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Sovereign Debt Management

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Sovereign debt management¹

Eduardo Levy Yeyati

Abstract

This paper reviews debt management strategies in Latin America from a positive and a normative perspective. It discusses the definition of the debt perimeter (what items should be considered to optimize the cost-risk balance of a debt strategy), broadening the scope beyond documented general government liabilities to include both contingent and non-financial items, provides an empirical account of the evolution of the composition of sovereign debt in Latin American in the past 20 years, and draws key policy implications.

¹ Prepared for the IADB's 2023 report "Leaving with Debt: Less risk for more growth". The author benefitted from the IADB's Research Department's financial support and from invaluable comments by Ugo Panizza, Andrew Powell, Joao Prats, Teresa Ter Minassian and Oscar Valencia. Outstanding research assistance by Alfonso Gauna, Carlos Guevara, and Nicolás Der Meguerditchian is also gratefully acknowledged.

Introduction

The main objective of public debt management is to ensure that the government financing needs and payment obligations are met at the lowest possible for an acceptable level risk over the medium term.² Normally, there is no single ideal strategy, the lowest cost for a certain level of risk might be may be consistent with a wide spectrum of choices regarding maturity, currency, jurisdiction, instrument and investor-base among other dimensions. It also depends on assumptions regarding the riskiness of the various elements of the public sector balance sheet including the liquidity risks associated with debt that must be rolled over.³

Debt management is not just about reducing costs and debt managers should avoid speculative positions to make short term gains, irrespective of the risks. Rather, it can be viewed as seeking hedges at reasonable cost against shocks that affect the country's capacity to pay. Once alternative strategies are quantified in the risk-cost space, the final choice should reflect the country's long run preferences. Short term benefits that imply longer term costs should be avoided. This implies that debt management should be governed by well-defined and stable criteria and that while debt managers should be accountable, they should also have a degree of independence.

Debt management should encompass all financial obligations under the control of the central government. However, when analyzing alternative strategies, the debt manager should be aware of explicit and contingent obligations that, while not part of the sovereign documented liabilities, may affect its financing needs in the future. The definition of the perimeter to be used in the calibration and selection of debt strategies can then be complex. This paper works with the definition of debt as discussed in Paper 3, but in addition considers liabilities that are not normally included in that standard approach.

Debt managers face multiple tradeoffs and these are most likely harsher in developing countries than advanced economies. Most notably, a tradeoff between hard currency external debt at lower cost and longer maturities, versus shorter and more expensive domestic debt in financially integrated emerging economies. But, also, one related to the composition of creditors and instruments. For example, between more expensive, risk-sensitive, and procyclical commercial bonded debt, which a country under extreme financial stress might default on, and cheaper, more stable, non-marketable, countercyclical official lending. Or, within the private investor base, between stable long-term investors and speculative short-term traders, between global risk-sensitive foreign bondholders and

² In what follows, risk refers to the objective of fiscal sustainability, developed in more detail in paper 5, namely, avoiding credit events or avoiding abrupt and possibly inviable fiscal adjustments.

³ As outlined in Paper 2, for example, developing countries may issue debt to hold reserves paying a premium to reduce liquidity risks. See also Levy Yeyati (2008).

locally-driven domestic ones, and between atomized fickle retail bondholders –both domestic and foreign– and locally regulated institutional investors.⁴ In addition, decisions are persistent (in that the key characteristics of debt composition evolve slowly over time; the more so, the longer the debt), so that targeting a particular debt profile is an approximate medium-term exercise.

This paper focuses on debt management strategies (DMS) in Latin America, from both a positive and a normative perspective. It starts with a brief review of the standard handbook of debt management –further illustrated by a brief outline of the DMS of Colombia. Next, it discusses the definition of debt perimeter –namely, the items to be considered when devising the space of strategies that optimize the cost-risk balance of a debt strategy for a specific economy–, broadening the scope beyond documented general government liabilities to include both contingent and non-financial items of the public sector balance sheet (PSBC), including a discussion of the embryonic market for green bonds. While not all of these items have the same relevance –or can be as properly quantified– as the conventional debt instruments, they cannot be ignored as they may affect the debt service and the sovereign’s solvency in a non-trivial way.

The paper continues with an empirical account of the evolution of sovereign debt composition in Latin American economies in the past 20 years, including recent changes during the pandemic crisis, to highlight the changes in debt composition underlying the resilience of market access and the perceived sustainability (as captured by credit ratings) of sovereign debt in most Latin American economies, despite a partial reversion of these improvements in recent years. The next section centers on a survey of Latin American Debt Management Offices (DMO), a key ingredient in the design and implementation of safe debt strategies, and a front on which, with a few exceptions, more should be invested in terms of technical capacity and institutional strength.

The final section recaps the discussion, highlighting the renewed relevance of a sophisticated debt management at a time when many countries in the region face the uphill task of gradually undoing the debt upcycle during the pandemic years without compromising an incipient recovery, draws the key policy implications.

Managing risk: Optimal debt composition

Debt management generally takes the government’s financing needs as given and attempts to meet them minimizing expected debt servicing costs, subject to an acceptable level of risk over the medium term. Perhaps the central and most complex part of a debt management exercise is optimizing the debt structure over these risks, including market risk (increases on debt service due to changes in market variables such as interest rates and exchange rates); interest rate / refinancing risk (increases in

⁴ On the private-official tradeoff, see Levy Yeyati (2009) and Cordella and Powell (2021), and the discussion in Paper 6 of this report. On the foreign-local tradeoff, see [Baumann Fonay \(2022\)](#).

refinancing costs that, in the limit, may lead to the loss of market access; because of this, short-term or floating rate debt is usually considered to be more risky than long-term, fixed rate debt); settlement risk (for example, if the government fails to deliver on the debt contract due to technical or legal reasons); and liquidity risk (typically, foreign currency shortages following unanticipated cash outflows or financing hurdles).

This set of considerations highlights a number of critical aspects related to debt composition: denomination, maturity, liquidity (particularly, access to foreign exchange) and access to (more dependable and less onerous) official lending. Moreover, to the extent that the investment base in part determines the currency of denomination and, in many cases, influences maturity and refinancing risks, the composition between financing sources (private versus official, domestic versus external) is an important dimension of the optimal debt strategy.

Needless to say, there is no one-size-fits-all approach to the optimal debt profile. In particular, in many developing economies, some profile choices in terms of currency, creditor base and maturity may not be readily available. In those cases, the best debt strategy may need to adapt to the relevant restrictions. For example, countries may lack sufficiently deep domestic markets, inducing the debt manager to choose between short-term local currency domestic debt and longer-term foreign currency debt, and leading to a heavier reliance on external (normally dollar) finance. Similarly, financially dollarized economies may face higher costs of issuing debt in local currency, which again may push the debt structure towards a larger degree of dollarization.⁵ In turn, low-income economies may have potential access to concessional emergency lending that dominates other official and private sources in cost, risk and liquidity, which in turn affects debt management decisions. Last but not least, debt ratios and composition move slowly, decisions taken today may have implications for several years.

Moreover, debt ratios are endogenous to changes in the environment: a cyclical appreciation in the real exchange rate tends to decrease debt ratios, and might give a misleading impression of the risks and debt management choices.⁶ Debt management should then typically take into account expected medium-term values of the key drivers, and any evaluation of debt policies needs to consider longer windows, thus giving time for policy to accommodate the impact of shocks.

⁵ Instruments in domestic currency may become highly illiquid as tenor rises leading to strongly increasing costs of issuance, pushing debt into foreign currency. See Paper 12 for further discussion. On the other hand, officially dollarized economies typically demand a precautionary pool of dollar liquidity to make up for the loss of the lender of last resort, which may increase reserves at the expense of the total debt.

⁶ This is similar to what happens with equilibrium real exchange rates that, analytically, should depend positively on net foreign assets that, empirically, correlate negatively with real exchange rates in economies with negative global investment positions.

Picking the best strategy

It is generally impossible to guarantee that debt composition will achieve the optimum subject to all the constraints at every moment in time. A more realistic objective is to identify desired parameter combinations that yield acceptable cost - risk combinations (and those that are excessively risky or costly) and to ensure that the actual debt composition follows a path within the desired parameter space. As there may be many ways to achieve this objective, this underlines the need to ensure DMO's with sufficient technical capacity and institutional independence to establish appropriate targets, monitor progress and adapt policies when needed.

The guidelines to the medium-term debt strategy (MTDS) framework developed by the IMF and the World Bank postulate 8 steps for DMOs to select a debt management strategy (DMS) that explicitly recognizes the cost-risk trade off consistent with ensuring debt sustainability:⁷

- 1) Scope and objectives of debt management;
- 2) Current DMS and the cost and risks of the existing debt;

⁷ See Balibek et al. (2019) for a detailed description, and Jonasson et al. (2019) for a brief summary of the cost-risk tradeoffs and their treatment.

- 3) Potential funding sources, including their cost-risk profiles;
- 4) Baseline projections and risks in key policy areas (fiscal, monetary, external, market);
- 5) Structural factors that may potentially influence the desired debt composition in the longer term;
- 6) Alternative strategies ranked on the basis of the cost-risk trade-off;
- 7) Implications of candidate strategies for fiscal, monetary and market conditions; 8) agreement at high levels on the desired DMS.

Specifically, step 6 involves the mapping of alternative scenarios for the debt dynamics. A standard methodology to identify the optimal debt profile would consist roughly in the following ingredients:

- Environment (a set of exogenous real and financial variables: GDP, real exchange rate, terms of trade, external demand, global interest rates, global risk variables, etc.);
- Policy parameters: response functions to changes in the environment for specific components of income and expenditures;
- Scenarios (from stress tests to simulated distributions of the exogenous variables);
- Simulated primary balances plugging the simulated paths for the exogenous variables using the parameters from (2) (it could include predetermined cash flows such as social security payments, as well as estimated “skeletons”);
- Debt service: *for each debt strategy*, an estimated debt service cash flow for each simulated scenario;
- Debt profile frontier: a cost-risk map of each individual debt strategy to pick one based on predefined preferences.

The MTDS offers a tentative list of possible metrics for cost (e.g., interest payments normalized by GDP or tax revenues) and risk (short-term share; foreign currency share, foreign currency debt service over reserves), as well as the more traditional stock variables (debt-to-GDP and debt-to-government revenue ratios, and the NVP of debt-to-GDP). The MTDS analytical tool ranks a limited number of strategies based on “cost-risk” analysis that do involve a trade-off between the variable’s expected value (under the baseline scenario) and the tail value (under stress) to guide the final choice, which may involve multiple such comparisons.⁸

Defining the debt perimeter: Beyond standard debt ratios

The discussion about sovereign debt usually centers on debt under the control of the Treasury. One aspect of this standard sovereign debt definition that merits attention is the level of government to be considered. Specifically, whether subnational entities will be included in a consolidated total, whether and how central bank assets and liabilities should be handled, and whether the liabilities of

⁸ The guidelines to the Colombia’s 2018-2022 debt strategy document (MinHacienda, 2018) is a good example of an exercise that follows broadly the same steps.

State-Owned Enterprises (SOE) should be added in the computation. For example, if we assume that subnational debt is implicitly guaranteed by the sovereign, then it should also be included in the model used to evaluate the cost-risk combinations of alternative strategies.⁹ While most advanced economies compile debt statistics for the general government, Latin American countries often include debts of state-owned enterprises and, in some cases, the Central Bank.

Similarly, a big item concerning the relevant debt definition is the cross holding of government debt by the Central Bank or other public institutions, or even regulated institutional investors –or, more generally, whether the DMO should focus in both gross and net debt and, in that case, what should be netted out. Two questions underlie these distinctions. The first one is, naturally, about the perimeter of the public sector; in particular, whether it should consolidate the central bank and other publicly guaranteed issuers such as state-owned banks and enterprises (as discussed in more detail in paper 3 of this report). The second one, more to the core of this paper, relates to the broader issue of whether different debt holders should be seen differently for the purpose of debt management. In particular, whether state-owned institutions and regulated debt holders should be regarded as more stable –hence, less risky– than private bondholders, a key distinction inasmuch as debt sustainability is at least partially linked to the country’s access to debt rollover.¹⁰

In addition, there are other, non-documented liabilities that may be relevant to assess debt sustainability and should therefore be taken into account when choosing a DMS. For example, potential exposures may arise from guaranteed debts of sub-central governments and SOEs (and of their borrowing calendars, so that auctions are properly distributed), from non-guaranteed borrowers that are likely to add to the government’s obligations under a systemic event, and from contingent liabilities such as guaranteed loans to the private sectors (of the kind prevalent in response to the COVID-19 shock), private guarantees embedded in PPP contracts, and state-contingent instruments (GDP warrants, commodity options) that are usually ignored in static analysis and official statistics. Finally, to the extent that financial stress is intimately related to refinancing and liquidity risk, the level at which the public sector balance sheet is consolidated is not trivial: what public sector perimeter should we take to assess sovereign financial risks?

In this section, we center on contingent liabilities and other elements of the country’s balance sheet not usually included in the standard DSA –and we come back to the relevance of creditors’ composition and the difference between net and gross debt later in the paper.

⁹ The presence of subnational debt has implications for the operation of the DMO, particularly regarding the need to ensure information flows and coordination mechanisms with subnational counterparts.

¹⁰ A similar distinction could be made between private bondholders, private banks and official lenders. We provide an empirical discussion of the relevance of the creditor composition later in the paper.

Contingent liabilities (“skeletons”)

The analysis so far has excluded contingent liabilities (CL) or “skeletons”, which are not documented government obligations but in practice may trigger new obligations (as in contingent debt instruments) or may be assumed by the sovereign in the event of a default of its issuer through explicit guarantees (as with SOEs) or implicit guarantees (as with subnational governments or large private companies).

A classic example of a large explicit contingent obligation is the social security balance, as pay-as-you-go pension schemes remain an undocumented long-term liability to be addressed by the financing strategy of the projected fiscal budget. Even a fully funded private capitalization system may introduce hidden fiscal obligations, as the successive reforms to buttress insufficiently funded private systems show. While the actuarial value of social security liabilities is virtually impossible to assess, a back-of-the-envelope estimation of the medium-term position may shed light on the consolidated debt structure of the government.¹¹

Other contingencies to be addressed by the DMS include state-contingent debt and guaranteed loans. For completeness, a DMO would also need to consider the potential incidence of non-publicly guaranteed corporate debt, particularly those denominated in foreign currency that, while unlikely to represent a fiscal obligation in normal times, may translate into one in the event of a corporate bailout during a crisis.

In short, there are many items that could be added to fatten the tail of the distribution of fiscal obligations in an adverse scenario: the determination of perimeter of fiscal outflows is bound to be a judgement call.

How to measure a skeleton: Alternative approaches to contingencies

A frequently used criterion for measuring the degree to which a program is funded, for example, in the case of social insurance programs, is that of actuarial balance, a closed relative to the concept of net worth in a firm and net wealth in public accounting (Towe, 1991):

$$\text{actuarial balance} = E[PV(\text{inflows} - \text{outflows} - \text{operating expenses})] + \text{reserves}$$

where quantities are in real terms and the discount rate is the real after-tax interest rate on government bonds (proxy for the government's opportunity cost). A contingency program would be said to be actuarially balanced if the expected value of future payouts to all current and future participants equaled the expected present value of the inflows from all current and future participants,

¹¹ The short-term social security flows are already covered in the budgetary projections. For the same reason, cross-country comparisons may consider partially netting sovereign debt with pension funds from the total, as countries that transition to fully funded social security schemes, as the increase in debt ratios is often the flipside of a decline in the contingent social security debt (see Borenzstein et al., 2007).

plus the value of any reserve fund. As in any DSA, in addition to targeting actuarial balance (that is, *solvency*), one needs to take into account the risks of a negative cash flow in excess of reserves in the near term (that is, *liquidity*), which suggest a more conservative strategy (additional reserves, or a buffer) than what would be needed to achieve actuarial balance.

There is a difference between implicit CLs (a moral obligation or expected responsibility of the government that not established by a law or a contract) and explicit CLs, and, within the latter, between guarantees for non-sovereign borrowing and obligations issued to subnational governments and public and private sector entities. In practice, only the most advanced countries provide a comprehensive overview of their CLs and, even then, implicit CLs are often not fully addressed.

To assess quantitatively the fiscal cost of contingencies, Bova et al. (2016) used a dataset that spans a total of 80 countries (34 advanced economies and 46 emerging market economies) over the period 1990-2014. They classify the CLs in seven categories (financial sector, SOEs, subnational government, natural disasters, private non-financial sector, legal, and PPPs) and used two complementary approaches: 1) a stock-flow adjustment: the discrepancy between the annual change in gross public debt and the budget deficit, and 2) the forecast error: regressing rises in the debt-to-GDP ratio into rises in the deficit and growth slowdowns, and attributing the residual term to increases in debt due to the realization of contingent liabilities.¹²

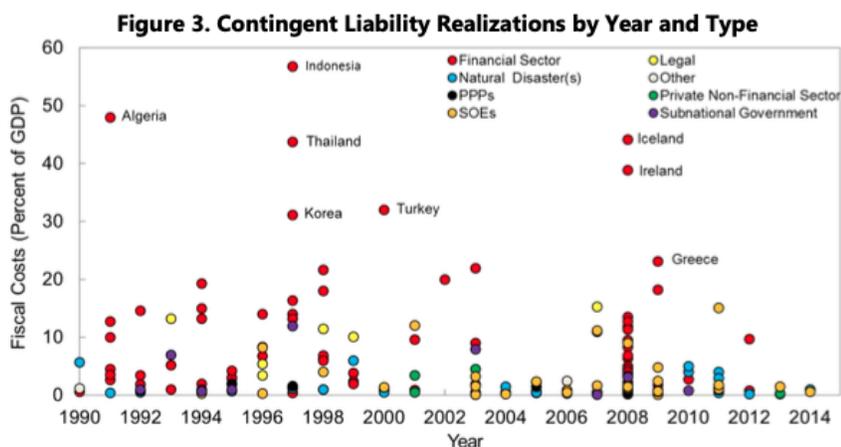
They find that financial sector CL realizations tend to be costly: an average 9.7 percent of GDP with many episodes with costs over 20 percent, associated with a worsening in the fiscal balance, a debt increase and a drop in growth). They also highlight that, although CL realizations tend to occur in periods of economic stress, emerging market economies that experienced large financial sector-related CL realizations during the Asian Crisis did not face comparable costs during the global financial crisis, which suggests that past experience may have taught countries how to attenuate CL exposure.

¹² From the stock-flow adjustment equation:

$$dt = -tdt - 1 - obt + t$$

where $x_t = x_t - E_{t-1}x_t$ is the difference between the WEO forecast of variable x for year t made in year $t-1$ and outcome for year t based on WEO data submitted in year t . The variable t is the forecast error residual. Additionally, they use key word search to control for potential false positives or missed true realizations.

Figure 1. Contingent liability realizations by year and type



Source: Bova et al. (2016)

State-contingent debt

Given the number of sovereign defaults, which tend to occur in bad times, there has been much interest in making debt state contingent – see also the discussion in Paper 9. There are many possible ways to reduce contractual payments in bad times and increase them when times are good.

There has been much recent interest in GDP-indexed bonds, that have the potential to smooth debt service ratios and stabilize public finances (BoE, 2016). These instruments limit interest payments in bad times and so reduce the probability of debt becoming unsustainable (Blanchard, Mauro, Acalin, 2016). They act as “a form of recession insurance that reduces principal and interest payments when a country is hit by a negative growth shock” (Brooke, Mendes, Pienkowski and Santor; 2013).

Costa Rica, Bulgaria and Bosnia and Herzegovina issued GDP-linked bonds as part of their Brady Plan restructurings. Similar instruments were issued by Argentina, Greece and Ukraine after their debt crises. (Costa, Chamon and Ricci, 2008; Zettelmeyer, Trebesch and Gulati, 2013; Ministry of Finance of Ukraine, 2015).¹³ In practice, markets tended to penalize the lack of liquidity in these instruments¹⁴ and as returns to investors may be more volatile, they commanded a premium relative to a standard bond (Blanchard, Mauro, Acalin, 2016).

Cecchetti and Schoenholtz (2017) also argued that government officials could coerce statistical agencies into reporting lower levels of nominal GDP to reduce payments, and that the GDP figures may

¹³ Italy’s [BTP-Futura](#) is an example of recent non-crisis-related, GDP-linked bond that grants minimum annual coupon rates plus bonus payment proportional to the country’s growth to holders that purchase during the placement and hold until maturity. Following previous concerns regarding target shareholders, this bond is aimed at medium-term retail investors.

¹⁴ See Cruces and Levy Yeyati (2016).

be subject to serious and delayed data revision complicating GDP indexed bond valuation and payment arrangements.

Commodity indexed bonds reduce these problems but are more relevant to those countries heavily dependent on commodity exports, or possibly commodity importers. Valuations are facilitated for a select number of commodities that have liquid derivative contracts at longer maturities. Still, a further problem with both GDP and commodity indexed debt is the potentially high “willingness to pay” risk in good times when countries would pay back more, and the contracts would be “out of the money” relative to a standard debt contract. Arguably this was a further reason why Argentina’s GDP warrants and Venezuela’s “oil recapture clause” (within its Brady deal) appeared to be under-valued by the market.

For this motive, Anderson, Gilbert and Powell (1989) argued for multilateral development bank to provide guarantees on commodity indexed instruments to kick-start a market in contingent debt instruments.¹⁵ More recently, the IDB and other MDB’s have played the role of intermediaries between countries and investment banks, to reduce perceived credit risks, and allow countries access to commodity linked loans or swaps on more attractive terms.

A further class of state contingent debt are CAT (catastrophe) bonds and disaster indenture clauses, tailored to hedge against specific external risks associated with natural disasters, have been used recently by Colombia, Mexico and Peru. Another option to smooth out variations in the debt service-to-GDP ratio is the use of Yet another, still untested state-contingent instrument endorsed by economist is the so called sovereign contingent convertible debt (or CoCos): bonds that automatically extend the repayment maturity when a country receives liquidity assistance from the official sector, is seen as a way to induce a bail in of creditors that would potentially increase market discipline on sovereigns, as well as, more importantly, facilitate the negotiation of IMF-led packages, which are typically subordinated to, and often delayed by, private sector restructuring. Sovereign CoCos were first advocated by Weber, Ulbrich and Wendorff (2011) in the context of the euro area, building on the ‘Universal Debt Rollover Option with a Penalty’ (UDROP) proposal by Buiters and Sibert (1999).

On a normative note, should these instruments be part of the manager’s toolkit? This will depend on the cost-risk tradeoff. Unfortunately, high perceived credit risk and illiquidity has tended to make costs relatively high. On a positive note, how should the DMU consider these issues in its debt management exercise? Because these are non-cash instruments,¹⁶ debt ratios are usually silent about them and therefore understate the debt service in good times –and may paint an overall rosier debt scenario.

¹⁵ “Securitization and Commodity Contingency in International Lending” Ronald W. Anderson, Christopher L. Gilbert and Andrew Powell Pages: 523-530, May 1989, American Journal of Agricultural Economics.

¹⁶ They have no principal and, in the particular case of a GDP linker, the state-contingent coupon is typically detached from the bond into a stand-alone, marketable GDP warrant.

Dynamic analyses of debt service, by contrast, tend to include naturally the case of the GDP and commodity warrants, since growth and the commodity terms of trade are key inputs in scenario design suggesting an advantage to dynamic debt sustainability methodologies.

A balance sheet approach¹⁷

A priori, debt management practices aimed at hedging risks and enhancing the ability to absorb exogenous shocks should take into account the government's overall balance sheet structure.¹⁸ However, a balance-sheet analysis requires a reliable assessment of future public revenues and on- and off- balance sheet liabilities. Perhaps the clearer example in this regard is New Zealand, which, in compliance with the Public Finance Act of 1989 (Part III), must prepare annual consolidated financial statements in accordance with generally accepted accounting practices.¹⁹

Table 4.1 presents a simplified scheme of the government's balance sheet and the resulting net worth. Measuring each of these components is not straightforward and entails methodological decisions: Should physical assets be treated as "marketable" in the sense that they can be used to finance liabilities? Should debt be valued at face or market value? Should contingent liabilities be taken at their actuarial value? Should the cash flow of state-owned-enterprises (SOE) –which typically includes a subsidy component–, social security or tax revenue be extended forward assuming today's legislation?²⁰ Last but not least, because of their different correlations with growth, discount rates on assets and liabilities may differ.²¹ Given that the balance sheet is the present value of future flows, what discount rate should be used to do such discounting?

¹⁷ This section borrows from Levy Yeyati and Sturzenegger (2020). See also Das, Udaibir S., Yin Lu, Michael G. Papaioannou, and Iva Petrova, 2012. As opposed to the discussion in paper 3 that focused on the sovereign's financial asset and liabilities, in this section I refer to the whole balance sheet, including non-debt assets.

¹⁸ As discussed in the next paper, debt sustainability usually refers to a situation in which obligations can be paid without resorting to an (economically or politically) unfeasible fiscal adjustment, a forced restructuring or a default. Thus, modern DSA tends to focus on liquidity indicators such as the debt service-to-fiscal revenues ratio or the stock of international reserves, or on potentially explosive debt dynamics that can trigger financial stress, as captured by the failure to stabilize the debt-to-GDP ratio (see The World Bank, 2019 and IMF, 2021), eluding an explicit measure of the country's solvency, which is at the center of the balance sheet approach.

¹⁹ Specifically, they must include, in addition to financial statements, statements of borrowings, capital expenditures, emergency and capital expenses, trust money administered by departments and offices of the Parliament, and any additional information and explanations needed to fairly reflect the consolidated financial operation and its financial position. Countries such as Australia, Canada, France and the UK publish integrated financial statements, while others (Austria, Cyprus, Portugal and Spain in the eurozone; China, Indonesia, Japan, Malaysia and Vietnam in Asia; Brazil, Chile and Peru in Latin America) have plans to do so soon (OECD, 2017).

²⁰ This appears to be the natural choice if sustainability is to be mixed under the current policy mix. Stress tests on net worth based on specific policy changes can be used to complement the analysis.

²¹ Based on this argument, Jiang, Lustig, Van Nieuwerburgh, and Xiaolan (2019) find that the present value of future surpluses in the U.S. is -155% of GDP! Surpluses are the difference between taxes and spending, both of comparable nominal value. But, because taxes are more procyclical than spending at medium to long horizons, they command a higher discount rate.

Table 1. The balance sheet

Assets	Liabilities
Liquid Assets	Explicit Liabilities
Physical Assets	Contingent Liabilities
NPV of taxes	(NPV Social Security)
Net worth of SOE	(NPV Health insurance)
	(NPV Other expenditures)
	Net Worth

The implementation of a balance-sheet approach follows directly from Table 3. The measurement of each of its components merits some comment. Within the asset side, liquid assets should be measured at their current market value. Physical assets are also valued at market value to the extent that they are assets that may be disposed of, but are excluded if they are unlikely to be sold on short notice at a reasonable price (roads, government buildings, IMF quotas, etc.). Finally, the net worth of SOEs should come from its approximate market value whenever there is one. The main component of the asset side is often the most difficult to assess: the net present value of taxes. To compute it, a future path of tax revenues needs to be postulated, usually based on the current tax structure, although alternative (possibly contingent) scenarios can also be tested. Regarding the liability side, in addition to liabilities with a predetermined cash flow (public debt, net social security outlays), government spending can be estimated as a function of a few exogenous variables, including contingent liabilities.²²

Debt composition in Latin America in the 2000s

How does the recent evolution of debt profiles in the region reconcile with the normative conclusions discussed above?

A brief account would go like this: as they survived or recovered from financial crises primarily induced by an over dependence on external, foreign currency-denominated finance, countries undertook debt de-dollarization policies through the development of local markets and the substitution of local currency debt for dollarized external bonds, aided by the real appreciation of commodity currencies in the 2000s that further reduced the incidence of external debt on the total. By 2011, after the commodity boom started to revert, a combination of modest growth, fiscal deficits and stable-to-weaker currencies led to a partial reversion of this process, although the lengthening of

²² As the Bova et al. (2013) point out, the lack of consistent balance sheet data makes country comparisons, let alone statistical inferences, quite difficult, but new technologies can improve the speed and accuracy of integrated financial statements, and could make the consolidation of financial information within the public sector more straightforward, and establish the balance-sheet analysis as a standard approach to analyze fiscal sustainability.

maturities slowed down in the 2010s but remained in place due to the generous global liquidity and historically low and relatively flat international yields.²³

In this context, the pandemic did not mark a disruption but rather a deepening of the most recent trends, increasing indebtedness and reliance on foreign currency debt, both from private creditors and official lenders. In short, the history of Latin American debt composition could be summarized as a “Nike swoosh”-shaped evolution of dollar and external debt ratios coupled with an upward trend in maturities and a discrete jump in 2020.

Before exploring this narrative in the data, a few comments are in order:

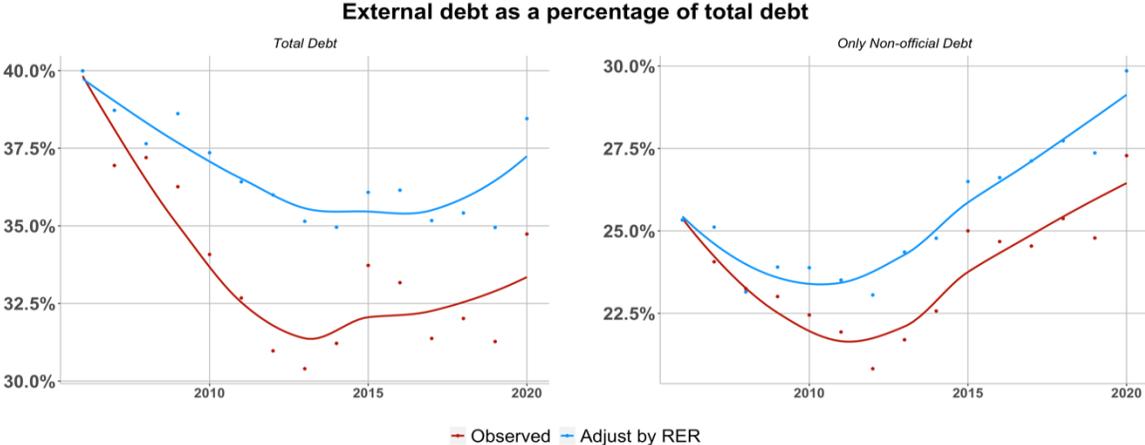
- Because debt ratios and external and foreign currency shares are sensitive to movements in the real exchange rate and changes in composition tend to be slow moving, we need to correct for the incidence of exchange rate fluctuations on debt ratios, which we do by presenting dollar and external debt ratios at both current and constant real exchange rates.
- We also need to correct for the country’s access to international bond markets by distinguishing financially integrated, emerging economies from both newcomers to the credit asset class (Bolivia and Paraguay), generally smaller Central American economies, and outliers (crisis countries such as Argentina and Venezuela, and officially dollarized economies such as Ecuador and El Salvador) for which, because of financial constraints (lack of access, illiquidity or credit events), the evolution of standard ratios could be misleading. We do that by focusing on two groups: Latin American emerging markets (LAC6: Brazil, Chile, Colombia, México, Perú, Uruguay), and Central American (CA: Costa Rica, Dominican Republic, Nicaragua, Honduras, Guatemala).
- Finally, while analyzing foreign currency shares, we correct for the incidence of official debt that does not involve the same foreign currency liquidity risk as the external debt with private creditors.

A quick look at the evolution of debt profiles in LAC6 confirms the previous account: both external and dollar debt ratios (intimately linked, given the tight correlation between jurisdiction and denomination) declined until the early 2010s, *pari passu* with the commodity (terms of trade) cycle, before reverting partially through 2019, a trend that accelerated in the pandemic year 2020 (**Figure 2**). When we correct for real exchange rate fluctuations, this shape is not altered but is considerably flattened (as perceived de-dollarization in part reflects relative price changes between the foreign and the local currency) and

²³ By contrast, countries such as Bolivia or Paraguay that accessed international markets for the first time in the 2000s, by contrast, gained lower costs and longer maturities at the expense of higher dollar/external debt ratios.

steepened (indeed, once “corrected”, the average foreign currency debt-over-GDP ratio is actually higher than at the beginning of the period).²⁴ Interestingly enough, while external and dollarization ratios are lower once (external and dollarized) official debt is excluded, the de-dollarization reversal is similarly, if not more, pronounced.

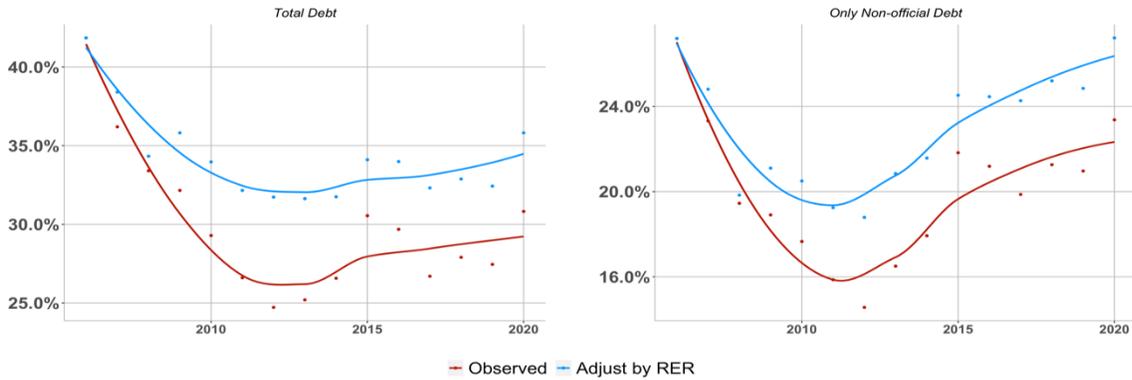
Figure 2. External and foreign currency debt ratios over time: LAC6 (smoothed averages)



Smoothed mean of LAC6 countries.
 Note: Due to data availability, the debt composition for Colombia and Peru for the years 2006-2007 are estimates.

²⁴ As with the rest of the figures in this section, box charts displaying the distribution of the evolution of debt ratios corresponding to Figure 5 are presented in the Appendix.

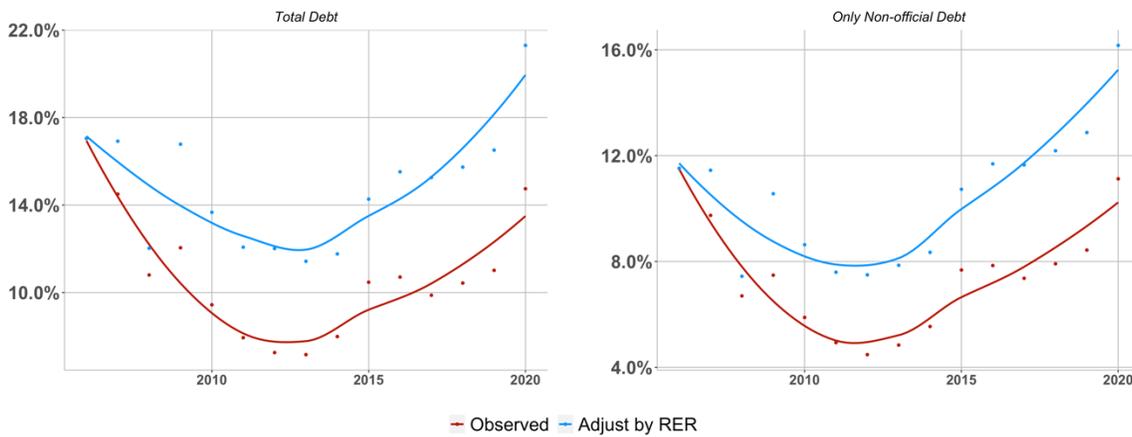
Debt denominated in foreign currency as a percentage of total debt



Smoothed mean of LAC6 countries.

Note: Due to data availability, the debt composition for Colombia and Peru for the years 2006-2007 are estimates.

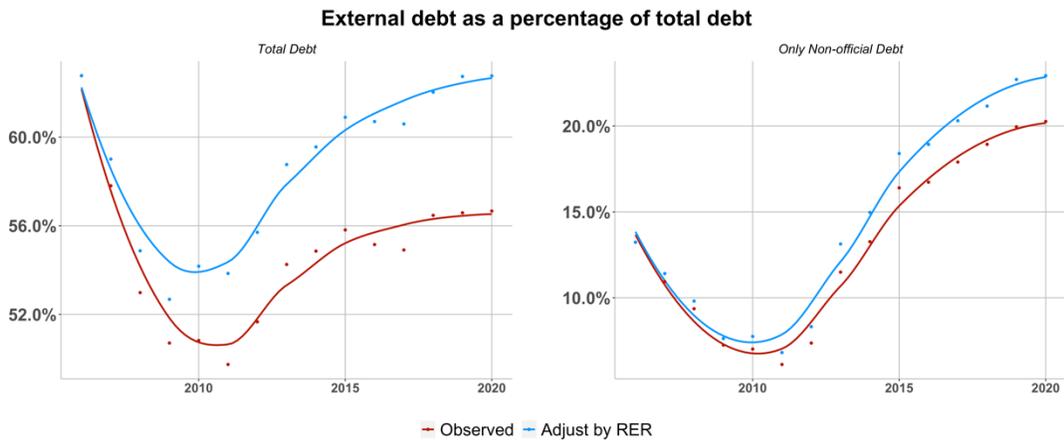
Debt denominated in foreign currency as a percentage GDP



Smoothed mean of LAC6 countries.

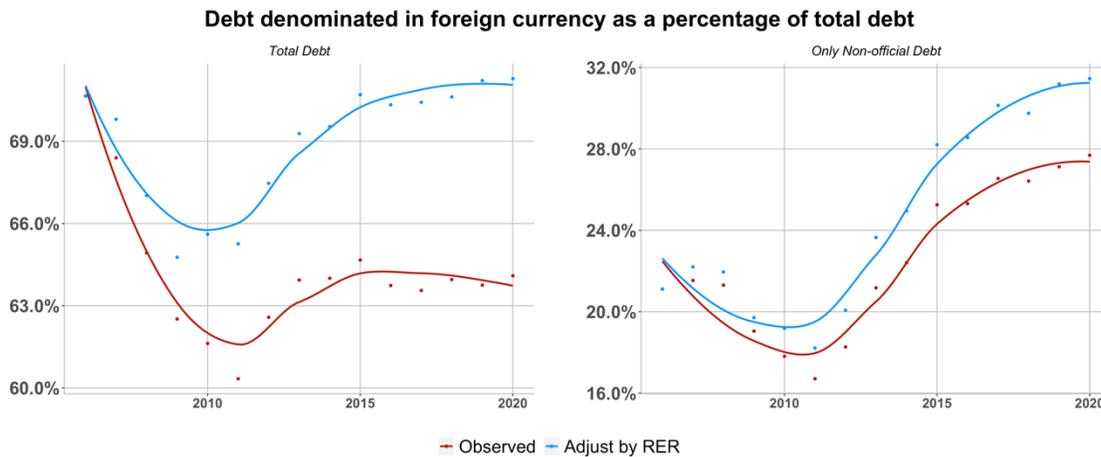
Note: Due to data availability, the debt composition for Colombia and Peru for the years 2006-2007 are estimates.

Figure 3. External and foreign currency debt ratios over time: Central America (smoothed averages)



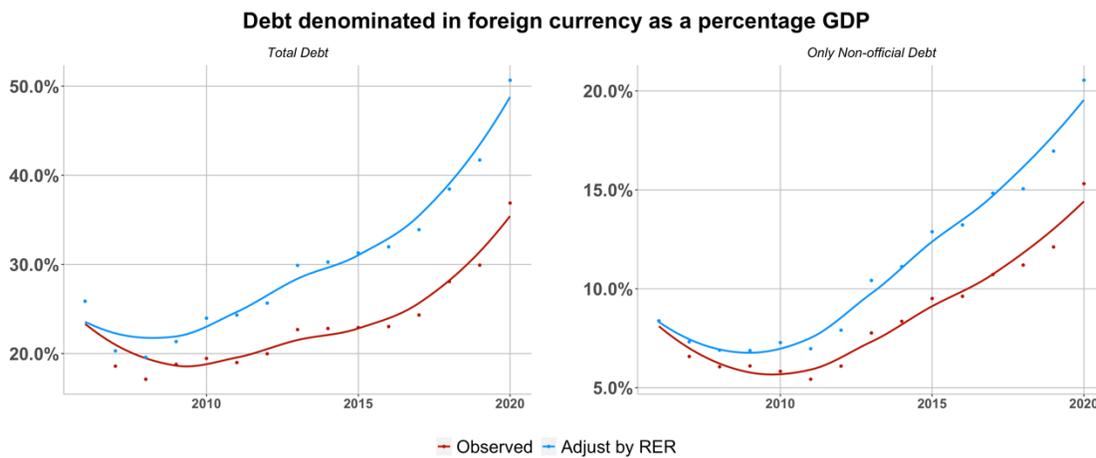
Smoothed mean of a pool of Central American countries.

Note: Due to data availability, the debt composition for Guatemala and Honduras for the years 2006-2007 are estimates.



Smoothed mean of a pool of Central American countries.

Note: Due to data availability, the debt composition for Guatemala and Honduras for the years 2006-2007 are estimates.

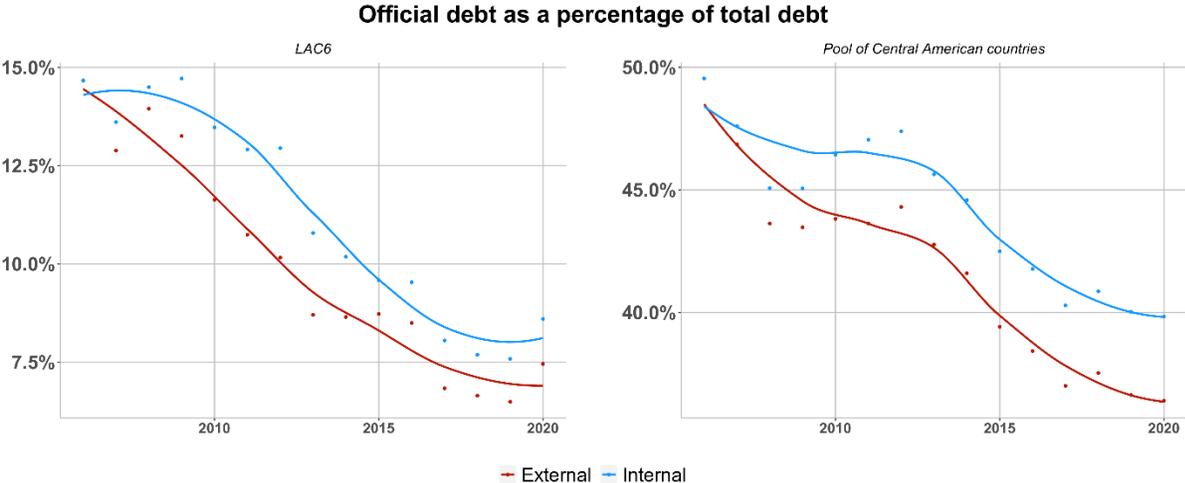


Smoothed mean of a pool of Central American countries.

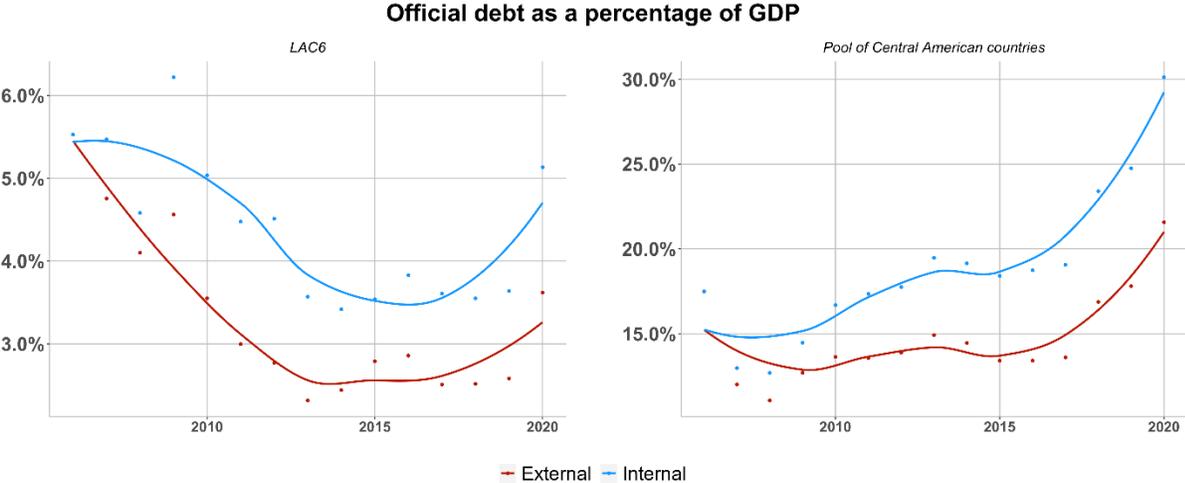
Note: Due to data availability, the debt composition for Guatemala and Honduras for the years 2006-2007 are estimates.

The data tells a similar story for Central American economies (**Figure 4.4**), with one crucial difference: a much larger incidence of official debt (**Figure 4.5**) that determines the evolution of total debt ratios (a stylized fact that should qualify the way in which we look at debt dynamics and exposures in the region), albeit with a recently upward trend in dollarized external bonded debt that adds to currency and liquidity exposures. As argued above, similar debt dollarization ratios have different implications for financial fragility depending on whether the creditor is private or official.

Figure 4. Official debt ratios: LAC6 & Central America (smoothed averages)



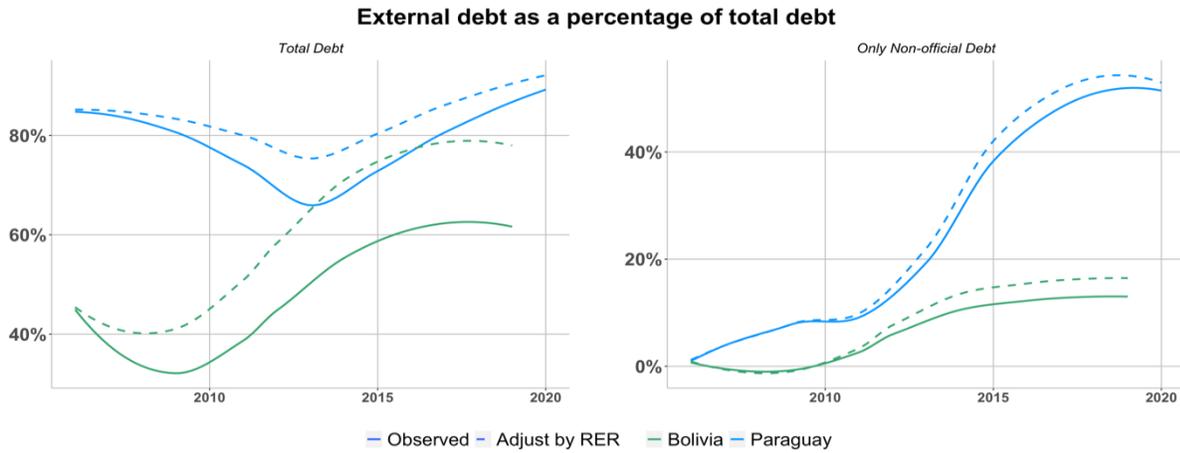
Smoothed mean of the average maturity by legislation.



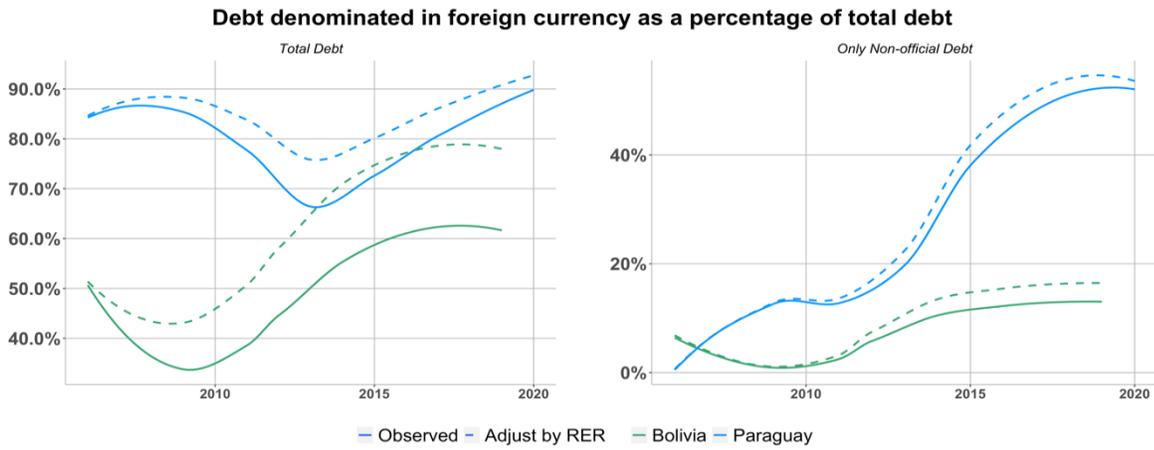
Smoothed mean of the average maturity by legislation.

Two countries (Bolivia and Paraguay) highlight the transition from official to private sources of finance. Both started to issue global bonds in the late 2000s and commercial debt became more dollarized as a result (Figure 4.6).

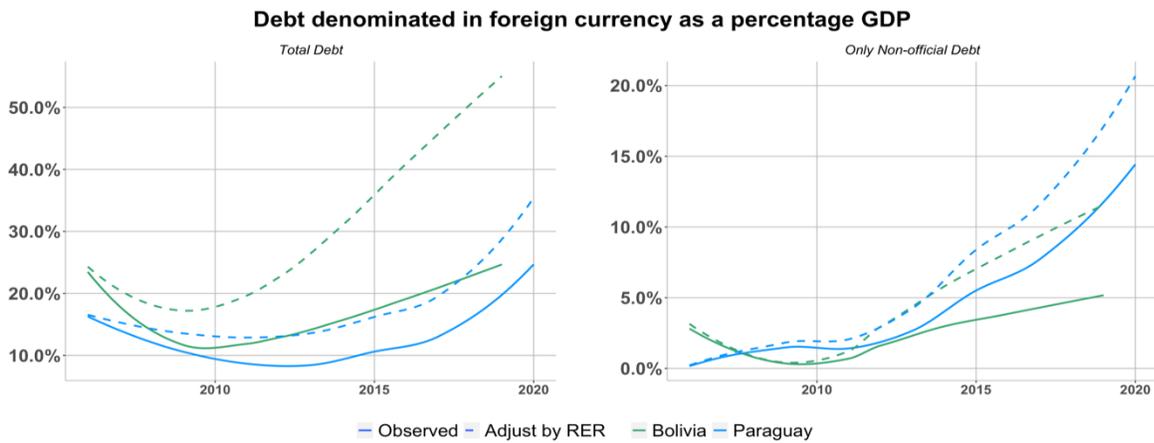
Figure 5. Official debt ratios: Bolivia & Paraguay (smoothed averages)



Note: Due to data availability, the debt composition for Paraguay the years 2006-2007 are estimates.



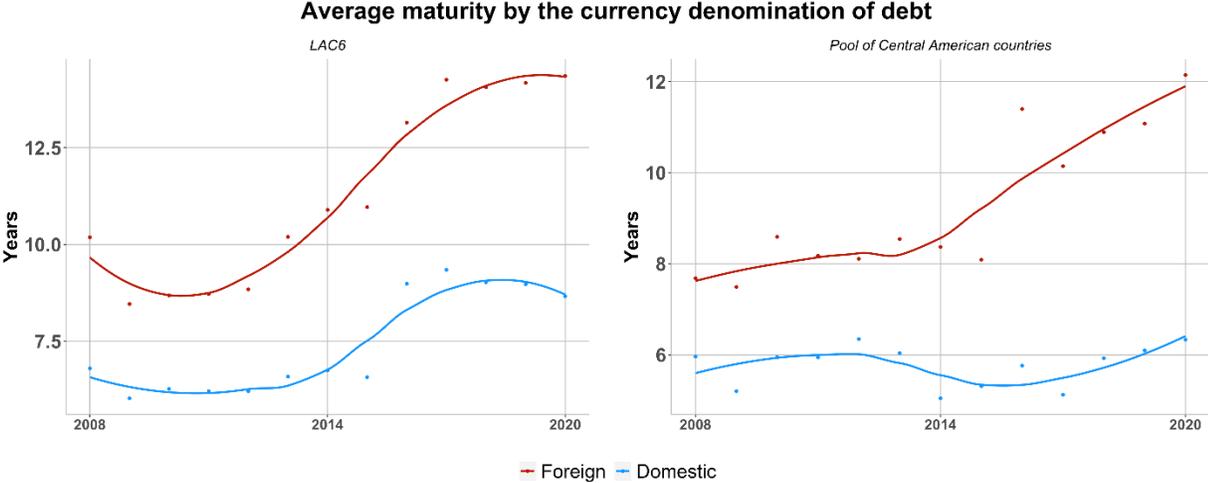
Note: Due to data availability, the debt composition for Paraguay the years 2006-2007 are estimates.



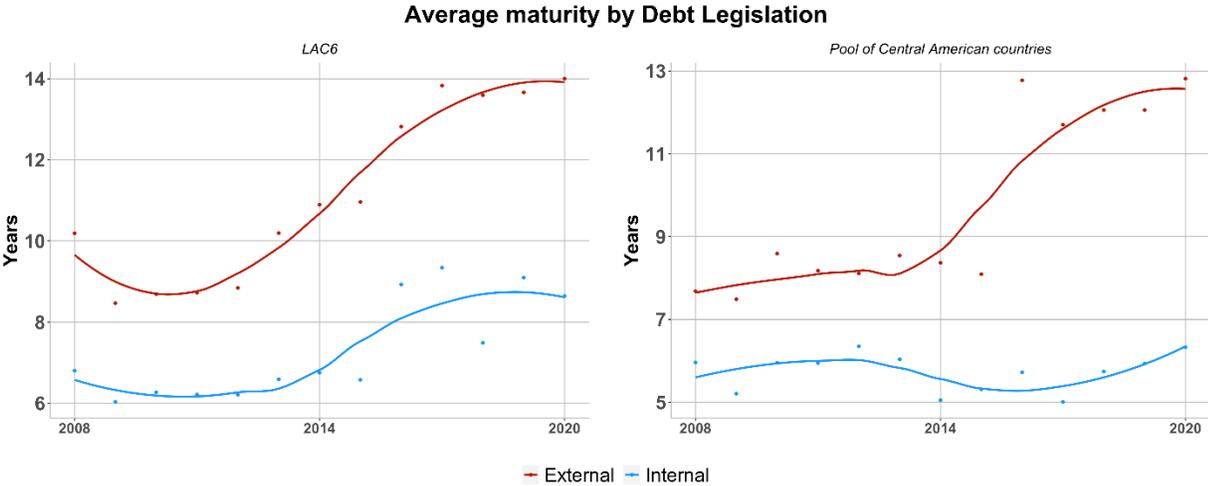
Note: Due to data availability, the debt composition for Paraguay the years 2006-2007 are estimates.

The data illustrates the currency-maturity tradeoff, as dollarized external debts was issued at longer maturities compared to that in domestic currency. Indeed, while bond duration has lengthened in both the domestic and external markets, it is in the latter where the advances look more striking, especially given the abundant global liquidity in recent years (Figure 4.7).

Figure 6. Evolution of the average maturity of bonded debt: LAC6 & CA (smoothed averages)



Smoothed mean of the average maturity by currency.



Smoothed mean of the average maturity by legislation.

To summarize this progress and compare it across counties in the region, Table 4.2 offers a summary before-and-after cross-country comparison of key features of the debt profile in Latin America countries over past 15 years (with the emerging market average excluding LAC as a reference). The list included, in addition to the public debt-to-GDP ratio (a standard measure of indebtedness), the sovereign spread and Standard & Poor’s external credit risk rating:

- the external-to-total debt ratio (to capture the incidence of jurisdiction on the probability of default and the associated recovery value);
- the foreign currency-to-total debt ratio (usually associated with a larger overall currency exposure);
- the official-over-total external debt ratio (to account for the more stable nature of official credit);
- the resident-over-total private creditor base ratio (to reflect the greater sensitivity of international investors to the global financial cycle);
- the reserve-to-total debt ratio (to reflect the benign impact of liquidity for a given net debt documented in the literature);²⁵ and
- the short term-over-total debt ratio (to account for the lower rollover and interest rate risk or longer-term debt).

²⁵ See Levy Yeyati (2008). Levy Yeyati and Gómez (2020) and Sosa-Padilla et al. (2021), and the discussion in papers 2 and 12 of this report.

Table 2. Debt profile indicators

		Debt Ratio (% GDP)	External Debt (% Total Debt)	FX Debt Ratio (% Total Debt)	Official Ratio (% External Debt)	Resident Ratio (% Total Debt)	Reserve Ratio (% Total Debt)	Short (% T
Argentina	2006	69%	41%	60%	32%	59%	20%	
	2019	89%	44%	78%	52%	56%	14%	
Belize	2008	79%	85%	85%	40%	15%	15%	
	2019	99%	70%	70%	58%	30%	15%	
Brazil	2006	52%	12%	11%	17%	88%	15%	
	2019	56%	4%	4%	2%	96%	34%	
Chile	2006	14%	21%	25%	27%	79%	96%	
	2019	30%	20%	19%	6%	81%	51%	
Colombia	2009	36%	36%	32%	39%	64%	28%	
	2019	48%	34%	34%	39%	66%	34%	
Costa Rica	2015	52%	20%	31%	23%	80%	29%	
	2019	58%	22%	42%	29%	78%	24%	
Dominican Republic	2008	24%	66%	70%	77%	34%	25%	
	2019	40%	67%	68%	29%	34%	25%	
Ecuador	2008	22%	73%	100%	58%	27%	33%	
	2019	48%	72%	100%	45%	28%	6%	
El Salvador	2008	35%	81%	100%	47%	19%	35%	
	2019	47%	79%	100%	35%	21%	35%	
Guatemala	2015	24%	48%	54%	77%	52%	50%	
	2019	27%	45%	49%	55%	55%	72%	
Jamaica	2008	101%	42%	51%	33%	58%	14%	
	2019	93%	62%	62%	44%	38%	24%	
Mexico	2006	20%	21%	21%	13%	79%	39%	
	2019	35%	21%	21%	29%	79%	39%	
Panama	2008	45%	81%	100%	18%	19%	23%	
	2019	46%	78%	100%	26%	22%	11%	
Peru	2008	22%	64%	58%	62%	36%	111%	
	2019	24%	30%	30%	30%	70%	124%	
Uruguay	2006	63%	77%	85%	25%	23%	26%	
	2019	49%	78%	56%	12%	22%	49%	
Emerging markets (exc. LAC)	2019	54%	46%	35%	21%	25%	34%	

Final remarks

Debt management is particularly complex in open developing economies with limited local savings and narrow domestic markets, to which we could add the presence of contingent liabilities²⁶ and the procyclicality of international investors with respect to emerging markets. It is as much about minimizing costs as it is about hedging risks. Sustainability implies the capacity not to repay debt at

²⁶ These include the not always transparent bilateral debt with China (see paper 6 in this report).

maturity but rather to refinance it at a reasonable cost, keeping the debt service within fiscally manageable limits. Naturally, debt stocks and service flows are connected: a debt ratio systematically trending upward would raise investors' concerns and widen spreads, increasing the debt burden and possibly cutting the country off from voluntary markets. But this could also be the result of an increase in global risk aversion due to external causes (as in the Great Recession or in the COVID pandemic) or a liquidity shortage coupled with U.S. strengthening following a sharp swing in the global financial cycle (as with the Fed tightening in 1979, 1994 and 2022). One key role of the DMO is to mitigate those exposures through the management of the debt profile, even at the expense of an immediately higher borrowing cost.

Given the dimensionality of the problem and the uncertainty of its key determinants, seeking "optimality" through a carefully calibrated algorithm is unrealistic. A more practical approach is to choose a strategy with no large vulnerabilities, that is, one that avoids really bad outcomes such as large balance sheet effects in the event of a sudden real devaluation; risky roll overs due to the excessive bunching of maturities; or large contingencies central public debt managers are not aware of (particularly those correlated with systemic factors that may also stretch documented financing needs), and manage liabilities aiming at gradual improvements, taking advantage of market opportunities. In addition, debt managers should manage debt taking into account the asset side, namely, the stock of liquid international reserves (which the literature has shown to mitigate financial stress) and, to the extent that can be translated into market values, the structure of public sector income and expenditure, including contingent obligations.

Many Latin American economies managed to gain financial resilience and decouple from foreign currency fluctuations in the past two decades by relying increasingly on local currency domestic markets and investors, lengthening maturities and keeping a dollar liquidity buffer for the rainy days. The improvement in debt management was reflected in a more benign debt composition, with lower shares of dollarized external debt, and longer maturities, both locally and externally, at lower borrowing costs. Indeed, learning from debt crises in the past, some Latin American countries have enhanced their DMOs and adopted more sophisticated –and less myopic– debt management strategies. However, these improvements have been heterogeneous within and across countries: these are areas that are generally weaker than others, and countries that still lack a proper DMS framework and a well-staffed and institutionally empowered DMO.

While liability management moving forward will likely tread a very narrow path as cost considerations become more taxing, given the risk that the liquidity conditions and international interest rates will not revert to those in the late 2010s any time soon, from a medium run perspective the advice remains to rekindle the demand for local currency debt and longer maturities. Perhaps more controversially, as multilateral lenders become more competitive in this new environment, a smart reliance on official

credit may help ameliorate the cost of debt lengthening. In this new landscape, the focus on debt management has become even more critical to preserve past progress in the years to come.

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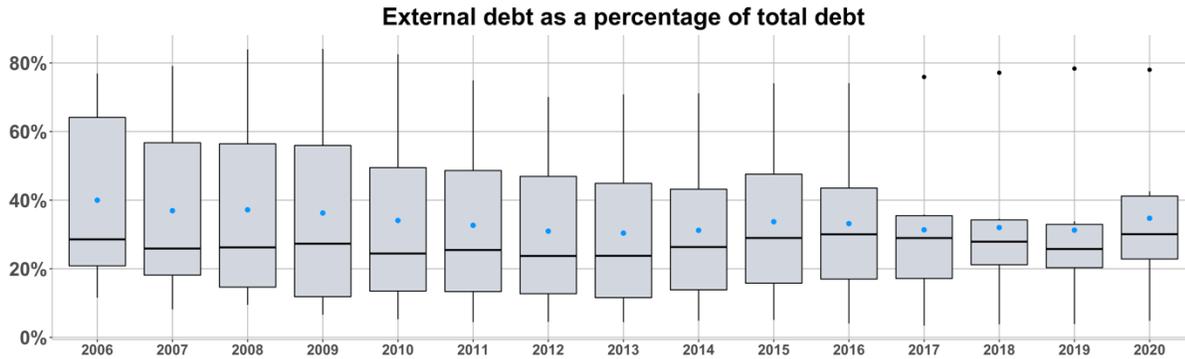
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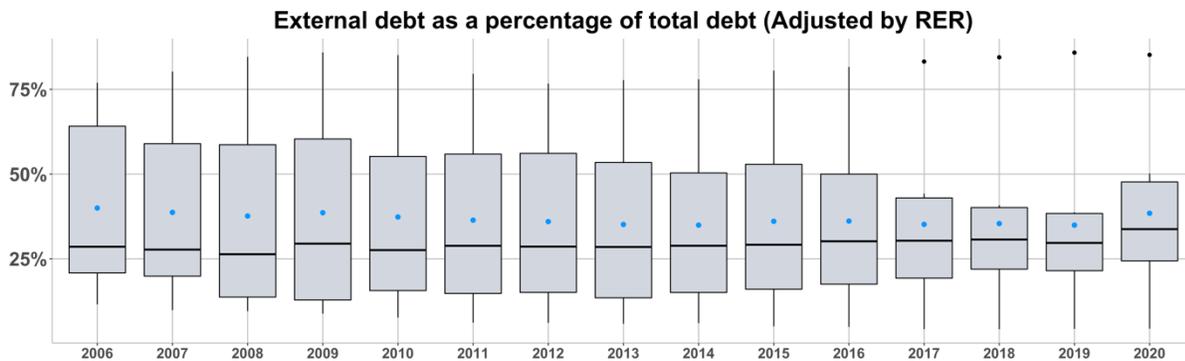
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Appendix

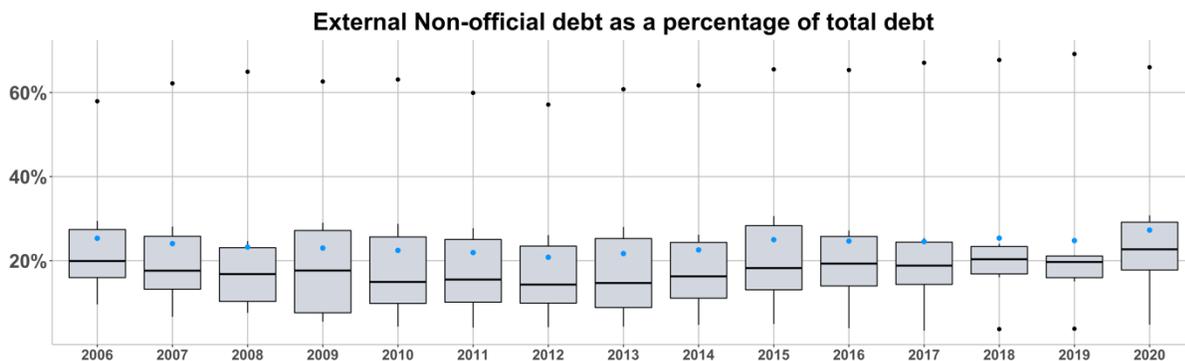
Figure A1. External and foreign currency debt ratios over time: LAC6



LAC6 countries. Blue dots represent the mean by year.
 Note: Due to data availability, the debt composition for Colombia and Peru for the years 2006-2007 are estimates.

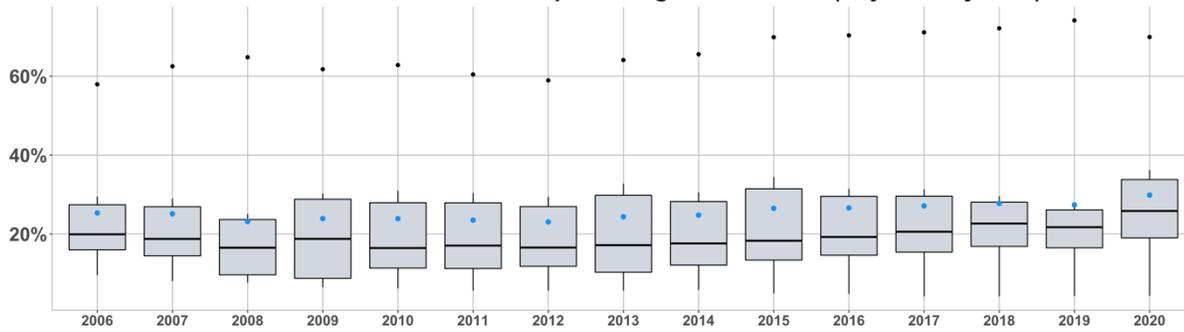


LAC6 countries. Blue dots represent the mean by year.
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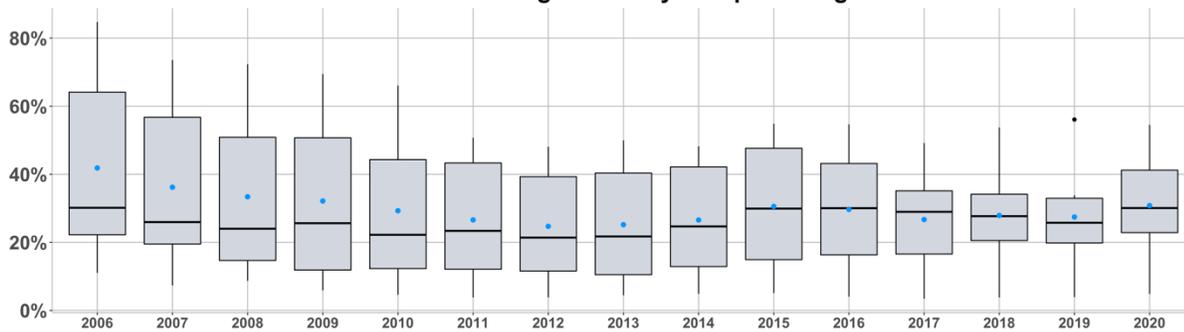
External Non-official debt as a percentage of total debt (Adjusted by RER)



LAC6 countries. Blue dots represent the mean by year.

Note: Due to data availability, the debt composition for Colombia and Peru for the years 2006-2007 are estimates.

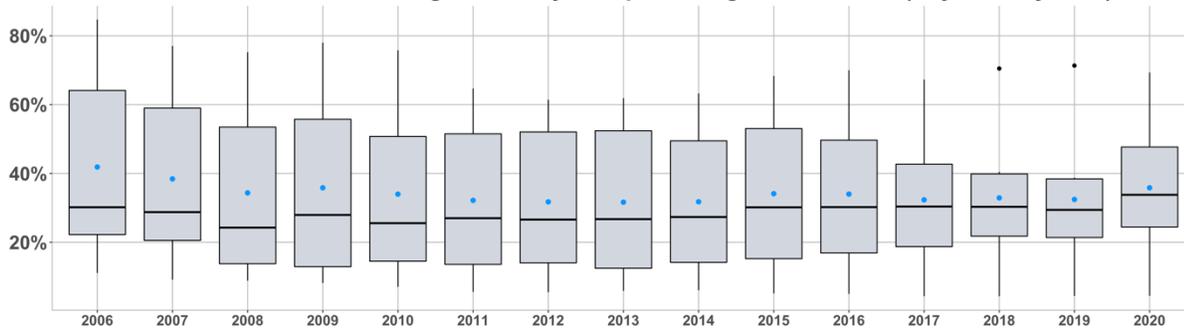
Debt denominated in foreign currency as a percentage of total debt



LAC6 countries. Blue dots represent the mean by year.

Note: Due to data availability, the debt composition for Colombia and Peru for the years 2006-2007 are estimates.

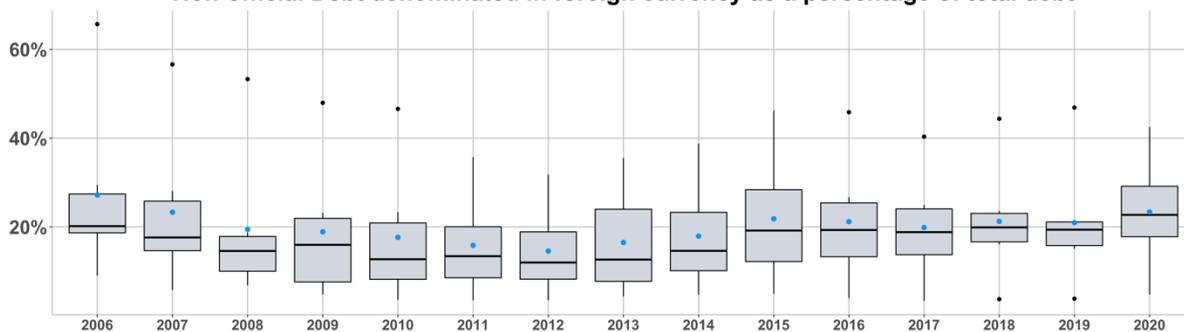
Debt denominated in foreign currency as a percentage of total debt (Adjusted by RER)



LAC6 countries. Blue dots represent the mean by year.

Note: Due to data availability, the debt composition for Colombia and Peru for the years 2006-2007 are estimates.

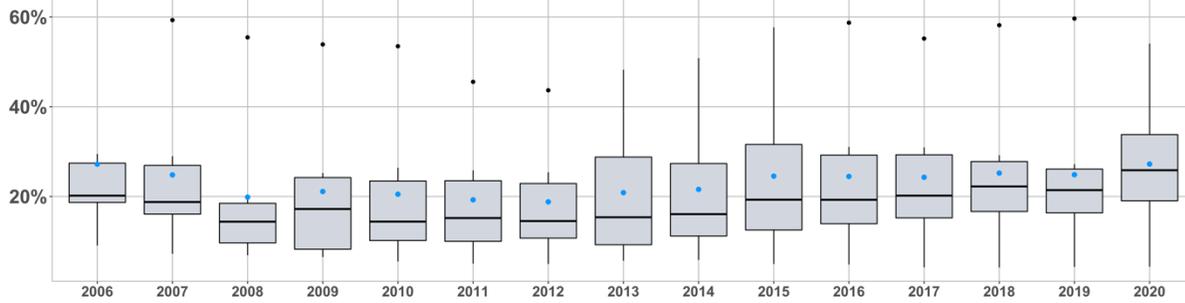
Non-official Debt denominated in foreign currency as a percentage of total debt



LAC6 countries. Blue dots represent the mean by year.

Note: Due to data availability, the debt composition for Colombia and Peru for the years 2006-2007 are estimates.

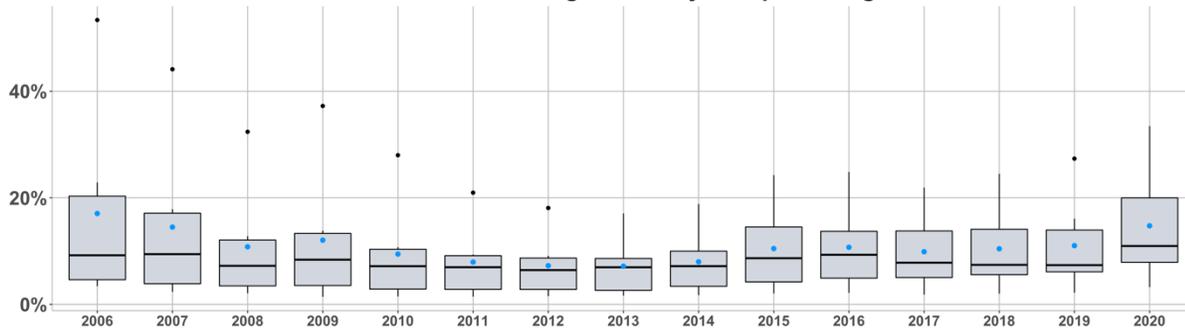
Non-official Debt denominated in foreign currency as a percentage of total debt (Adjusted by RER)



LAC6 countries. Blue dots represent the mean by year.

Note: Due to data availability, the debt composition for Colombia and Peru for the years 2006-2007 are estimates.

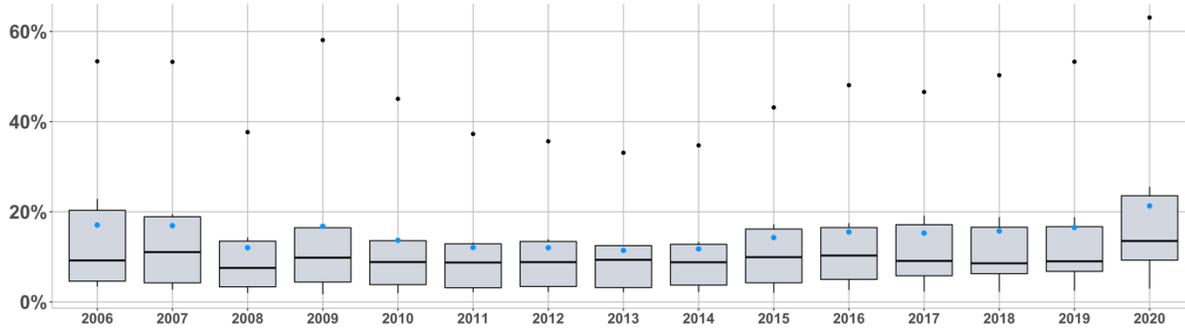
Debt denominated in foreign currency as a percentage of GDP



LAC6 countries. Blue dots represent the mean by year.

Note: Due to data availability, the debt composition for Colombia and Peru for the years 2006-2007 are estimates.

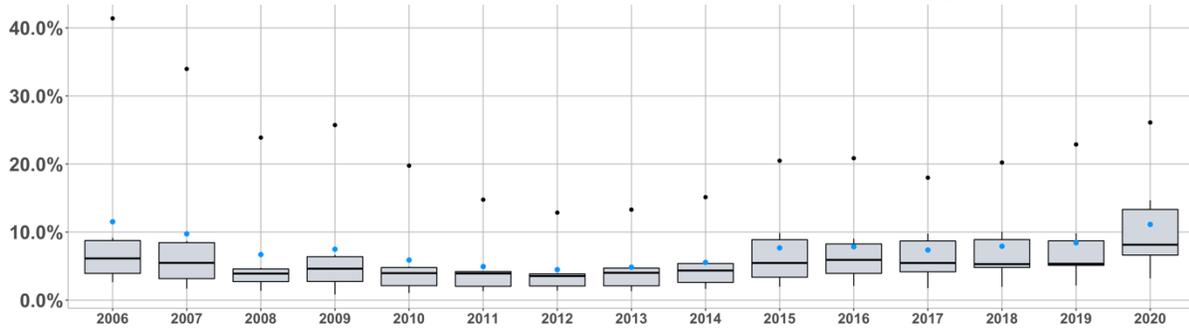
Debt denominated in foreign currency as a percentage of GDP (Adjusted by RER)



LAC6 countries. Blue dots represent the mean by year.

Note: Due to data availability, the debt composition for Colombia and Peru for the years 2006-2007 are estimates.

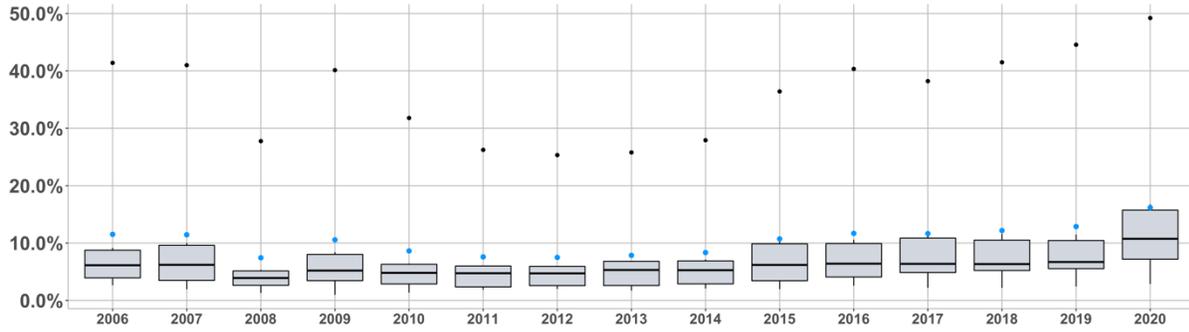
Non-official Debt denominated in foreign currency as a percentage of GDP



LAC6 countries. Blue dots represent the mean by year.

Note: Due to data availability, the debt composition for Colombia and Peru for the years 2006-2007 are estimates.

Non-official Debt denominated in foreign currency as a percentage of GDP (Adjusted by RER)

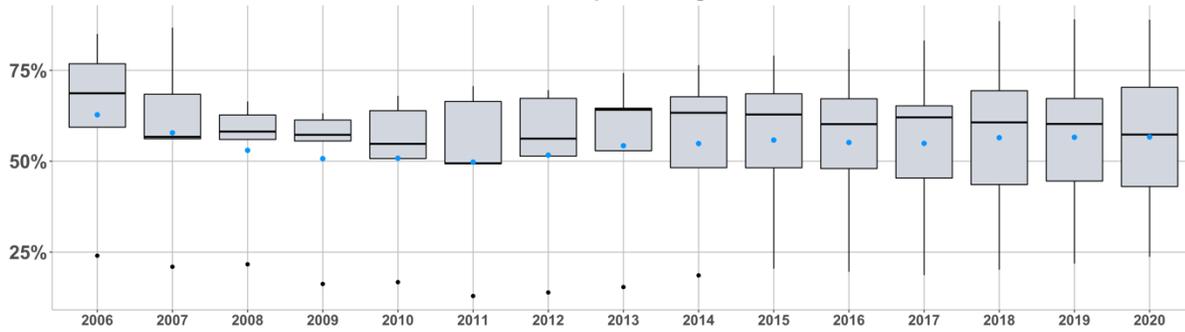


LAC6 countries. Blue dots represent the mean by year.

Note: Due to data availability, the debt composition for Colombia and Peru for the years 2006-2007 are estimates.

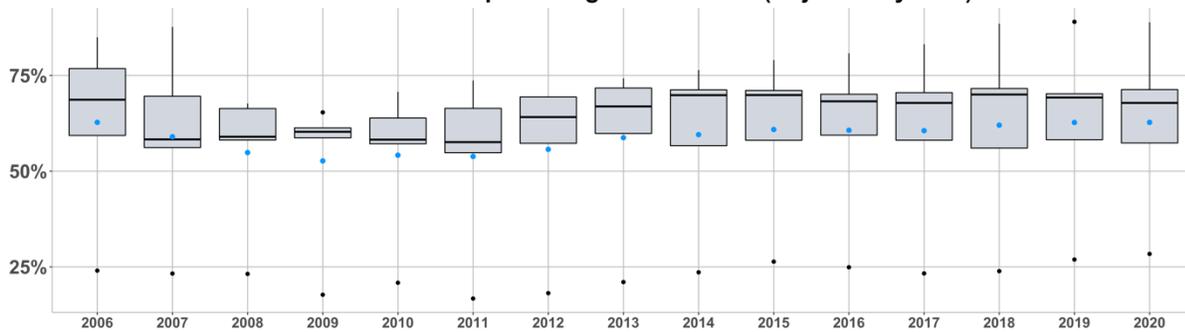
Figure A2. External and foreign currency debt ratios over time: Central America

External debt as a percentage of total debt



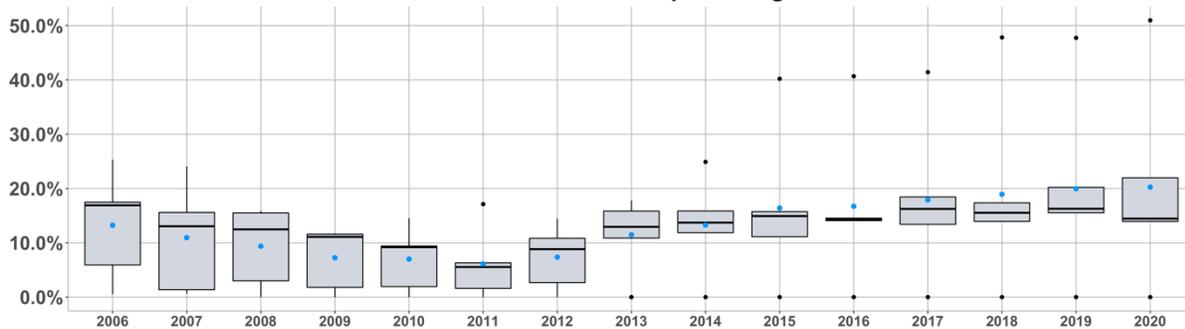
Pool of Central American countries. Blue dots represent the mean by year.
 Note: Due to data availability, the debt composition for Guatemala and Honduras for the years 2006-2007 are estimates.

External debt as a percentage of total debt (Adjusted by RER)



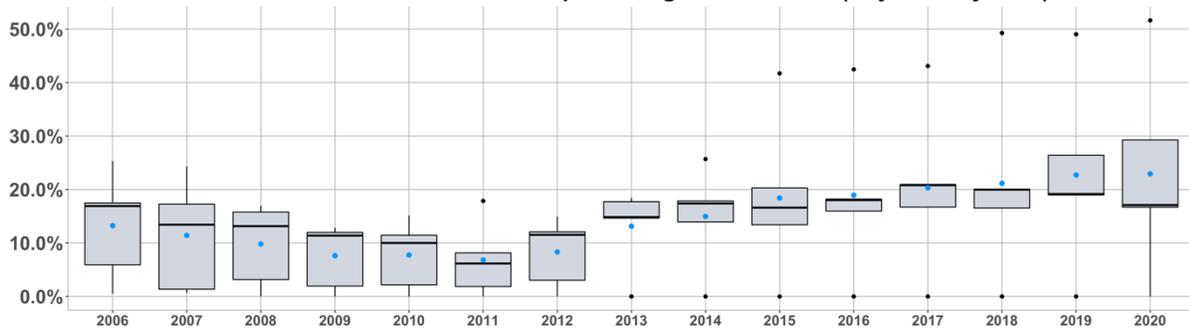
Pool of Central American countries. Blue dots represent the mean by year.
 Note: Due to data availability, the debt composition for Guatemala and Honduras for the years 2006-2007 are estimates.

External Non-official debt as a percentage of total debt



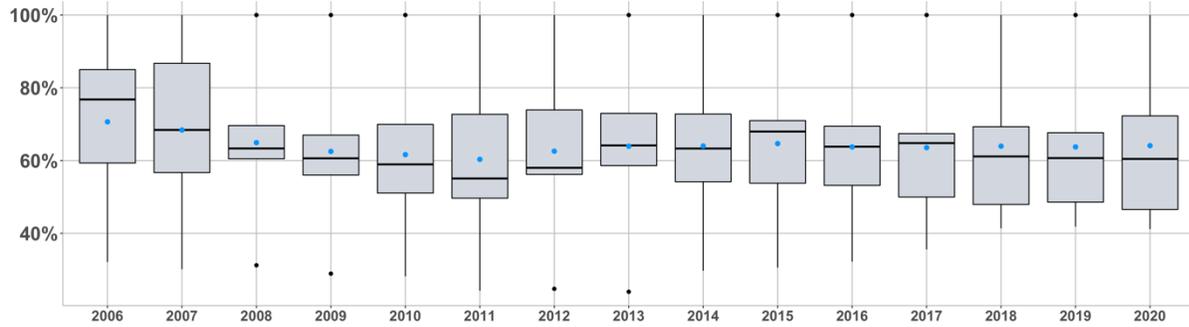
Pool of Central American countries. Blue dots represent the mean by year.
 Note: Due to data availability, the debt composition for Guatemala and Honduras for the years 2006-2007 are estimates.

External Non-official debt as a percentage of total debt (Adjusted by RER)



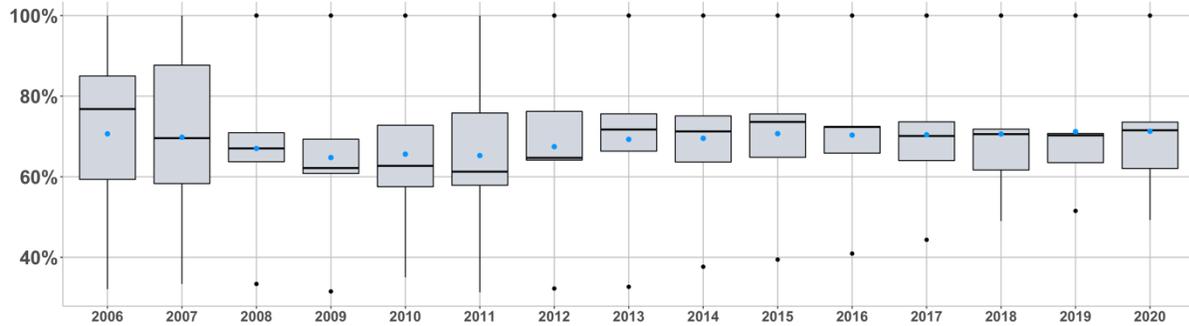
Pool of Central American countries. Blue dots represent the mean by year.
 Note: Due to data availability, the debt composition for Guatemala and Honduras for the years 2006-2007 are estimates.

Debt denominated in foreign currency as a percentage of total debt



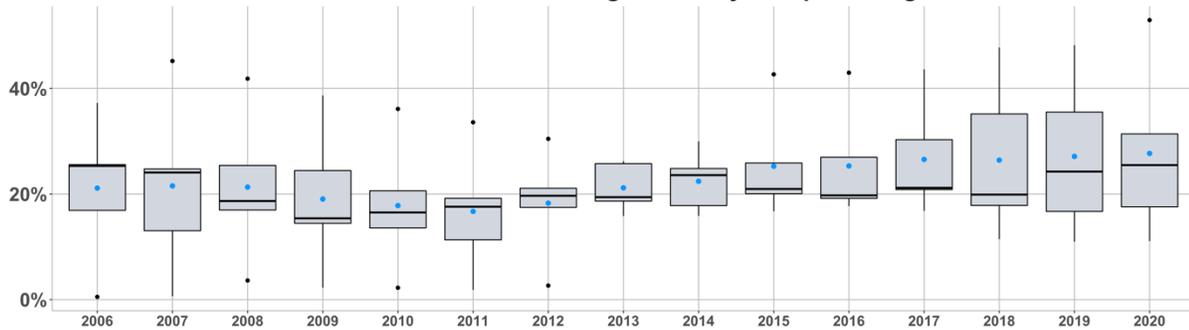
Pool of Central American countries. Blue dots represent the mean by year.
 Note: Due to data availability, the debt composition for Guatemala and Honduras for the years 2006-2007 are estimates.

Debt denominated in foreign currency as a percentage of total debt (Adjusted by RER)



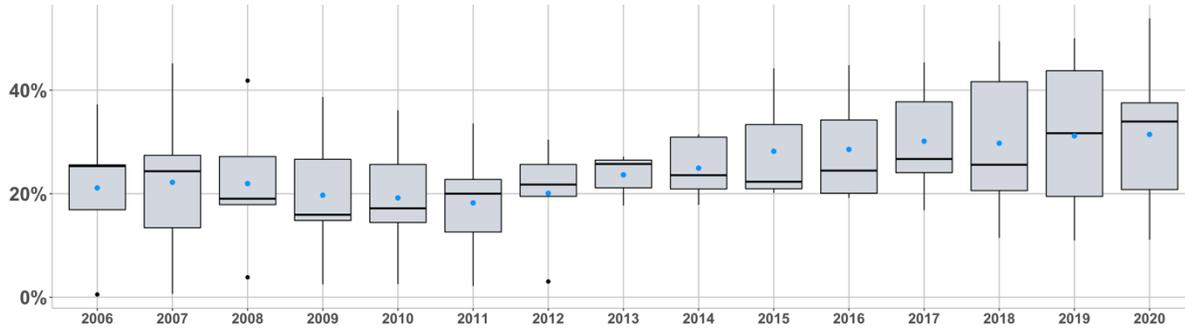
Pool of Central American countries. Blue dots represent the mean by year.
 Note: Due to data availability, the debt composition for Guatemala and Honduras for the years 2006-2007 are estimates.

Non-official Debt denominated in foreign currency as a percentage of total debt



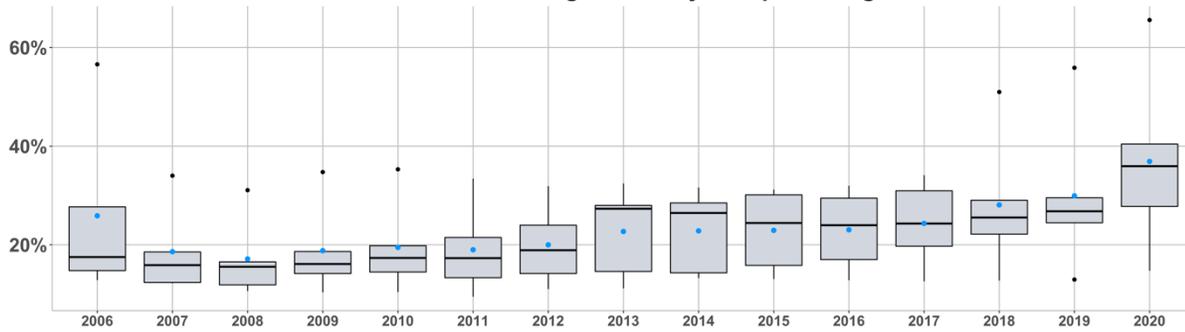
Pool of Central American countries. Blue dots represent the mean by year.
 Note: Due to data availability, the debt composition for Guatemala and Honduras for the years 2006-2007 are estimates.

Non-official Debt denominated in foreign currency as a percentage of total debt (Adjusted by RER)



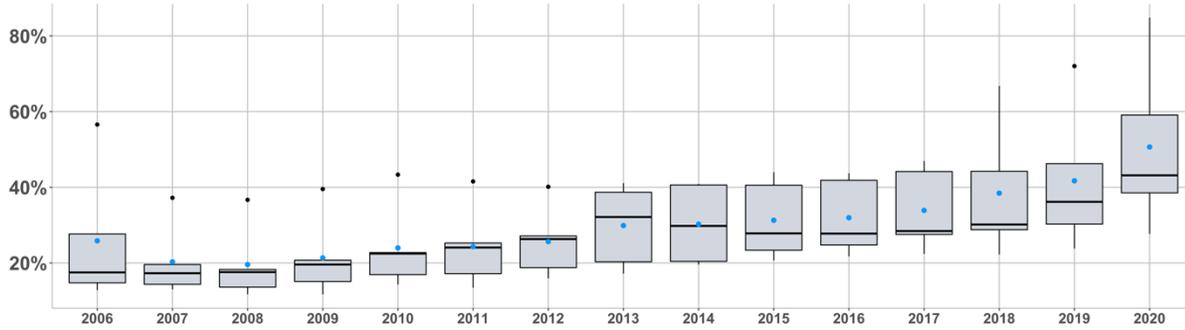
Pool of Central American countries. Blue dots represent the mean by year.
 Note: Due to data availability, the debt composition for Guatemala and Honduras for the years 2006-2007 are estimates.

Debt denominated in foreign currency as a percentage of GDP



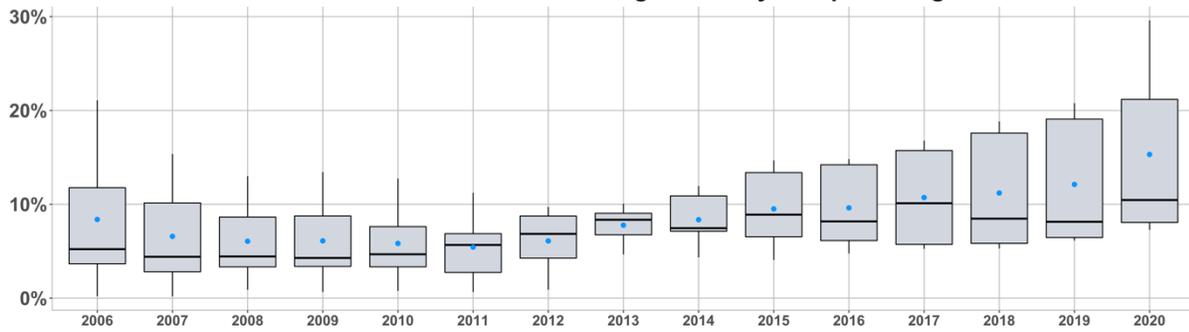
Pool of Central American countries. Blue dots represent the mean by year.
 Note: Due to data availability, the debt composition for Guatemala and Honduras for the years 2006-2007 are estimates.

Debt denominated in foreign currency as a percentage of GDP (Adjusted by RER)



Pool of Central American countries. Blue dots represent the mean by year.
 Note: Due to data availability, the debt composition for Guatemala and Honduras for the years 2006-2007 are estimates.

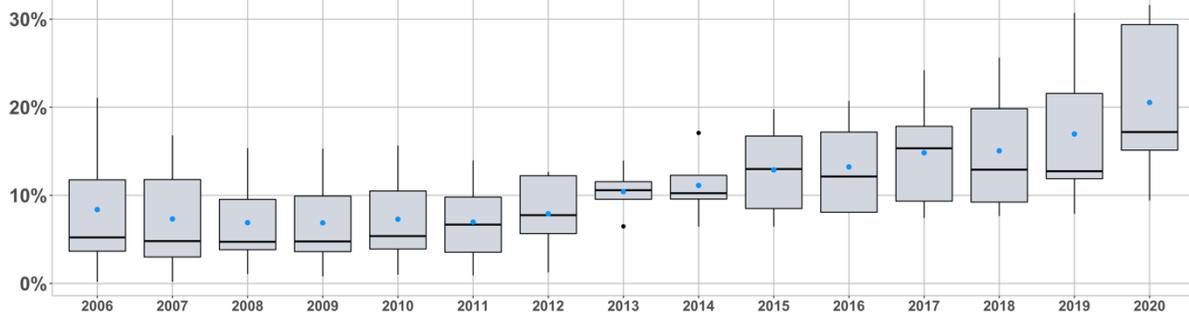
Non-official Debt denominated in foreign currency as a percentage of GDP



Pool of Central American countries. Blue dots represent the mean by year.

Note: Due to data availability, the debt composition for Guatemala and Honduras for the years 2006-2007 are estimates.

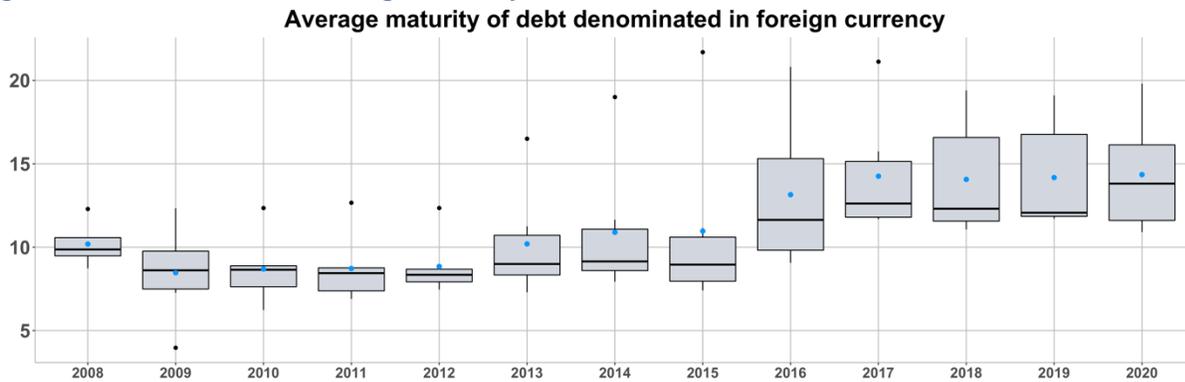
Non-official Debt denominated in foreign currency as a percentage of GDP (Adjusted by RER)



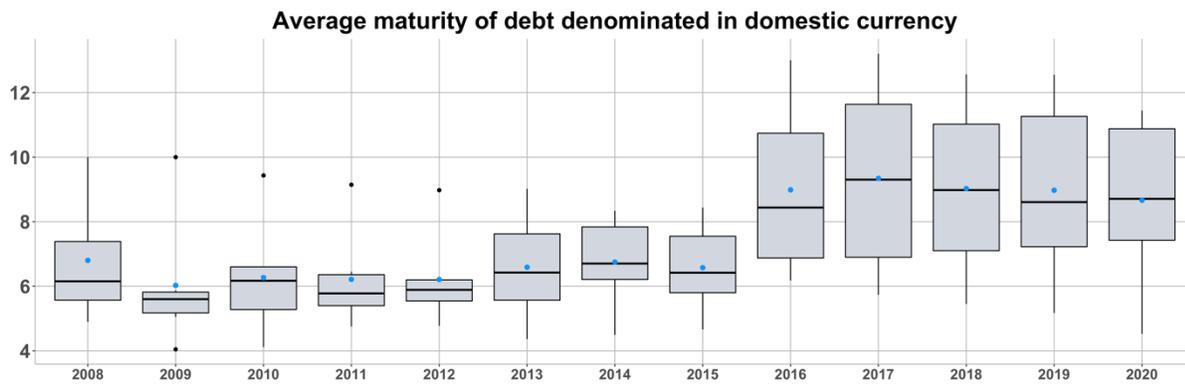
Pool of Central American countries. Blue dots represent the mean by year.

Note: Due to data availability, the debt composition for Guatemala and Honduras for the years 2006-2007 are estimates.

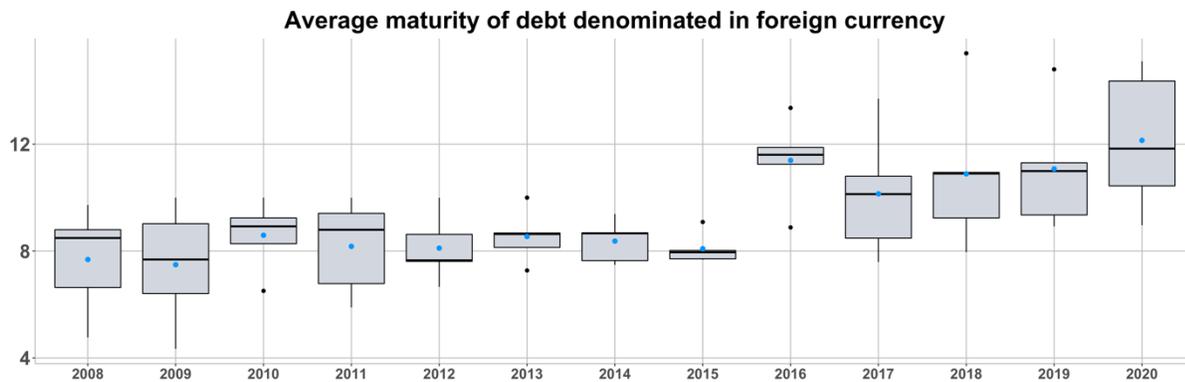
Figure A3. Evolution of the average maturity of bonded debt: LAC6 & Central America



LAC6 countries. Blue dots represent the mean by year.

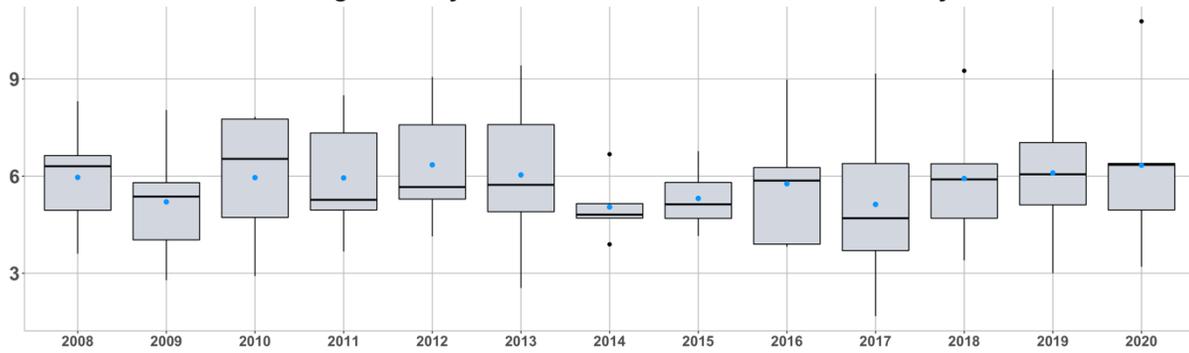


LAC6 countries. Blue dots represent the mean by year.



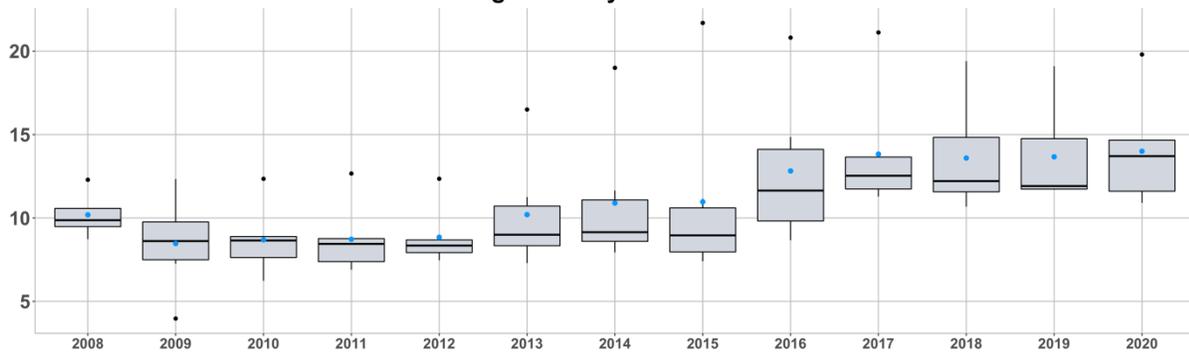
Pool of Central American countries. Blue dots represent the mean by year.

Average maturity of debt denominated in domestic currency



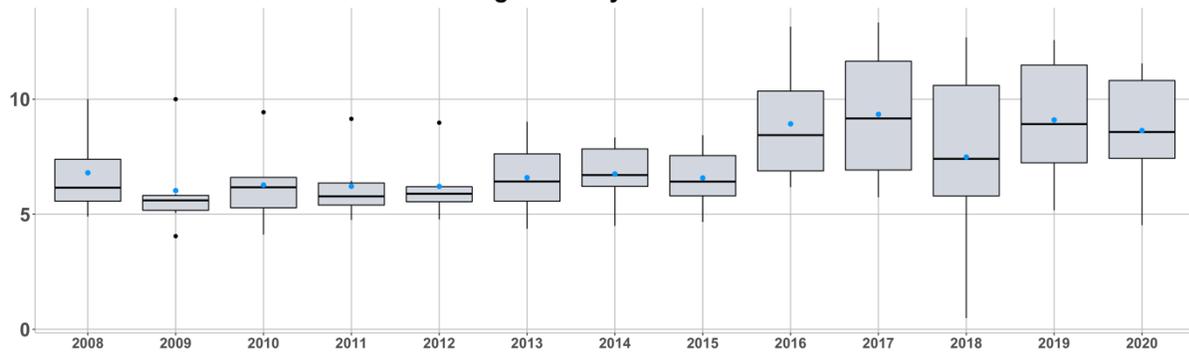
Pool of Central American countries. Blue dots represent the mean by year.

Average maturity of external debt



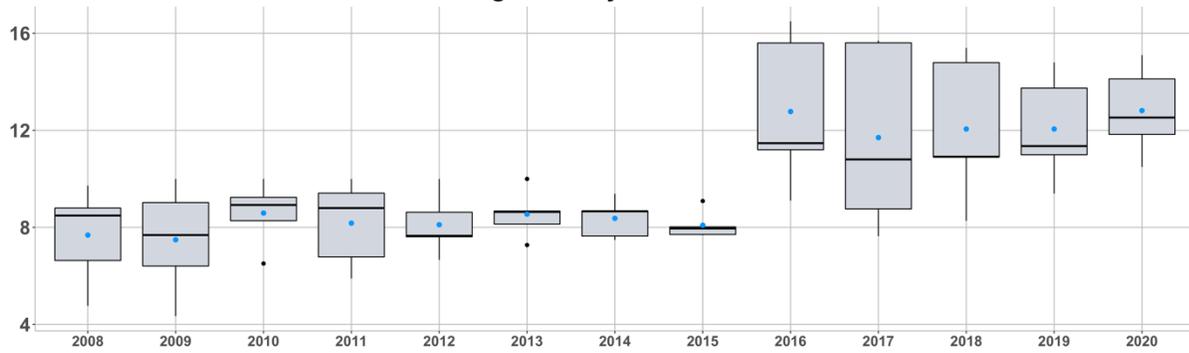
LAC6 countries. Blue dots represent the mean by year.

Average maturity of internal debt



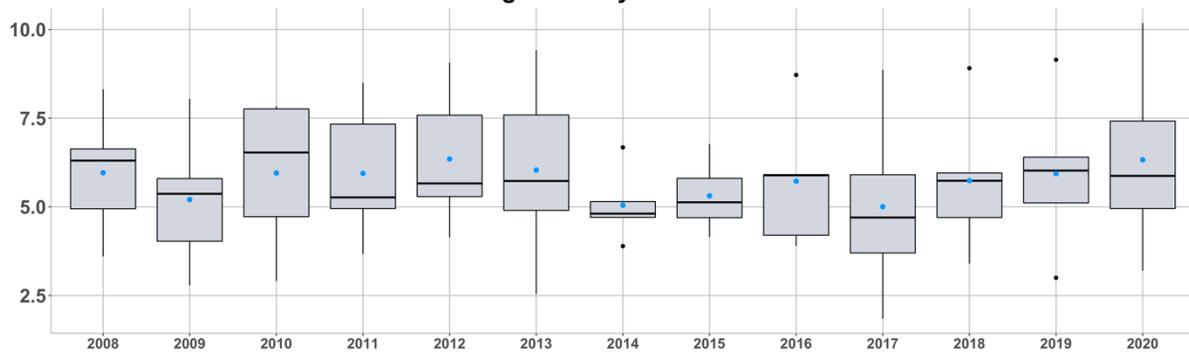
LAC6 countries. Blue dots represent the mean by year.

Average maturity of external debt



Pool of Central American countries. Blue dots represent the mean by year.

Average maturity of internal debt



Pool of Central American countries. Blue dots represent the mean by year.