement with a Californian public pension fund in 2015, and in the same year it agreed to pay US\$687.5 million to each of the U.S. Department of Justice and to 19 states along with the District of Columbia. The lawsuits alleged that the ratings were driven more by economic interest rather than objective analysis, (Viswanatha and Freifeld 2015). Moody's, similarly, paid US\$864 million to the U.S. Department of Justice, 21 states and the District of Columbia.

More recently, in December 2019, Lehman Brothers Australia filed a lawsuit against Fitch over the credit ratings it assigned to collateralized debt obligations (CDOs). The focus here is Fitch's use of an undisclosed "Significance Table" which generated discrepancies between the output of Fitch's VECTOR model, as described in the user's manual, and the output derived by using probabilities of defaults associated with the table. The Significance Table was apparently "hidden and password protected to prevent user discovery," (Amicus Advisory 2020). If true, this would suggest the presence of inaccuracies in published methods. The extent of discrepancies needs to be investigated across the ratings industry.

The lack of competition is yet another concern. The global market for ratings is dominated by Standard and Poor's, Moody's, and Fitch. They control approximately 95% of the international market for credit ratings, and 98.7% of the ratings for government securities (SEC 2020a). The industry has often been characterized as imperfectly competitive. There are a few reasons for this. The industry rewards these firms with market power because of the economies of scale they have established over the years in gathering, processing, evaluating, and disseminating information. There are strong barriers to entry in this market. Their status and market power are reinforced with their Nationally Recognized Statistical Ratings Organization (NRSRO) status in the United States. This status is granted to selected rating agencies for use in regulatory purposes, such as the discrimination of investment from non-investment issues.<sup>23</sup> The status is thought to make the agencies complacent about improving their methods and due diligence. The market share of the top three ratings has raised concern about the potential for collusion (Malik 2014).

<sup>2</sup> While regulatory changes in the wake of the Global Financial Crisis weakened explicit reference to use of credit ratings for regulatory purposes, investors can still refer to them (Gaillard and Waibel, 2018; Darbellay, 2013).

<sup>3</sup> There are smaller agencies with this status: A.M. Best Rating Services, Japan Credit Rating Agency Ltd., DBRS, Inc., Kroll Bond Rating Agency, Inc., Egan Jones Co., and HR Ratings de Mexico S.A. de C.V.

An issue that often surfaces in debates about the rating industry is the conflict of interest with the issuer-pays model. A conflict of interest pertains to a situation in which one party to a transaction or decision is swayed to bias the outcome for personal or professional gain. Income from issuers could lead to pressure on rating staff for an upward bias on ratings to appeal to investors. The presence of a conflict of interest could lead to inefficient decisions of investors and lenders. This situation is thought to arise at some point during the rating process because of the remuneration structure of the firms, the use of ratings for regulatory purposes, and relationships between issuers, regulators and rating staff.

Negative changes in ratings can act as triggers by prompting investors to shift the composition of their portfolios, particularly if they are required to hold investment grade securities. Instability in financial markets can occur when a large rating agency downgrades a widely held asset and investors shift *en masse*. A downgrade can also prompt lenders to re-consider financing terms, rolling over existing debt or issuing new debt. Investors tend to view emerging markets as an asset class. Rating agencies reinforce this perception when they downgrade countries within a short time span (Bouchet et al. 2018).

This raises the concern about the procyclical nature of sovereign ratings. What this means is as economic activity softens, and a government's fiscal position weakens, sovereign risk increases, and the rating comes under downward pressure. The U.S. Securities and Exchange Commission recently began a monitoring group to investigate the phenomenon (SEC 2020b). It is evaluating how rating agencies have responded to the effects of the pandemic, the impact of changes in ratings and outlooks on financial markets, and whether the agencies are adhering their policies, methods, and procedures. There Financial Stability Board is also assessing the procyclical nature of ratings, particularly sovereign ratings (Business Standard 2021). Procyclical changes to ratings and outlooks will have knock on effects for all securities whose ratings are set relative to sovereign ratings, such as corporate bonds.

There is concern about potential inconsistencies between solicited and unsolicited ratings. Solicited ratings are created using a combination of public and private information. Unsolicited ratings are created using public information only, as the agencies do not have access to the private information. The assessments involving unsolicited ratings are thought to be less favorable because of the lack of private information.

As sovereign exposures influence many facets of an economy, there is a wide range of stakeholders. This includes sovereigns and other public borrowers, such as states and municipalities, investment and commercial banks, insurance companies, pension funds, money market funds, mutual funds, and non-financial firms and the Paris club of official creditors. All these entities relate in various ways to households and their communities. Stakeholders will be of interest when we discuss the functions and funding of a MCRA.

## **1. How do rating agencies evaluate creditworthiness of sovereigns and their issues?**

There are generalities across the three major agencies. Sovereign creditworthiness pertains to the ability and willingness of sovereigns to service their debt obligations. This is akin to sovereign debt sustainability. The agencies are primarily concerned with default events, considering other risk events such as currency redenomination (actual or anticipated), a shift in monetary policy towards inflating debt away, default by a quasi-sovereign entity or market stress as influences on sovereign default risk.

After being approached to compile an assessment, the agencies will collect publicly available data and conduct interviews with the sovereigns for additional information. The information pertains to public finances (includes fiscal position, public debt, and financing), economic structure and performance, external position, quality of institutions and effectiveness of management (includes monetary authorities). The selection of data indicators used to gauge these factors will vary as will the methods used to compile the data into ratings. Scorecards and weighting systems are common, as is discretion of rating staff to suggest adjustments to outcomes at various points in the construction of assessments. It is through the adjustments that qualitative considerations are often captured.

Indicators are combined using weights into a composite indicator to represent the factor they gauge. Notches are used to adjust for qualitative factors. The factors are then combined into a preliminary assessment and discussed among a committee, typically a team of analysts and senior executives. The outcome rating is relayed to the issuer who has the right to comment before the rating is released publicly. Sometimes the indicators are decomposed into sub-indicators for another set of weights to be applied for better accuracy. Tables VI.3 through VI.5 summarize the indicators used in ratings constructions by the three major agencies.

**Table VI.3**  
**Standard & poor's sovereign factors and indicators**

Institutional assessment	Payment culture and debt sustainability. Promotion of balanced economic growth. Ability to respond to economic and political shocks. Transparency, stability and reliability of data and statistical information. Institutions, and payment culture. Possible geopolitical risks (external security risk).
Economic assessment	Income levels (e.g., GDP/capita). Growth pattern and prospects (e.g., trend GDP/capita). Economic diversity and volatility (exposure to a cyclical industry).
External assessment	Presence of a sovereign's currency in international transactions. Country's external liquidity (e.g., current account receipts, office reserves). External indebtedness (e.g., net external debt to current account receipts). Residents' assets and liabilities relative to ROW.
Fiscal assessment	Sustainability of a sovereign's deficits and its debt burden (e.g., general government debt/GDP, size of liquid assets, ability to raise revenue or cut expenditure). Fiscal flexibility (debt burden assessment, interest cost). Long-term fiscal trends and vulnerabilities, Debt structure and funding access, and potential risks arising from contingent liabilities.
Monetary assessment	Monetary authority's ability and credibility to implement monetary policy (exchange rate regime). Control of dominant currency used in transactions, monetary base and money supply and domestic liquidity conditions. Effectiveness of monetary policy, as evidenced by inflation (e.g., % change in CPI). The breadth and depth of the domestic financial system.

Source: Standard & Poor's (2017).

**Table VI.4**  
**Moody's sovereign factors and indicators**

Economic strength	Growth Average GDP growth, volatility of GDP growth Scale Nominal GDP National income GDP/capita Adjustment factors Diversification, credit boom
Institutions and governance strength	Quality of institutions Quality of legislative and executive institutions Strength of civil society and judiciary Policy credibility and effectiveness Inflation's level and volatility Adjustment factor Default history

Fiscal strength	Debt burden General government debt relative to GDP and to revenues Debt affordability Government interest payments relative to GDP and to revenues Adjustment factors Debt trend Other government debt/GDP Foreign currency debt/total debt Public sector financial assets or sovereign wealth funds/GDP
Susceptibility to event risk	Political risk Domestic Geopolitical Government liquidity risk Fundamental metrics Market funding stress Banking sector risk Size Strength Funding vulnerabilities External risk Vulnerability indicator Net international investment position/GDP (Current account balance plus FDI)/GDP

Source: Moody's (2019).

**Table VI.5**  
**Fitch's sovereign factors and indicators**

Structural features	Governance quality Wealth and flexibility of the economy Political stability and capacity Financial sector risks (Variables for modelling: World Bank's governance indicators, GDP/capita, share in world GDP, years since default, money supply)
Public finances, General Government	Government debt Fiscal balance Debt dynamics Fiscal policy (Variables: gross general government debt/GDP, general government interest/revenue, general government fiscal balance/GDP, foreign currency government debt/general government debt)
External finances	Balance of payments External balance sheet External liquidity (Variables: reserve currency flexibility, commodity dependence, sovereign net foreign assets/GDP, external interest service/CXR, current account balance plus net foreign direct investment/GDP, foreign exchange reserves (months of CXP))
Macroeconomic performance, policies, and prospects	Policy framework Domestic GDP growth Inflation Real effective exchange rate (Variables: real GDP growth volatility, consumer price inflation, real GDP growth)

Source: Fitch (2021b).

Moody's approach is a nested scorecard in the sense that economic strength is combined with institutions and governance strength to yield a country's economic resiliency. When resiliency is combined

with fiscal strength, they form government financial strength. When government financial strength is combined with susceptibility to a risk event, the scorecard's indicated outcome is obtained and expressed within a range. Other considerations are made to adjust the outcome to obtain issuer- and instrument-level ratings (Moody's, 2019).

Standard & Poor's also employs a nested approach. The institutional and economics assessments, together, form the institutional and economic profile. Flexibility and performance profile is comprised of the external, fiscal, and monetary assessments. Together the two profiles yield an indicative rating level. The indicative rating level may experience a supplement adjustment to yield the foreign currency issuer rating. One notch of uplift over the foreign currency rating yields the local currency issuer rating (Standard and Poor's, 2017).

Fitch is the most forthcoming about a specific quantitative model. Each of Fitch's factors is weighted according to their importance, with structural features given the heaviest weight. The weights are determined from standardized coefficients derived from an ordinary least squares regression on standardized data (Fitch, 2021b). Its sovereign rating model (SRM) is a multiple regression rating model that employs 18 variables.

The agencies have been working with market-based approaches to evaluate sovereign risk. The idea is that in a perfect world, a traditional credit rating and a rating implied with a credit default swap (CDS) would be the same. As the world is not perfect, they are not the same. Market-based versions of ratings are thought to lead traditional ratings in terms of sovereign creditworthiness because the market-based version incorporates new information and market opinion much more quickly (Schroeder, 2015). There is an implicit recognition by the rating agencies that traditional ratings are rather sluggish.

The International Monetary Fund (IMF), itself, is looking for ways to improve its own framework for predicting sovereign risk (IMF, 2021b). In the wake of the most recent review, it will adopt probabilistic assessments into its framework along with tools involving multiple time horizons, better incorporation of structural characteristics, and enhanced transparency of assessments. It comes with a new name: Sovereign Risk and Debt Sustainability Framework for Market Access Countries (MAC SRDSF). The IMF also suggests expanding debt coverage to general government as opposed to central government. Developing countries are more apt to report central government debt rather than general government.

The rating agencies and the IMF appear to concede there is still room for improvement when it comes to evaluating sovereign creditworthiness. What could be improved? The IMF has noted debt sustainability requires debt to stabilize with low financing risks under a feasible set of policies, but not necessarily under the policies assumed in a baseline scenario, (IMF, 2021a). Unsustainable debt entails a lack of politically and economically feasible policies for stabilizing the debt to GDP ratio with suitably low rollover risk.

This brings us to the time horizons used to evaluate sovereign creditworthiness. The traditional ratings are evaluated on 3- to 5-year trends (Griffith-Jones and Kraemer 2021). S&P's growth trend is based on ten years of data on GDP per capita: six years prior, the current year, and the forecasts of three years hence. The trend is meant to capture at least one economic cycle. Apparently, six years of actual data capture the good part, if not all, of one cycle (S&P 2017: 11). Moody's does likewise. The timeline for its average rate of growth of GDP is defined on ten years of data: five years of prior data and forecasts of the next five years (Moody's 2019: 6). Fitch employs 3-year centered averages of annual % change in real GDP in its Sovereign Risk Model; the time horizon for its Debt Dynamics Model is 5 years (Fitch 2021b: 19).

These timelines are relatively short and better aligned with the informational needs of financial investors. Sovereigns of EMDEs require longer time horizons underlying their assessment of creditworthiness because of the heavy influence of infrastructure development. Without that recognition, cycles and instability transmitted into these economies from other global regions will adversely influence their risk assessments (constructed with short time horizons). For instance, if interest rates were to rise in the United States, several EMDEs may find their trends, and outlooks, weaken under a 3–5-year time horizon, but still be near trend according to a 10–30-year time horizon. In other words, what impacts a 3- to 5-year

trend may not impact a 10- to 30-year trend so strongly, if much at all. A longer-time horizon under credit risk assessment of sovereign debt for EMDEs would stabilize their ratings and promote stability. Dedicated time horizons will force market participants to recognize how unique these economies are. Better accuracy in the assessments will give investors who are interested in longer-term horizons the confidence to engage. If it were profitable for CRAs to rate EMDEs on a scale with a longer-time horizon, they would have done so long ago. Apparently, their target audience would not find this appealing.

Discrepancy in the time lines is a likely source of the perception of bias in sovereign ratings of EMDEs. Developed countries have infrastructure in place. The influence of infrastructure development is not as strong than with EMDEs. For developed countries, shorter time horizons are more suitable for sovereign risk assessment. Rather than recognize the influence of infrastructure more explicitly, the agencies promote comparability of sovereign ratings of EMDEs with ad-hoc qualitative adjustments for their features, as viewed by analysts.

This introduces an element of subjectivity. Research suggests home bias in risk assessment is introduced through subjective judgements. Subjectivity is influenced by culture and shared through cultural proximity, as gauged by linguistic proximity (Fuchs and Gehring (2017)). Shared culture may cause analysts to be more positive in their evaluations. Evaluations of sovereign risk are conducted by analysts employed at CRAs who control 98% of the market for sovereign ratings. At present, the headquarters of S&P, Moody's and Fitch are in the United States (New York City). The home bias is American. It is likely that the analysts do not fully comprehend the influence of cultural differences in unfamiliar contexts, such as the EMDEs. This leads them to miscalculate adjustments to standard risk criteria. There is evidence that "American rating agencies favor countries which have a geopolitical alignment with the U.S.," (Luitel et al 2016: 288). The influence of home bias has also been found in sub-sovereign government debt (Ioannou et al. 2021).

Another issue is what constitutes a productive activity. If one looks closely at the criteria or data indicators, all three agencies recognize diversity of economic activity to some degree. They do so out of concern about dependence on a particular industry, such as real estate investment or the exports of commodities. There is an implicit understanding that all industries, and the activities they pursue, are productive in the sense they contribute to the creation of new wealth (goods and services). However, not everyone agrees that all activities and industries are productive of new wealth in terms of goods and services, that is, objects of social use which facilitate social provisioning (the reproduction of society).

If true, this carries important implications for how the GDP indicator is interpreted. When evaluating overall economic performance one often finds the level, volatility, and sustainability of GDP growth. Evaluations of sovereign debt sustainability and risk rely on the debt to GDP indicator. If not all industries are productive, the role of GDP in sustainability analyses needs to be supplemented with a systematic analysis of industrial configuration and their associated activities. Let's look at this more closely.

Activities associated with social reproduction include (i) production (the creation of objects and services in a production or labor process in combination with fixed and circulating factors of production), (ii) distribution (objects of social use are employed to transfer other objects from immediate possessors to those who will use them), (iii) social maintenance and reproduction (objects of social use are consumed in private and public administration, maintenance and reproduction of the social order by government), and (iv) personal consumption (objects of social use are consumed directly by consumers), (Shaikh and Tonak 1994).

National accounting records various types of expenditures, value added and incomes. For any country, one will find production activities (such as, agriculture, mining, forestry, manufacturing, construction, accommodation, and food), as well as distribution activities (such as, finance and insurance, real estate, professional services) and social maintenance (for instance, health, education, military). The structure of System of National Accounts (SNAs) has changed over time. One of the ways it has changed is the treatment of financial activities. The 1953 and 1968 versions did not explicitly incorporate the activities associated with financial intermediation, (Assa, 2017). The 1953 version treated financial activities as not productive since they transferred funds and did not generate new goods and services; the 1968 version treated financial activities as an input with no associated output. The 1993 SNA was the first version

that defined financial activities as productive and part of output. Financial activities were defined as risk management and liquidity transformation, activities where institutions issue financial liabilities to acquire financial assets. The scope of financial activities expanded in the SNA 2008 to include “monitoring services, convenience services, liquidity provision, risk assumption, underwriting and trading services,” (United Nations (2009), as quoted by Assa (2017)).

Financial activities are typically proxied by financial and insurance activities (FI) in SNAs. These are fee-based services treated as productive and are imputed a value added based on net revenue. Another industry whose value added is largely imputed is real estate activities (RE). Taken together FIRE lies at the heart of financialization, a phenomenon where the presence of financial activities plays an increasing role in how incomes and profits are obtained. Incomes and profits are obtained by means that do not create new goods and services. The growth of these activities has the effect of making economies more reliant on speculative activities, such as investment in real estate, and less resilient to shocks. If their presence increases relative to productive activities, in other words, countries become more exposed to sudden shifts in sentiment of speculative investors.

Financialization is thought to be is also an important source of inequality. Piketty (2014) and Saez and Zucman (2020) find inequality is related to high wealth holders’ ability to earn passive income on their assets and grow assets more quickly than those who do not hold much wealth. FIRE not only raises financial and economic risk, but also the risk of social unrest and political tensions. Assa (2017) found that when FIRE activities are removed from GDP and treated as a cost, the adjusted GDP figure is a better proxy as a leading indicator measure of aggregate demand and measure of standard of living.

What if we isolate the primary industries rather than simply removing FIRE from GDP? That is, how could recognition of industry configurations add to our understanding of economic health and locate opportunities for sustainable development? Primary activities consist of production activities along with the distribution and transportation needed to realize their sale. Production activities include agriculture, forestry, fishing, mining, quarrying, manufacturing, electricity/gas/steam, construction, accommodation, and food services. Distribution consists of wholesale and retail activities. Transportation activities (land, water, air) include warehousing and storage to support transportation. Primary activities are the engines, so to speak, of an economy and its ability to support social reproduction.

Production activities do not include water supply, sewerage, waste collections, information and communication, professional, scientific, and technical activities, administrative and support services, public administration and defence and compulsory social security, human health and social work, arts, recreation, and entertainment. A number of these excluded activities—such as, water supply, sewerage, waste collection, public administration and defence, human health and social work, and arts and recreation—are part of social maintenance and enable government to support the social order. Others are secondary in orientation and are more likely distributive in nature. It could be that the excluded activities contain sub-categories that may be classified as productive. To include them involves confirmation as to how each country has interpreted and classified the activities. For simplicity, they have been excluded for the purposes of this analysis; the sub-categories are so small, they will not affect the result.

Table VI.6 presents OECD data on the shares of FIRE activities and the primary activities from 1995 to 2019 (or most recent year available). The development of FIRE activities varies over time. For most countries FIRE activities rose over this time. For others, however, they declined (for instance, Germany, Hungary, Lithuania, Slovak Republic, Sweden, Switzerland) or remained stable (such as, Denmark, Iceland, Japan, Korea, The Netherlands). What almost always declined are the primary activities. While they grow, they do so more slowly than other activities and so their shares of value-added decline. There is a divergence between economic health as indicated by GDP and economic health as indicated by primary activities. GDP and variations of it are important for rating agencies assessments of economic vitality (see tables VI.3 and VI.5). If all activities are classified as productive in the sense of being marketable, collectively they suggest stronger economic growth than if the economy’s engines (primary activities) are monitored.



**Table VI.6**  
**Selected OECD countries<sup>a</sup>: FIRE and primary activities**  
**as a percentage of GDP (value added), 1995 and 2019**

OECD country	1995		2019	
	Primary	FIRE	Primary	FIRE
Australia	48.8	20.9	44.2	21.3
Austria	55.5	18.6	51.8	20.6
Belgium	46.5	16.4	39.6	17.0
Czech Republic	61.6	12.4	57.4	13.4
Denmark	46.6	15.3	44.8	14.8
Estonia	50.8	12.7	53.0	14.2
Finland	45.2	17.1	44.8	16.3
France	41.2	18.0	37.8	18.8
Germany	48.1	18.4	45.5	16.1
Greece	53.0	17.5	45.7	22.8
Hungary	53.4	20.3	53.0	12.7
Iceland	52.0	18.2	46.3	18.6
Italy	48.8	18.8	44.3	19.4
Japan <sup>b</sup>	57.2	17.8	50.4	17.3
Korea <sup>b</sup>	59.0	14.0	52.8	14.0
Latvia	54.4	13.0	51.8	16.0
Lithuania	60.0	11.8	65.2	9.4
Luxemburg	37.6	33.6	30.0	32.3
Mexico	63.4	12.8	61.0	16.9
Netherlands	45.7	15.3	42.2	15.2
Norway	58.9	9.6	49.1	13.7
Poland	69.9	7.6	60.4	9.5
Portugal	49.9	16.9	49.1	17.8
Slovak Republic	43.5	34.8	53.3	13.8
Spain	57.1	11.6	47.6	16.1
Sweden	45.0	15.4	43.3	14.0
Switzerland <sup>c</sup>	49.4	18.3	47.2	16.9
UK <sup>b</sup>	47.6	18.6	37.1	21.4
USA <sup>c</sup>	41.3	18.6	37.2	19.8

Source: OECD Statistics (2021), <https://stats.oecd.org/>.

<sup>a</sup> OECD data is not complete or available for all countries.

<sup>b</sup> The most recent year of data is 2018.

<sup>c</sup> Starting year is 1997.

Table VI.7 illustrates that GDP generally grows more quickly than primary activities. What this suggests is that a key indicator of debt sustainability—the debt to GDP ratio—is overly robust. This could be a possible reason as to why traditional ratings seem rosy at a times when sovereign risk events appear. Care needs to be taken when using indicators involving GDP for assessing macroeconomic health and sovereign debt sustainability and risk.

**Table VI.7**  
**Selected OECD countries<sup>a</sup>: percentage of GDP (value added)**  
**versus primary activities**

OECD country	GDP	Primary
Australia	106.4	86.8
Austria	56.4	49.5
Belgium	54.8	31.6
Czech Republic	85.6	72.8
Denmark	48.3	42.5
Estonia	171.2	183.1
Finland	64.0	62.8
France	48.0	37.5
Germany	41.6	34.0
Greece	21.0	4.3
Hungary	90.0	88.2
Iceland	130.9	105.5
Italy	16.1	10.2
Japan <sup>b</sup>	21.0	6.7
Korea <sup>b</sup>	167.9	140.0
Latvia	150.8	138.8
Lithuania	168.2	191.3
Luxemburg	117.1	61.6
Mexico	84.1	77.1
Netherlands	62.3	50.2
Norway	54.7	29.1
Poland	156.2	121.1
Portugal	38.9	36.5
Slovak Republic	148.4	204.4
Spain	65.8	38.2
Sweden	80.6	73.7
Switzerland <sup>c</sup>	55.1	48.2
UK <sup>b</sup>	60.3	25.1
USA <sup>c</sup>	62.3	46.1

Source: OECD National Accounts database.

<sup>a</sup> National base years used as reported to the OECD.

<sup>b</sup> The most recent year of data is 2018.

<sup>c</sup> Starting year is 1997.

Another aspect overlooked in ratings' methods is type of firm organization. While small and medium-sized enterprises (SMEs) are an important source of employment they are peripheral to the agencies' assessments of economic vitality. SMEs are an important element in the network of trade credits, whereby supply chains are cemented both domestically and globally. The volume of trade credit is comparable to outstanding corporate bonds and approximately one-third of non-financial corporations' outstanding loans (Boissay et al 2020). The Covid-19 pandemic has shaken this network as cash flows weakened. SMEs bear the brunt of larger firms' decisions to delay payment to protect their cash flows. Employment by SMEs, and consumption, will suffer, as do trade credit insurers and banks who hold discounted trade receivables.

The informal sector is also underdeveloped within ratings' methods. The informal sector is a range of activities within the social provisioning process which lie beyond market activities. It exists as a pre-condition from which economies transition to increased reliance on markets for what they need. Here, the culture of society helps determine what is produced, how production occurs and who receives the output. The presence of informal sector can be stabilizing, ensuring certain aspects of social provision proceed when the formal sector exhibits instability.

Risks associated with environmental, social and governance (ESG) tend to be peripheral in rating agencies' methods. That is, these risks enter as refinements to the methods. For instance, while climate change and social considerations may not have an explicit presence in Moody's scorecard approach, they will be part of the analysis that rationalizes the rating (Moody's, 2019). Environmental concerns are considered as they impact the factors of economic strength and fiscal strength, and possibly institutional and financial capacity. Social change will pose challenges for institutions and governments and for susceptibility to domestic and geopolitical risk. Demographic factors will influence assessment of economic and fiscal strengths; a spike in domestic violence, for example, may lead to government intervention, and an expansion of its wages bill, which compromises the sovereign's fiscal strength. If a sovereign receives strong revenue from exports of hydrocarbon products, a carbon transition risks its fiscal strength. Fitch makes comparable adjustments to their assessments through its qualitative overlay (QO) feature.

Standard & Poor's maintains its approach has incorporated ESG risks into their credit ratings for some time, where relevant to do so. ESG factors are incorporated into a rating through qualitative adjustments. ESG considerations are reflected in the assessments of a sovereign's institutional quality and governance effectiveness. At this time, S&P believes climate change, on average, will not have much bearing on sovereign ratings of developed economies, climate change will have a more significant impact on EMDEs, particularly in the Caribbean and Southeast Asia. S&P's insights dovetail with a recent observation that climate and ESG risks have negatively impacted approximately 60% of developing countries ratings, (Jones 2021b).

The MCRA has a challenging mandate to support improvements sovereign credit risk assessment, locate ways to moderate sovereign risk, and facilitation of SDGs. It needs to do these while recognizing the elephant in the room—climate change. The mandate will be executed during an ecological transition. The MCRA's functions and structure need to reflect that.

## **B. Institutional design and governance structure of a Multilateral Credit Rating Agency (MCRA)**

The institutional design and governance structure of the MCRA is shaped by its functions. The functions support two key objectives. The first objective is to improve assessments of creditworthiness for sovereigns, particularly those of developing countries. It should be aware of related opportunities to stabilize and moderate sovereign risk. The second objective is to facilitate the implementation of sustainable development goals (SDGs). The MCRA must accomplish both as the global community progresses through an ecological transition. Recognizing the importance of how industries relate to the climates in which they are embedded renders the agency forward-looking in ways the private rating agencies and multilateral institutions are not. This recognition supports evaluating risk assessments for EMDEs on longer-time horizons until they attain developed status. The MCRA would have a unique role, edge, and design for supporting sovereigns in the 21<sup>st</sup> century.

### **1. On functions**

The first function of the MCRA is to conduct much needed due diligence for the ratings industry's products as an independent third party. Validation of their methods is a labour-intensive process and costly. The process will enable the MCRA to generate insights as to what could be done better. Those

insights would stimulate the basis of formal studies. An advantage of the MCRA is it validates the major agencies collectively, as a group, so as not to reveal their proprietary models. The previous section suggests timelines, industrial configuration, small-and medium sized enterprises and informal economies are underappreciated in their methods. These would be good starting points.

The due diligence process enables MCRA to concretize a forward-looking approach for monitoring economies, a second function, that can be both strategic and flexible in locating vulnerabilities. By understanding economies at the levels of their industries, the MCRA can tap an important spatial aspect with respect to how each industry impacts the environment as it supports a country's regions, employment, and communities. Insights can be located as to how the industries are contributing to the overall social provisioning of goods and services, tax bases and, hence, revenues to service national debts. This will be helpful for locating new ways to attenuate sovereign risk.

To facilitate social development goals, a third function of the MCRA is to identify how adept communities are at producing goods and services both within their regional locale and their dependency on a transport network to access what they do not. The activities and geographic span of industrial configuration will help determine how well societies satisfy human needs. Basic needs involve an optimal level of physical health and autonomy, and intermediate needs involve adequate nutritional food and water, protective housing, healthcare, and basic education (Doyal and Gough, 1991; Gough, 2017). The MCRA could verify what is deficient, and how climate change poses challenges to the processes. By doing so, it would assist sovereigns understand how they could do better with the support of sustainable development programs for eradicating poverty and hunger, improving education, reduce inequality, create sustainable communities and cities, and various climate-related tasks. The programs created to support sustainable development goals will be more strategic and targeted, and possibly more economical. There is a role for indigenous knowledge and informal economies for comprehending the ecosystems and manage how they are changing. The support for an ecological transition will be more effective.

Industrial analysis will be able to ascertain the range of firm organizations within the industries. Again, weak presence of SMEs in evaluations of economic health overlook a substantial source of employment and support for consumption activities. This style of analysis will also lead to a better understanding of the structure of financial sectors. For instance, developing countries in which SMEs are more prevalent means a greater reliance on banks rather than capital markets. Certain segments of the financial sector will exhibit a stronger presence than others. Domestic sources of funding will reflect this structure. Variations will exist across countries.

A fourth function is stakeholder engagement. There is a wide range of stakeholders because of the heavy use of sovereign exposures for asset management, portfolio structure, regulatory purposes, and implementation of fiscal and monetary policies. It is important to canvas stakeholders' opinions for feedback about the MCRA's findings and strategies for developing research. By doing so, the MCRA facilitates understanding of the challenges faced by sovereigns and what they need to accomplish for their societies.

## 2. On structure

The structure of the MCRA reflects its functions and objectives. The organization proposed here enables the MCRA to identify the impacts of climate change on the industries and countries embedded within each botanical region.<sup>4</sup> In this way the MCRA enhances the coordination of countries across regions to work together on shared issues of concern. The classification of countries according to botanical regions is different from the classification of countries according to political boundaries, as found in the Central Intelligence Agency's World Factbook. For instance, many of the countries located within the CIA's South Asia, Central Asia and East and Southeast Asia groups are located within the botanical regions of Asia-Temperate, Asia-Tropical and Eastern Europe; this botanical classification is attributed to Brummit

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<sup>4</sup> A botanical region refers to a geographic area with a relatively uniform composition of plant species.

(2001), update soon to be released through the Hunt Institute. Classification by political boundaries can obscure insights of how the ecological changes within the botanical regions are influencing industries both within and across countries.

Within the MCRA there are four divisions: Analytics, Special Projects, Communication and Market Development and Support. The Analytics Division is segmented according to botanical regions around the globe, where some areas of this classification political considerations override the botanical. The countries are then allocated according to the regions (see annex 1). The regions are segmented into sub-regions or areas. Most countries, particularly small countries, entail one botanical sub-region. However, large countries, such as the United States and Brazil, involve multiple sub-regions.

The organization of countries in this way adds depth to our understanding of how countries relate to each other globally. While trade and finance linkages amongst countries are important, so are the linkages between cultures and communities. The MCRA would have a unique vantage point to harness research being performed at the various United Nations programs, funds, and agencies. It is an edge that private rating agencies do not have and would be hard pressed to replicate.

The Analytics Division will compile data, maps, and other visualizations and basic analysis related to creditworthiness of sovereigns. Techniques include checklists and scorecards, old hands or Delphi approach (country and regional visits), heat maps, and debt projections employing fan charts. Checklists of assessments are dovetailed into categories of riskiness. Fantail maps anticipate various scenarios under different financing, international, environmental, and social-political conditions.

Within this division, one analyst per country is the rule of thumb. Large countries may need more than one analyst, whereas small countries in a particular region may warrant 2-3 countries per analyst. The analysts would be grouped into teams according to their sub-regions and regions. The teams are organized in groups of 4-5 analysts. Each team is coordinated by a leader. The team leader role is rotated every 6-9 months to prevent analysts' skills from deteriorating.

Meetings should occur across the teams to compare and discuss experiences across countries and regions according to, say, their levels of income, states of development, industrial configuration, and so on. The initial segmentation on the basis on botanical regions and industries rather than income groups stimulates deeper analysis and insights of regional experiences with inequality, financialization, climate change and environmental degradation. As the linkages between countries are broader than trade and financial links, the approach will likely reveal how one approach towards sustainable development may work well in one region but not another.

At this level, one can get a sense of industries' reach into the geography of a country, their impacts on the environment, on communities, on the structure of the financial system, and how they collectively influence the macroeconomics conditions of an economy. Savvy analysis can locate overlooked opportunities to support a sovereigns' abilities to enhance the stability, health, and well-being of their constituents.

The Analytics Division monitors the economic health and financing conditions of industries, sectors, and the overall economy in a unique way. Besides the above tasks, a series of benchmarks can be created for each industry to record their rates of return relative to their financing costs, that is, their states of fragility. The idea is that if rate of return on new productive investment for the average or regulating firm in an industry is greater than the financing costs, the industry is in a good position. While there will be firms that do not do as well as the regulating firm, there are firms who are doing better than the industry average. The approach is based upon Hyman Minsky's Financial Instability Hypothesis which is cast at the level of the firm. It was extended and applied to American industries in Schroeder (2015); a rating scheme was created for individual firms. Additional indicators of fragility can be collected for study and use in benchmarks.

The positions of the industries will indicate how the structure of activities is changing, that is, which industries are growing better than average and which industries are declining? Are those declining industries necessary for social reproduction? If the answer is 'yes', then the industry warrants support. What is the configuration of firms in the industry? Are they mainly SMEs? What do they need to do better? What are the challenges they face from climate change? Would funding from a sustainable development program help? Should particular firms re-tool themselves for another industry? These are the types of innovative insights stakeholders like and the Analytics Division would generate.

The Analytics Division is coordinated by a manager and an associate manager. The manager engages with strategy of the MCRA Directors, facilitates improvements to processes, and liaises with the other divisions. The associate manager oversees daily activities across the regions, such as monitoring the outputs and processes and troubleshooting. This division will likely be the first to glean insights across countries within regions. That gleaning process will undoubtedly bring forth issues for additional investigation and contributions to various literatures within economic development and sustainability, economic geography, industrial configuration and organization, climate change and inequality. The Analytics Division will have a strong relationship with the Special Projects Division.

Each regional supervisor coordinates the teams within his/her respective region and engages with strategies and process improvements with the management team and supervisors in other regions. The number of teams varies with the size of the region. It is possible that an associate supervisor needs to be installed alongside the supervisors.

In-depth treatment of issues is relegated to the Special Projects Division. This division investigates issues as agreed upon by the MCRA Director, the Manager of the Analytics Division, and its own Manager. The issues need to be revisited every 6 months for update and possible revision. The Special Projects Division performs validation studies (due diligence on sovereign ratings) and studies related to its objectives, such as sovereign creditworthiness and default, debt sustainability, financialization, inequality and facets of sustainable development and climate change. This suggests a variety of expertise required in its staffing - environmentalists, economic geographers, social and political economists. For professional and personal growth, analysts in the Analytics division could be given opportunity to engage with the Special Projects Division, workloads permitting.

The outputs of this division could be made accessible by the public, thus promoting dissemination of information. There should be a peer-review process involved, suggesting need to develop a network of referees. There would need to be care in handling the models developed in-house due to the intellectual property involved.

A Communications and Market Development Division facilitates the release and discussion of the studies, emerging issues, and industry trends. One way it does so is by conducting semi-annual meetings with stakeholders. There is likely to be opportunity for sharing insights with stakeholders and adapting insights to new contexts. This division would also coordinate a potential, and potent, source of funding for the MCRA—the re-introduction of a subscription series for a nominal fee. The subscription would contain overviews of recent research, activities and its own assessment of credit risk based upon an alternative approach developed by its Analytics and Special Projects Divisions.

Last, there needs to be a Support Division to facilitate processes associated with human resources, payroll, finance, and legal teams. Administrative staff is needed to manage processes, documentation, and dissemination. Finance staff is required to record inflows and outflows of funds. Custodial staff and security are needed to maintain the physical location. Human resources staff is required to oversee human capital acquisition. Information technology specialists are needed to manage data and its storage, software and programming, hardware, visual and graphic artists, equipment, videoconferencing, and cybersecurity. A legal team will be needed.

### 3. On governance

Each envisaged division is headed, at least initially, by a manager and administrative assistant. The Analytics Division may require an Associate Manager at the start. Additional staff can be added as needed.

The MCRA, itself, is led by a Director, Associate Director and Assistant Director. All positions are 4 year-terms. The Director liaises with other UN agencies, programmes and funds and provides strategy, ensures the agency is accountable to its mandates and bylaws, locates resources and develops the agency's exposure to stakeholders. The functions of a MCRA compliments the work on public finance by multilateral organizations such as the IMF and the World Bank. The Director will need to keep abreast and liaise with these entities and others interested in sovereign exposures and debt sustainability. The Bank for International Settlements (BIS) might also be included as it would give the MCRA more direct exposure to central banks. The Associate Director monitors the activities of research staff and coordinates those with operations (via the Assistant Director). The Assistant Director oversees daily operations and troubleshooting (HR, Finance, IT, administrative support).

An advisory committee should be installed to locate insights and solutions for issues that arise. It can oversee processes and provide counsel. The committee could consist of UN programmes/agencies/funds that work the closest with MCRA. These entities can provide valuable information and advice regarding how the new agency overlays with work already initiated and processes within the United Nations. This configuration is not exhaustive of the possibilities. To avoid regulatory capture, the rating agencies and national governments should be kept off (see section 4).

The suggested structure of the MCRA is summarized in figure VI.1.

**Figure VI.1**  
**Structure of MCRA**

Composition of directors  
 Director (with Executive Secretary)  
 Associate Director (with Secretary)  
 Assistant Director (with Secretary)  
 Analytics Division (as above)  
 Manager  
 Associate Manager  
 Administrative Assistant  
 8 regions: Supervisor and Administrative Assistant for each region  
 Visual and Graphic Artists, as needed  
 Special Projects Division  
 Manager  
 Administrative Assistant  
 Communications and Market Development Division  
 Manager  
 Administrative Assistant  
 Communications Team (with team leaders)  
 Market Development Team (with team leaders)  
 Support Division  
 Manager  
 Administrative Assistant  
 Finance Team (with team leaders)  
 Human Resources Team (with team leaders)  
 Computers, IT, and Security Teams (with team leaders)  
 Building and Maintenance (with team leaders)  
 Legal Team  
 Advisory Committee

Source: Author's own elaboration.

#### 4. On costs and financing

The financing of an MCRA might not be as daunting as one would expect. The MCRA should start with a small structure to test the processes and structure, and then expand as details are settled. A skeletal staff would conduct initial validations, compile data for monitor industries and how they overlay with geography and communities. Their experience will facilitate adjustments to communication, workloads, and processes. The structure can be scaled up after the structure and processes are streamlined. The structure is more horizontal rather than vertical in orientation. This facilitates communication, engagement, and sense of direct contribution to the research being generated.

An initial set of 32 analysts is envisioned as its starting point; supervisors can assist when needed. Given the emphasis on monitoring developments and creation of benchmarks, for the industries. The analysts are strategically placed to cover the botanical regions and areas as widely as possible to record the diversity of contexts and the features of the countries. This initial set could transition to roles as team leaders as new analysts are added to provide additional range of coverage. Skeletal staff will reduce the initial set up costs, and garner material to solicit additional funds through the implementation of a subscription service. Salaries of staff will depend on cost of living in the city selected; a Latin American location would be suitable for its manageable cost of living. The cost of the skeletal structure ranges from US\$6.5–7.1 million

At the next level, there could be an additional 200 analysts across the Analytics and Special Projects Divisions (mainly, the Analytics Division), which would add approximately US\$10 million to cost. An additional 20 Communications and Market Development staff, at least, will be needed which adds approximately US\$1 million; likewise, an additional 35 staff will be needed in the Support Division, adding US\$1.225 million. Computers, supporting software and IT support increase to US\$4.5 million, and building to US\$2million. Travel and incidentals add US\$750 thousand. Total cost in this version is approximately US\$24–26 million. Pay increases, subject to performance review, is expected to pressure salaries to grow about 5% per year, higher if inflation needs to be accounted for.

Initial funding of the MCRA could be raised through grants and contributions of sovereigns and central banks. The MCRA needs to shift quickly towards a self-sustaining state. The MCRA is in a unique position to shift towards self-financing by reverting to the old subscription model rating agencies used to rely on for revenue. Prior to the issuer-pays model that rating agencies currently employ revenues came from subscriptions to a publication that announced ratings of issuers. That model was abandoned because revenues could not keep up with the costs of compiling the information with enough profit to permit expansion. While the MCRA is not a profit-generating enterprise, it would not hurt to think entrepreneurially going forward. It has as the advantage of an historical context in which the number of financial institutions around the globe has increased tremendously. The fee for a subscription could be set on a sliding scale according to firm size and locale.

An example of the potential revenue from a subscription service is the following. One of the stakeholders of the MCRA is the insurance industry. As per Statista, in 2019 there were nearly 6000 insurance companies in the United States and nearly 7000 in Europe; approximately 13,000 total. If the average, annual subscription rate—for an annual report, quarterly updates, and a newsletter—was \$2,500, the revenue from the US and Europe, alone, would amount to US\$26 million. That's one year of cost at the expanded level (as suggested above) funded by a small snippet of the global configuration of stakeholders in this agency. Other stakeholders who would find MCRA subscriptions useful are pension funds, mutual funds, holding companies, the range of banks and the entities which rating agencies rate. There is strong revenue potential from a subscriptions model to fund the MCRA because of the United Nation's reputation and global reach and the role of sovereign bonds in banking systems, financial markets, monetary policies, fiscal policies, and the use in satisfying capital requirements for financial institutions.

So, it conceivable to envision a much larger scale for the MCRA. In fact, the MCRA could become a mechanism to generate funds for the UN and its SDG initiatives. The MCRA could easily warrant a larger size comparable with S&P, with over 1500 analysts and satellite offices.

### **C. Challenges faced by an MCRA**

A MCRA would face challenges, none of which is insurmountable. The first challenge is it must establish a track record of improvements to assessment of sovereign creditworthiness. Toward this end it needs to establish a body of work that objectively validates the accuracy of private ratings. What do the rating agencies get right, and what could be better? This will establish the agency with a reputation for integrity and transparency.



The MCRA also needs to pilot new methods of credit risk assessment and for achieving debt sustainability. The agency must be bold in breaking new ground because the global community needs it to be so. The new paths cannot simply adjust or provide minor updates to the methods of the private rating agencies. Simply generating modest changes or adjustment would risk their absorption by the agencies into their own methods and make the MCRA's approaches redundant and the agency itself unnecessary. The basis of the MCRA must be such that it will be daunting for the private rating agencies to replicate.

Recognition of the complex relationship between the economy and ecology would be a strategy for creating something bold, forward-looking, and innovative. Paying close attention to the industrial configurations and how they interact with botanical regions will provide a clearer picture of how well productive activities are supported by climate conditions. Rating agencies are concerned with industries only so far as they may facilitate cyclical behavior or shocks. They also do not distinguish between productive and non-productive activities or the importance of legal form of organizations within the industries.

A bold approach is possible due to the access the MCRA has to the wealth of information and research generated by the various programs, agencies and funds housed within the United Nations. This approach enhances its support for the United Nations' Sustainable Development Goals. Sustainable development involves understanding how societies can reproduce themselves in ways that improve opportunities and living conditions during an ecological transition climate change. MCRA's clarification of the links between economy and ecology via industrial configuration will reveal how communities relate to their current systems of social reproduction, and how those systems are underperforming. The knowledge and data generated by the MCRA would facilitate the implementation of SDGs.

Another challenge will be to convince national governments to incorporate MCRA improvements and assessments into regulations and guidelines. To do this requires a track record of assessments of sovereigns which are at least as discerning as those of the rating agencies. It is important that the MCRA hits the ground running, so to speak, with validation studies that facilitate an improved methods of sovereign credit risk assessment. If it can make improvements to sovereign assessments, it could conceivably be able to evaluate the interactions between sovereigns and other instruments such as corporate bonds.

The MCRA could target NRSRO status from the U.S. government. This would facilitate use of its innovations for regulatory purposes. An application for NRSRO status includes a track record ("performance measurement statistics") of its methods, as well as the class of ratings, a statement of accessibility, policies to prevent misuse of non-public information, organization structure, code of ethics, and conflicts of interests related to its issue of credit ratings, pertinent information about its analysts, including their remuneration, and compliance officers, users of its ratings and sources of revenue. It can file additional forms if the MCRA expands to add classes of ratings. (SEC n.d.).

Having NRSRO does not protect the rating agencies from liability on blown calls? How would an MCRA be different? Firms in the rating industry create and sell financial information to professional investors. That is, ratings are a form of commercial speech, and not necessarily free speech. Credit rating agencies do not readily publish their opinions to the public at large. Their opinions are available to a particular group of investors, and, as such, are private. They do not constitute a matter of public concern, and freedom of speech immunity does not apply (Gaillard and Waibel, 2018). The opinions of the MCRA are of public concern as they would be disseminated widely, it would not have conflict of interest in providing opinions and would be mindful of maintaining quality in the construction of its opinions (ibid). Its statements would be made to the global public at large, and not restricted to a particular group of individuals (investors).

Of course, funding will be a challenge. Funding of a MCRA could be initiated through institutional donations from the UN, sovereigns, and central banks. The challenge will be to shift away from donations towards a self-funding state. However, the experience of Bertelsmann's INCRA may prove valuable. The Bertelsmann foundation proposed the creation of an international non-profit credit rating agency (INCRA) in 2012. The idea was to improve ratings accuracy by reducing the influence of conflict of interest in the issuer-pays model. The issuer-pays model was to be replaced with an endowment funded by governments,

non-governmental organizations, civil society foundations and financial services industries. Sufficient funds could not be gathered, let alone be maintained. A key problem was the ratings were not distinctive enough with those of the three main rating agencies, which had tremendous history and global reach.<sup>5</sup>

The key to funding is to create a body of work that could be used as the basis for a subscription service. While the MCRA would disseminate information about its research to the public realm, its own assessments, and outlooks on an annual and quarterly basis as part of a subscription service. The data could be released with a time lag to researchers and community members. The subscriptions would be of help to stakeholders—such as insurance and assurance companies, banks, pension funds, mutual funds—who purchase sovereign bonds assets for their portfolios and/or as part of their capital requirements.

What will influence cost is location and competition for staff. Cost of living is more forgivable if the MCRA is in a major city which is not a major financial centre. The major financial centres of London, New York, Tokyo, Shanghai, Hong Kong, and Singapore are frequently noted for high costs of living (Mercer 2021).

Triggers are another challenge. A change in a sovereign's fiscal position and ability to service its debt commitments may trigger shifts in portfolio and instability on financial markets. While the MCRA could press for moratoriums on negative outlooks and rating downgrades, investors will come to view a moratorium as another form of a default. As such, a moratorium cannot occur in isolation from a plan for how to adjust to the challenges being posed to the sovereign. This would not only maintain investor confidence but also keep distressed debt from falling prey to vulture funds. One possible strategy is for some international entity or consortium of organizations to buy distressed debt on secondary markets. This would seem to be the most expedient route as anti-vulture legislation has been introduced by few countries (UK and Belgium), and an international bankruptcy mechanism may be years away (Brutti, 2020 and UN, 2018). It is conceivable that the MCRA could house such a fund and work with distressed sovereigns to implement sustainability development goals to stimulate growth and development. A small fraction of debt service payments contracted to creditors could be financed from the fund. Even better would be to locate untapped sources of tax revenue to service and retire sovereign debt.

This leads to yet another challenge: to support innovative ways to service government debt. Debt forgiveness and restructuring may lighten the burden, but the burden remains for generations. Raising income taxes is a possibility, but they will ultimately burden firms and workers. The time has come change the game on how sovereign debt sustainability is achieved. A wealth tax based upon gross private assets has potential, and an initial estimate was provided in Schroeder (2021). The tax is defined as a rate on private gross assets which equated with interest rate on national debt. The tax generates the revenue to cover net interest obligations on the national debt. Sustainability is linked to tax on wealth, as opposed to a tax on income. The tax is equitable in the sense that everyone's assets are subject to the tax, with possible exemptions for the poor, owner-occupied dwellings (under a certain threshold), small business owners and tradespersons. It is important that a wealth tax be equitable to avoid distorting investment and consumption decisions. How big would it be?

Due to data availability, the United States will be used as an example. At the end of 2020, the national debt for the United States was US\$26.95 trillion. The size of gross private assets is US\$322.2 trillion.<sup>6</sup> With respect to the interest rate, the Congressional Budget Office (2020) notes the highest interest rate in a 10-year forecast period is 3.15%; we use this as the worst-case scenario. With this information, the wealth tax is 0.263%. When applied to private assets it yields revenue of US\$847.4 billion. Net interest outlay is projected to be US\$345 billion, which leaves US\$502.4 billion left over. That money could be used to reduce reliance on new borrowing in plans for fiscal spending and keep austerity at bay. Over a 10-year period, it will generate nearly \$10 trillion in revenue. This is enough to cover the net interest outlays in the forecast period, about \$4 trillion, and leave nearly \$6 trillion as a surplus to reduce reliance on new borrowing, fund green

<sup>5</sup> While the INCRA did not survive it left in its wake the Bertelsmann transformation indicator and sustainable governance indicators.

<sup>6</sup> \$137.8 trillion for households, \$21.9 trillion for non-financial, non-corporate firms, \$47.2 trillion for non-financial corporate firms, \$115.4 trillion for the domestic financial sector, as per the FRED databank at the St. Louis Federal Reserve.

initiatives associated with a Green New Deal and reinforce the social safety net. The reduction in reliance on new borrowing can slow, if not reverse, the debt to GDP ratio, by slowing the growth of the numerator.

A key point is if a sovereign finds itself in difficulty for completing debt commitments it simply raises the tax temporarily to generate the funds and returns the tax to its original rate after the period of stress has subsided. The approach could be adapted to cases where there are negative interest rates to cases where sovereign debt is denominated in foreign currencies by converting foreign currency denominated national debt into a domestic currency estimate to cases where general government debt is used in place of sovereign debt, and to cases where gross financing needs rather than net interest outlays need to be covered. The tax not only releases fiscal budgets from the threat of austerity, but also enables governments to spend much more liberally on initiatives which strengthen social safety nets and enable green transitions. The mechanism has potential for developing and emerging countries, particularly in Latin America and the Caribbean, which recently experienced downgrades to reverse the situation while thwarting the threat of austerity once and for all.

Degrees of sovereign creditworthiness come down to how much tax revenue can be generated by a wealth tax more than net interest outlays. A rating system could be constructed to capture variations in creditworthiness or debt sustainability through the margins of safety defined as estimated tax revenue and forecasted net interest outlays. For instance, an "A" rating is awarded for tax revenues that are 20% + in excess of net interest outlays; "B" for 11–20% of outlays; C for 5–10% of outlays; D for < 0% of net interest outlays. Graduations could be developed according to government's effectiveness in managing the tax and ability to locate assets, changes in economic and financial conditions that prompt new expenditures and/or declining revenues.

A challenge for implementing a wealth tax is the accuracy of data on assets. What is available is likely to be underreported because of the use of tax havens by high wealth holders; Saez and Zucman (2020), for instance, have documented the extent of tax havens and opportunities to improve data on assets. Obtaining data is not insurmountable. It is in the wealth holders' benefit to be forthcoming on assets because more complete information will lower the tax. The United States has already begun a process of locating overseas wealth. In 2010 it enacted the Foreign Account Tax Compliance Act which implemented an automatic exchange of data between foreign banks and the Internal Revenue Service. Other countries have followed suit. Possibly, those efforts could be reinforced with a sub-division within the MCRA that facilitates this process.

Regulatory capture is yet another challenge for the MCRA. Regulatory capture is the result or process by which regulation, in law or application, is consistently or repeatedly directed away from the public interest and towards the interests of the regulated industry. In our context, it is concern that the rating agencies will exert control over the MCRA. The MCRA may not be able to directly regulate the industry, although it may be able to coordinate moratoriums on ratings downgrades.

Regulatory capture exists in degrees, from weak to strong to corrosive. Weak regulatory capture is influence exerted by the regulated industry or special interest in a way that does not influence healthy regulatory functioning (Carpenter and Moss 2014: 12). With respect to the MCRA, it is the influence by ratings agencies in a way that the MCRA's functions are not compromised. The agencies may seek to be informed about the developments and research outcomes of the MCRA. It is possible the insights gleaned by the MCRA teams could be incorporated into the methods of the agencies. As an entity of the United Nations system the MCRA cannot stop this from occurring.

However, a structure, like the one outlined above, is so unique that while the rating agencies may be able to adapt insights, they cannot replicate the outcomes entirely. The basis—a systematic treatment of industrial configurations, distinction between productive and non-productive activities, nested within respective botanical regions, and supported by teams of specialists (within and outside the UN) would be very distinctive and costly to replicate. Even if they could replicate it, they would be hard-pressed to locate the intellectual expertise to competitively complete with the MCRA's research and projects.

Strong regulatory capture pertains to an industry or special interest that interferes with the functioning of regulation (here, the MCRA), rendering it useless for purposes for which it was designed. That is, the benefits of regulation are less than the costs of capture. The difference between strong regulatory capture and corrosive regulatory capture is that strong regulatory capture involves an intention to seek rents by shaping the regulation in its interests, whereas corrosive capture involves deregulation or thwarting new regulations (without public support for deregulation). With respect to the MCRA, there is a risk that rating industry could shadow the MCRA, allowing the private agencies to locate opportunities for credit risk assessment of sovereigns for which they currently do not cover. It would seem to be a way to erode the role for the MCRA for gain. This would be strong regulatory capture. Corrosive regulatory capture is unlikely, as the MCRA, technically, does not regulate the industry. The UN is oriented to promote cooperation, uncooperative behavior on the part of private rating agencies is not in their or the UN's interests. In these instances, the MCRA would likely have an advantage in rendering assistance since it would come as part of the UN's promotion of programs associated with sustainable development goals. Many of the stakeholders would be receptive to what an independent agency would generate in terms of improvements.

What could the MCRA do further to thwart regulatory capture or influence by the agencies? The MCRA's division structure and its engagement with multiple (stakeholders) satisfies one of the criteria that Carpenter and Moss (2014) suggest for avoiding regulatory capture. Other criteria include empowering diffuse interests, employing experts with diverse and independent opinions, locating devil's advocates, and involving the press. The expertise embodied in the MCRA's labor force and engagement with external interests will provide a stimulating working environment and a means to avoid shaping its viewpoints on, for instance, research design and methodology. Devil's advocates could come in the form of soliciting the opinions of private rating agencies (major and minor) during workshops and seminars. The agencies ought not to be part of the MCRA's advisory committee. While they have a role just as any entity who has a stake in the efforts of the Agency, they are welcome during public events but need to be kept at arm's length on day-to-day activities and management.

Before we leave regulatory capture, cultural capture needs to be mentioned. Cultural capture is a form of indirect capture where nonrational influence can occur during human interactions. Such interactions will likely occur with engagement with the rating agencies at workshops and seminars. In-house staff may be convinced to change tactics and approaches after such interactions. The changes may ultimately benefit the agencies at the expense of the MCRA. Another way cultural can occur is through revolving doors of employment opportunities. Employees of the MCRA may wish to migrate to the private rating agencies, and vice versa. The advice here is to limit this type of migration by establishing a mandatory time between migration (2-3 years) after resigning from the MCRA to ensure sensitive knowledge of the MCRA is not transferred to the agencies. Migration into a sovereign or another U.N. programme/fund/agency might be more suitable for career advancement.

A final aspect to consider is how the MCRA relates to other multilateral agencies and the rating agencies, themselves. The activities of the MCRA could be viewed as complimentary to IMF's and World Bank's efforts on public debt sustainability. Both work jointly on the debt sustainability framework to assist low-income countries to mobilize financing and evaluate their debt loads so as not to allow them to become excessive (IMF, 2021c). As noted above, the IMF is keen to improve its ability to predict sovereign defaults. It also publishes the Fiscal Monitor, which is part of its surveillance of fiscal developments and provide medium-term fiscal projections. The MCRA is interested to improve sovereign credit risk assessment, not projections. While being mindful of advances being made by the IMF, the MCRA is more attuned to monitoring for vulnerabilities. While this seems to overlap with the IMF and World Bank's efforts, its unique methods and organization will generate insights that are distinctive. Its distinctiveness gives it an edge, enabling it to survive and contribute to debates and innovative sustainable development programs. It may be possible to require national governments to obtain two assessments for their issues—one private and one by the MCRA—to promote complementarity.

## D. Conclusion and policy discussion

The rationale for an MCRA is to promote the global public good of economic and financial stability. These, in turn, will promote political and social stability. Sovereign risk exposures are an integral part of our financial systems, monetary and fiscal policies. They serve as assets in portfolios and as part of capital requirements. They also serve as benchmarks for other types of funding associated with production of new wealth. The rating industry arose in the context of sovereign risk evaluation because there was no independent third party to perform the task. Sovereigns cannot evaluate their own creditworthiness. The task was effectively outsourced to the market. While multilateral agencies such as the IMF and World are concerned about fiscal and sovereign debt sustainability, they do not provide ratings that are used to discern creditworthiness for use by investors.

The use of NRSROs' opinions to discern between investment from non-investment grade issues endows them, in a sense, with pseudo-regulatory presence. There is tension in that regulations and supervisory frameworks are intended to promote the public good of stability. Rating agencies generate financial information targeted to a particular investor audience, for profit; the speech is commercial speech, intended to enhance profit and not necessarily the public good. The MCRA would be generating financial information to parallel the opinions of the rating agencies, but with a different focus—the public good. The information is created according to best practice and good intent for that purpose and is disseminated to the public to inform; the information constitutes free speech.

Rating agencies have developed their methods to facilitate the comparability of assessments of sovereign risk across countries. The methods are constructed for use by professional investors. At present, the timeframe preferred by investors (3-5 years) is not consistent the stage of development of emerging market and developing countries. To force assessment of credit risk for sovereigns of these countries into a 3- to 5-year a time horizon renders their assessments more sensitive to shocks, particularly those transmitted from overseas. Time horizons needs to be lengthened to reflect the strong influence of infrastructure development.

Longer time horizons would render sovereign risk assessments more resilient and stable in the face of instability. Increased accuracy and stability of assessments of EMDEs will clarify their funding needs. SDGs will be better targeted and adequately funded. The increased accuracy and stability of assessments will also benefit investors by enhancing their ability to make robust investment decisions. There will be investors who may not be interested in investments with long time horizons. A dedicated assessment/rating system for EMDEs would direct these investors elsewhere.

Stabilizing the ratings of EMDE sovereigns would also be helpful for thwarting the predatory activity of vulture funds. Vulture funds purchase distressed debt at low prices with the intention of using legal structure to thwart restructuring and litigate forced payment for a short-term, speculative gain. The gain comes at the expense of the public good (economic and financial stability) which a sovereign is supposed to protect and support. Moreover, the delaying a restructuring may increase its cost (UNCTAD, 2016; Bradlow, 2020; Brutti, 2020).

The MCRA may be deemed with the power to enact moratoriums when downgrades are immanent. However, they cannot be enacted without support to allay investors' concerns and keep them holding the debt instruments. Debt forgiveness and haircuts in combination with debt restructurings are ways to allay concern. Another possibility is the creation of a fund to buy distressed debt and give the sovereigns the opportunity to return to a healthier position before addressing their debt burdens. The MCRA could coordinate such a fund.

Besides stability of assessments and ratings, the MCRA needs to be bold in locating new solutions for debt sustainability. A promising solution is a wealth tax on private, gross assets. The tax is likely to be very modest and can be adapted for contexts where sovereign debt is denominated in multiple currencies and where negative interest rate exists. It can also be adjusted quickly, and temporarily, to obtain additional funds when needed. There are challenges here in terms of locating where assets are and pushing through legislation to enact it. However, it is politically feasible if it is designed to be equitable, with allowances for the poor, equipment of tradesmen, and homeowners.

Stability and sustainability need to be conducted in the contexts of climate change, inequality and financialization. An MCRA would entail multidisciplinary approaches involving economic geographers, visual/graphic artists to record how industries are dispersed over a landscape and where communities are located, sociologists and anthropologists to understand the cultures of social provisioning within and between communities. Political economists are needed to understand the interplay between political structures and policy and the ability of an economy to socially provide goods and services for its constituents.

The MCRA's approach is envisioned to incorporate industrial configuration more explicitly. This will reveal a host of opportunities for not only improving sovereign credit risk assessment, but target funding for funding of SDGs. Observing the relationships between industries and geographical regions can yield important insights on how climate change affects each society's ability to reproduce itself and how industrial configuration may need to adjust to support communities in more sustainable ways.

Industrial configuration is important as not all industries are productive in the sense that they produce new goods and services which add to a country's wealth. Some industries are non-productive. That is, they do not produce goods and services which directly add to wealth but enhance the efficiency of the market activities by facilitating the sale of the products, transferring ownership and titles, locating resource for future activities, distribute products, etc. The greater proportion of non-productive activities the less resilient an economy is to shocks, that is, the higher development of fragility in the system.

Orienting the MCRA to allow more detailed analysis of industrial configuration paves the way for re-orienting industrial policy. Industrial policy became implicit in the neoliberal era when free markets were relied upon to determine market structure and industrial development. There is a resurgence of interest in industrial policy. As per Noman and Stiglitz (2017), "industrial policy refers to public policy measures aimed at influencing the allocation and accumulation of resources, and the choice of technologies. A particularly important set of industrial policies, ..., comprises those targeted at activities that promote learning and technological upgrading." One could read into this definition that climate change has an underlying presence to influence allocation and accumulation of resources, with the support of technology. One could just as easily not read that into the definition.

The MCRA will render explicit what is implicit. It will unlock how industries influence the ability of societies to reproduce themselves. It will glean information on what communities need, what could be done better and how they can be made more self-sufficient. The MCRA's organization engages the environment and climate change directly. By doing so, it will garner insights into how climate change impacts the primary activities that generate new wealth or goods and services. What are the speeds at which industries are deteriorating? Is something about to collapse? How could national governments support it? Could sustainable development programs assist their efforts? How are tax revenues impacted by climate change's influence on industrial configuration and, by implication, employment? How is sovereign risk changing?

The MCRA's orientation is forward-looking. Industrial policy needs to be different during an ecological transition. Sustainable development programs will be invaluable. An MCRA will be strategic tool for facilitating their design and funding needs. It can accomplish this, in part, by exploiting a key weakness in how activities and industries are treated in assessment methodologies. They are not alike in their roles for social provisioning.

Besides the invaluable services of performing due diligence, locating areas to improve credit risk assessment of sovereigns, and supporting SDGs the MCRA can be bold and recognize another elephant in the room—severe wealth inequality—and finds ways to exploit it for the social good. For some time, the focus for alleviating heavy debt burdens has been on changing the terms of debt (maturity, financing costs and structure) and finding ways to increase taxes on income (wages, profit) to service debt obligations. The time has come for a wealth tax to promote sustainability of national debts. The wealth tax presented above is just one possibility. In whatever form, the MCRA could be an important advocate for changing the game.

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## Annex VI.A1

### Region 1: Europe

*Northern*  
*Middle*  
*Southwest*  
*Southeast*  
*Eastern*

### Region 2: Africa

*Northern*  
*Macaronesia*  
*West Tropical*  
*West-Central Tropical*  
*Northeast Tropical*  
*East Tropical*  
*South Tropical*  
*Southern Africa*  
*Middle Atlantic*  
*Western Indian Ocean*

### Region 3: Asia-Temperate

*Siberia*  
*Far East Russia*  
*Middle Asia*  
*Caucasus*  
*Western Asia*  
*Arabian Peninsula*  
*China*  
*Mongolia*  
*Eastern Asia*

### Region 4: Asia-Tropical

*Indian subcontinent*  
*Indo-China*  
*Malesia*  
*Papuasias*

### Region 5: Australasia

*Australia*  
*New Zealand*

### Region 6: Pacific

*Southwestern*  
*South-central*  
*Northwest*  
*North-central*

### Region 7: Northern America

*Subarctic America*  
*Canada*  
*Mexico*  
*The United States*

### Region 8: Southern America

*Central America*  
*Caribbean:*  
*Northern South*  
*America*  
*Western South America*  
*Brazil*  
*Southern South*  
*America*

### Region 9: Antarctica

*Subantarctic islands,*  
*Antarctic continent*

Source: Brummit (2001); The Hunt Institute indicates an update is imminent.

In the aftermath of the global financial crisis (2008–2009), the external financing needs of Latin America and the Caribbean increased significantly, reflecting a process of external debt accumulation in all developing regions. This process has been exacerbated by the impacts of the coronavirus disease (COVID-19). As things stand, Latin America and the Caribbean is the most indebted region in the developing world. The region's debt profile makes it highly vulnerable to changes in international lending conditions and to perceptions of risk in issuing countries, increasing volatility of lending conditions and making them more liable to sudden reversals. This has placed a major constraint on government responses to the COVID-19 emergency and, in the medium term, undermines their capacity to build forward better. This document focuses on two proposals to address these challenges: (i) expanding and redistributing liquidity from developed to developing countries through innovative uses of special drawing rights (SDRs); and (ii) expanding the set of innovative instruments to increase debt repayment capacity and avoid excessive indebtedness. These include state-contingent instruments, hurricane clauses and a multilateral credit rating agency.

