Debt Sustainability Analysis

Fundamental Concepts and IMF/WBG Frameworks

November 24 - 26, 2025

Introduction

- Welcome to the Debt Sustainability Analysis (DSA) Training
- Instructors: Anne Epaulard and Juan Pradelli
- Rules and guidelines for interactive participation (Mentimeter Questions and Quizzes, questions in chat, Test-in/out, Case Study)
- Case studies participation on Day 3
- Introduction participants

Ground Rules – Virtual Class

Our daily sessions are scheduled to last 4 **hours** (two 15’ breaks included).
Please be on time!

Please ensure you have your webcam ON during the sessions.
If it not possible, switch it on when intervening ☺, it makes our sessions livelier!

Make sure to have a headphone connected to your computer, the sound will be better

Please mute yourself when not talking – but **do not hesitate to intervene** with questions, suggestions and contributions!

Keep next to you a good coffee and a bit of patience, sometimes technology is not perfect. And let colleagues and supervisor know you are on training!

European Commission

Getting to Know Each Other!

Mentimeter

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Pre-Course Questionnaire (Test-in)

Objectives

- Introduce the main principles and concepts of debt sustainability
- Provide a comprehensive overview of DSA and its role in assessing public debt dynamics
- Understand the implications of unsustainable debt and the potential need for debt default or restructuring
- Recognize the importance of policy adjustments and reforms to ensure sustainable debt levels
- Familiarize with the terminology used in DSA
- Grasp the fundamental concepts underlying DSA frameworks developed by IMF and WBG
- Learn to interpret and analyze outputs in IMF/WBG reports, including country case studies

Outline

- Why is Debt Sustainability Important?
- What are the Building Blocks of Debt Sustainability Analysis?
- DSA Frameworks - The LIC DSF
- DSA Frameworks - The MAC DSA and SR DSF

Outline

Why is Debt Sustainability Important?

What are the Building Blocks of Debt Sustainability Analysis?

DSA Frameworks - The LIC DSF

DSA Frameworks - The MAC DSA and SR DSF

Why do Governments Borrow?

Kenya: Central Government Financial Operations, 2019/20–2023/24

(in percent of GDP)

	2019/20	2020/21	2021/22	2022/23	2023/24
	Prel		Projected		
Revenue	17.3	17.0	16.8	17.6	18.6
Expenditure	25.1	25.7	24.3	23.5	22.9
Overall Balance	**(7.8)**	**(8.7)**	**(7.5)**	**(5.8)**	**(4.3)**
Financing	**7.8**	**6.7**	**6.3**	**5.3**	**3.9**
Net Foreign Financing	3.3	1.7	1.1	0.9	1.1
Project loans	1.5	2.2	2.2	2.2	2.2
Program loans	2.3				
IMF RCF	0.7				
Commercial borrowing	0.1	3.2	3.9	0.8	0.7
Standard Gauge Railway	0.4	0.1	0.0	0.0	0.0
Repayments	(1.0)	(3.8)	(5.0)	(2.0)	(1.8)
Net Domestic Financing	4.5	5.0	5.2	4.4	2.8
Financing gap		**(2.0)**	**(1.2)**	**(0.5)**	**(0.4)**
Potential additional sources					
IMF (EFF/ECF)		0.7	0.5	0.5	0.4
DSSI Relief		0.6			
World Bank		0.7	0.7		
Memo item:					
Primary Balance	(3.5)	(4.6)	(3.0)	(1.1)	0.2

Sources: Kenyan authorities and IMF staff calculations.

Why do Governments Borrow?

- Governments may run **budget deficits,** resulting in a financing gap
- The financing gap refers to the shortfall between expenditures and revenues
- Government can reduce the **financing gap** by improving the 'primary balance' through increased taxation or reduced spending
- Governments have the option to close the financing gap by **borrowing** from lenders
- Borrowing **increases the stock of debt**
- Borrowing leads to higher interest payments, contributing to an increase in the overall deficit

Government Borrowing and Fiscal Policy

- Borrowing to address **short-term financing challenges** caused by exogenous shocks can help governments avoid costly and difficult policy adjustments
- Borrowing allows for the **'*smoothing*' of expenditures** and can lead to higher early investment that increases total productive capacity in the long term
- Borrowing enables governments to implement temporary ***counter-cyclical policies***
- Borrowing for ***productive social and infrastructure investments*** can generate higher growth, revenue, and exports
- Such investments can also **enhance the capacity to repay debt** and help mitigate risks to debt sustainability
- **LICs often rely on external debt** to finance their **investment and development needs**
- We will see later that some of these concepts, such as productive investment are key components underlying the baseline scenario which is critical for a credible assessment of debt sustainability. 'Realism' tools are used to assess macroeconomic assumptions that confirm investment in the baseline will generate growth and increase revenues

THE GOVERNMENT'S FLOW OF FUNDS AND THE PUBLIC DEBT DYNAMICS

- The flow of funds reflects the ***accounting and financial identity***:

$$Revenues_t + Financing\ Sources\ _t + Debt\ Issuances\ _t = Expenditures_t + Financing\ Needs_t + Debt\ Repayments_t$$

Any **receipt** on the left-hand side of the equation… → … must be allocated to a certain **payment** on the right-hand side.

- Just re-arranging terms:

$$Debt\ Issuances\ _t - Debt\ Repayments_t = (Expenditures_t - Revenues_t) + (Financing\ Needs\ _t - Financing\ Sources_t)$$

$$Debt_t - Debt_{t-1} \qquad Debt_t - Debt_{t-1}$$

A *debt manager* sees the annual variation in public debt is driven by debt issuances and repayments.

A *fiscal policy maker* observes the annual variation in public debt is driven by budget imbalances and financing transactions.

THE GOVERNMENT'S FLOW OF FUNDS AND THE NOTIONS OF SOLVENCY AND LIQUIDITY

- Consider other rearrangements of receipts and payments:

$$Debt\ Issuances_{\ t} = (Expenditures_t - Revenues_t) + Debt\ Repayments_t + (Financing\ Needs_{\ t} - Financing\ Sources_t)$$

Why the government borrows? …

… to finance the budget deficit …

… to service maturing debts …

… to finance other needs beyond the budget deficit …

$$Debt\ Repayments_t = Debt\ Issuances_t + (Revenues_t - Expenditures_t) + (Financing\ Sources_t - Financing\ Needs_{\ t})$$

Borrowed funds

Non-borrowed funds
('Own resources')

Debt repayments corresponding to maturing financial liabilities are financed either with
(i) non-borrowed funds (own resources) → **solvency**
(ii) borrowed funds → **liquidity**

How do you Define Debt Sustainability?

DEBT SUSTAINABILITY, ABILITY AND WILLINGNESS TO PAY

PUBLIC DEBT SUSTAINABILITY

The ability of a government to honor its current and future financial obligations…

ABILITY TO PAY

WILLINGNESS TO PAY

…preserving sound policies over time, without being forced to undertake major fiscal adjustments (presumably unrealistic), debt restructurings, or outright defaults

UNDER CURRENT POLICIES OR WITH FEASIBLE ADJUSTMENT

ECONOMIC PERFORMANCE

FISCAL POLICY

FINANCIAL POLICY

DEBT MANAGEMENT

DEBT SUSTAINABILITY, SOLVENCY AND LIQUIDITY

SOLVENCY

A government's capacity to **repay** financial obligations over an **extended period of time**

- **Funding debt repayment with budgetary resources in the long-term**
- **Without systematically borrowing** to fund budget deficits and rollover maturing liabilities
- **No need to incur in unrealistic fiscal policy adjustment** to generate budgetary resources sufficient to repay financial obligations
- **No need to engage with creditors to restructure existing liabilities** in view of insufficient budgetary resources in the long-term to repay them under the original contractual terms

LIQUIDITY

A government's capacity to **borrow** funds in the **short- to medium term**, at a reasonable cost to meet gross financing needs (including rollover of maturing financial obligations)

- **Without facing higher-than-normal interest rates or severe disruptions in the financing flows** provided by regular creditors
- In theory, **a solvent debtor would always be liquid**. Creditors recognize the short-term borrowing is consistent with a long-term path where the debtor's financial liabilities and repayment capacity are balanced
- However, liquidity issues may arise due to coordination failures or information asymmetry, e.g., uncertainty about a debtor's budgetary resources or capacity to undertake policy adjustments
- A solvent government who fails to raise enough short-term funds to service maturing debt, may become insolvent due to liquidity problems

More on Solvency and Liquidity

Difficult to distinguish between insolvency and illiquidity situations

Liquidity problems are often symptoms of underlying solvency problems: creditors refuse to roll over maturing debt because of solvency concerns

Liquidity problems may give rise to insolvency, by raising interest rates or pressuring the exchange rate

More on Solvency and Liquidity

- **Solvency** compares the present value of a country's current and future assets and liabilities to determine if it can meet its current and future obligations
  - If the present value of total assets exceeds the present value of total liabilities, the country is considered 'solvent'. Conversely, if the present value of total assets is less than the present value of total liabilities, the country is considered 'insolvent'
  - Public debt sustainability is equated with the **government's** ability to honor all its future obligations. It depends on the government's present value of current and future expenditures not exceeding the present value of its current and future income

- **Liquidity** examines the **availability of liquid assets and access to financing** to meet **maturing liabilities**
  - It assesses whether a country has sufficient liquid assets and available financing to meet or rollover its maturing liabilities. If the value of liquid assets exceeds the maturing liabilities, the country or government is considered 'liquid'. Conversely, if the value of liquid assets is insufficient to roll over maturing liabilities, the country or government is considered 'illiquid'

HOW IS DEBT SUSTAINABILITY ASSESSED? SOLVENCY, LIQUIDITY, AND PUBLIC DEBT DYNAMICS

- The two sources of funding for debt repayments are reflected in the notions of solvency and liquidity.

- How debt repayments are funded by the government is essential to the public debt dynamics:
  - The government effectively reduces the public debt stock if and when it is able to generate own resources and allocate them to fund repayment of maturing liabilities
  - The government, however, maintains the public debt stock unchanged if and when it is able to access borrowed funds and roll over maturing debts

SUSTAINABILITY ASSESSMENT

- **Formulate a judgement** on whether the government will have the ability and willingness to meet its current and future financial obligations
- **Identify the risks** likely to affect the economic and policy performance driving the public debt dynamics over the medium term

HOW IS DEBT SUSTAINABILITY ASSESSED? DEBT RATIOS ARE USED AS INDICATORS

LIABILITIES TO SERVICE
(in nominal values)

- Total financial obligations (debt stock)
- Debt service obligations (debt-service flow)

REPAYMENT CAPACITY
(in nominal values)

- Repayment in the long term
- Re-financing in the short- to medium term (rollover)

SOLVENCY

RELATES TO DEBT BURDEN

Public Debt
External Debt
Present Value (PV) of Debt

LIQUIDITY

RELATES TO FINANCING NEEDS

Budget deficit
Gross financing needs
Interests and amortizations

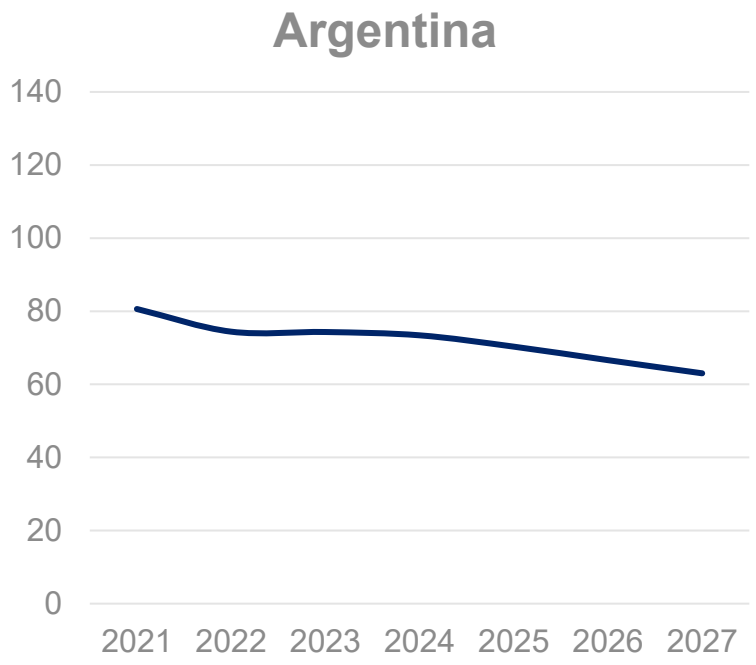
REPAYMENT CAPACITY

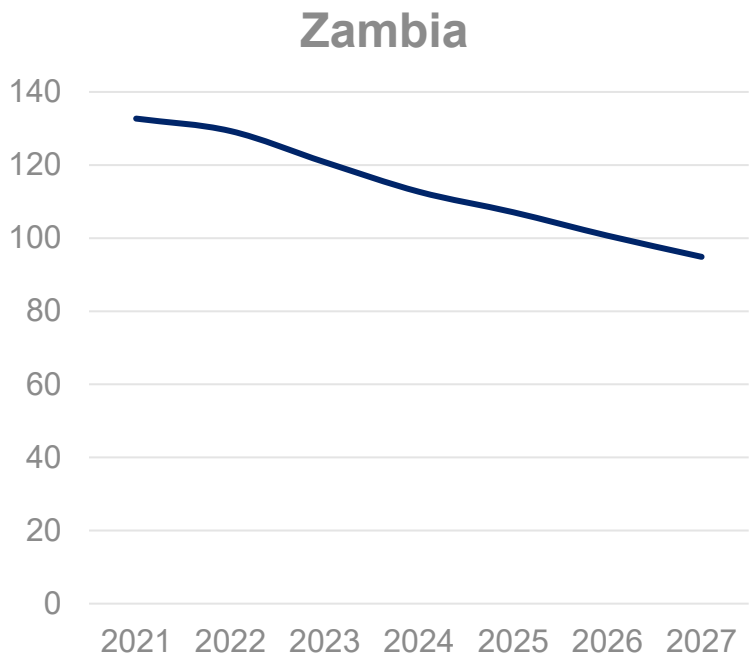
RELATES TO INCOMES

GDP
Revenues
Exports

EXAMPLE - WHICH COUNTRY EXHIBITS A SUSTAINABLE PUBLIC DEBT?

Debt/GDP





- **SUSTAINABLE**
  … with moderate risk

- **SUSTAINABLE**
  … but not with high probability

- **UNSUSTAINABLE**
  In Debt Distress

HOW IS DEBT SUSTAINABILITY ASSESSED?
DEBT RATIOS AND PUBLIC DEBT DYNAMICS

Dynamics of public debt ratios (e.g., debt-to-GDP)

LIABILITIES TO SERVICE *(in nominal values)* **>** **REPAYMENT CAPACITY** *(in nominal values)*

*Debt-sustainability conditions would **deteriorate** and result in a **rising public debt ratio.***

LIABILITIES TO SERVICE *(in nominal values)* **<** **REPAYMENT CAPACITY** *(in nominal values)*

*Debt-sustainability conditions would **improve** and result in a **decreasing public debt ratio.***

Debt/GDP ratio *evolves over time as a result of **debt dynamics** and **GDP growth***

- Borrowings depend on fiscal deficits and other financing needs → Fiscal and financing policies
- Exchange rates (ER), interest rates, and other market conditions → Monetary, financial, and ER policies
- Economic growth and price inflation → Economic conditions and policies

SUSTAINABILITY INDICATORS

- Subjective judgements and interpretations
- Collective consensus and conventions

HOW IS DEBT SUSTAINABILITY ASSESSED?
DEBT RATIOS AND PUBLIC DEBT DYNAMICS

Debt is SUSTAINABLE if projected debt-to-GDP ratio is low, or if it shows a declining trend

Debt is UNSUSTAINABLE if projected debt-to-GDP ratio is high, or if it shows an increasing trend

THESE TWO BASIC INTUITIONS SHOULD BE COMPLEMENTED WITH VARIOUS CONSIDERATIONS …

- Projection need to be based on realistic assumptions
- Economies are vulnerable to unexpected shocks
- Economies with declining debt ratios but high debt levels would still be unsustainable if high risk of default or illiquidity
- Public debt could be low but gross financing needs could be high affecting the market perception in the short-term.

What if Debt is Unsustainable?

Sustainability can also be viewed from an economic policy perspective, focusing on the required policy adjustments to avoid default

Required **policy adjustment** refers to the degree to which governments need to adjust their current policies to avoid default

It assesses the level of policy change necessary to meet current and future payment obligations **without resorting to implausible large policy adjustments, debt renegotiation, or default.**

A country's public debt is considered sustainable if it can fulfill its current and future payment obligations without relying on unrealistic policy adjustments that are socially and politically unfeasible

Chad IMF Country Report, Dec. 2021:

'Public debt is now classified as in distress, and the authorities decided to seek a restructuring of its external debt through the G20 Common Framework…meeting all financial obligations without a debt restructuring ***would entail unrealistic adjustments and sacrifices*** *on social and development needs that are not compatible with the Fund's debt sustainability definition for LICs.'*

Letter: Argentina faces painful adjustments if it is to end its debt crisis

From Danny Leipziger, Professor of International Business, George Washington University, Washington, DC, US

Labour unions and civil society groups protest against the IMF in Buenos Aires in October © Anadolu Agency via Getty Images

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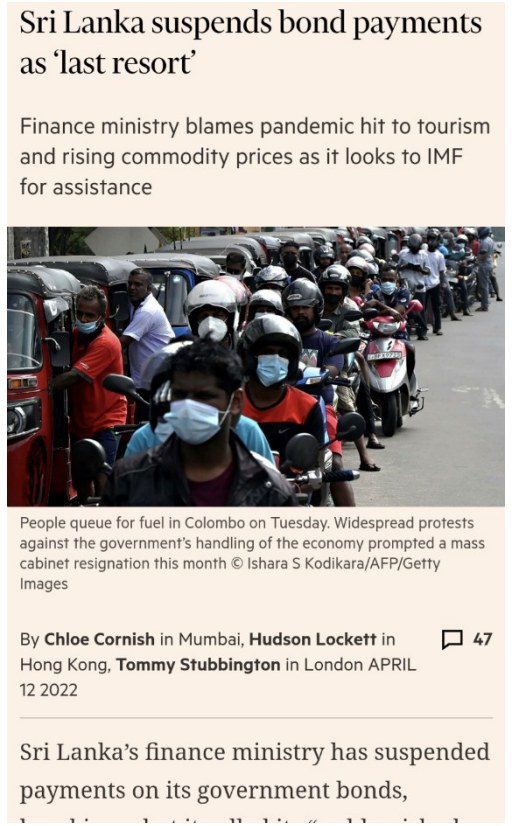
The FT Big Read on Argentina's clash with the IMF (November 11) serves as a lesson in how all can get it wrong on bailouts — country officials, lenders and the IMF.

What if Debt is Unsustainable?

- Unsustainable debt means a country cannot fulfil its financial obligations without resorting to implausible policy adjustments or default
- Defaults can have severe consequences, including **loss of market access,** higher borrowing costs, threats to macroeconomic stability, and setbacks in development
- **Political instability** and economic or financial **mismanagement can lead to default**, even if a country is considered **solvent and liquid**
- The IMF takes a case-by-case approach, considering **debt sustainability analysis and** availability of the financing required for countries' long- term growth and development



Sri Lanka suspends bond payments as 'last resort'

Finance ministry blames pandemic hit to tourism and rising commodity prices as it looks to IMF for assistance

People queue for fuel in Colombo on Tuesday. Widespread protests against the government's handling of the economy prompted a mass cabinet resignation this month © Ishara S Kodikara/AFP/Getty Images

By **Chloe Cornish** in Mumbai, **Hudson Lockett** in Hong Kong, **Tommy Stubbington** in London APRIL 12 2022 47

Sri Lanka's finance ministry has suspended payments on its government bonds,

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Debt Restructuring Mechanisms

- The LIC DSF aims to support low-income countries in achieving their development goals while **minimizing the risk of debt distress**
- **Debt restructuring is costly** for both debtors, creditors, and the international monetary and financial system
- It can have spillovers effect on various segments of the economy and potentially lead to contagion in other countries
- IMF financial support can only be provided for countries with sustainable debt
- In some cases, debt sustainability may be restored through sufficient access to concessional financing
- However, in other cases, debt **restructuring** may be necessary to reduce debt burdens or extend debt service over a longer period

Debt Restructuring Mechanisms

- The **Paris Club (PC)** is an informal group of official creditors that aims to find coordinated and sustainable solutions for debtor countries experiencing payment difficulties
- PC creditors provide debt treatments to debtor countries through rescheduling, which involves debt relief through postponement or, in the case of concessional rescheduling, reduction of debt service obligations during a defined period (flow treatment) or as of a set date (stock treatment)
- The **Common Framework** is an agreement between the G20 and PC countries to coordinate and cooperate on debt treatments for up to 73 low-income countries
  - Comparability of treatment: when a debtor country signs an MoU with participating creditors under the CF, it is required to seek from all its other official bilateral creditors and private creditors **a treatment at least as favorable as the one signed in the MoU**.

Quiz 1/4

Let’s go to Menti!

Mentimeter

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Outline

Why is Debt Sustainability Important?

What are the Building Blocks of Debt Sustainability Analysis?

DSA Frameworks - The LIC DSF

DSA Frameworks - The MAC DSA and SR DSF

How do public debt dynamics work?

- **New debt** is incurred when **total expenditure exceeds tax revenue**, resulting in a budget deficit
- If the public debt is in domestic currency, then ….
- the **change in government debt** between two years equals the **interest paid** on the stock of debt and the **primary deficit:**

$$Dt = (1 + i_t)D_{t-1} - PB_t$$

where *Dt* represents the government debt at the end of period *t*, i_t is the interest rate over the period *t*, and PB*t* is the primary deficit over the period *t*

- Understanding debt evolution relative to a country's **capacity to country's capacity to service debt is crucial**
- Consistently , we can express the equation in relation to the country's **GDP**

How do public debt dynamics Work?
(arithmetic - once in your lifetime)

$$D_{2025} = D_{2024} - Budget\ Balance_{\ 2025}$$

$$D_{2025} = D_{2024} + Interest\ on\ D_{2024} - Primary\ Budget\ Balance_{\ 2025}$$

$$D_{2025} = D_{2024} + i_{\ 2025}\ D_{2024} - Primary\ Budget\ Balance_{\ 2025}$$

$$D_{2025} = (1 + i_{\ 2025}) D_{2024} - Primary\ Budget\ Balance_{\ 2025}$$

How do public debt dynamics Work?
(arithmetic - once in your lifetime)

$$D_{2025} = (1 + i_{2025})D_{2024} - Primary\ Budget\ Balance_{2025}$$

$$\frac{D_{2025}}{GDP_{2025}} = (1 + i_{2025})\frac{D_{2024}}{GDP_{2025}} - \frac{PB_{2025}}{GDP_{2025}}$$

$$\frac{D_{2025}}{GDP_{2025}} = (1 + i_{2025})\frac{D_{2024}}{(1 + g_{2025} + \pi_{2025})GDP_{2024}} - \frac{PB_{2025}}{GDP_{2025}}$$

$$\frac{D_{2025}}{GDP_{2025}} = \frac{(1 + i_{2025})}{(1 + g_{2025} + \pi_{2025})}\frac{D_{2024}}{GDP_{2024}} - \frac{PB_{2025}}{GDP_{2025}}$$

How do public debt dynamics Work?
(arithmetic - once in your lifetime)

$$\frac{D_{2025}}{GDP_{2025}} = \frac{(1+i_{2025})}{(1+g_{2025}+\pi_{2025})}\frac{D_{2024}}{GDP_{2024}} - \frac{PB_{2025}}{GDP_{2025}}$$

$$d_{2025} = \frac{(1+i_{2025})}{(1+g_{2025}+\pi_{2025})}d_{2024} - pb_{2025}$$

$$d_{2025} \cong (1+i_{2025}-\pi_{2025}-g_{2025})d_{2024} - pb_{2025}$$

$$d_{2025} - d_{2024} \cong (i_{2025}-\pi_{2025})d_{2024} - g_{2025}d_{2024} - pb_{2025}$$

How Do Public Debt Dynamics Work?
(arithmetic - once in your lifetime)

$$d_{2025} - d_{2024} \cong (i_{2025} - \pi_{2025})d_{2024} - g_{2025}d_{2024} - pb_{2025}$$

Total change in public debt as percentage of GDP

Real interest rate effect

real growth effect

primary balance as share of GDP

Automatic debt dynamics

How Do Public Debt Dynamics Work? *(some simple arithmetic)*

$$d_t - d_{t-1} \cong (i_t - \pi_t)d_{t-1} - g_t d_{t-1} - pb_t$$

Total change in public debt as percentage of GDP

real interest rate effect

real growth effect

primary balance as share of GDP

Automatic debt dynamics

- The difference between the interest rate and the growth rate of the economy plays a significant role in debt dynamics
- If the real interest rate *(r = i - π)* is lower than the real growth rate (*g*) ….and the primary deficit is null (*pb = 0*) then the ratio of debt to GDP will diminish over time.
- if (r-g) < 0, you can run a primary deficit (pb <0) and have a declining ratio of debt to GDP thanks to the "automatic debt dynamics"

How Do Public Debt Dynamics Work? *(numerical example)*

$$d_{2025} - d_{2024} \cong (i_{2025} - \pi_{2025})d_{2024} - g_{2025}d_{2024} - pb_{2025}$$

Total change in public debt as percentage of GDP

real interest rate effect

real growth effect

primary balance as share of GDP

Let's start with $d_{t-1} = 120\%$, $i_t = 8\%$, $\pi_t = 5\%$, $g_t = 4\%$

- What is the primary balance needed to stabilize the ratio of debt to GDP $(d_t - d_{t-1} = 0)$?
- Same question in the case $g_t = 2\%$?

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How Do Public Debt Dynamics Work? *(numerical example/solution)*

$$d_{2025} - d_{2024} \cong (i_{2025} - \pi_{2025})d_{2024} - g_{2025}d_{2024} - pb_{2025}$$

Total change in public debt as percentage of GDP

real interest rate effect

real growth effect

primary balance as share of GDP

		d = 120%, i=8%, π= 5%, g = 4%	d = 120%, i=8%, π= 5%, g = 2%
Primary balance (in% of GDP) that stabilizes the debt / GDP ratio (pbs)	pbs = $(i_t - \pi_t - g)$x d_{t-1}	= (8% - 5% - 4%) x 120% = -1% x 120% = **-1.2%**	

To stabilize the debt to GDP ratio, the government needs to run a primary balance equal to -1.2% of GDP (a primary **deficit** of 1.2% of GDP)

How Do Public Debt Dynamics Work? *(numerical example/solution)*

$$d_{2025} - d_{2024} \cong (i_{2025} - \pi_{2025})\, d_{2024} - g_{2025}\, d_{2024} - pb_{2025}$$

Total change in public debt as percentage of GDP

real interest rate effect

real growth effect

primary balance as share of GDP

		d = 120%, i=8%, π= 5%, g = 4%	d = 120%, i=8%, π= 5%, g = 2%
Primary balance (in% of GDP) that stabilizes the debt / GDP ratio (pbs)	pbs = $(i_t - \pi_t - g)$x d_{t-1}	= (8% - 5% - 4%) x 120% = -1% x 120% = **-1.2%**	= (8% - 5% - 2%) x 120% = 1% x 120% = **1.2%**

To stabilize the debt to GDP ratio, the government needs to run a primary balance equal to -1.2% of GDP (a primary **deficit** of 1.2% of GDP)

To stabilize the debt to GDP ratio, the government needs to run a primary balance equal to 1.2% of GDP (a primary **surplus** of 1.2% of GDP)

Public debt dynamics with borrowing in foreign currency

- The arithmetic on public dynamics becomes more complicated when there is some public borrowing in foreign currency
- One needs to introduce:
  - The difference between the interest on domestic currency debt (i) and the interest rate on foreign currency (i*). (usually i* < i)
  - The evolution of the exchange rate (1 $ = E local currency)
    - A depreciation of the local currency corresponds to an increase in E ….and an increase to the value of the foreign currency debt measured in local currency
    - An appreciation of the local currency corresponds to a decrease in E ….and a decrease to the value of the foreign currency debt measured in local currency

Public debt dynamics when there is borrowing in foreign currency

$$d_t - d_{t-1} \cong (i_t - \pi_t) d^D_{t-1} + (i^*_t - \pi_t) d^*_{t-1} - g_t d_{t-1} + \Delta e_t \, d^*_{t-1} - pb_t$$

Total change in public debt as percentage of GDP

real interest rate effect

real growth effect

Exchange rate effect

primary balance as share of GDP

d_t = total debt expressed in domestic currency (using the end of period exchange rate)

= debt in foreign currency

d^D_t = debt in domestic currency

Δe Is the growth rate of the exchange rate E, with E such that 1 $ = E unit of domestic currency

An increase in E (Δ e >0) means that there is a depreciation of the currency between *(t-1)* and *t*

Adding Other debt creating (or reducing) flows

Some government operations have an impact on public debt but are not taken into account when computing the primary balance. These operations are ”below the line” in the government account

Examples :

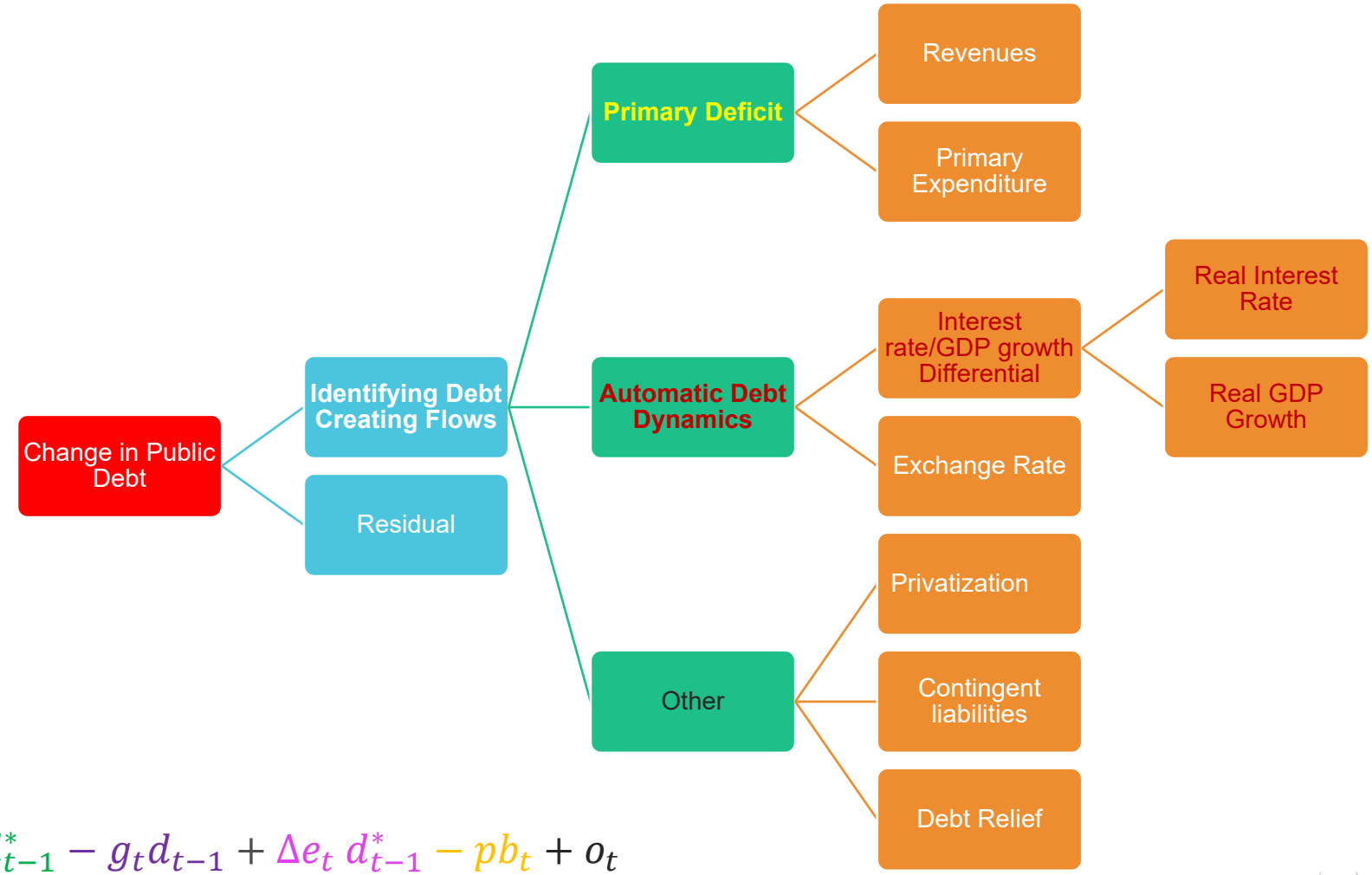
- Revenues from privatization have no impact on the budget balance but reduce government debt
- Bank recapitalisation operations can increase the public debt (while having no effect on the budget balance)

This can be introduced in the debt dynamic equation by adding the term o_t

$$d_t - d_{t-1} \cong (i_t - \pi_t)d_{t-1} - g_t d_{t-1} - pb_t + o_t$$

$$d_t - d_{t-1} \cong (i_t - \pi_t)d^D_{t-1} + (i^*_t - \pi_t)d^*_{t-1} - g_t d_{t-1} + \Delta e_t\, d^*_{t-1} - pb_t + o_t$$

What are the drivers of the debt-to-GDP ratio?



$$d_t - d_{t-1} = (i_t - \pi_t)d^D_{t-1} + (i^*_t - \pi_t)d^*_{t-1} - g_t d_{t-1} + \Delta e_t\, d^*_{t-1} - pb_t + o_t$$

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Public Debt Dynamics / Chad

The decomposition of debt evolution into its driving factors based on debt dynamics equation are displayed in the output table below

Table 2. Chad: Public Sector Debt Sustainability Framework, Baseline Scenario, 2015-2038

(In percent of GDP, unless otherwise indicated)

	Actual			Projections							
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2028	2038
Public sector debt 1/	**70.4**	**72.9**	**74.2**	**70.2**	**66.0**	**62.7**	**60.3**	**57.9**	**55.4**	**48.9**	**39.3**
of which: external debt	**44.9**	**49.2**	**49.3**	**51.0**	**49.1**	**46.9**	**45.4**	**43.2**	**41.8**	**34.4**	**29.0**
Change in public sector debt	12.4	2.5	1.3	-4.0	-4.2	-3.3	-2.4	-2.4	-2.5	-1.3	-1.0
Identified debt-creating flows	**11.0**	**1.5**	**0.1**	**-3.5**	**-3.0**	**-2.0**	**-0.9**	**-0.9**	**-1.2**	**-0.6**	**-0.6**
Primary deficit	**3.9**	**0.4**	**2.4**	**-0.2**	**-2.2**	**-2.2**	**-2.0**	**-1.8**	**-1.6**	**-0.3**	**-0.3**
Revenue and grants	18.4	19.6	17.3	18.9	18.6	19.0	19.1	18.9	18.7	17.8	17.2
of which: grants	0.7	2.0	0.7	0.7	0.5	0.3	0.2	0.2	0.1	0.0	0.0
Primary (noninterest) expenditure	22.3	20.0	19.7	18.7	16.5	16.8	17.1	17.1	17.2	17.5	17.0
Automatic debt dynamics	**7.2**	**1.1**	**-2.3**	**-2.2**	**-0.9**	**0.2**	**1.1**	**0.9**	**0.4**	**-0.3**	**-0.3**
Contribution from interest rate/growth differential	-0.4	-0.2	-0.1	-2.1	-1.2	0.3	1.2	1.0	0.4	-0.3	-0.3
of which: contribution from average real interest rate	1.8	2.4	2.3	2.0	4.5	4.0	4.3	4.0	3.4	1.9	1.5
of which: contribution from real GDP growth	-2.2	-2.6	-2.4	-4.1	-5.7	-3.7	-3.0	-3.0	-2.9	-2.1	-1.8
Contribution from real exchange rate depreciation	7.6	1.2	-2.2	...	...	...	...	...	...	...	...
Other identified debt-creating flows	**0.0**	**0.0**	**0.0**	**-1.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Privatization receipts (negative)	0.0	0.0	0.0	-1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recognition of contingent liabilities (e.g., bank recapitalization)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Debt relief (HIPC and other)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other debt creating or reducing flow (please specify)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Residual	**1.3**	**1.0**	**1.2**	**-0.6**	**-0.8**	**-1.4**	**-1.6**	**-1.6**	**-1.4**	**-0.8**	**-0.4**
Sustainability indicators											
PV of public debt-to-GDP ratio 2/	**...**	**...**	**71.0**	**67.3**	**62.9**	**59.4**	**56.9**	**54.8**	**52.7**	**46.2**	**38.2**
PV of public debt-to-revenue and grants ratio	**...**	**...**	**411.8**	**357.2**	**337.6**	**313.3**	**298.9**	**290.3**	**281.0**	**259.5**	**221.8**
Debt service-to-revenue and grants ratio 3/	**93.3**	**114.6**	**127.1**	**126.4**	**89.9**	**81.9**	**81.1**	**88.1**	**81.1**	**84.4**	**51.4**
Gross financing need 4/	21.0	22.8	24.4	22.5	14.6	13.3	13.5	14.9	13.6	14.7	8.6

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Public Debt Dynamics / Chad

Table 2. Chad: Public Sector Debt Sustainability Framework, Baseline Scenario, 2015-2038

(In percent of GDP, unless otherwise indicated)

	Actual			Projections							
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2028	2038
Public sector debt 1/	**70.4**	**72.9**	**74.2**	**70.2**	**66.0**	**62.7**	**60.3**	**57.9**	**55.4**	**48.9**	**39.3**
of which: external debt	**44.9**	**49.2**	**49.3**	**51.0**	**49.1**	**46.9**	**45.4**	**43.2**	**41.8**	**34.4**	**29.0**
Change in public sector debt	12.4	2.5	1.3	-4.0	-4.2	-3.3	-2.4	-2.4	-2.5	-1.3	-1.0
Identified debt-creating flows	**11.0**	**1.5**	**0.1**	**-3.5**	**-3.0**	**-2.0**	**-0.9**	**-0.9**	**-1.2**	**-0.6**	**-0.6**
Primary deficit	**3.9**	**0.4**	**2.4**	**-0.2**	**-2.2**	**-2.2**	**-2.0**	**-1.8**	**-1.6**	**-0.3**	**-0.3**
Automatic debt dynamics	**7.2**	**1.1**	**-2.3**	**-2.2**	**-0.9**	**0.2**	**1.1**	**0.9**	**0.4**	**-0.3**	**-0.3**
Other identified debt-creating flows	**0.0**	**0.0**	**0.0**	**-1.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Residual	**1.3**	**1.0**	**1.2**	**-0.6**	**-0.8**	**-1.4**	**-1.6**	**-1.6**	**-1.4**	**-0.8**	**-0.4**
Sustainability indicators											
PV of public debt-to-GDP ratio 2/	**...**	**...**	**71.0**	**67.3**	**62.9**	**59.4**	**56.9**	**54.8**	**52.7**	**46.2**	**38.2**
PV of public debt-to-revenue and grants ratio	**...**	**...**	**411.8**	**357.2**	**337.6**	**313.3**	**298.9**	**290.3**	**281.0**	**259.5**	**221.8**
Debt service-to-revenue and grants ratio 3/	**93.3**	**114.6**	**127.1**	**126.4**	**89.9**	**81.9**	**81.1**	**88.1**	**81.1**	**84.4**	**51.4**
Gross financing need 4/	21.0	22.8	24.4	22.5	14.6	13.3	13.5	14.9	13.6	14.7	8.6
Key macroeconomic and fiscal assumptions											
Real GDP growth (in percent)	4.0	3.8	3.5	5.9	8.9	5.9	5.1	5.2	5.4	4.5	4.6
Average nominal interest rate on external debt (in percent)	5.5	4.6	5.1	5.2	6.7	7.0	7.1	6.6	6.2	5.0	6.1
Average real interest rate on domestic debt (in percent)	2.8	3.7	2.6	2.3	9.7	8.3	9.6	9.5	8.2	5.0	3.6
Real exchange rate depreciation (in percent, + indicates depreciation)	26.7	3.2	-5.0	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	16.7	16.4	18.1	14.2	9.6	9.1	7.4	6.3	6.3	6.3	6.2
Growth of real primary spending (deflated by GDP deflator, in percent)	3.9	-7.0	2.1	0.4	-3.9	7.8	6.9	5.5	5.7	4.6	4.2
Primary deficit that stabilizes the debt-to-GDP ratio 5/	-8.5	-2.1	1.1	3.8	2.1	1.1	0.4	0.6	0.9	1.0	0.8
PV of contingent liabilities (not included in public sector debt)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Sources: Country authorities; and staff estimates and projections.

4/ Gross financing need is defined as the primary deficit plus debt service plus the stock of short-term debt at the end of the last period and other debt creating/reducing flows.

5/ Defined as a primary deficit minus a change in the public debt-to-GDP ratio ((-): a primary surplus), which would stabilizes the debt ratio only in the year in question.

6/ Historical averages are generally derived over the past 10 years, subject to data availability, whereas projections averages are over the first year of projection and the next 10 years.

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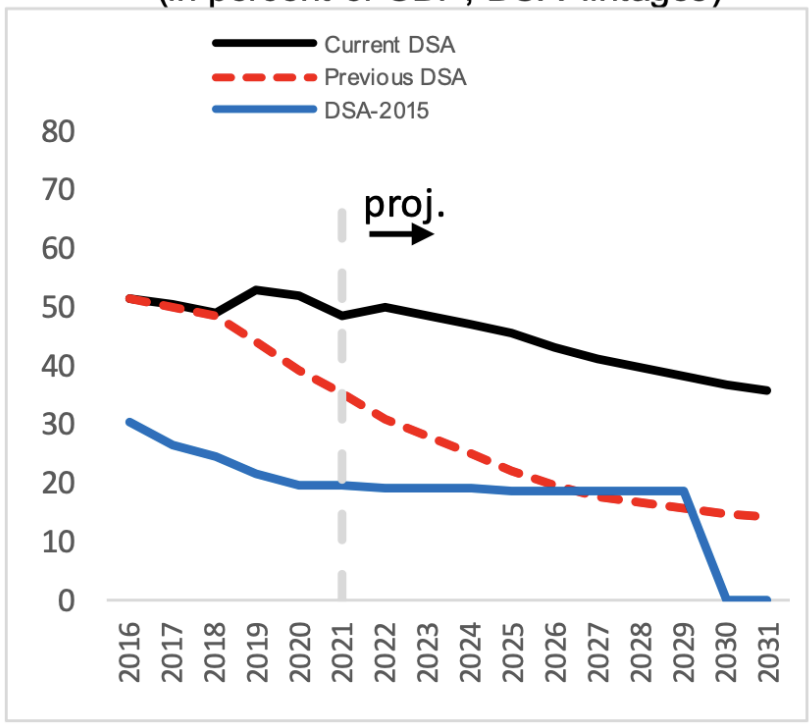
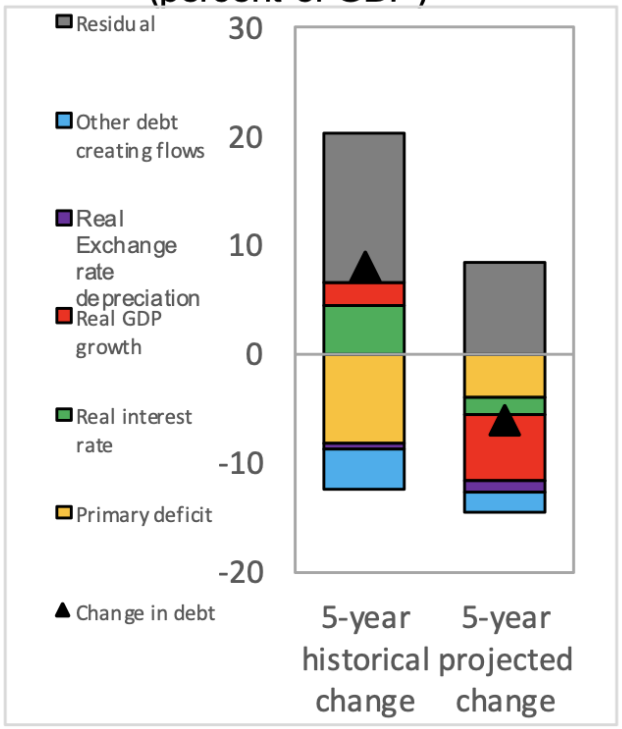
Public Debt Dynamics / Chad

Public debt

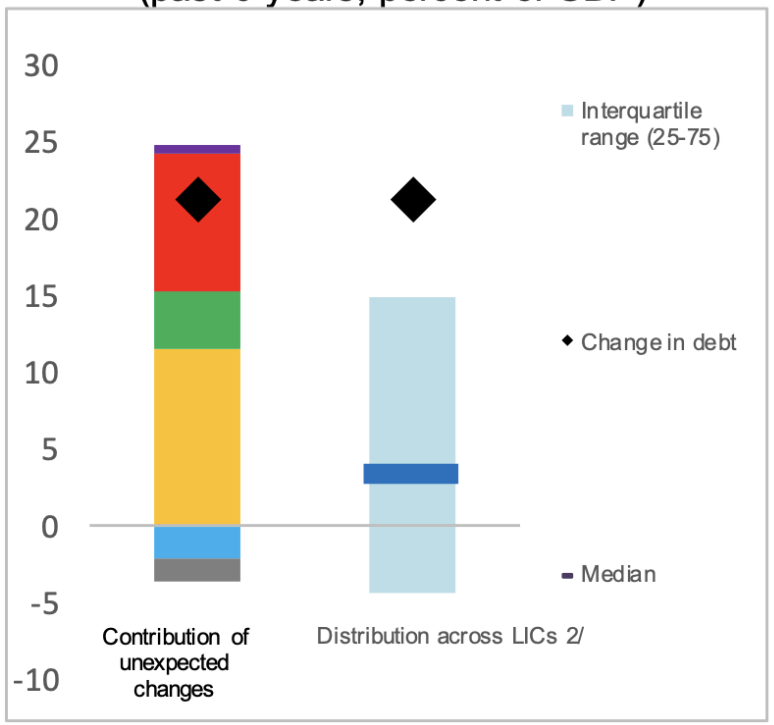
Gross Nominal Public Debt
(in percent of GDP; DSA vintages)



Debt-creating flows
(percent of GDP)



Unexpected Changes in Debt 1/
(past 5 years, percent of GDP)



1/ Difference betw een anticipated and actual contributions on debt ratios.

2/ Distribution across LICs for w hich LIC DSAs w ere produced.

Source : IMF, 2024

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External Debt Sustainability

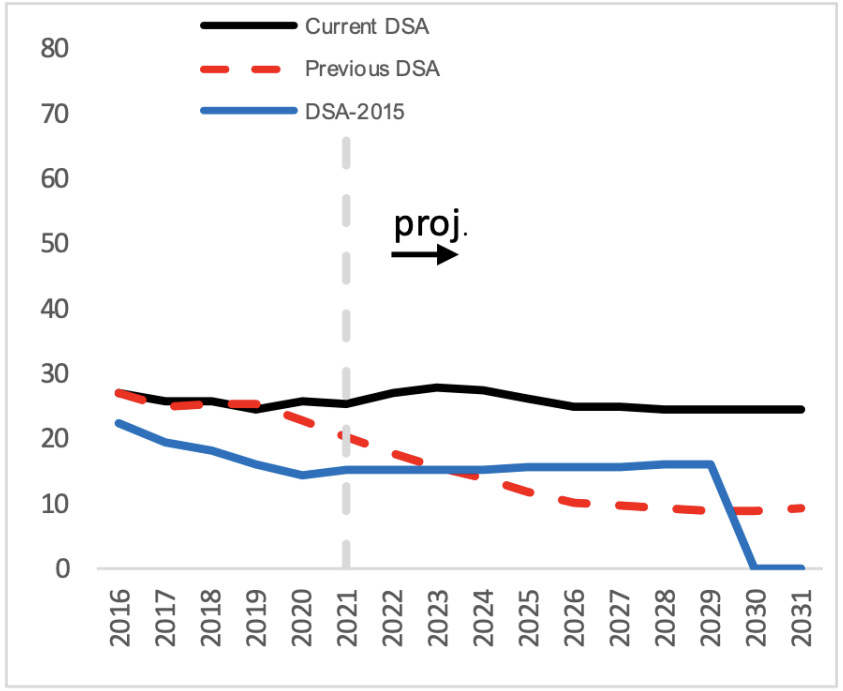
- External debt sustainability is analogous to fiscal sustainability but focuses on the Balance of Payments (BoP) current account balance
- Similarly, to the budget balance, the change in external debt over time is determined by the part of the current account balance that is financed by new debt
- However, unlike the budget balance which the government had direct control over, the Current Account Balance is influenced by factors beyond the government's control
- The exchange rate plays a significant role in determining the CAB

External Debt Dynamics / Chad

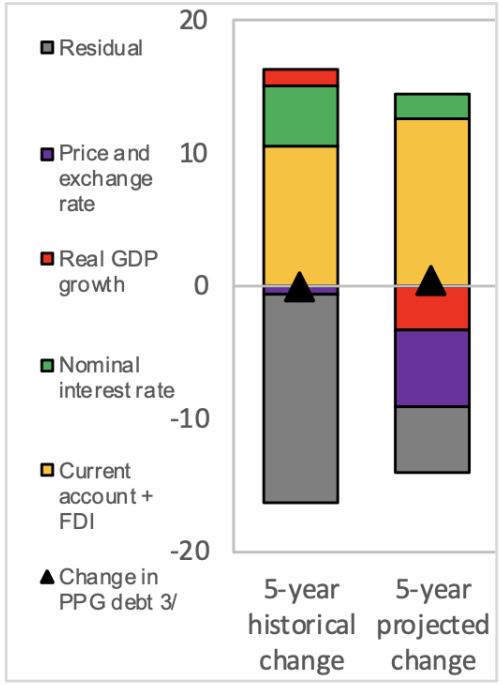
Figure 3. Chad: Drivers of Debt Dynamics- Baseline Scenario

External debt

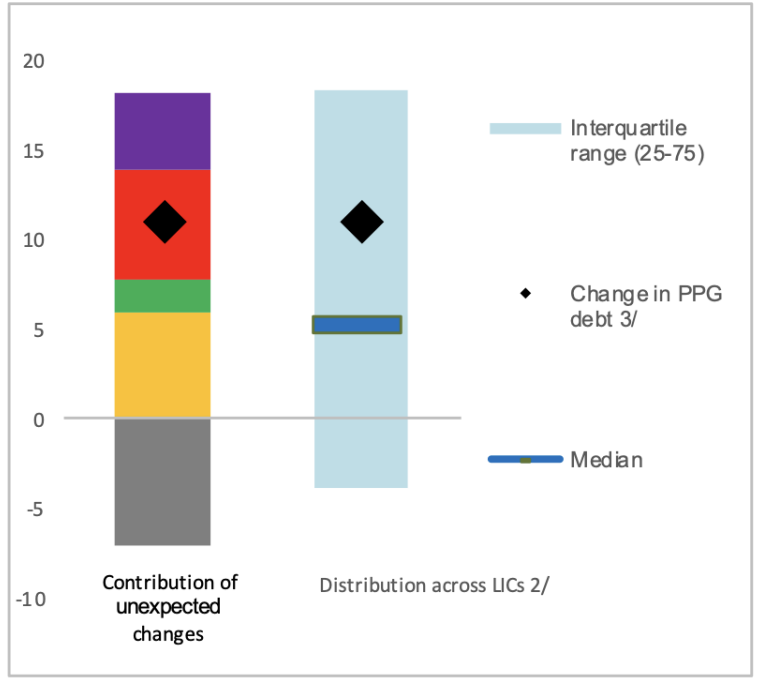
Gross Nominal PPG External Debt
(in percent of GDP; DSA vintages)



Debt-creating flows
(percent of GDP)



Unexpected Changes in Debt 1/
(past 5 years, percent of GDP)



Source : IMF, 2024

External Debt Dynamics / Madagascar

Table 1. Madagascar: External Debt Sustainability Framework, Baseline Scenario

(In percent of GDP; unless otherwise indicated)

	Actual			Projections								Average 8/	
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2030	2040	Historical	Projections
External debt (nominal) 1/	**50.2**	**69.4**	**65.4**	**73.3**	**73.0**	**69.4**	**66.1**	**63.9**	**61.7**	**57.4**	**54.3**	**45.0**	**63.5**
of which: public and publicly guaranteed (PPG)	**25.7**	**26.4**	**26.6**	**32.0**	**34.7**	**36.1**	**37.3**	**38.1**	**38.6**	**43.2**	**47.9**	**24.6**	**38.4**
Change in external debt	-0.8	19.2	-3.9	7.8	-0.3	-3.6	-3.3	-2.3	-2.2	-0.3	-1.0		
Identified net debt-creating flows	**-7.4**	**-7.1**	**-2.9**	**7.7**	**0.5**	**-1.4**	**-1.9**	**-2.2**	**-2.2**	**-1.2**	**-0.6**	**-2.2**	**-0.7**
Non-interest current account deficit	**0.0**	**-1.2**	**1.7**	**6.1**	**4.5**	**3.9**	**3.8**	**3.4**	**3.2**	**3.6**	**3.6**	**2.9**	**3.8**
Deficit in balance of goods and services	3.3	3.4	4.6	9.1	8.8	6.9	6.9	6.6	6.6	6.7	6.9	**6.0**	**7.0**
Exports	30.9	31.2	27.8	18.3	23.1	26.3	27.6	28.0	28.6	26.8	24.3		
Imports	34.2	34.6	32.4	27.4	31.8	33.2	34.5	34.6	35.2	33.6	31.3		
Net current transfers (negative = inflow)	-5.6	-6.9	-5.5	-5.5	-5.3	-5.1	-5.1	-5.0	-5.1	-4.6	-4.2	**-5.5**	**-5.0**
of which: official	-2.5	-2.6	-3.0	-3.1	-2.3	-1.8	-1.3	-0.9	-0.6	-0.1	0.0		
Other current account flows (negative = net inflow)	2.3	2.3	2.6	2.5	1.1	2.1	2.0	1.8	1.7	1.5	0.9	**2.5**	**1.7**
Net FDI (negative = inflow)	**-2.7**	**-3.6**	**-2.6**	**-1.8**	**-2.2**	**-2.4**	**-2.8**	**-2.9**	**-3.0**	**-3.1**	**-3.2**	**-4.0**	**-2.8**
Endogenous debt dynamics 2/	**-4.8**	**-2.4**	**-2.1**	**3.4**	**-1.8**	**-2.9**	**-2.9**	**-2.6**	**-2.4**	**-1.7**	**-1.0**		
Contribution from nominal interest rate	0.4	0.5	0.5	0.5	0.4	0.5	0.5	0.6	0.6	1.0	1.4		
Contribution from real GDP growth	-1.8	-1.5	-2.9	2.9	-2.2	-3.4	-3.4	-3.2	-3.0	-2.7	-2.4		
Contribution from price and exchange rate changes	-3.3	-1.4	0.3	...	...	...	...	...	...	...	...		
Residual 3/	**6.6**	**26.3**	**-1.0**	**0.1**	**-0.8**	**-2.1**	**-1.4**	**-0.1**	**0.0**	**0.9**	**-0.4**	**5.9**	**0.0**
of which: exceptional financing	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0		
Sustainability indicators													
PV of PPG external debt-to-GDP ratio	**...**	**...**	**15.6**	**19.2**	**21.0**	**22.0**	**23.0**	**23.7**	**24.4**	**28.6**	**34.5**		
PV of PPG external debt-to-exports ratio	**...**	**...**	**56.1**	**104.4**	**91.1**	**83.7**	**83.3**	**84.8**	**85.3**	**106.8**	**141.9**		
PPG debt service-to-exports ratio	**5.6**	**2.9**	**2.8**	**4.4**	**3.9**	**4.2**	**4.9**	**4.9**	**4.9**	**7.3**	**10.6**		
PPG debt service-to-revenue ratio	**16.7**	**8.9**	**7.3**	**8.9**	**8.7**	**9.8**	**11.0**	**10.8**	**10.6**	**14.1**	**17.4**		
Gross external financing need (Million of U.S. dollars)	12.5	-488.0	699.5	1253.2	787.7	1168.5	1182.2	842.0	817.1	1149.6	2171.7		
Key macroeconomic assumptions													
Real GDP growth (in percent)	3.9	3.2	4.4	-4.2	3.2	5.0	5.4	5.2	5.0	5.0	4.6	**3.0**	**4.1**
GDP deflator in US dollar terms (change in percent)	7.0	2.8	-0.5	-0.5	3.2	3.1	2.7	1.9	1.7	1.6	1.7	**1.4**	**1.8**
Effective interest rate (percent) 4/	0.8	1.1	0.7	0.7	0.6	0.7	0.8	1.0	1.1	1.8	2.7	**1.0**	**1.1**
Growth of exports of G&S (US dollar terms, in percent)	21.6	7.0	-7.2	-37.2	33.9	23.7	13.3	8.7	9.1	5.1	5.6	**8.0**	**7.1**
Growth of imports of G&S (US dollar terms, in percent)	26.2	7.1	-2.5	-19.4	23.7	13.0	12.3	7.5	8.7	5.9	6.6	**2.5**	**6.7**
Grant element of new public sector borrowing (in percent)	...	...	...	37.7	42.9	41.4	39.5	39.1	38.4	34.7	31.4	...	**37.9**
Government revenues (excluding grants, in percent of GDP)	10.3	10.4	10.5	9.2	10.3	11.4	12.2	12.8	13.3	14.0	14.8	**9.3**	**12.6**
Aid flows (in Million of US dollars) 5/	588.5	615.5	733.4	436.7	853.1	889.3	903.7	846.2	831.4	1078.7	1412.8		
Grant-equivalent financing (in percent of GDP) 6/	...	...	...	3.4	4.5	3.8	3.2	2.6	2.2	1.8	1.3	...	**2.7**
Grant-equivalent financing (in percent of external financing) 6/	...	...	...	55.4	60.0	57.7	52.4	49.7	47.0	35.7	31.4	...	**46.8**
Nominal GDP (Million of US dollars)	13,176	13,974	14,519	13,837	14,746	15,972	17,283	18,524	19,776	27,295	51,511		
Nominal dollar GDP growth	11.2	6.1	3.9	-4.7	6.6	8.3	8.2	7.2	6.8	6.7	6.4	**4.4**	**6.0**
Memorandum items:													
PV of external debt 7/	...	...	54.5	60.4	59.3	55.4	51.8	49.5	47.5	42.8	40.9		
In percent of exports	...	...	195.6	329.4	257.1	210.2	187.7	176.9	165.9	159.5	168.1		
Total external debt service-to-exports ratio	9.0	4.1	20.3	25.9	13.2	22.2	21.1	14.6	13.8	13.8	15.6		
PV of PPG external debt (in Million of US dollars)			2267.8	2650.8	3095.4	3521.0	3970.2	4398.7	4824.2	7816.0	17784.3		
(PVt-PVt-1)/GDPt-1 (in percent)				2.6	3.2	2.9	2.8	2.5	2.3	2.8	2.1		
Non-interest current account deficit that stabilizes debt ratio	0.9	-20.4	5.7	-1.7	4.8	7.5	7.1	5.6	5.3	3.9	4.6		

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LIC DSF, PV, GE and the Discount Rate

- The LIC DSF focuses on indicators of debt that consider present value, which is influenced by the discount rate.
- The choice of discount rate is important, and the **LIC DSF uses a uniform 5% discount rate.**
- The discount rate is used to calculate the present value in Debt Sustainability Analyses (DSAs) and the grant element for individual loans.
- During DSF reviews, the discount rate can be revised.

Present value, grant element, discount rates, concessionality: what are they and why do they matter?

In the LIC DSF the **present value (PV)** compares cash flows over time to assess the burden of debt:

- The PV of debt is calculated as the sum of all future debt service (DS) payments (principal and interest), discounted to the present using a specific **discount rate 'δ' ,** set at 5% in the LIC DSF

$$PV_t = \frac{DS_{t+1}}{(1+\delta)} + \frac{DS_{t+2}}{(1+\delta)^2} + \frac{DS_{t+3}}{(1+\delta)^3} + \cdots + \frac{DS_{t+M}}{(1+\delta)^M}$$

- If the discount rate δ is equal to the interest rate *i* (δ= *i*), the PV is equal to the nominal value of debt
- If the interest rate *i* is lower than the discount rate δ (*i*< δ), the PV of the debt is lower than the nominal value, indicating that the loan has some degree of concessionality
- **The choice of discount rate is important, and t**he LIC DSF uses a uniform 5% discount rate

δ = discount rate
i = loan's contractual interest rate

Present Value, grant element, discount rates, concessionality: what are they and why do they matter?

This difference between the present value of the loan and the nominal value of the loan is very important.....

The difference is known as **the Grant Element,** the portion of a loan that takes the form of a grant.

A grant is a special type of “loan” that is **fully concessional**, meaning that it does not require repaymennt effectively turning it into a gift

We can calculate the precise proportion of the loan that constitutes the grant element using the following formula:

$$\text{Grant Element} = 100*\left(\frac{\text{NomValue-PV}}{\text{NomValue}}\right)$$

Loans with a **Grant Element of 35%** or higher are considered **'concessional’** while those with a Grant Element of less than 35% are considered 'non-concessional'

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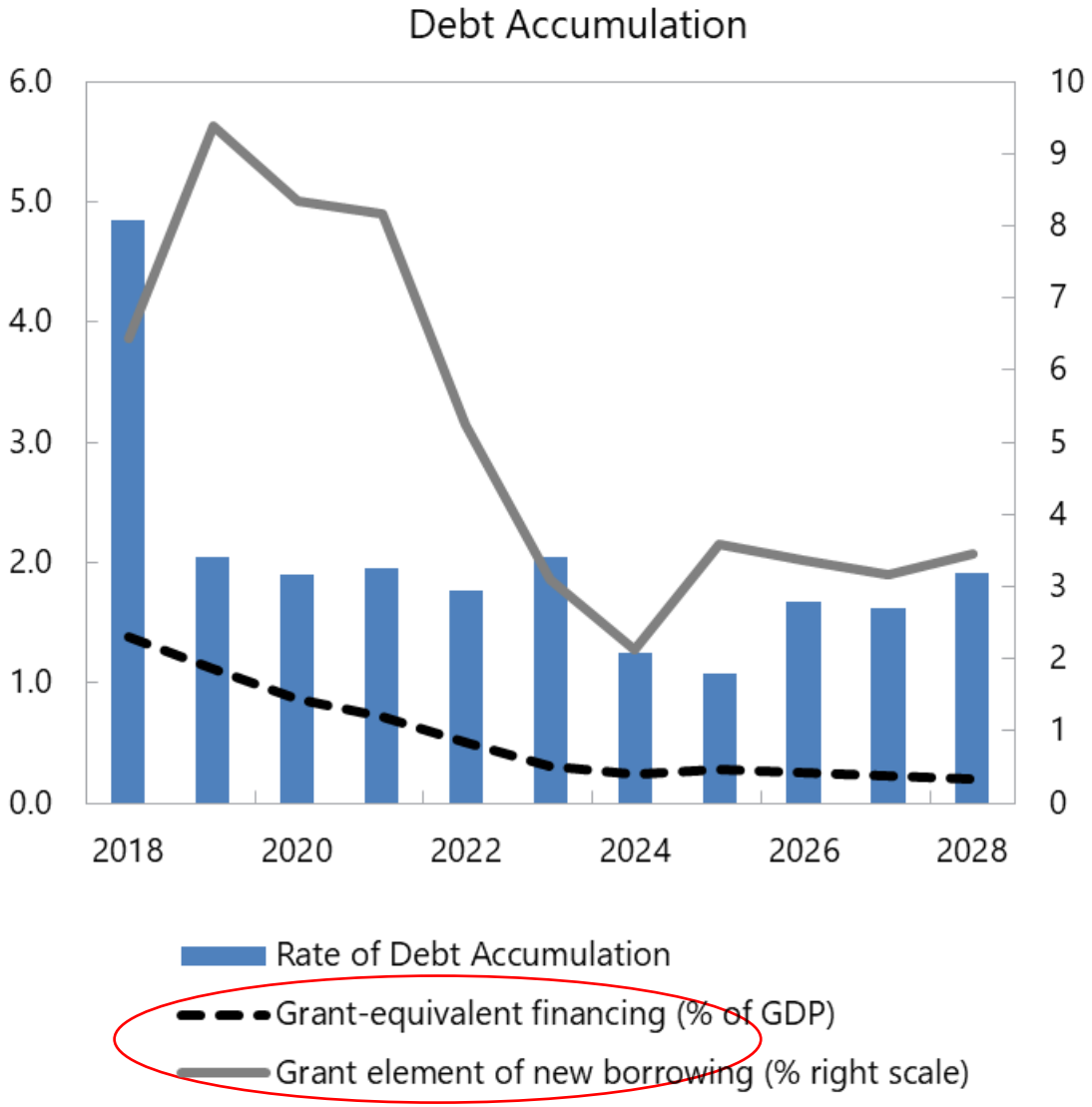
Present Value, grant element, discount rates, concessionality: what are they and why do they matter?



Output chart of the external DSA with assumptions on the grant element of the new borrowing in the next 20 years

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Quiz 2/4

Let’s go to Menti!

Mentimeter

European Commission

Exercise on Public Debt Dynamics

Instruction

- **Part 1**
  - **Use the excel file “Exercise DSA Domestic currency only”, start with the baseline sheet, answer questions,**
  - **go to the next sheet “Fiscal consolidation 1” answer questions ……**
  - **In total there are 4 sheet + 1 graph sheet that summarize all the results**
- **Part 2 (if time permits)**
  - Use the excel file “Exercise DSA Domestic and Foreign currency”. There is only one sheet “baseline” answer the questions

Outline

- Why is Debt Sustainability Important?
- What are the Building Blocks of Debt Sustainability Analysis?
- DSA Frameworks - The LIC DSF
- DSA Frameworks - The MAC DSA and SR DSF

FRAMEWORKS TO ASSESS DEBT SUSTAINABILITY

	MAC SR DSF	MAC DSA	LIC DSF	DDT
Used for	**Advanced Economies & Emerging Markets**	**Advanced Economies & Emerging Markets**	**Low-Income Countries**	**All Countries**
Why?	Countries with sustained access to international capital markets	Countries with sustained access to international capital markets	Countries relying on concessional resources	Countries with limited data availability and technical capacity
Horizon	5 years (optional 10 years)	5 years	20 years	12 years
Debt Scope	Total PPG Debt N.B.: PPG = Public and Publicly Guaranteed Debt Total = Domestic + External	Total PPG Debt External PPG Debt	Total PPG Debt External PPG Debt	Total PPG Debt
Solvency/Liquidity Assessment	YES/YES	YES/YES	YES/YES	YES/NO
Perspective	Debt Manager	Debt Manager	Debt Manager	Fiscal Policy Maker

FRAMEWORKS TO ASSESS DEBT SUSTAINABILITY

- In practice, IFIs use these tools both during the process of granting additional financing, as well as to assess/monitor the macro situation and the economic program (in terms of impact on debt sustainability).
- These tools supports the IMF surveillance and lending functions.
- In surveillance, these tools acts as an early warning system gauging debt-related risks. When risks are detected, these frameworks can help identify policy recommendations to prevent potential stress from materializing.
- Where public debt is found to be unsustainable, these frameworks provides a methodology for setting targets to guide debt restructurings.
- Policy recommendations are derived from these evaluations.

Low-Income Country Debt Sustainability Framework (LIC DSF)

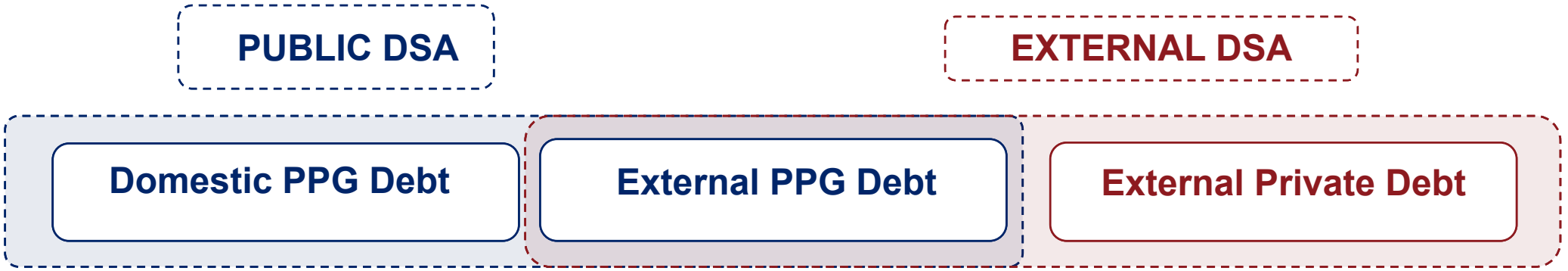
LIC DSF: COUNTRIES AND ASSESSMENTS

- A **sophisticated framework** for assessing debt sustainability and evaluating the risk of debt distress, developed jointly by the IMF and the World Bank in 2005.
- Integrates concepts and procedures from the **three approaches** (accountability, analytical and empirical) and tackles **solvency and liquidity** issues.
- Suitable for **low-income countries whose sovereigns still significantly rely on concessional financing**.
- Combines the assessments of debt sustainability and debt-distress risk by adopting the empirical approach and using debt projections and thresholds for sustainability.
- The assessments aim to **identify two conditions**:
  - **Vulnerability to debt-distress events**:
    - episodes where a country has difficulty servicing debt;
    - a risk rating is established to measure such vulnerability.
  - The **risk of the unsustainability** of the public debt due to the breaching of the debt indicators thresholds:
    - LIC DSF determines whether a country's public debt is sustainable or unsustainable.

LIC DSF: STRENGHS AND DRAWBACKS

- LIC DSF´s main **strengths** are:
  - delivers **projections for several debt indicators** in various scenarios;
  - provides **detailed analysis** of debt stocks, issuances and debt-service obligations;
  - formulates a **debt-distress risk rating** for the public external debt and the total public debt; and
  - **rigor and high quality** of calculations and visualizations.

- Main **drawbacks** are:
  - is **complex,** the spreadsheets implementing it is **not easy to use**;
  - **several inputs are required** and debt targets and fiscal-policy adjustment paths are not addressed;
  - It **does not include stochastic simulations** and fan charts.



N.B.: PPG Debt = Public and Publicly Guaranteed Debt

LIC DSF: DEBT DYNAMICS, HORIZON, DEBT COVERAGE

- LIC DSF adopts the **debt manager's perspective** for projecting debt indicators and tracking gross and net borrowings required to fund budget imbalances, debt repayments and other net financing needs.
- Tracks **individual types of financial liabilities** separately, emphasizing major classes of financiers.
- I**nputs needed**:
  - Historical annual data and 20-year forecasts for macro and debt-related variables.

- Calculates the debt ratios involving the **present value of all future debt-service obligations due until maturity**.
- LIC DSF's projections extend to a protracted, **20-year horizon.** The horizon allows assessment of the opportunity for a government to boost repayment capacity in the long term as the country develops and grows.

Empirical thresholds correspond to debt indicators related to solvency and liquidity.

LIC DSF: DEBT THRESHOLDS

- LIC DSF debt indicators are projected under various scenarios:

SOLVENCY

- **Present value (PV) of the public and publicly guaranteed (PPG) total debt-to-GDP ratio**
- **PV of the PPG external debt-to-GDP ratio**
- **PV of the PPG external debt-to-exports ratio**

LIQUIDITY

- **PPG external debt service-to-exports ratio**
- **PPG external debt service-to-revenues ratio**

- LIC DSF thresholds depend on a country's debt carrying capacity (strong, medium, weak):

	Strong	Medium	Weak
PV of PPG total debt-to-GDP	70%	55%	35%
PV of PPG external debt-to-GDP	55%	40%	30%
PV of PPG external debt-to-exports	240%	180%	140%
PPG external debt service-to-exports	21%	15%	10%
PPG external debt service-to-revenues	23%	18%	14%

LIC DSF: DEBT THRESHOLDS

- **Thresholds for public external debt** and **total public debt** are estimated as follows:
  - episodes of "public external debt distress" are identified as a situation where a government has **difficulty paying foreign debt**.
  - the probability of a country undergoing public external debt distress is formalized using a **probit model**; estimated with a large sample of **observed events**, including debt distress and normal situations for many countries **throughout the last 50 years** or so.
  - thresholds are calibrated to reflect the **maximum acceptable probability of debt distress**, conditional upon a country's capacity to service and manage debt (debt-carrying capacity).

Identification of debt distress and non-distress episodes on the basis of 'signals' of external debt servicing difficulties such as arrears, Paris Club reschedulings, and IMF GRA financing.

Estimation of a parsimonious econometric model (probit) to explain the incidence (probability) of debt distress. The probit model takes the following form:

$$P(\text{debt distress}) = \Phi(\beta_1 * \text{debt burden} + \beta_2 * \text{governance} + \beta_3 * \text{shock} + \beta_4 * \text{other}) \quad (1)$$

where "debt distress" is a binary variable taking the value of 1 if the country experiences debt distress and zero otherwise; Φ is the cumulative distribution function (CDF) of the standard normal distribution; "debt burden" is a measure of indebtedness (PV of debt or debt service) scaled by a measure of repayment capacity (GDP, exports, or government revenue); "governance" is a measure the quality of policies and institutions (the World Bank's CPIA index); "shock" is a proxy for macroeconomic shocks to the economy (real GDP growth); and "other explanatory variables" in Staff 2004 included GDP per capita and a dummy variable for Africa.[2]

Calibration of indicative debt burden thresholds. This is achieved by fixing in equation (1) the values for the probability of debt distress, governance, and macroeconomic shock, and solving for the debt burden. In the DSF, the probability of debt distress was set between 18–22 percent, depending on the debt burden indicator.[3]

$$\text{Threshold} = \frac{\Phi^{-1}(P(\text{debt distress})) - \hat{\beta}_2 * \text{governance} - \hat{\beta}_3 * \text{shock} - \hat{\beta}_4 * \text{other}}{\hat{\beta}_1} \quad (2)$$

LIC DSF: DEBT-CARRYING CAPACITY

- Distinguishes between **three groups of countries**, depending on their **debt-carrying capacity.**
- Reflects the maximum acceptable **probability of debt distress**, conditional upon a country's capacity to service and manage debt.
- Debt-carrying capacity is based in **two pillars**:
  - Country Institutional and Policy Assessment (CPIA, elaborated by the World Bank)
  - Prevailing macroeconomic framework
- The LIC DSF thresholds distinguish between three groups of countries exhibiting strong, medium, or weak debt-carrying capacity.

LIC DSF: DEBT DISTRESS RATINGS

- Assesses **two debt-distress risk ratings**:
  - **Risk of public external debt distress**:
    - indicators related to public external debt are compared against their respective thresholds.
    - LIC DSF quantifies the risk of undergoing public external debt distress, since the (estimated) probabilities of occurrence are utilized to calibrate the thresholds.
    - builds a risk rating for the public external debt distress.
  - **Risk of total public debt distress**:
    - analysis of public external debt is extended by adding a comparison between the indicator of total public debt and its threshold.
    - LIC DSF determines a risk rating for the total public debt distress.
- Determining debt-distress risk ratings needs to be complemented with the analyst's expert judgment. The LIC DSF calls for expert judgment when the analysis encounters circumstances that may justify a deviation from the mechanical comparison of debt-indicator projections and threshold.

LIC DSF: ANALYTICAL FRAMEWORK

Debt Carrying Capacity (DCC = weak, medium, strong) based on the WBG's CPIA and other key fundamentals

Thresholds for the three DCC categories. Higher (lower) thresholds for strong (weak) DCC

Macro-fiscal projections (20 years)
-Baseline Scenario
- Stress tests (history-driven and shock scenarios)

Debt projections (ratios of PV, debt service, etc.) for various scenarios

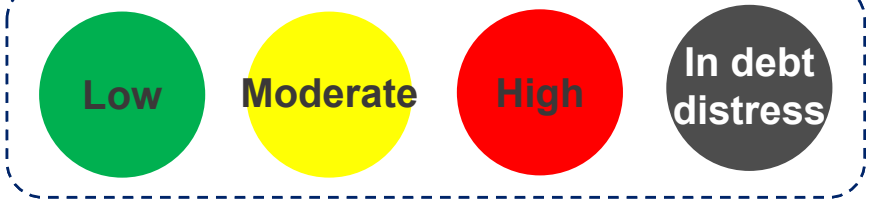
Additional Tools
Assessment of forecast realism
Domestic debt vulnerabilities
Fiscal space to absorb shocks

Comparisons between debt projections and thresholds for all scenarios

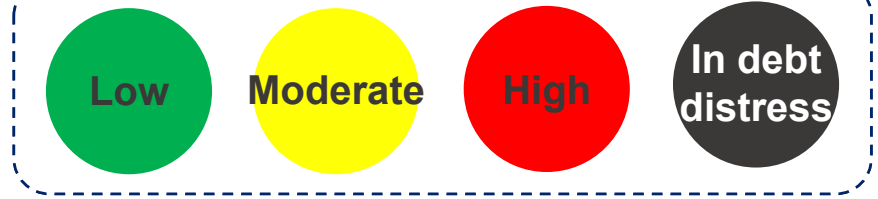
Rules to assign debt-distress risk ratings (akin to credit-risk ratings) based on those comparisons

Analyst's judgment complements rules to avoid 'mechanistic' determination of risk ratings

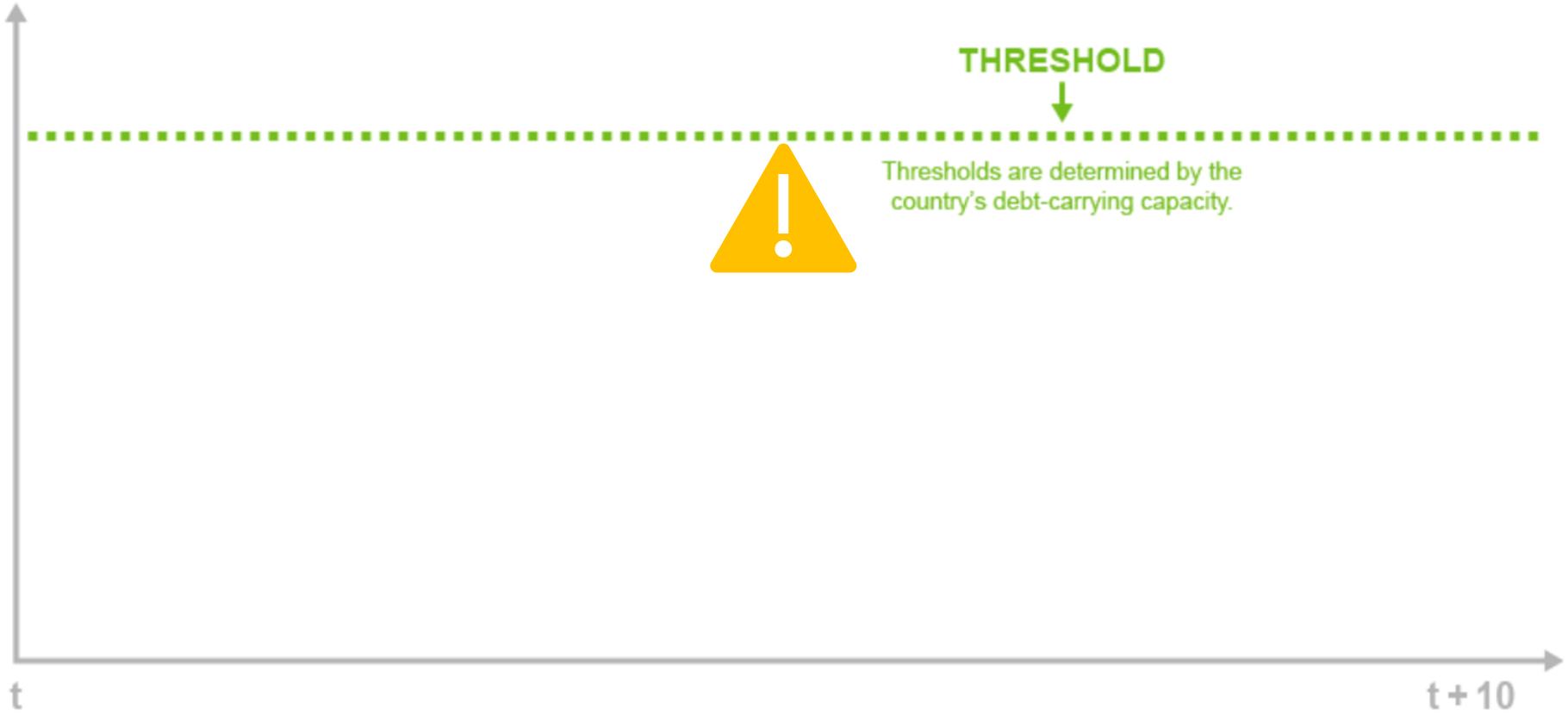
Debt-Distress Risk for Public External Debt



Debt-Distress Risk for Total Public Debt



How is the Risk Rating Determined? 1/6



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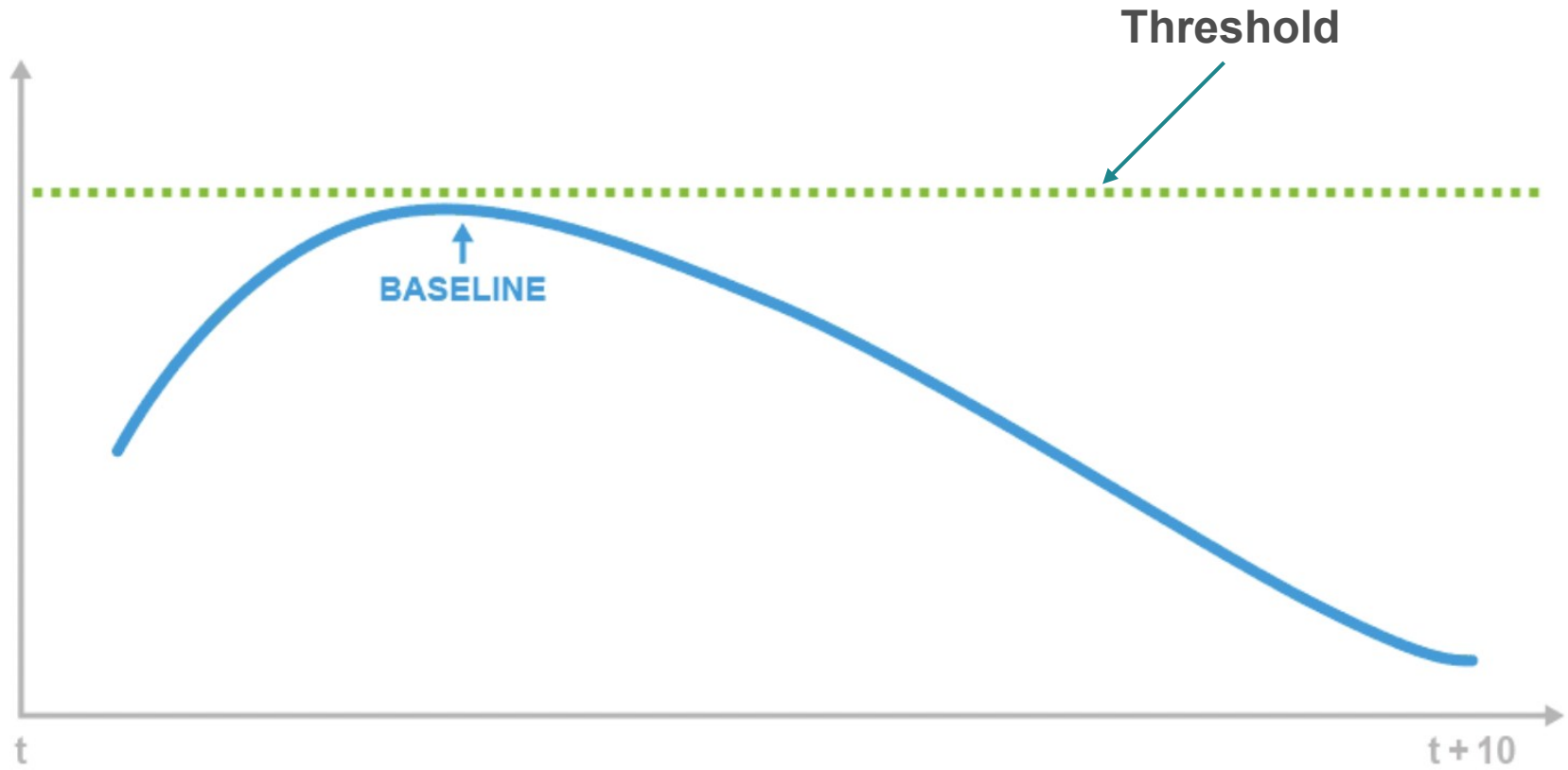
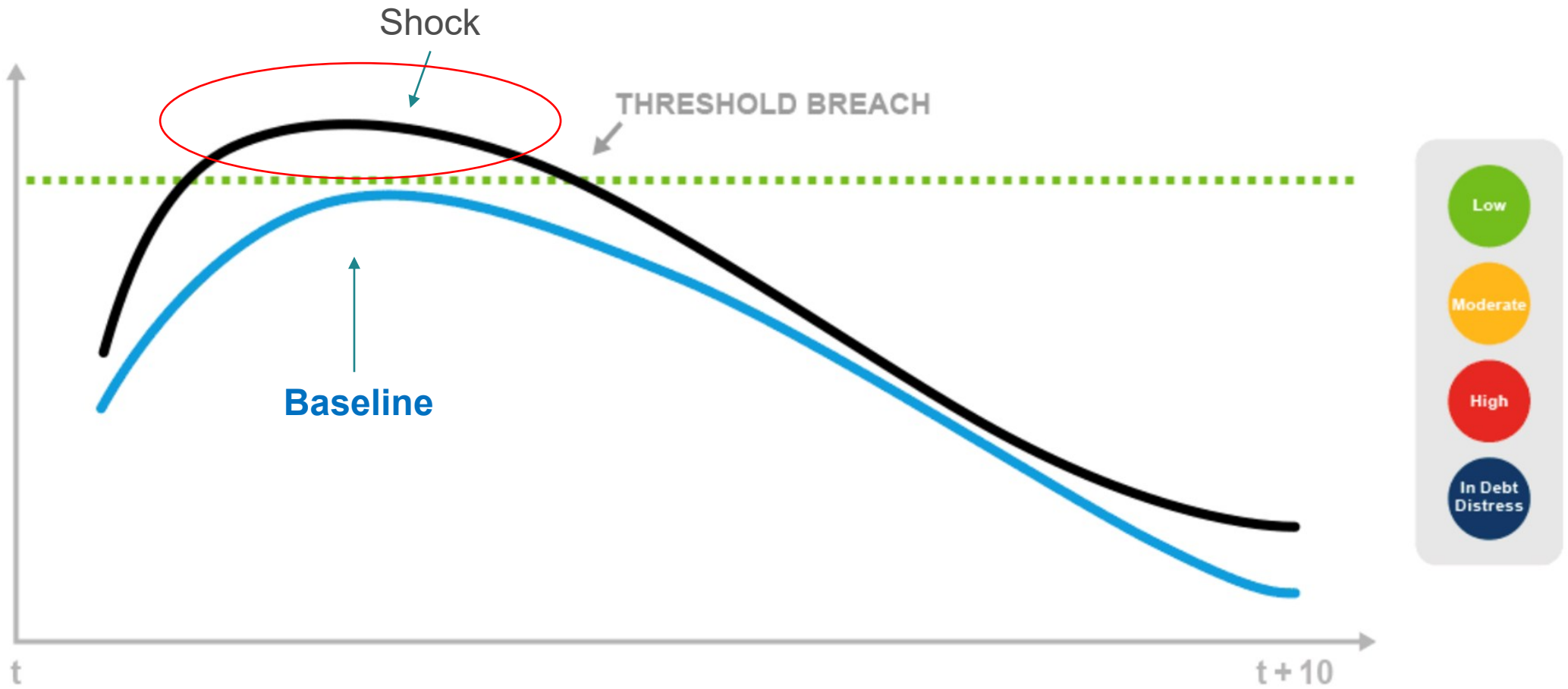
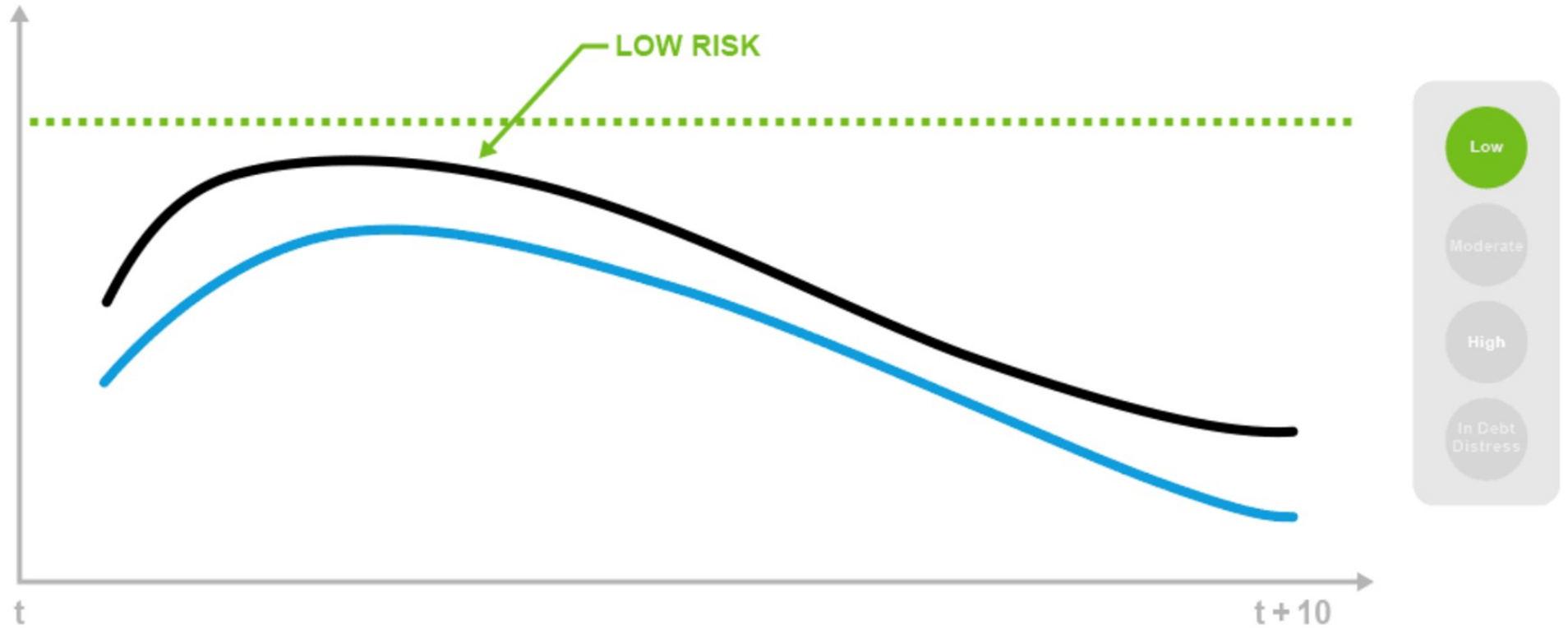
How is the Risk Rating Determined? 2/6



How is the Risk Rating Determined? 3/6



How is the Risk Rating Determined? 4/6



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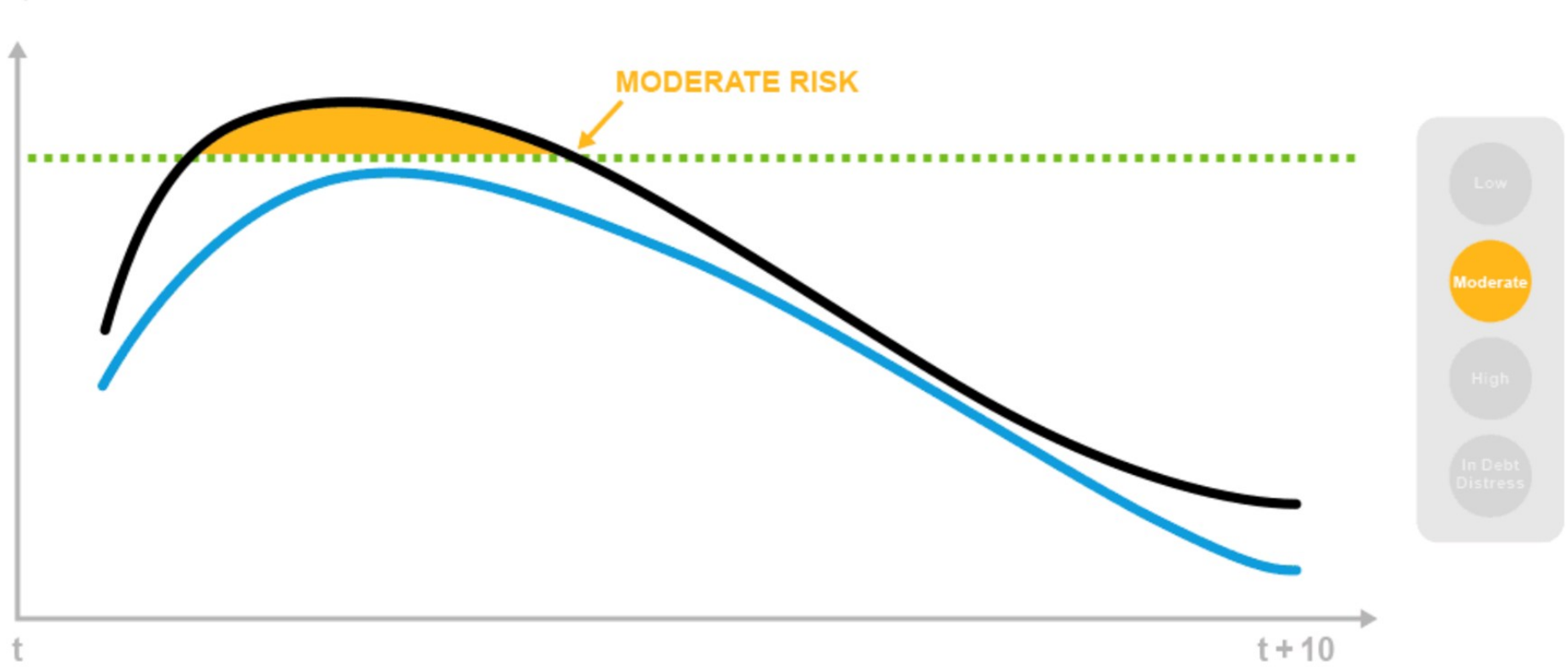
How is the Risk Rating Determined? 5/6



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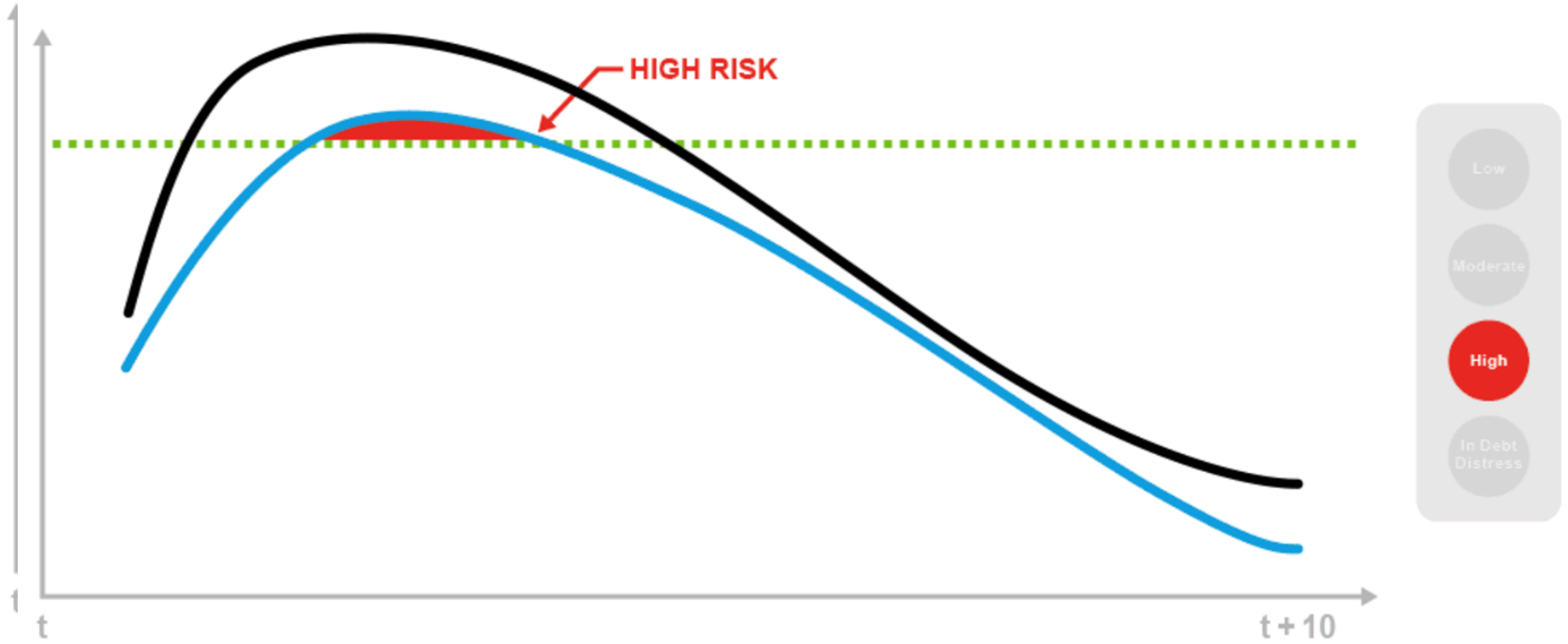
How is the Risk Rating Determined? 6/6



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LIC DSF: ANALYTICAL FRAMEWORK

LIC DSF assigns a debt-distress risk rating for **public external debt** where a country is rated as:

- **Low risk** if none of the indicators breach their respective thresholds under the baseline scenario or in the stress-test scenarios
- **Moderate risk** if none of the indicators breach their respective thresholds under the baseline scenario, but at least one indicator breaches its threshold in a stress-tests scenario
- **High risk** if one indicator breaches its threshold in the baseline scenario
- In **public external debt distress** when specific conditions are observed (e.g., arrears to official creditors, nonvoluntary debt negotiations) regardless of any comparison between indicators and thresholds

LIC DSF: ANALYTICAL FRAMEWORK

LIC DSF assigns a debt-distress risk rating for **total public debt** where a country is rated as:

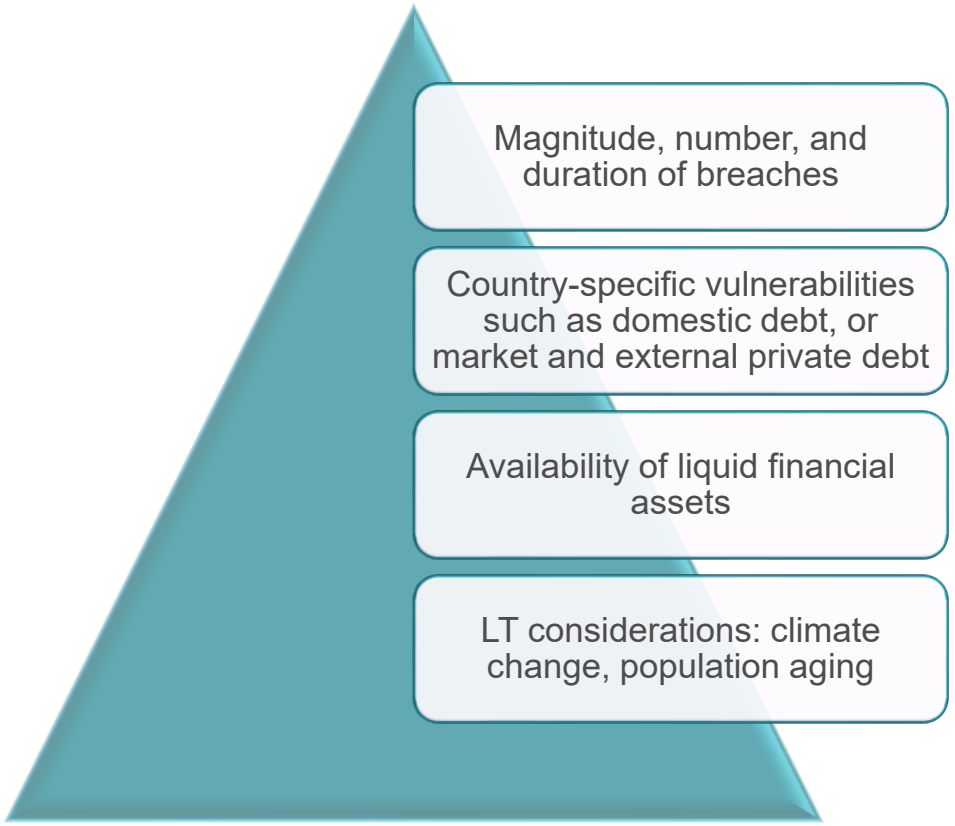
- **Low risk** if the risk rating for external public debt is low and the total public debt indicator does not breach its respective threshold under any scenario
- **Moderate risk** if the risk rating for external public debt is moderate, or if it is low and the total public debt indicator does breach its respective threshold in a stress-test scenario
- **High risk** if the risk rating for external public debt is high, or if it is low or moderate and the total public debt indicator does breach its respective threshold in the baseline scenario
- In **total public debt distress** when specific conditions are observed (e.g., arrears to official creditors, nonvoluntary debt negotiations) regardless of any comparison between indicators and thresholds

Realism

- Realism tools provide a point of comparison for forecasts, drawing on the country's history, cross-country experiences, and economic theory relationships
- They are crucial for a **credible assessment** of debt sustainability
- Assumptions in the baseline scenario must be realistic and LIC DSF includes 4 realism tools that examine different aspect of the macroeconomic framework
- Realism tools **scrutinize past and future drivers of debt dynamics**, planned fiscal adjustments, the potential impact of fiscal adjustment on growth, as well as the public investment-growth nexus
- The assessment considers the evolution of projections for external and public debt-to-GDP ratios over DSA vintages (from one year and five years ago)

Analyst's Judgement

- Judgement plays an important role in the DSA process, complementing the mechanical risk derived from the underlying model
- It allows for considerations of factors that may not be captured by the DSF's model, addressing ambiguities
- The use of judgement is not meant to arbitrarily change the mechanical risk rating
- It incorporates additional vulnerability signals from factors such as domestic debt and market financing



Policy Implications: Linking the LIC DSF with IMF/WB Policies and Facilities

Borrowing ceilings *aim at supporting countries* ***meet their financing needs*** *consistent with debt sustainability*

IMF

- DSF results inform the **IMF debt limits policy (DLP**), which sets **limits on debt accumulation** with Fund-supported programs
- The DLP adopts a risk-based approach, aligning **conditionality with debt vulnerabilities** identified through the DSA

WB

- DSF serves as an input for the **World Bank Sustainable Development Finance Policy (SDFP),** which sets nominal limits on non-concessional external PPG debt
- **Different risk categories** correspond to specific debt ceilings to prevent risk downgrade and ensure prudent debt management

Lao PDR LIC DSF 2023-2024

EXAMPLE - LIC DSF – LAO PDR

- **Risk assessment:**
  - Due to the on-going negotiations about debt service deferral and sustained breaches of indicative debt thresholds, Lao's debt is rated as **in debt distress** and **unsustainable**.

Risk of external debt distress	In debt distress
Overall risk of debt distress	In debt distress
Granularity in the risk rating	Unsustainable
Application of judgement	Yes. Given on-going negotiations about debt service deferral and significant and sustained breaches of debt thresholds

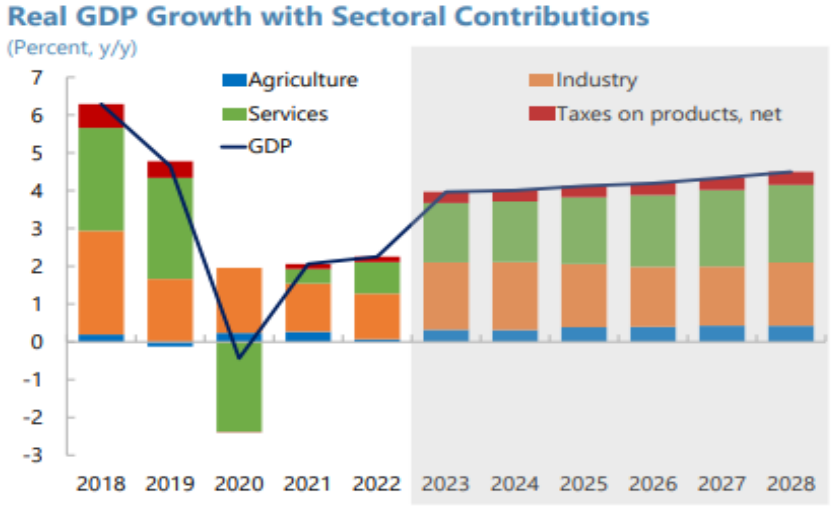
Source: Lao People's Democratic Republic: 2023 Article IV

European Commission

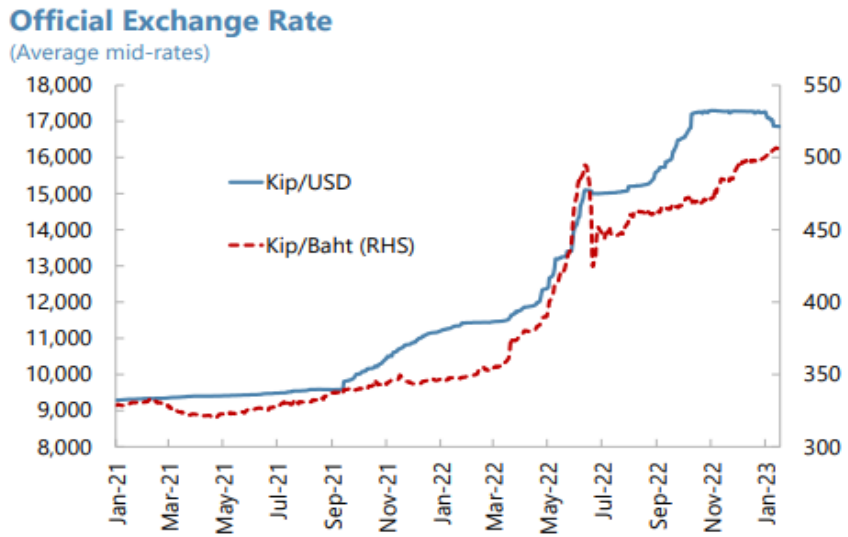
EXAMPLE - LIC DSF – LAO PDR

Recent Economic Developments

- **GDP growth** was nearly flat in 2020 and gradually recover the next two years
- Increase in global commodity prices accelerated **exchange rate** pressures and increased **inflation** rates
- **Fiscal policy** was contractive, driven equally by expenditure cuts and recovery in revenue collection
- **FX reserves** fell down posing the economy with little room to absorb external shocks
- **Exchange rate** depreciated more than 50% against USD since 2021.
- **Current account** deficit widened in 2022 with income repayment pressures, despite the surplus achieved in the trade balance the precedent year



Sources: National authorities and IMF staff calculations and projections.



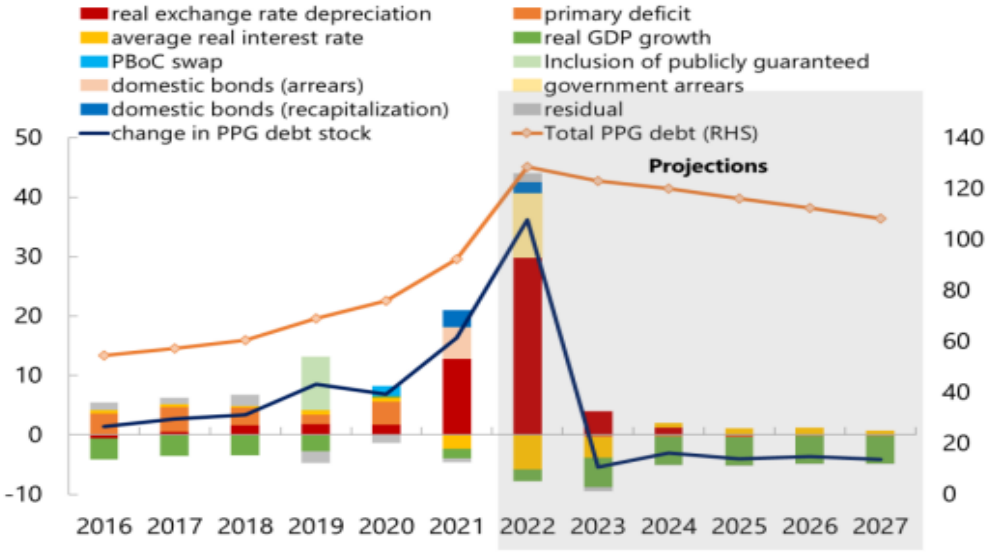
Sources: National authorities and IMF staff calculations.

Source: [Lao People's Democratic Republic: 2023 Article IV]

EXAMPLE - LIC DSF – LAO PDR

- **Recent Debt Dynamics**
  - **Public debt** ratio increased 36p.p. to 129% of GDP in 2022, mainly explained by the exchange rate depreciation, contributing 30 p.p.
  - **Domestic arrears** to private contractors account for around 11 percentage points of GDP
  - **External debt repayment** was deferred the past three years: accumulating arrears with China for US$ 1,280 during this period

Text Figure 3. PPG Debt Changes And Contributions
(In percent of GDP)



Sources: National authorities; and IMF staff calculations and projections.

Source: [Lao People's Democratic Republic: 2023 Article IV]

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EXAMPLE - LIC DSF – LAO PDR

Public Debt Composition

- China is by far the largest creditor of Lao, representing 36.9% of Total PPG Debt and 42.9% of Total External PPG Debt in 2021.
- Multilateral (ADB and IDA) account for 12.6% of external debt.

Text Table 3. Stock of Public Debt as of end-2021
(in percent of total external PPG and domestic debt)

At end-2021	as percent of total PPG debt	as percent of total external PPG debt	as percent of GDP	in mln USD
Total PPG debt	**100.0%**	-	**92.36%**	**14,950.8**
External debt	**86.1%**	**100.0%**	**79.5%**	**12,869.9**
ADB and IDA	10.9%	12.6%	10.02%	1,622.8
Other Multilateral	1.2%	1.3%	1.07%	172.7
China	36.9%	42.9%	34.07%	5,515.6
Other Bilateral	10.3%	12.0%	9.54%	1,544.6
Commercial Banks	6.4%	7.5%	5.96%	964.1
External Bonds	6.8%	7.9%	6.32%	1,023.1
Publicly Guaranteed	13.6%	15.8%	12.52%	2,027.1
Domestic debt	**13.9%**	-	**12.85%**	**2,080.8**

Sources: Authority data and IMF staff calculations

Note: $300 million from the PBoP swap and $130 million of deferred interest payment in 2021 is included in China, in addition to the authority numbers.

Gross Financing Needs (GFN) Composition

- Gross Financing Needs associated to payments to China represent around 7.9% of GDP in 2023 and 48% of total GFN's.

Decomposition of GFNs in 2023

		mln in Kip	mln in USD	percent of GDP
GFNs in 2023		42,733,278.8	2,295.1	16.3%
Primary deficit		-838,129.1	-45.0	-0.3%
Debt service for domestic existing debt		6,332,375.8	340.1	2.4%
Debt service for domestic new debt		2,717,302.0	145.9	1.0%
Debt service for external existing debt		34,185,509.2	1,836.1	13.0%
of which:	ADB	1,222,412.4	65.7	0.5%
	WB	807,256.0	43.4	0.3%
	Other multilateral	294,998.3	15.8	0.1%
	China (including PBoC swap)	20,642,494.0	1,108.7	7.9%
	Principal	11,310,760.4	607.5	4.3%
	Interest (excluding swap interest)	3,466,736.2	186.2	1.3%
	Swap interest	279,285.6	15.0	0.1%
	PBoC swap repayment	5,585,711.8	300.0	2.1%
	Other bilateral	2,552,613.2	137.1	1.0%
	Bonds/Commercial bank	8,665,735.3	465.4	3.3%
Debt service for external new debt		336,221.0	18.1	0.1%

Sources: Country authorities; and staff estimates and projections.

EXAMPLE - LIC DSF – LAO PDR

- **Macroeconomic Framework underpinning the DSA**
  - GDP growth is envisaged to slow down to around 2% in the ST and increase gradually to 4% in the MT, representing a reduction of more than 2% from the previous DSA
  - Primary balance is assumed to be slightly positive in the medium-term (on average: 0.2% of GDP)
  - Primary expenditure is projected constant at 15% of GDP over the entire horizon and interest payments increase significantly in the next few years

Text Table 4. Key Macroeconomic Assumptions

	2021	2022	2023	2024	2025	2026	2027	Long-term 1/
Real GDP (y/y growth)								
Current DSA	2.1	2.3	4.0	4.0	4.1	4.2	4.3	4.7
Previous DSA (2019 AVI)	6.7	6.8	6.8	6.8	6.7	6.5	6.6	5.9
GDP deflator (y/y growth)								
Current DSA	5.6	17.6	16.1	3.5	3.0	3.0	3.0	3.0
Previous DSA (2019 AVI)	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Primary fiscal balance (percent of GDP)								
Current DSA	-0.1	0.1	0.3	0.3	0.2	0.2	0.1	-0.3
Previous DSA (2019 AVI)	-2.4	-2.3	-2.2	-2.2	-2.2	-1.9	-1.8	-1.5
Revenue and grants (percent of GDP)								
Current DSA	15.0	14.9	15.1	15.1	15.1	15.1	15.0	14.7
Previous DSA (2019 AVI)	16.0	16.1	16.3	16.3	16.4	16.5	16.6	17.2
Primary expenditure (percent of GDP)								
Current DSA	15.1	14.8	14.8	14.8	14.9	14.9	14.9	15.0
Previous DSA (2019 AVI)	18.4	18.4	18.5	18.6	18.6	18.4	18.4	18.7
Fiscal balance (percent of GDP)								
Current DSA	-1.3	-1.6	-3.4	-3.5	-3.4	-3.6	-3.0	-2.6
Previous DSA (2019 AVI)	-3.9	-3.8	-3.7	-3.8	-3.7	-3.4	-3.3	-2.5
Current account balance (percent of GDP)								
Current DSA	-0.6	-6.0	-2.6	-6.2	-7.8	-8.4	-7.6	-6.1
Previous DSA (2019 AVI)	-11.1	-10.8	-10.9	-10.9	-10.8	-10.4	-9.7	-7.4
Exports of goods and services (percent of GDP)								
Current DSA	42.2	53.2	64.4	68.0	68.4	68.4	68.4	70.0
Previous DSA (2019 AVI)	36.5	37.0	37.1	35.8	35.3	34.8	34.4	31.9
Imports of goods and services (percent of GDP)								
Current DSA	38.2	52.8	60.0	66.1	69.0	70.3	70.9	75.2
Previous DSA (2019 AVI)	45.7	45.6	45.0	44.2	43.5	42.8	42.1	38.3

Sources: FSM authorities and IMF staff estimates and calculations.

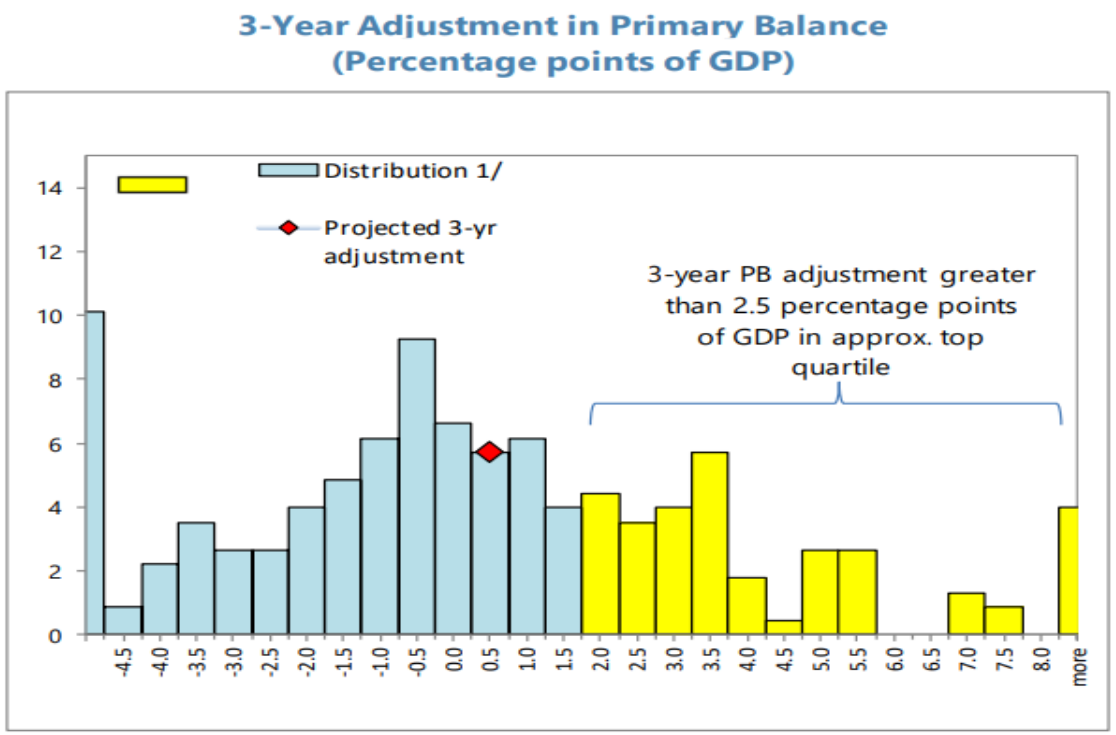
1/ Average 2028-2042 for current DSA and 2028-2038 for previous one.

Source: Lao People's Democratic Republic: 2023 Article IV

EXAMPLE - LIC DSF – LAO PDR

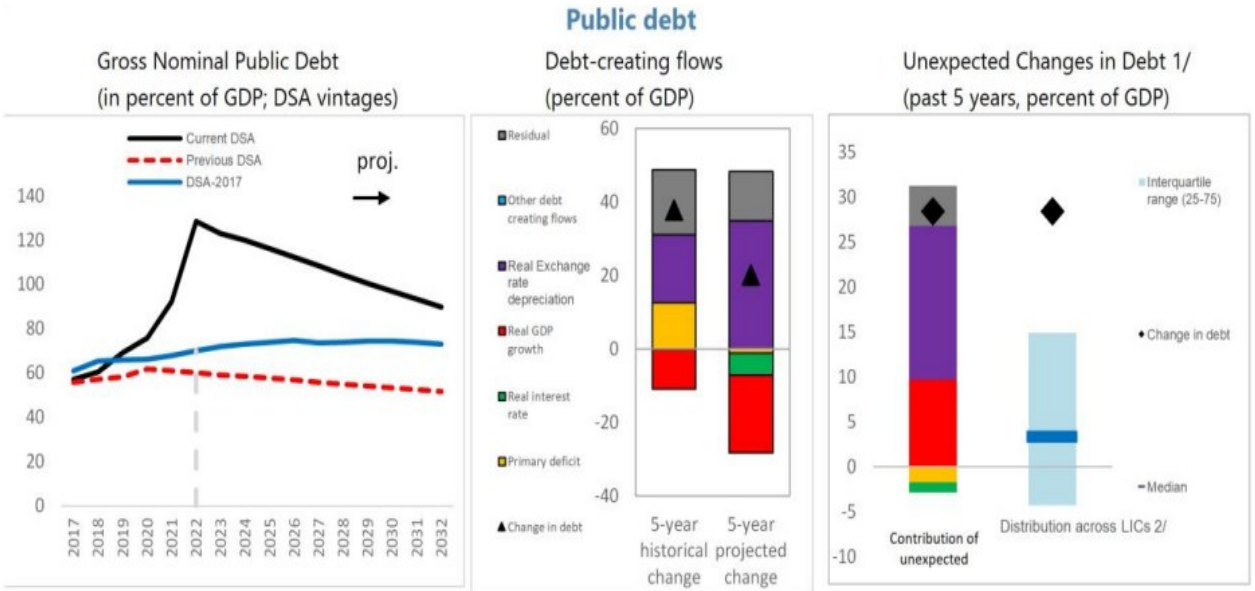
Realism tool: is the fiscal adjustment too optimistic?

- The 3-year fiscal adjustment lies below the upper quartile of the distribution, showing credibility on the baseline fiscal assumption



Realism tool: drivers of debt dynamics

- Main contributors of unexpected changes in public debt in the past were the real exchange rate depreciation (violet) and the real GDP growth (red), indicating both variables were underestimated in previous assessments



1/ Difference between anticipated and actual contributions on debt ratios.

2/ Distribution across LICs for which LIC DSAs were produced.

3/ Given the relatively low private external debt for average low-income countries, a ppt change in PPG external debt should be largely explained by the drivers of the external debt dynamics equation.

Source: Lao People's Democratic Republic: 2023 Article IV

EXAMPLE - LIC DSF – LAO PDR

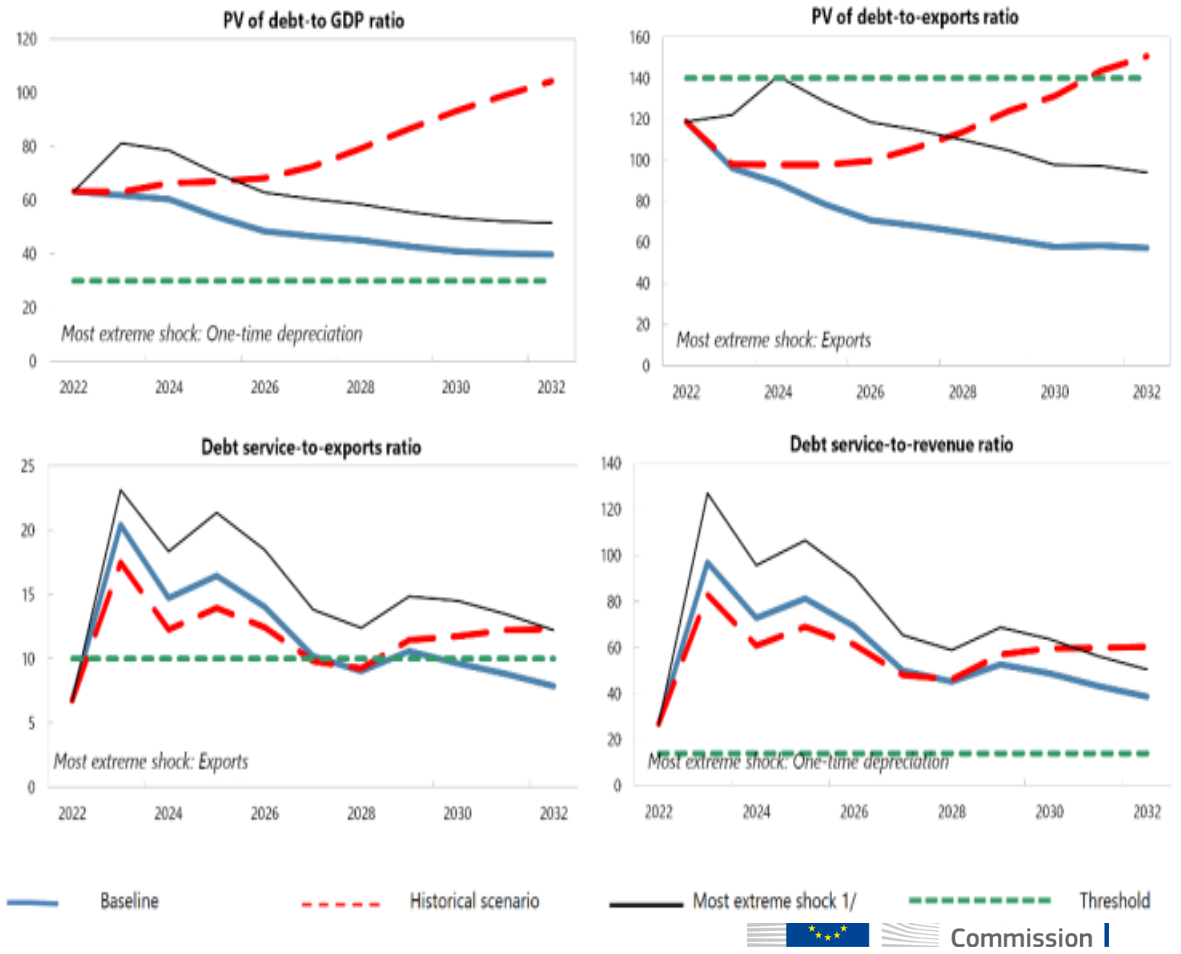
Baseline scenario

- Regarding solvency, the PV of external debt-to-GDP ratio is expected to breach the threshold throughout the whole projection horizon. The PV of external debt-to-exports ratio is expected not to breach the threshold in the baseline.
- Regarding liquidity, debt service-to-exports ratio is expected to breach the threshold . Meanwhile, the debt service-to-revenue ratio is expected to breach the threshold throughout the entire projected period.

Stress tests

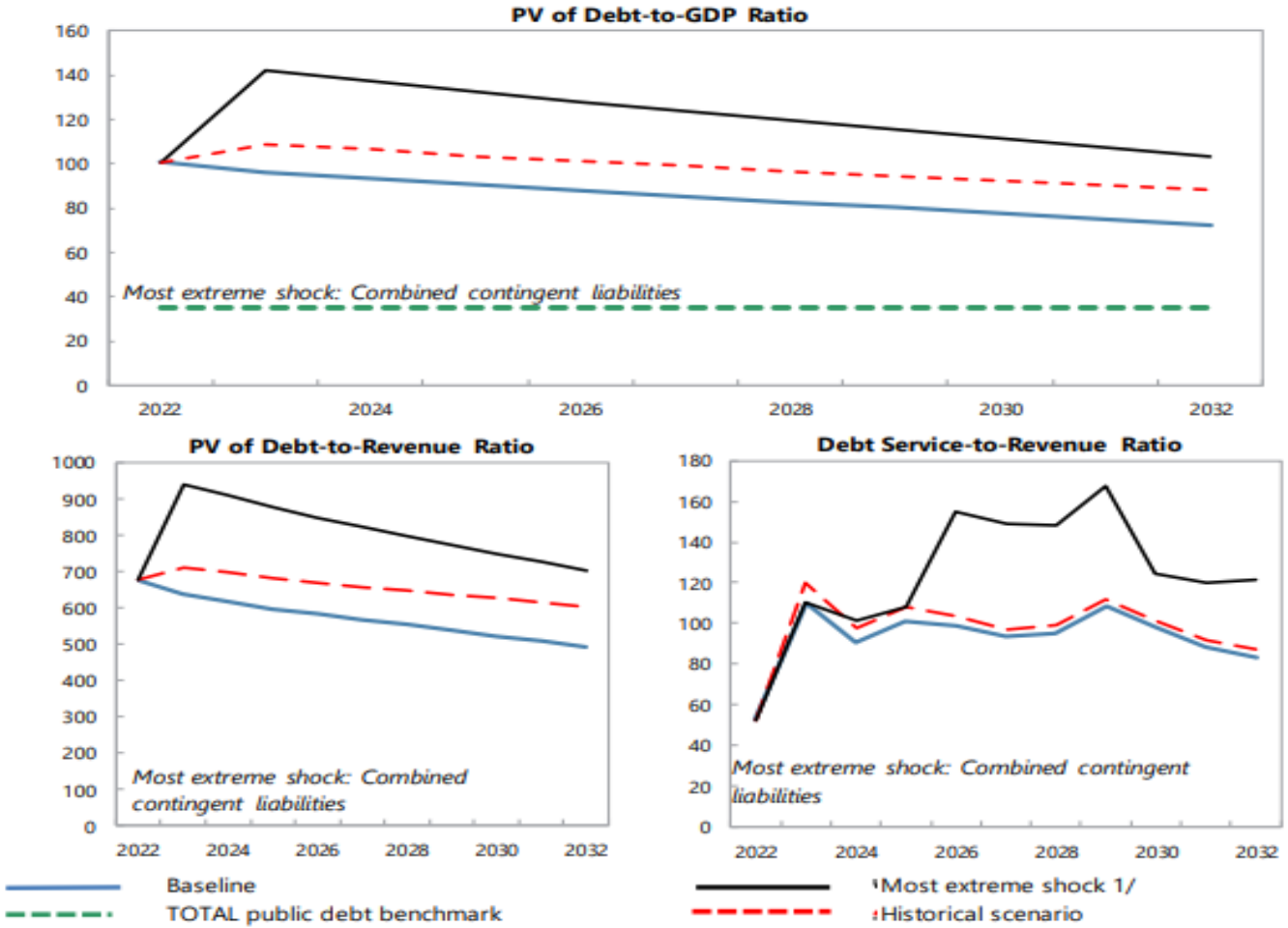
- In the most extreme shock (exports) for the PV of debt-to-exports and the debt service-to-exports breach the threshold.
- The most extreme shock for the PV of debt-to-GDP ratio and debt service-to-revenue ratio is the currency deprecation. For both indicators the thresholds are breached during the entire projection horizon.

Figure 1. Indicators Of Public And Publicly Guaranteed External Debt Under Alternative Scenarios, 2022–2032



EXAMPLE - LIC DSF – LAO PDR

Figure 2. Indicators Of Public Debt Under Alternative Scenarios, 2022–2032



Source: [Lao People's Democratic Republic: 2023 Article IV]

Quiz 3/4

Let’s go to Menti!

Mentimeter

European Commission

Outline

Why is Debt Sustainability Important?

What are the Building Blocks of Debt Sustainability Analysis?

DSA Frameworks - The LIC DSF

DSA Frameworks - The MAC DSA and SR DSF

FRAMEWORKS TO ASSESS DEBT SUSTAINABILITY

	MAC SR DSF	MAC DSA	LIC DSF	DDT
Used for	**Advanced Economies & Emerging Markets**	**Advanced Economies & Emerging Markets**	**Low-Income Countries**	**All Countries**
Why?	Countries with sustained access to international capital markets	Countries with sustained access to international capital markets	Countries relying on concessional resources	Countries with limited data availability and technical capacity
Horizon	5 years (optional 10 years)	5 years	20 years	12 years
Debt Scope	Total PPG Debt N.B.: PPG = Public and Publicly Guaranteed Debt Total = Domestic + External	Total PPG Debt External PPG Debt	Total PPG Debt External PPG Debt	Total PPG Debt
Solvency/Liquidity Assessment	YES/YES	YES/YES	YES/YES	YES/NO
Perspective	Debt Manager	Debt Manager	Debt Manager	Fiscal Policy Maker

FRAMEWORKS TO ASSESS DEBT SUSTAINABILITY

- In practice, IFIs use these tools both during the process of granting additional financing, as well as to assess/monitor the macro situation and the economic program (in terms of impact on debt sustainability).
- These tools supports the IMF surveillance and lending functions.
- In surveillance, these tools acts as an early warning system gauging debt-related risks. When risks are detected, these frameworks can help identify policy recommendations to prevent potential stress from materializing.
- Where public debt is found to be unsustainable, these frameworks provides a methodology for setting targets to guide debt restructurings.
- Policy recommendations are derived from these evaluations.

Market-Access Country Debt Sustainability Analysis (MAC DSA)

MARKET-ACCESS COUNTRY DEBT SUSTAINABILITY ANALYSIS (MAC DSA)

- Historical predecessor of the SRDSF.
- Relies on **empirical thresholds** as benchmarks against which different debt indicators can be compared, improving the sustainability assessment relative to the DDT.
- Thresholds for the public debt-to-GDP ratio and the GFN-to-GDP ratio are used in relation to **solvency and liquidity**, respectively.
- **Debt indicators projected** in the baseline and alternative scenarios **are compared against the indicative benchmarks.**
- MAC DSA introduces a procedure to **quantify sovereign debt-related risks** emerging from solvency or liquidity vulnerabilities. Presents a **heat map** comparing vulnerability indicators.
- **Risk indicators:**
  - **Emerging Markets Bond Index Global Spread** is a measure of cost of borrowing,
  - the **external financing requirements as a share of GDP** indicate liquidity needs,
  - the **share of public debt in foreign currency** as a measure of currency-risk exposure and the
  - **change in short-term public debt as a percentage of total debt**, together with the **share of public debt held by nonresidents**, indicates **liquidity risk**.

MARKET-ACCESS COUNTRY DEBT SUSTAINABILITY ANALYSIS (MAC DSA) - DEBT INDICATORS & THRESHOLDS

- MAC DSA debt indicators:
  - **Public debt-to-GDP ratio** (solvency)
  - **GFN-to-GDP ratio** (liquidity)
- MAC DSA thresholds depend on a country's level of development and market integration:
  - Emerging Markets
  - Advanced Economies

	Advanced Economies	Emerging Markets
Public Debt-to-GDP ratio	85%	70%
GFN-to-GDP ratio	20%	15%

MARKET-ACCESS COUNTRY DEBT SUSTAINABILITY ANALYSIS (MAC DSA) - SIGNALS & HEAT MAP

HEAT MAP COLORS

Debt and GFN	Baseline above benchmark?	Stress test above benchmark?
High	Yes	Yes
Moderate	No	Yes
Low	No	No

Debt Profile Vulnerabilities

If actual values are over, between or under benchmarks

High

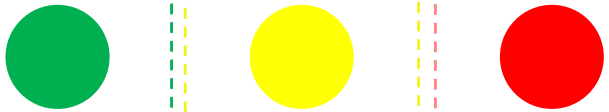
Moderate

Low

MARKET-ACCESS COUNTRY DEBT SUSTAINABILITY ANALYSIS (MAC DSA) - SIGNALS & HEAT MAP (CONT.)

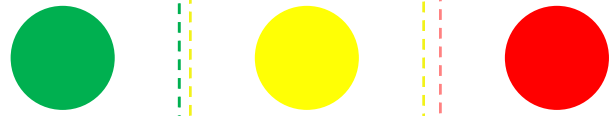
DEBT PROFILE EMERGING MARKETS

Debt Profile Indicators	Low Risk	Moderate Risk	High Risk
EMBI Global Spreads (basis points)	Below 200	Between 200 and 600	Above 600
External Financing Requirements (% of GDP)	Below 5	Between 5 and 15	Above 15
Public Debt in Foreign Currency (share of total)	Below 200	Between 20 and 60	Above 60
Change Short-Term Public Debt (in percent of total debt)	Below 0.5	Between 0.5 and 1	Above 1.0
Public Debt held by non-residents (share of total)	Below 15	Between 15 and 45	Above 45



DEBT PROFILE ADVANCED ECONOMIES

Debt Profile Indicators	Low Risk	Moderate Risk	High Risk
Bonds Spreads (bases points)	Below 400	Between 400 and 600	Above 600
External Financing Requirements (% of GDP)	Below 17	Between 17 and 25	Above 25
Change Short-Term Public Debt (in percent of total debt)	Below 1.0	Between 1.0 and 1.5	Above 1.5
Public Debt held by non-residents (share of total)	Below 30	Between 30 and 45	Above 45



Market-Access Country Sovereign Risk and Debt Sustainability Framework (MAC SR DSF)

MAC SR DSF: COUNTRIES AND ASSESSMENTS

- Introduced in 2021 by the IMF to succeed the MAC DSA, developed in 2002.
- **A sophisticated framework** to assess debt sustainability and evaluate the risk of sovereign debt-related stress.
- Built on concepts and procedures from **the three approaches** (accounting, analytical and empirical), **focusing on solvency- and liquidity-related indicators**.
- Suitable for **advanced economies and emerging markets** whose sovereigns have regular access to domestic and international capital markets.
- It has been utilized in a few countries thus far.

MAC SR DSF: STRENGHS AND DRAWBACKS

- SRDSF´s main **strengths** are:
  - availability of **projections for several debt indicators** in various scenarios;
  - a **detailed analysis** of debt-service obligations, gross financing needs, gross borrowing requirements and borrowing options with assumed financing terms;
  - elaboration of a **risk rating** to assess sovereign debt-related stress;
  - **simplicity of stochastic simulations** and fan charts; and
  - **rigor and high quality** of calculations and visualizations.

- Its main drawback:
  - SRDSF is **technically complex** and not straightforward to apply;
  - **significant amounts of historical data** and forecasts required as inputs;
  - It **does not systematically analyze debt targets and fiscal-policy adjustment paths**.

MAC SR DSF: DEBT DYNAMICS, HORIZON, DEBT COVERAGE

- SRDSF adopts the **debt manager's perspective** to project the public debt ratio and other indicators, emphasizing gross and net borrowings required to fund budget imbalances, debt repayments and other net financing needs.

- **Inputs needed** are:
  - Historical annual data and 10-year forecasts for the same variables for the DDT.
  - The debt-service obligations of outstanding financial liabilities and working assumptions for new debt issuances and their financing terms.

- Provides guidance to determine the overall rating of sovereign stress risk, which takes on board the risk ratings corresponding to each of the three horizons, together with the prospects for stabilizing the public debt ratio in the baseline outlook by implementing feasible policies and reforms.

MAC SR DSF: SOVEREIGN RISK AND DEBT SUSTAINABILITY

SRDSF provides two assessments: **sovereign debt-related stress risk** and **debt sustainability**.

Both assessments aim to identify three conditions:

1. Vulnerability to "sovereign stress events": refers to an event where market and/or fiscal pressures related to public debt become acute.
   - Risk rating to measure such vulnerability: **High**, **Moderate** or **Low** risk of sovereign stress.
   - Three horizons: near term (one to two years ahead), medium term (up to five years ahead) and long term (more than five years ahead).

2. Risk that public debt may become unsustainable: lack of politically and economically feasible policies that can stabilize the debt-to-GDP ratio while reducing the rollover risk.
   - Signal on debt sustainability: **Unsustainable**, **Sustainable but not with high probability**, or **Sustainable with a high probability**.

3. The prospects for stabilizing the public debt ratio in the baseline outlook by implementing politically and economically feasible policies and reforms.

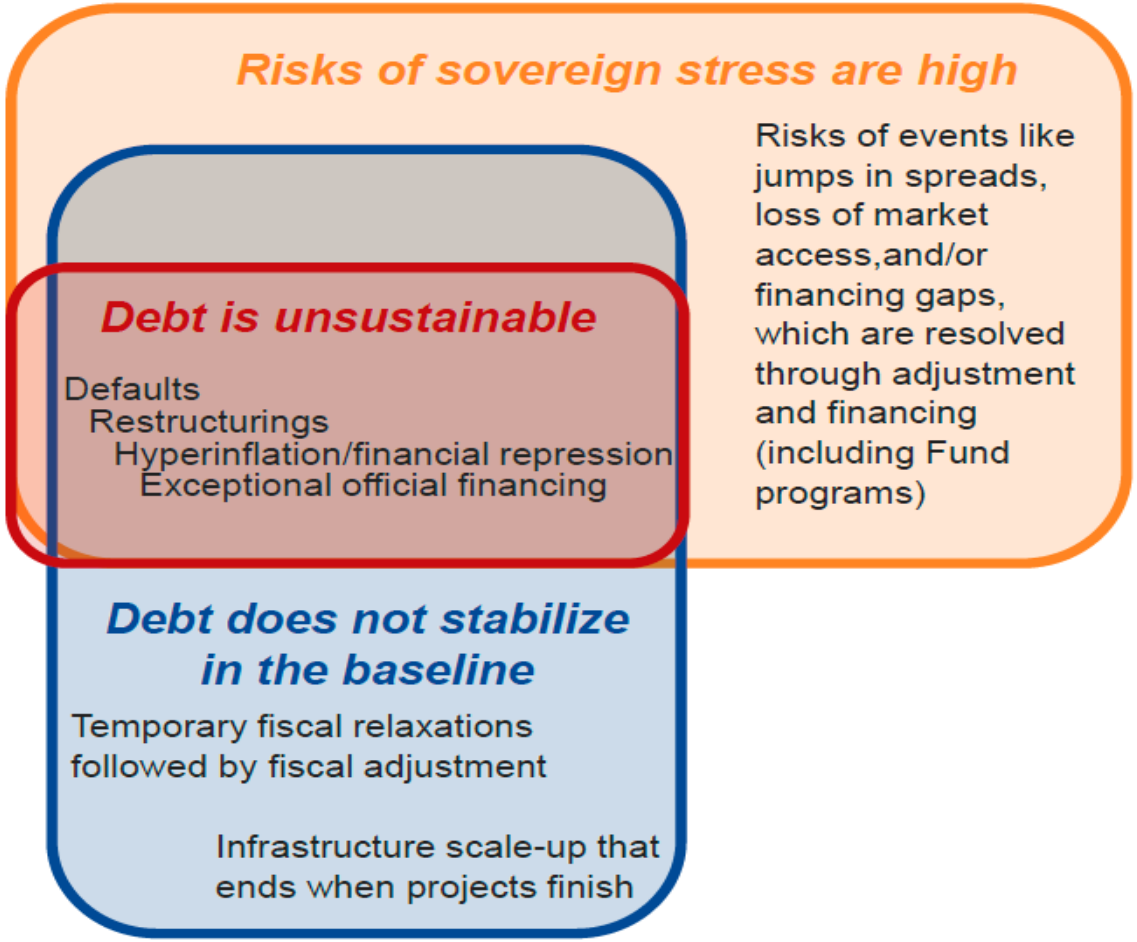
MAC SR DSF: SOVEREIGN RISK AND DEBT SUSTAINABILITY

- SRDSF provides two assessments: **sovereign debt-related stress risk** and **debt sustainability**.

- **Sovereign stress** refers to an event where market and/or fiscal pressures related to public debt become acute

- **Unsustainable debt** is the most severe type of stress event. It occurs when there are no politically and economically feasible policies that stabilize debt-to-GDP and deliver acceptable rollover risks without restructuring and/or exceptional bilateral support

- **Debt that does not stabilize in baseline projections** describes a situation where the debt-to-GDP ratio is not expected to stabilize. Sometimes it is an indicator of sovereign stress or unsustainable debt, but not always.



MAC SR DSF: ANALYTICAL FRAMEWORK FOR SOVEREIGN RISK NEAR TERM ASSESSMENT

GOAL MOTIVATION

Calculate the **probability** of a short-term **debt stress** event.
Formulate a multivariate logistic regression model.

STRESS INDICATORS

10 indicators, in four categories: structural indicators, cyclical indicators, debt and buffer indicators, and global variables

COMPOSITE INDEX

Multivariate logistic regression combines indicators in a
continuous metric (fitted probability of stress)

SIGNAL DERIVATION

Stress probability split in low, moderate, and high-risk zones (thresholds are calibrated to keep the rate of missed crises and false alarms at 10 percent)

MAC SR DSF: ANALYTICAL FRAMEWORK FOR SOVEREIGN RISK NEAR TERM ASSESSMENT

Logit Model: Explanatory Variables

Category	Explanatory Variable	Intuition	Calculation	Source
Structural factors	Institutional quality	A proxy for debt carrying capacity where stronger institutions point to lower probability of stress	Average of government effectiveness and regulatory quality components of the World Governance Indicators	Fund staff calculation on World Governance Indicators (Kaufmann and Kraay)
	Stress history	Summarizes the track record of stress episodes, with recent events indicating higher probability of renewed stress	If a country is in stress, previous observation + 1. If a country is not in stress, 0.9 x previous year's observation.	Fund staff calculation
Cyclical position	Current account/GDP	Weaker current accounts may signal overheating that is subject to reversal	Current account/GDP x 100, with appropriate currency conversion to GDP	Country authorities or WEO
	Three-year change in REER	Strong appreciation can raise risks of abrupt exchange rate depreciations that can cause FX debt to spike	[REER(t)/REER(t-3)-1]x100	IMF, Information Notice System (INS) University of Bruegel when INS unavailable
	Credit-to-GDP gap, lagged (if positive)	Positive gaps suggest potential excess in the financial system that could result in contingent liabilities for the government if financial sector instability emerges	Cyclical component from a one-sided HP filter run on credit-to-GDP ratios with smoothing parameter of 400,000 if positive (zero otherwise). Credit-to-GDP calculated as private credit/GDP x 100.	Bank for International Settlements or Fund staff calculation on IFS data when BIS unavailable
Debt burden and buffers	Change in debt-to-GDP ratio	Sudden spikes in debt tend to be difficult to manage and result in stress	[Total Public Debt(t)/GDP(t) - Total Public Debt(t-1)/GDP(t-1)]x100	Latest WEO or SRDSF user (when updated data available)
	Public debt/revenues	More readily available resources to service debt make stress less likely	[Total Public Debt(t)/Total Revenues(t)]x100	Latest WEO or SRDSF user (when updated data available)
	FX public debt/GDP	Higher FX debt increases vulnerability	[Forex Debt(t)/GDP(t)]x100	Latest WEO or SRDSF user (when updated data available)
	International reserves/GDP	Higher buffers to service foreign currency debt reduce stress risks	[Gross International Reserves(t)/GDP(t)]x100	Latest WEO or SRDSF user (when updated data available)
Global conditions	Change in VIX	Weaker global market sentiment can raise probability of stress	Year-to-year level change in VIX, with VIX indexed to 2010 = 100.	Fund staff calc., Chicago Board of Trade via Haver Analytics
	Currency union members in stress (alternate specification)	When stress is spreading around the currency union members, vulnerability to contagion is higher	Number of countries in stress (e.g. where stress history defined above = 1) divided by number of countries in currency union	Fund staff calculation

MAC SR DSF: ANALYTICAL FRAMEWORK FOR SOVEREIGN RISK NEAR TERM ASSESSMENT

Sheet LOGIT

Near-term risk assessment calculation								
				2018	2019	2020	2021	2022
Logit stress probability calculation								
		Coefficient						
Group	Regressor	Estimate	Sig.	Data				
Constant	Ones	-2.957	***	1.00	1.00	1.00	1.00	1.00
Institutions	Institutional quality index	-0.972	***	0.31	0.30	0.34	0.14	0.14
History	Stress history index	0.521	***	0.05	0.05	N.A.	N.A.	N.A.
Cyclical position	Current account balance-to-GDP	-0.029	**	6.83	4.27	-6.34	10.45	14.34
	3-year pct. change in REER	0.008		-4.87	-2.00	1.14	-0.60	N.A.
	Credit-to-GDP gap, if positive (t-1)	0.079	***	6.06	5.19	5.51	8.18	#N/A
Debt burden & buffers	Change in public debt-to-GDP	0.053	***	0.87	4.58	15.14	0.70	-6.28
	Public debt-to-revenue	0.002	**	200.76	197.58	299.66	301.34	211.07
	FX public debt-to-GDP	0.024	***	14.62	15.72	20.78	19.15	17.30
	International reserves-to-GDP	-0.036	***	31.82	28.75	28.15	24.19	20.31
Global condition	Change in VIX (2010=100)	0.011	***	24.61	-5.55	61.48	-42.56	-22.03
	Share of currency union MACs in stress	0.000		0.00	0.00	0.00	0.00	0.00
	Check: All variables entered			TRUE	TRUE	FALSE	FALSE	FALSE
	Logit stress probability			0.04	0.05	n.a.	#N/A	#N/A
	Signal							#N/A
	Change in logit stress probability			n.a.	0.00	#N/A	#N/A	#N/A
Contribution to change in logit stress probability Part 1. Averages								
Constant	Ones				-2.96	-2.96	-2.96	-2.96
Institutions	Institutional quality index				-0.30	-0.31	-0.24	-0.14
History	Stress history index				0.03	#VALUE!	#VALUE!	#VALUE!
Cyclical position	Current account balance-to-GDP				-0.16	0.03	-0.06	-0.36
	3-year pct. change in REER				-0.03	0.00	0.00	#VALUE!
	Credit-to-GDP gap, if positive (t-1)				0.44	0.42	0.54	#N/A
Debt burden & buffers	Change in public debt-to-GDP				0.14	0.52	0.42	-0.15
	Public debt-to-revenue				0.40	0.50	0.60	0.51
	FX public debt-to-GDP				0.36	0.44	0.48	0.44
	International reserves-to-GDP				-1.09	-1.02	-0.94	-0.80
Global condition	Change in VIX (2010=100)				0.10	0.31	0.10	-0.36
	Share of currency union MACs in stress				0.00	0.00	0.00	0.00

MAC SR DSF: ANALYTICAL FRAMEWORK

Hypothetical country: SRDSF Guidance Note

Ruritania: Summary of the sovereign risk and debt sustainability assessment

Horizon	Mechanical signal	Final assessment	Comments
Overall	...	Moderate	The overall risk of sovereign stres is moderate, reflecting a relatively consistent level of vulnerability across the medium-, and long-term horizons.
Near term[1]	Moderate	Moderate	The near-term risk of sovereign stress is moderate. This reflects a large increase in public debt-to-GDP in the past year, and a low level of international reserves-to-GDP.
Medium term	Low	Moderate	Medium-term risks are assessed as moderate against a mechanical low risk signal due to the potential effects of contingent liabilities from a narrow debt coverage and sub-national governments that are demonstrating symptoms of weak finances.
Fanchart	Low	...	
GFN	Moderate	...	
Stress test	Cont. Liab, Exch. Rate	...	
Long term	...	Moderate	Long-term risks are moderate arising from population aging, the expected need to refinance concessional debt at less favorable terms, and the winding up of oil production. That said, the long time horizon and the authorities plans for corrective reforms should contain risks.
Sustainability assessment[2]	Sustainable but not with high probability	Sustainable but not with high probability	With the implementation of the policies in the program, the projected debt path is expected to stabilize and GFNs will remain at manageable levels. There continue to be important risks with respect to market sentiment, and therefore debt is assessed as sustainable but not with high probability.
Debt stabilization in the baseline			Yes

Sri Lanka MAC SR DSF 2023-2024

EXAMPLE – MAC SR DSF - SRI LANKA

Table 1. Sri Lanka: Risk of Sovereign Stress (Restructuring Scenario)

Horizon	Mechanical signal	Final assessment	Comments
Overall	…	High	Sri Lanka is in debt distress. The fiscal adjustment, combined with debt restructuring will eventually restore debt sustainability. However, downside risks remain high under a restructuring scenario.
Near term 1/	n.a.	n.a.	Not applicable
Medium term	High	High	Risks remain high under a restructuring scenario due to relatively high levels of debt and GFNs, a strong sovereign-bank nexus, and the economy's vulnerability to large shocks.
Fanchart	High	…	
GFN	High	…	
Stress test	…	…	
Long term	…	High	Long-term risks include slowing growth due to a declining labor force and climate vulnerabilities.
Sustainability assessment 2/	…	Sustainable	The debt operation will put Sri Lanka on a firm downward path. But the reduction of debt vulnerabilities to safe levels will take time. Meanwhile, external shocks or domestic policy reversals could lead to renewed debt increase.
Debt stabilization in the baseline		Yes	

DSA summary assessment

Sri Lanka is in a deep crisis, as debt is unsustainable. Deep fiscal reforms are necessary but not sufficient to address the situation in a durable manner. Contributions from creditors are therefore needed, along with new concessional financing, to restore debt sustainability. Even after a successful program and debt restructuring, debt risks will remain high for many years.

Source: Sri Lanka: Request for an Extended Arrangement Under the Extended Fund Facility-Press Release; Staff Report; and Statement by the Executive Director for Sri Lanka (imf.org)

EXAMPLE – MAC SR DSF - SRI LANKA

Sri Lanka announced in April 2022, external debt service suspension.

Authorities stopped servicing their foreign-law government and government guaranteed debt, except multilateral debt and emergency credit lines received from India in 2022.

Sri Lanka: Decomposition of Public Debt and Debt Service by Creditor, 2023-25 1/

	Debt Stock (end of period, incl. arrears) 2022			Debt Service on end-2022 debt stock (on contractual terms) 2023	2024	2025	2023	2024	2025
	(In US$mn)	*(Percent total debt)*	*(Percent GDP)*	*(In US$mn)*			*(Percent GDP)*		
Total public debt	**83,595**	**100.0**	**128.1**	**27,727**	**10,164**	**9,887**	**36.8**	**13.4**	**12.6**
External (foreign law)	**41,474**	**49.6**	**63.6**	**7,356**	**5,190**	**5,803**	**9.8**	**6.8**	**7.4**
Multilateral creditors[2]	11,495	13.8	17.6	1,080	1,141	1,152	1.4	1.5	1.5
IMF	1,062	1.3	1.6	212	244	236	0.3	0.3	0.3
World Bank	3,836	4.6	5.9	284	291	307	0.4	0.4	0.4
ADB	5,973	7.1	9.2	521	525	530	0.7	0.7	0.7
Other Multilaterals	624	0.7	1.0	63	81	80	0.1	0.1	0.1
Bilateral Creditors	11,419	13.7	17.5	1,755	1,167	1,377	2.3	1.5	1.8
Paris Club	4,784	5.7	7.3	473	422	392	0.6	0.6	0.5
o/w: Japan	2,828	3.4	4.3	197	188	180	0.3	0.2	0.2
Non-Paris Club	6,635	7.9	10.2	1,282	745	985	1.7	1.0	1.3
o/w: China	4,483	5.4	6.9	596	576	519	0.8	0.8	0.7
India	1,833	2.2	2.8	653	137	438	0.9	0.2	0.6
Bonds	13,364	16.0	20.5	2,010	2,343	2,741	2.7	3.1	3.5
Commercial creditors	3,159	3.8	4.8	479	540	533	0.6	0.7	0.7
o/w: China Development Bank	2,901	3.5	4.4	477	538	532	0.6	0.7	0.7
Central bank bilateral currency swaps	2,036	2.4	3.1	2,033	-	-	2.7	0.0	0.0
Domestic (local law)	**42,121**	**50.4**	**64.6**	**20,372**	**4,973**	**4,084**	**27.1**	**6.5**	**5.2**
T-Bills	11,364	13.6	17.4	10,404	-	-	13.8	0.0	0.0
Bonds	25,124	30.1	38.5	6,106	4,829	3,946	8.1	6.4	5.0
Loans	5,633	6.7	8.6	3,862	144	138	5.1	0.2	0.2

Source: Sri Lanka: Request for an Extended Arrangement Under the Extended Fund Facility-Press Release; Staff Report; and Statement by the Executive Director for Sri Lanka (imf.org)

EXAMPLE – MAC SR DSF - SRI LANKA

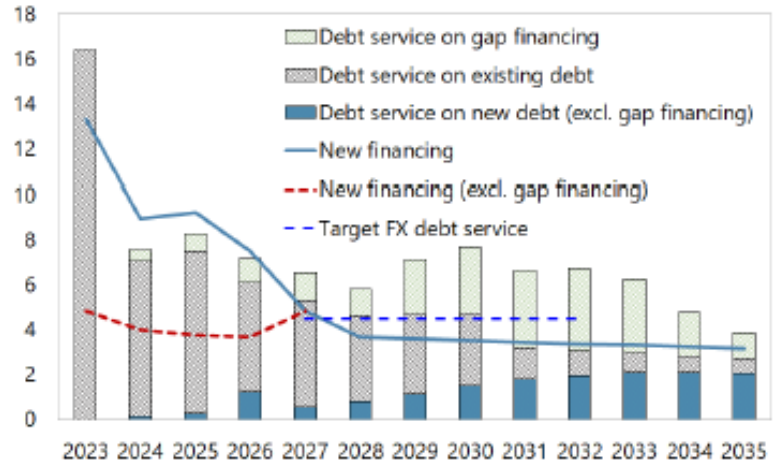
Scenario Without Debt Restructuring

Annex II. Public Debt Sustainability Analysis

8. Under an illustrative "pre-restructuring" scenario, debt would remain unsustainable, despite the large fiscal adjustment. For illustrative purposes, this scenario assumes that the external financing gap in 2022-27 is closed through additional new external financing, which Sri Lanka does not presently have access to.[3] The charts below show that, under the baseline macroeconomic assumptions, the debt stock and gross financing needs would remain above the targets of 95 percent of GDP and 13 percent of GDP throughout the projection horizon. If additional downside risks were to materialize, debt would fail to stabilize. FX debt service would spike in the post-program period, exceeding the new financing, which would lead to a rapid decline in reserves.

Pre-Restructuring Scenario: FX Debt Flows

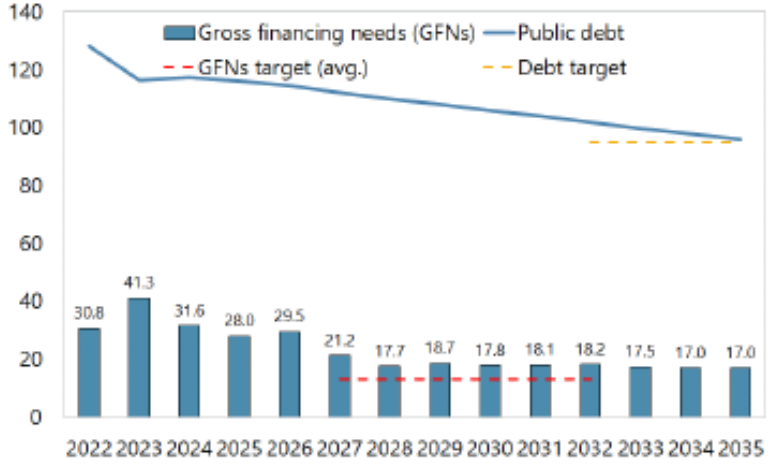
(In percent of GDP)



Sources: Sri Lanka authorities; and IMF staff calculations.

Pre-Restructuring Scenario: Public Debt and GFNs

(In percent of GDP)



Sources: Sri Lanka authorities; and IMF staff calculations.

Source: Sri Lanka: Request for an Extended Arrangement Under the Extended Fund Facility-Press Release; Staff Report; and Statement by the Executive Director for Sri Lanka (imf.org)

EXAMPLE – MAC SR DSF - SRI LANKA

Annex II. Public Debt Sustainability Analysis

Restructuring Scenario

9. Staff's restructuring scenario serves purely illustrative purposes. There are many alternative ways of restructuring Sri Lanka's debt that would also achieve the debt restructuring targets described above. The authorities have indicated their objective to take each creditor's specific needs into account when designing the restructuring operation, while also stressing the importance of fair burden sharing across creditors. The perimeter of restructuring is based on preliminary considerations shared by the authorities and their financial advisors, taking into account the need to safeguard domestic financial stability. Accordingly, under the staff's illustrative restructuring scenario: T-bills held by the Central Bank are exchanged into longer term debt instruments[4]; a select pool of the remaining domestic debt is assumed to be reprofiled to reduce gross financing need, while limiting the impact on the financial sector. For external private debt, a principal reduction is assumed, with amortization beyond the program period, implying a large NPV reduction. For official bilateral debt, similar debt relief in NPV terms is assumed, implemented through a long maturity extension – with amortization payments starting in 2033.

Source: Sri Lanka: Request for an Extended Arrangement Under the Extended Fund Facility-Press Release; Staff Report; and Statement by the Executive Director for Sri Lanka (imf.org)

Argentina MAC SR DSF 2023-2024

EXAMPLE – MAC SR DSF - ARGENTINA

Annex II. Application of the Sovereign Risk and Debt Sustainability Framework

Table 1. Argentina: Risk of Sovereign Stress

Horizon	Mechanical signal	Final assessment	Comments
Overall	…	High	Despite moderate risk signal at the medium-term horizon, the exceptional level of current uncertainty and risks around the necessary eventual re-entry to international markets indicate that overall risks of sovereign stress continue to be high.
Near term 1/	n.a	n.a	Not applicable.
Medium term	Moderate	Moderate	Staff concurs with the mechanical signal. While there is substantial uncertainty around the baseline debt trajectory, the 2020 restructuring and implementation of the program should help contain financing risks.
Fanchart	Moderate	…	
GFN	Moderate	…	
Stress test	Cont. Liab.	…	
Long term	…	High	Given Argentina's susceptibility to adverse shocks, need to maintain tight fiscal policy, and re-enter international debt markets after the program, there are relevant risks of a renewed episode of sovereign stress over the longer term. Full implementation of the program will help contain these risks.
Sustainability assessment 2/	…	Sustainable but not with high probability	There are good prospects for debt stabilization and acceptable rollover risks, consistent with debt sustainability. However, substantial uncertainty around the baseline indicates high risks to this assessment.
Debt stabilization in the baseline			Yes

Source: Argentina: Fourth Review Under the Extended Arrangement Under the Extended Fund Facility, Requests for Modification of Performance Criteria, Waiver of Nonobservance of Performance Criteria, and Financing Assurances Review-Press Release; Staff Report; and Statement by the Executive Director for Argentina (imf.org)

EXAMPLE – MAC SR DSF - ARGENTINA

DSA Summary Assessment

The Sovereign Risk and Debt Sustainability Framework (SRDSF) tools indicate that debt is sustainable but not with high probability, although overall risks of sovereign stress are high.

At a medium-term horizon, staff assesses risks to be moderate, unchanged from the third review. The GFN module continues to show moderate risk, including because vulnerabilities are contained somewhat by the 2020 restructuring and expectations of financing from less risky creditors. Notably, the updated baseline incorporates significantly lower gross financing needs over the forecast period, reflecting the impact of the authorities' new financing strategy, including the recent bond exchange and the planned long-term extension of public sector peso debt maturities. The debt fanchart signal also indicates moderate risk, as at the third review. Importantly, the continued high/moderate borderline result is largely due to the very wide fan chart, reflecting Argentina's history of high volatility.

Over the longer-term, 10-year fanchart analysis points to debt sustainability (albeit with substantial risks) and there are high risks of a renewed round of sovereign stress as Argentina needs to re-enter international debt markets. While projected long-term private debt service metrics are now somewhat lower than at the third review, reflecting the new financing strategy, they remain above the targets set out in the March 2020 Technical Note on Debt Sustainability (consistent at the time with sustainable debt with high probability), indicating that buffers remain limited.

Risks to the updated baseline are exceptionally high, reflecting Argentina's exposure to shocks, significant uncertainty around the evolution of the drought and external conditions, and policy implementation risks, including with respect to the new financing strategy. In this context, the assessment of moderate risk of sovereign distress in the medium term still hinges critically on the steadfast implementation of macroeconomic and structural policies under the Fund program. Notably, failure to successfully implement the new financing strategy, would imply greater near-term financing pressures, and higher gross financing needs over the medium- to long-term. In this context, contingency planning and agile policy making remain indispensable to improve the likelihood of program success, with additional policy tightening and FX policy adjustments potentially required.

Latent structural vulnerabilities remain including: the low and undiversified export base, thin domestic capital markets, high shares of foreign currency and non-resident debt, and contingent liabilities from provinces' FX debt and central bank balance sheet weaknesses. In this context, sustained fiscal consolidation, including beyond the program, along with efforts to deepen domestic capital markets and boost exports and productivity, remain essential to mobilize domestic saving, strengthen reserves, and improve prospects of international market access, which in turn would strengthen debt-servicing capacity. Importantly, measures (i.e., debt buybacks or foreign-financed repos) that compromise reserves and add to near-term external debt service must be avoided.

Source: Argentina: Fourth Review Under the Extended Arrangement Under the Extended Fund Facility, Requests for Modification of Performance Criteria, Waiver of Nonobservance of Performance Criteria, and Financing Assurances Review-Press Release; Staff Report; and Statement by the Executive Director for Argentina (imf.org)

EXAMPLE – MAC SR DSF - ARGENTINA

- Under an IMF Extended Fund Facility program.
- Considerable fiscal imbalances.
- Inflation and FX market pressures.
- Trade balance has deteriorated on account of sharply weaker export performance.
- Argentina's capacity to repay debt obligations hinge on strong policy implementation to improve reserve coverage and an eventual resumption of market access.
- Under the current baseline and policy framework, Argentina's public debt is sustainable but not with high probability.

Source: Argentina: Fourth Review Under the Extended Arrangement Under the Extended Fund Facility, Requests for Modification of Performance Criteria, Waiver for Nonobservance of Performance Criteria, and Financing Assurances Review-Press Release; Staff Report; and Statement by the Executive Director for Argentina (imf.org)

EXAMPLE – MAC SR DSF - ARGENTINA

Annex II. Application of the Sovereign Risk and Debt Sustainability Framework

	Debt Stock (end of period) 31-Dec-22		
	(In US$ bn)	*(Percent total debt)*	*(Percent GDP)*
Total	**394.10**	100.00	83.23
External	144.44	36.65	30.50
Multilateral creditors[2,3]	75.44	19.14	15.93
IMF	45.71	11.60	9.65
World Bank	9.20	2.33	1.94
CAF	3.93	1.00	0.83
ADB/AfDB/IADB	20.35	5.16	4.30
FONPLATA	0.48	0.12	0.10
BEI	0.21	0.05	0.04
BCIE	0.09	0.02	0.02
Other Multilaterals	0.18	0.05	0.04
OFID	0.14	0.04	0.03
FIDA	0.04	0.01	0.01
o/w: list largest two creditors			
list of additional large creditors			
Bilateral Creditors[2]	5.09	1.29	1.07
Paris Club	1.97	0.50	0.42
list of additional large creditors			
Non-Paris Club	3.11	0.79	0.66
o/w: China	2.54	0.65	0.54
T-Bills	0.78	0.20	0.16
Bonds	63.00	15.99	13.30
Commercial creditors	0.08	0.02	0.02
o/w: list largest two creditors			
list of additional large creditors			
Other international creditors			
o/w: list largest two creditors			
list of additional large creditors			
Domestic	249.66	63.35	52.72
T-Bills	98.40	24.97	20.78
Held by: central bank			
local banks			
local non-banks			
Bonds	129.11	32.76	27.27
Held by: central bank			
local banks			
local non-banks			
Loans	19.86	5.04	4.19
Held by: central bank			
local banks			
local non-banks			

Source: Argentina: Fourth Review Under the Extended Arrangement Under the Extended Fund Facility, Requests for Modification of Performance Criteria, Waiver of Nonobservance of Performance Criteria, and Financing Assurances Review-Press Release; Staff Report; and Statement by the Executive Director for Argentina (imf.org)

Quiz 4/4

Let’s go to Menti!

Mentimeter

European Commission

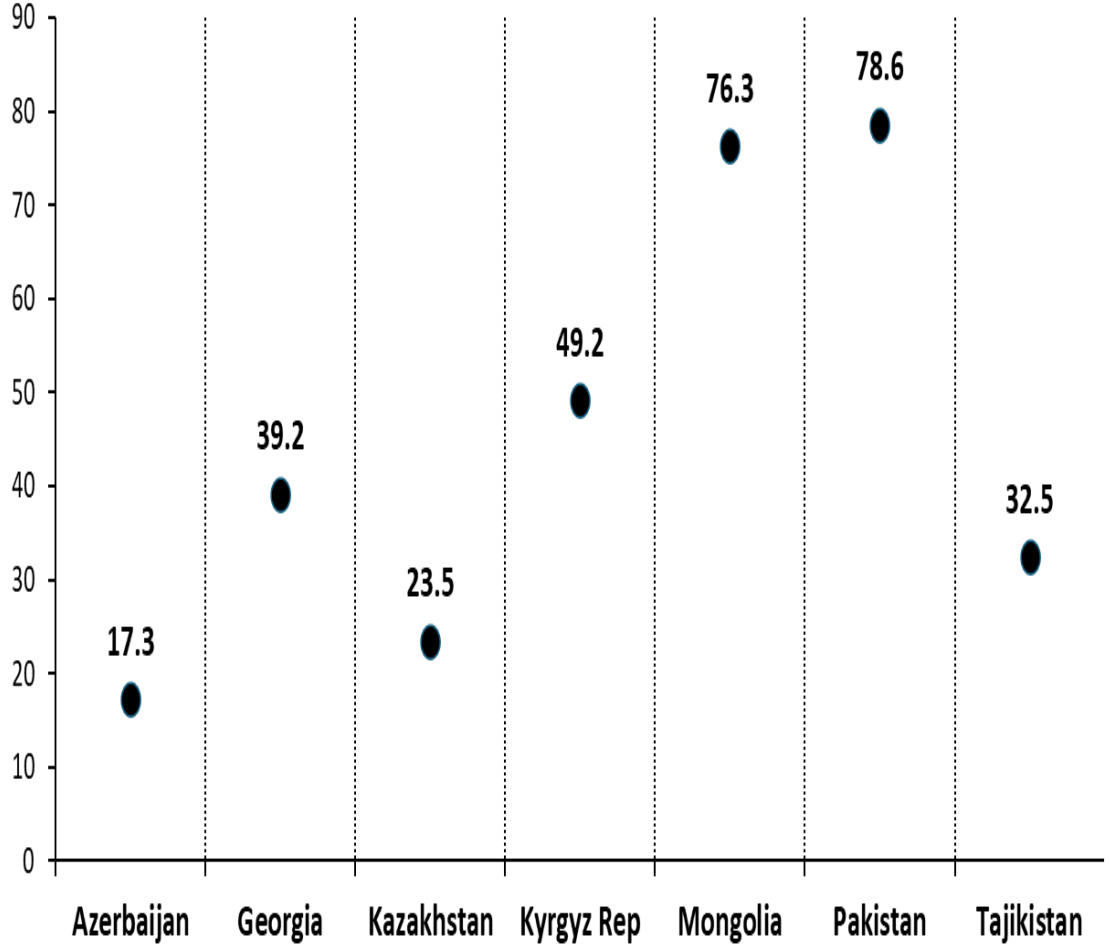
Exercise on DSA Frameworks

European Commission

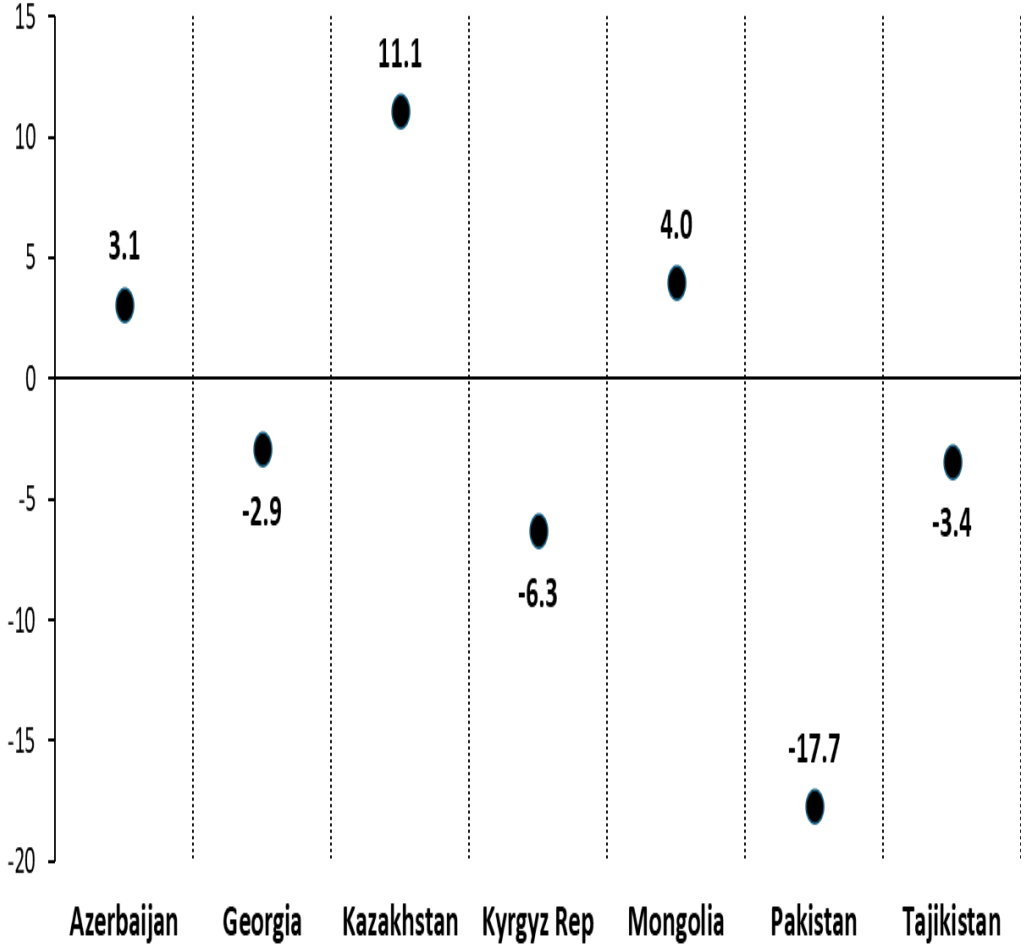
Instruction

- Part 1
  - Observe the debt levels and drivers of debt dynamics for the seven countries.
  - Discuss how the variables shown affect the sustainability of public debt.
  - In your view, among these seven countries, which ones appear to have a sustainable public debt and why? Also, which ones appear to have an unsustainable public debt and why?
- Part 2
  - Compare your views against the LIC DSF and SR DSF prepared by the IMF and WBG.

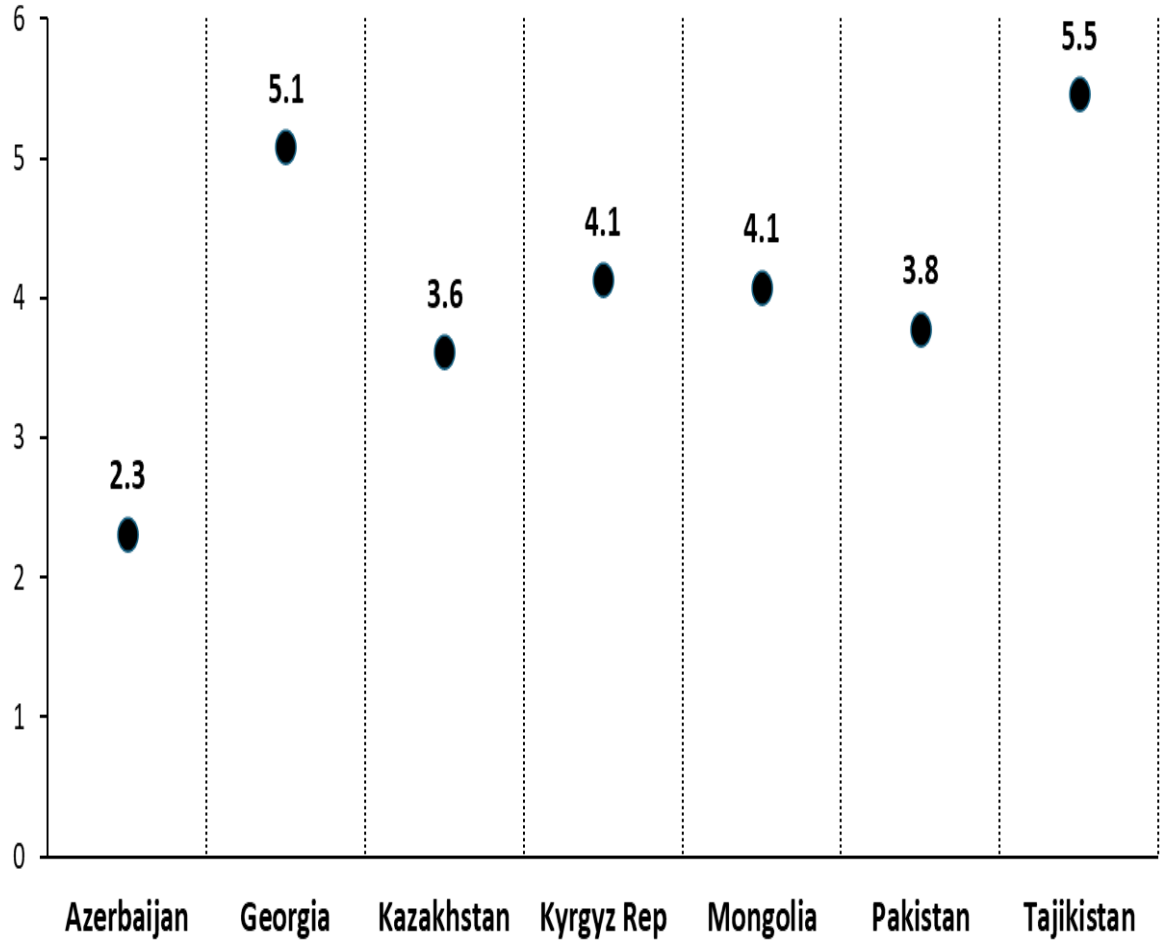
Public Debt (% of GDP)



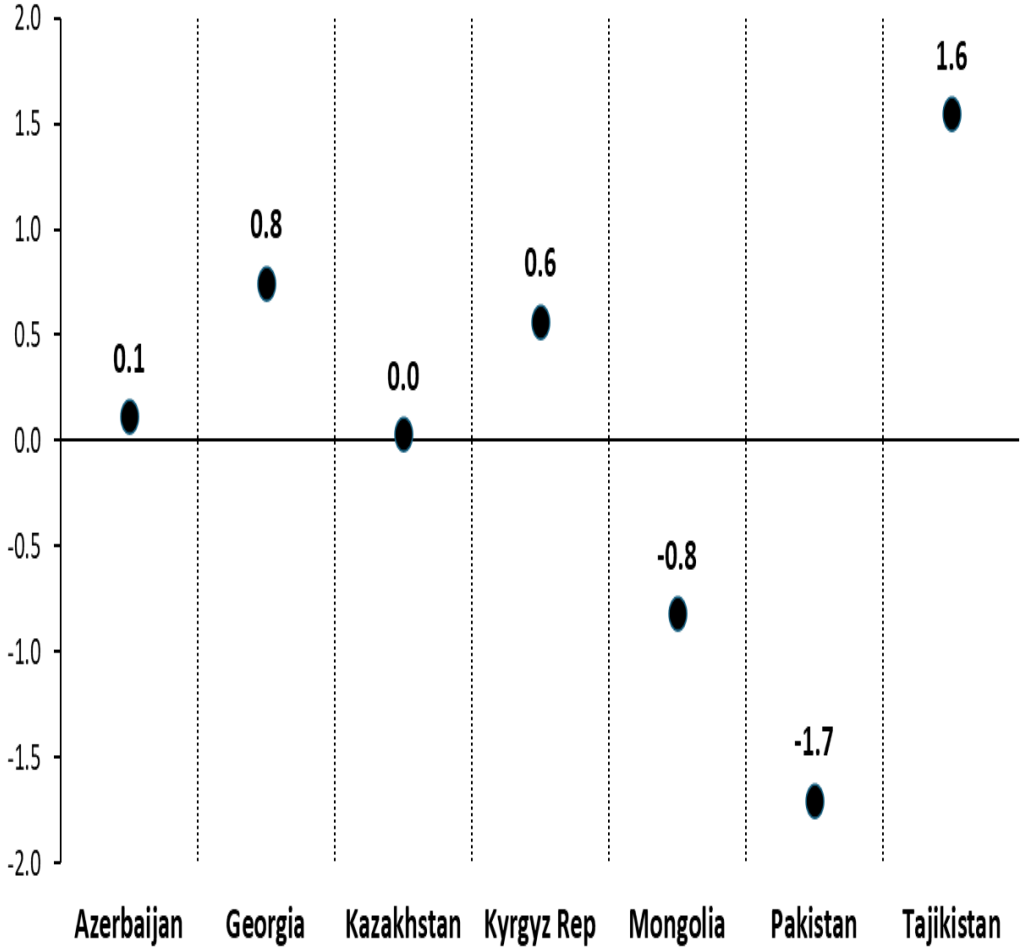
Change in the Public Debt/GDP Ratio (p.p. T+6)



Real GDP growth forecast (average T+6)

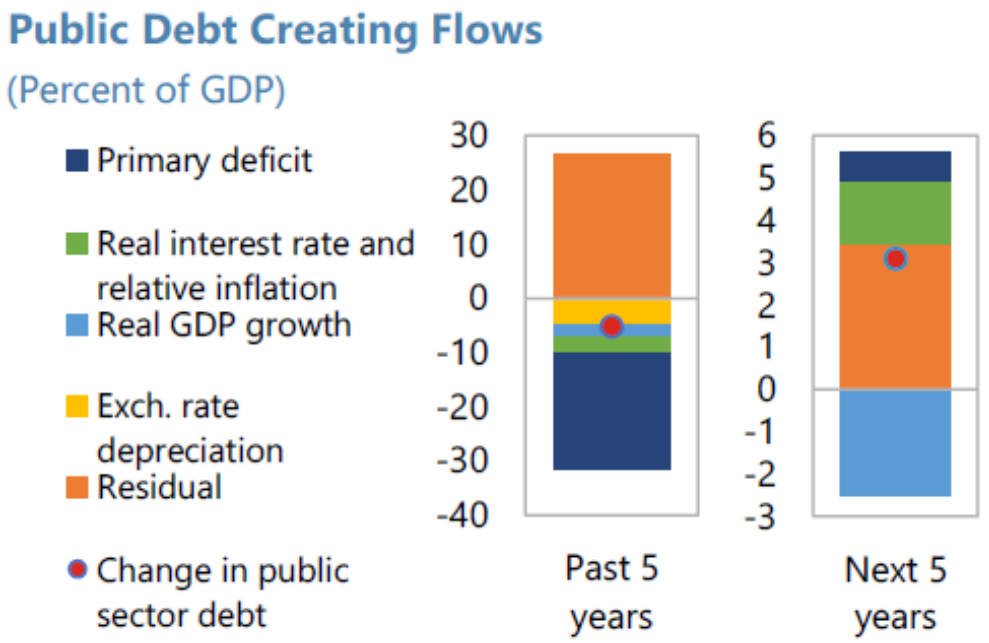


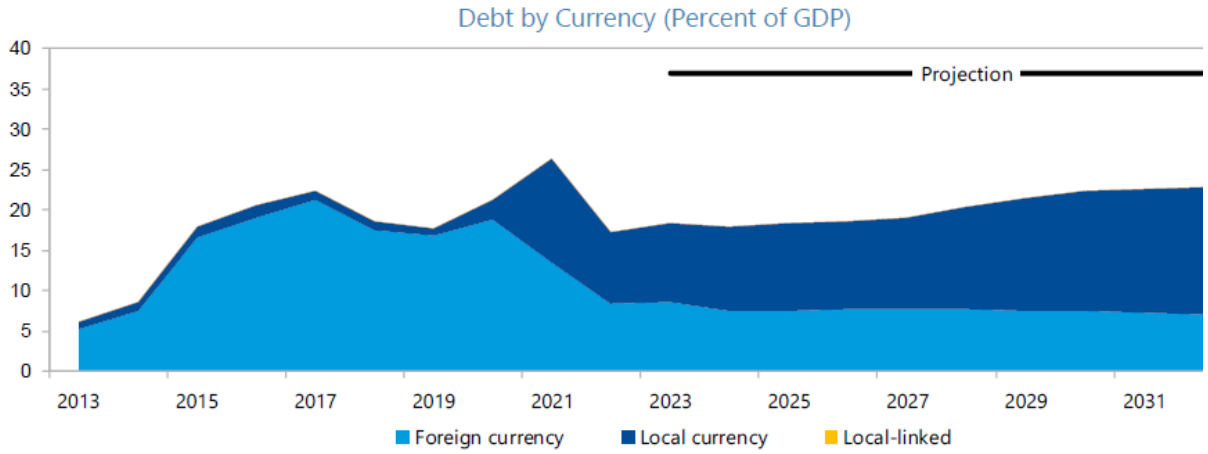
Primary deficit as % of GDP (average T+6)



#	Country	Framework
A	Azerbaijan	SR DSF
B	Georgia	SR DSF
C	Kazakhstan	SR DSF
D	Kyrgyz Rep	LIC DSF
E	Mongolia	SR DSF
F	Pakistan	SR DSF
G	Tajikistan	LIC DSF
H	Turkmenistan	Non-published

Azerbaijan

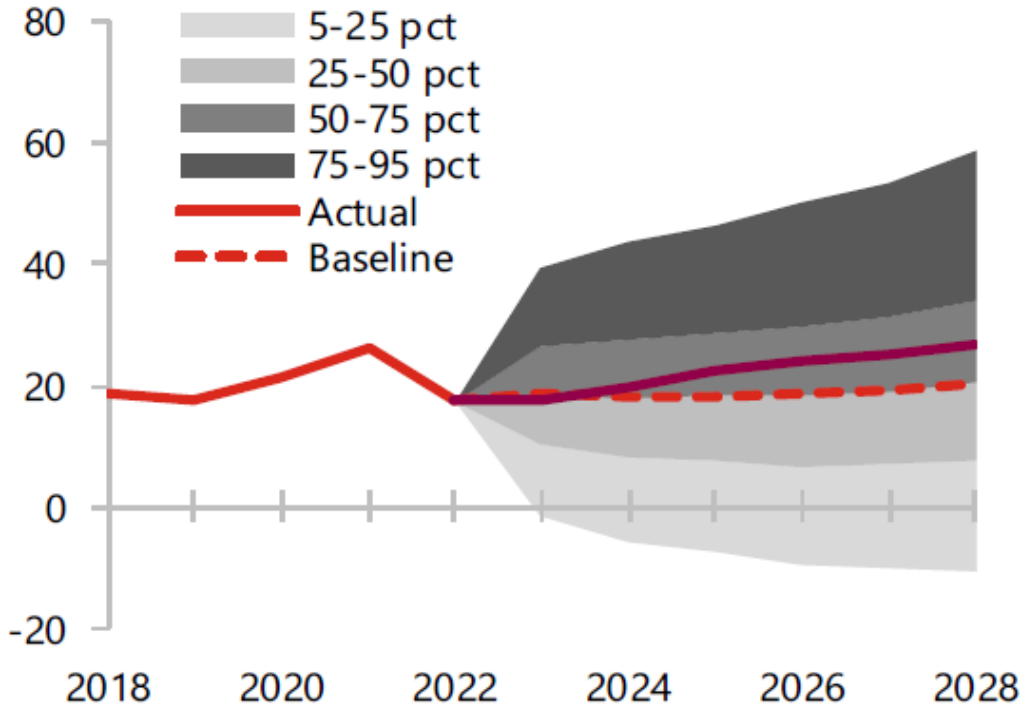




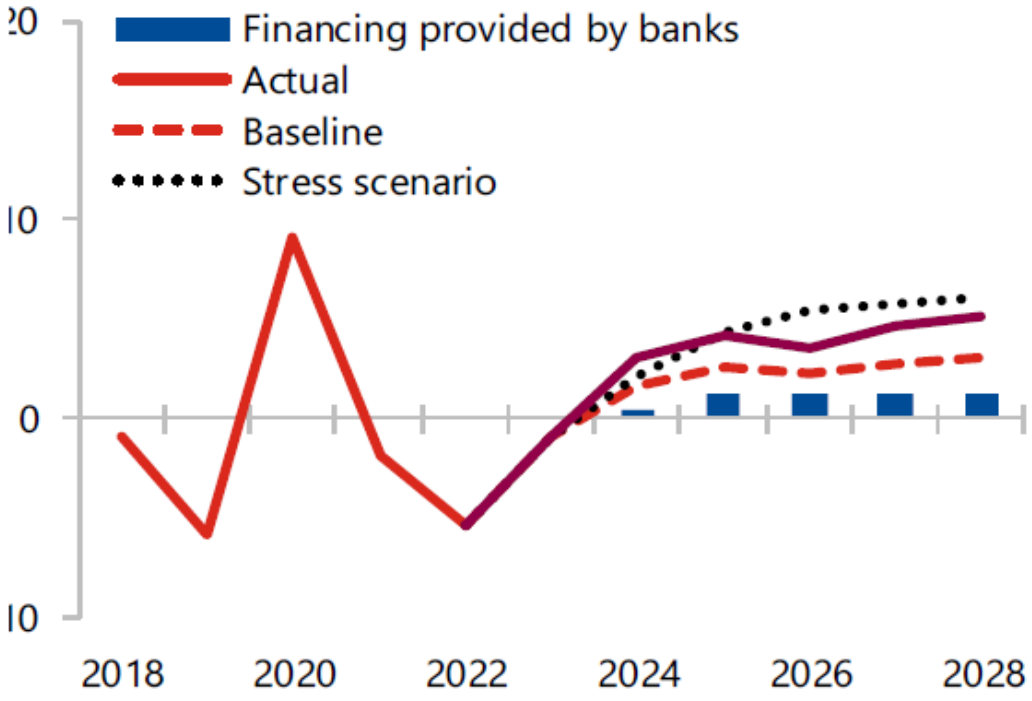
Percent of GDP unless indicated otherwise	Actual	Medium-term projection					
	2022	2023	2024	2025	2026	2027	2028
Public debt	17.3	18.4	18.0	18.4	18.6	19.0	20.4
Change in public debt	-9.0	1.1	-0.4	0.4	0.2	0.4	1.4
Contribution of identified flows	-8.3	0.4	0.4	1.0	0.1	0.2	0.6
Primary deficit	-6.4	-2.4	-0.2	1.4	0.6	0.6	0.7
Noninterest revenues	32.2	33.5	31.8	29.7	29.1	28.5	27.5
Noninterest expenditures	25.7	31.1	31.6	31.0	29.7	29.2	28.2
Automatic debt dynamics	-7.5	0.2	-0.3	-0.2	-0.2	-0.2	-0.2
Real interest rate and relative inflation	-3.7	0.6	0.1	0.2	0.2	0.2	0.2
Real interest rate	-6.4	0.6	0.1	0.2	0.2	0.2	0.2
Relative inflation	2.7	0.0	0.0	0.0	0.0	0.0	0.0
Real growth rate	-1.2	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4
Real exchange rate	-2.7	...	...	...	...	...	...
Other identified flows	5.7	2.7	0.9	-0.1	-0.3	-0.3	0.1
Contingent liabilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other transactions 1/	5.7	2.7	0.9	-0.1	-0.3	-0.3	0.1
Contribution of residual	-0.7	0.7	-0.8	-0.6	0.1	0.3	0.8
Gross financing needs	-5.3	-0.9	1.7	2.6	2.3	2.7	3.0
of which: debt service	1.1	1.5	1.9	1.2	1.7	2.1	2.3
Local currency	0.3	1.0	0.6	0.7	1.1	1.5	1.6
Foreign currency	0.9	0.6	1.2	0.5	0.5	0.6	0.8
Memo:							
Real GDP growth (percent)	4.6	2.4	2.3	2.3	2.3	2.3	2.3
Inflation (GDP deflator; percent)	37.3	-1.3	1.8	1.5	1.5	1.3	1.4
Nominal GDP growth (percent)	43.6	-2.4	3.8	3.8	4.1	4.2	4.5
Effective interest rate (percent)	2.6	1.9	2.3	2.4	2.6	2.7	2.6

Azerbaijan

Public Debt (% of GDP)



Gross Financing Needs (% of GDP)



Triggered stress tests (stress tests not activated in gray)

Banking crisis | Commodity prices | Exchange rate | Contingent liab. | Natural disaster

Azerbaijan

SOVEREIGN DEBT-RELATED RISK ASSESSMENT

Horizon	Mechanical signal	Final assessment	Comments
Overall	...	Low	The overall risk of sovereign stress is low, reflecting a low level of vulnerability in the near and medium term, and moderate level of vulnerability in the long term.
Near term 1/	Low	...	
Medium term	Low	Low	Medium-term risks are assessed as low as overall deficit and borrowing needs are projected to remain moderate, with projected high oil price and increasing production of natural gas mitigating the impact of declining oil production and oil revenues.
Fanchart	Moderate	Moderate	
GFN	Low		
Stress test	...	...	
Long term	...	Moderate	Long-term risks are moderate as the decline in hydrocarbon revenues is projected to increase the deficit and public debt gradually and moderately, while public sector assets are projected to increase further.

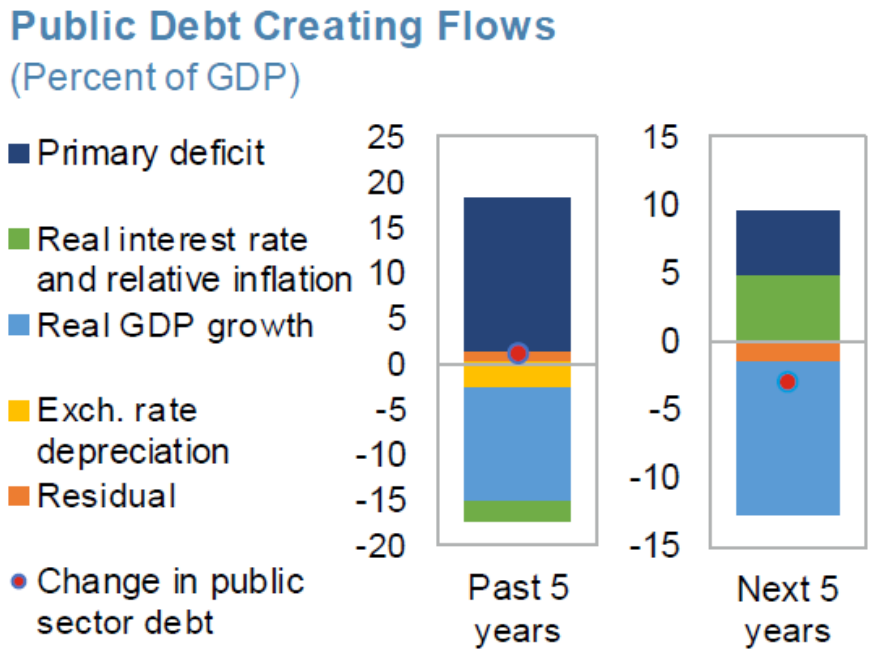
DEBT SUSTAINABILITY ASSESSMENT

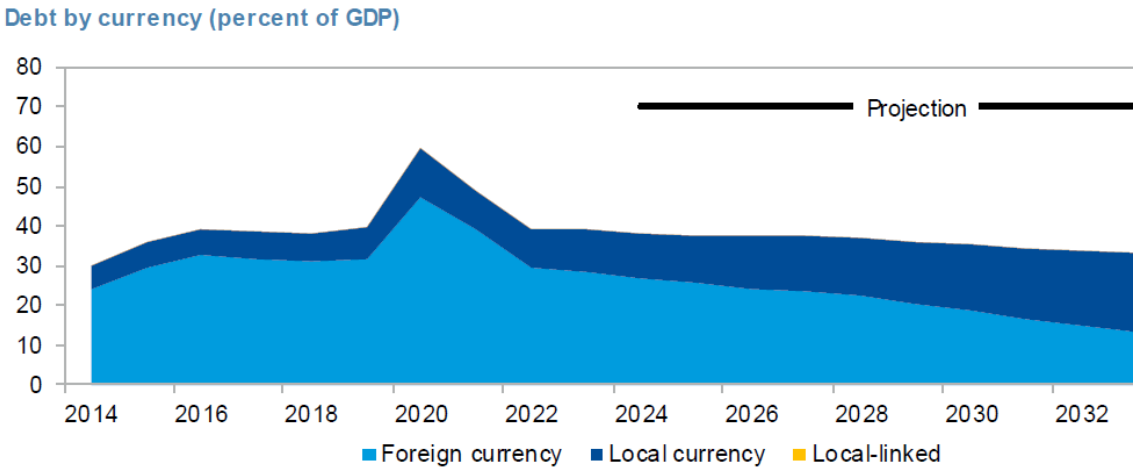
Sustainability assessment 2/			Not required for surveillance-only countries.
Debt stabilization in the baseline			No

DSA Summary Assessment

Commentary: [redacted] is at a low overall risk of sovereign stress. While [redacted] public debt is projected to increase gradually in the baseline, it remains relatively low as a percent of GDP and relative to sovereign fund assets. However, with hydrocarbon production and government hydrocarbon revenues projected to gradually decline in the medium- and long term, in the absence of fiscal adjustment, fiscal balance is projected to gradually weaken, and borrowing requirements and public debt to gradually increase. Still, medium-term liquidity risks as analyzed by the GFN Financeability Module are low. Mechanical signal shows moderate fanchart risk, reflecting past elevated volatility of debt drivers. With an improved macro framework, less procyclical fiscal policy and large asset buffers, staff also assesses this risk as moderate. Over the longer run, [redacted] should implement reforms to diversify its economy, reduce reliance on the hydrocarbon revenues and boost nonoil revenues. The authorities acknowledge the need to undertake this adjustment and are planning measures to diversify the economy, reducing the probability that this risk would materialize. Thus, staff assesses the long-term risks as

Georgia

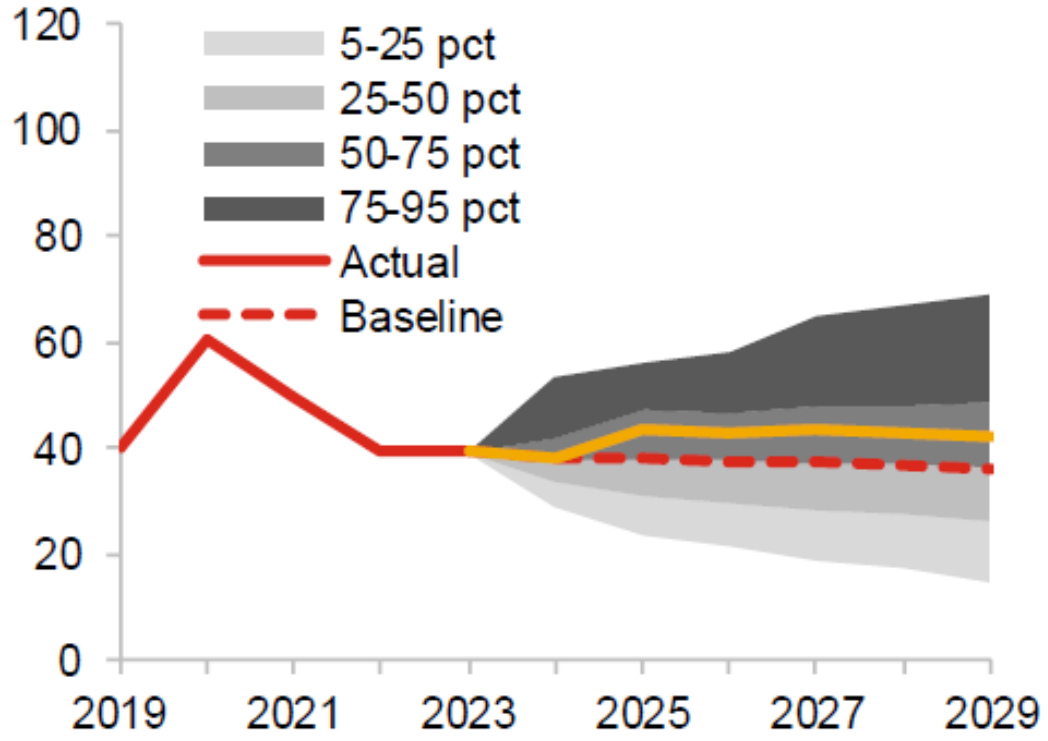




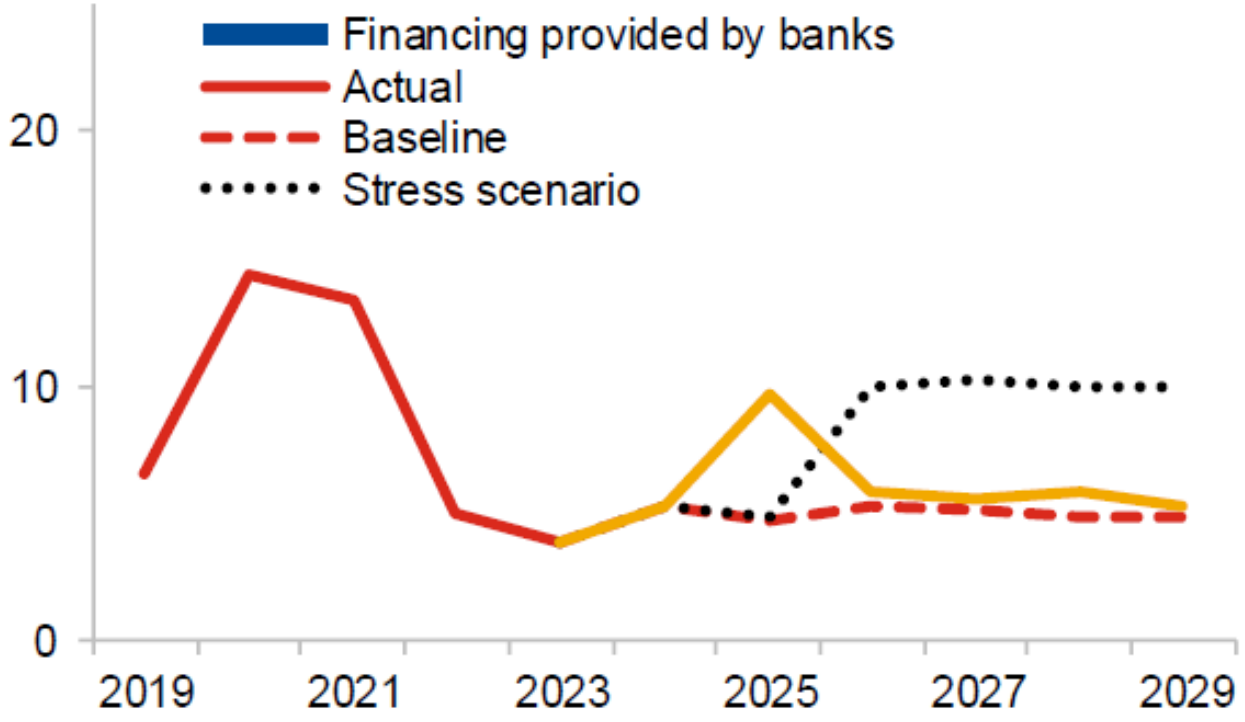
Percent of GDP unless indicated otherwise	Actual	Medium-term projection					
	2023	2024	2025	2026	2027	2028	2029
Public debt	39.2	37.9	37.8	37.4	37.4	37.1	36.2
Change in public debt	0.1	-1.3	-0.1	-0.4	0.0	-0.3	-0.8
Contribution of identified flows	-3.1	-1.0	0.2	-0.2	0.1	-0.4	-0.5
Primary deficit	1.2	1.1	0.6	0.6	0.7	0.7	0.8
Noninterest revenues	27.2	27.8	27.4	27.3	27.3	27.4	27.3
Noninterest expenditures	28.4	28.9	28.1	27.9	28.0	28.1	28.1
Automatic debt dynamics	-4.9	-1.4	-1.1	-0.8	-0.8	-0.9	-1.0
Real interest rate and relative inflation	0.3	0.7	0.8	0.9	0.9	0.9	0.8
Real interest rate	0.5	0.3	0.2	0.5	0.6	0.5	0.4
Relative inflation	-0.2	0.5	0.6	0.4	0.4	0.4	0.3
Real growth rate	-2.7	-2.1	-1.9	-1.7	-1.7	-1.8	-1.8
Real exchange rate	-2.4	...	...	...	...	...	...
Other identified flows	0.6	-0.7	0.6	-0.1	0.2	-0.2	-0.3
Contingent liabilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other transactions	0.6	-0.7	0.6	-0.1	0.2	-0.2	-0.3
Contribution of residual	3.1	-0.3	-0.3	-0.2	-0.1	0.1	-0.3
Gross financing needs	5.6	5.7	5.1	5.6	5.3	5.0	5.0
of which: debt service	4.8	4.9	4.7	5.2	4.8	4.5	4.4
Local currency	2.8	2.8	2.6	1.9	2.9	2.5	2.5
Foreign currency	2.0	2.2	2.1	3.3	1.9	2.0	1.9
Memo:							
Real GDP growth (percent)	7.5	5.7	5.2	4.7	4.9	5.0	5.0
Inflation (GDP deflator; percent)	2.8	4.1	4.7	3.8	3.5	3.5	3.5
Nominal GDP growth (percent)	10.1	10.4	10.2	8.7	8.5	8.7	8.7
Effective interest rate (percent)	4.2	4.9	5.2	5.2	5.2	5.0	4.8

Georgia

Public Debt (% of GDP)



Gross Financing Needs (% of GDP)



Triggered stress tests (stress tests not activated in gray)

Banking crisis | Commodity prices | Exchange rate | Contingent liab. | Natural disaster

Georgia

SOVEREIGN DEBT-RELATED RISK ASSESSMENT

Horizon	Mechanical signal	Final assessment	Comments
Overall	...	Low	The overall risk of sovereign stress is low, reflecting low levels of vulnerability in both the near and medium-term modules. The debt level is projected to be relatively low and stable under the baseline, supported by prudent fiscal policy and strong economic growth.
Near term 1/	Low	Low	The near-term stress signal is "low" in 2023 in line with the mechanical signal, given the reduced debt burden and the cyclical position of the economy including the low current account deficit.
Medium term	Low	Low	Medium-term risks are assessed as "low" in line with the aggregate medium-term mechanical signal on the basis of balanced risks around the debt baseline, and manageable gross financing needs.
Fanchart	Moderate	...	
GFN	Low	...	
Stress test	...	...	
Long term	...	Low	Climate change mitigation and adaptation needs will lead to higher amortization than in the past, but under a baseline scenario, in line with the [redacted] climate change strategy, debt is likely to remain sustainable in the long-term.

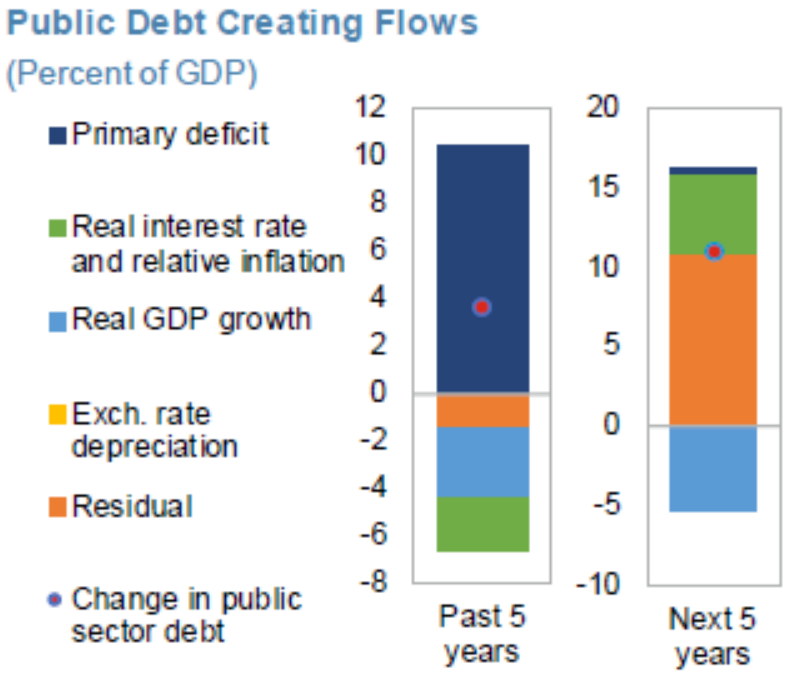
DEBT SUSTAINABILITY ASSESSMENT

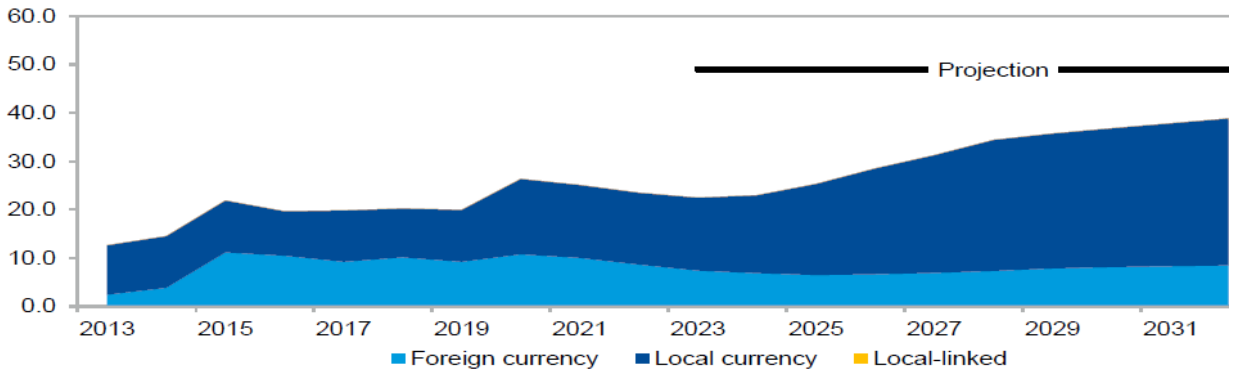
Sustainability assessment 2/	Sustainable with high probability	Sustainable with high probability	The projected debt path is expected to stabilize and GFNs will remain at manageable levels. Debt is assessed as sustainable with high probability.
Debt stabilization in the baseline			Yes

DSA Summary Assessment

Commentary: [redacted] is at a low overall risk of sovereign stress, and public debt is sustainable. After a short-lived surge in 2020 to 60 percent of GDP, reaching the upper limit of the fiscal rule, general government debt declined below 40 percent of GDP in 2022, and has been stable since then. This was driven by strong growth and inflation, as well as [redacted] appreciation especially since 2022. Debt is expected to remain stable below 40 percent of GDP in the medium term, as fiscal deficits remain modest in compliance with the fiscal rule. Over the longer run, reforms should continue to tackle risks arising from climate change mitigation and adaptation needs.

Kazakhstan

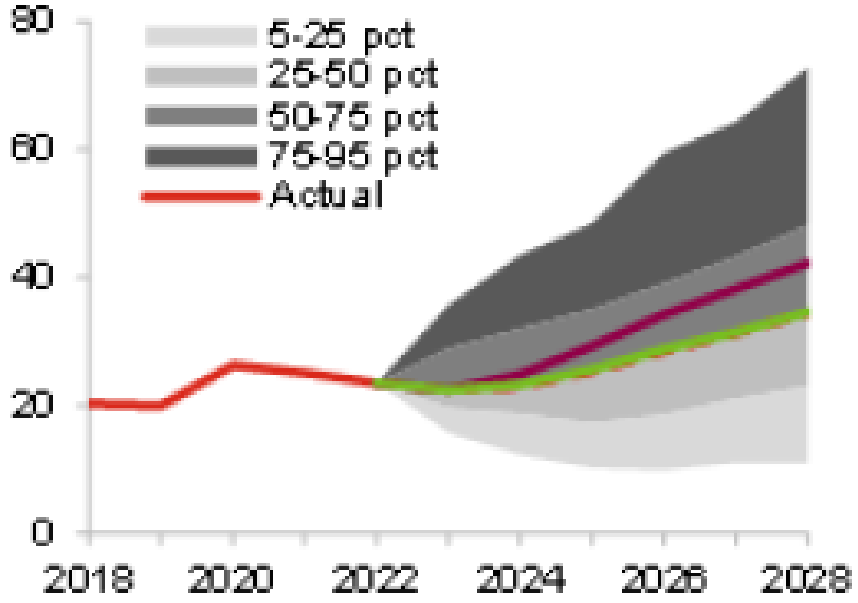




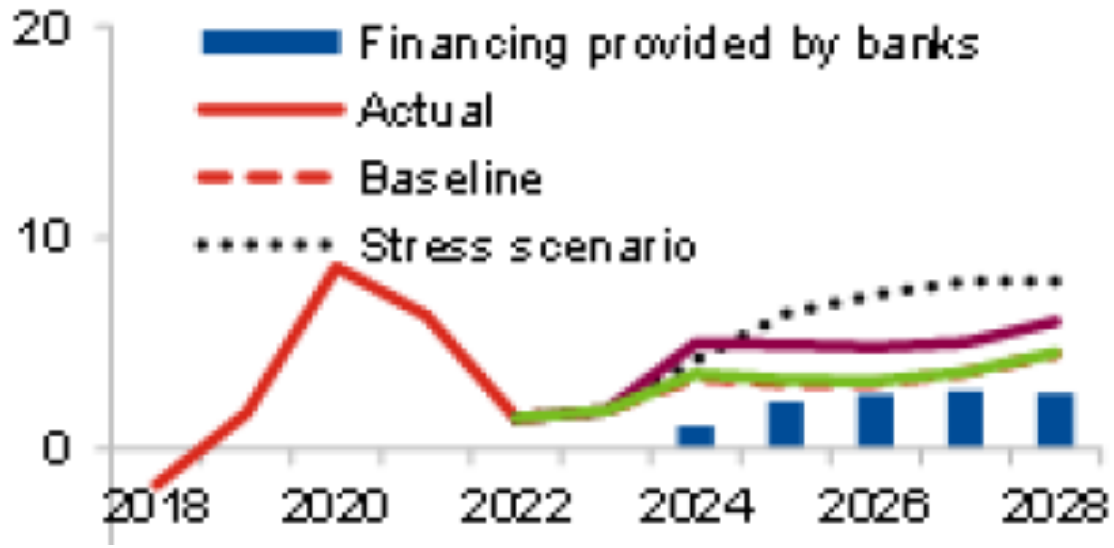
Percent of GDP unless indicated otherwise	Actual	Medium-term projection					
	2022	2023	2024	2025	2026	2027	2028
Public debt	23.5	22.5	23.0	25.4	28.5	31.3	34.5
Change in public debt	-1.6	-1.0	0.5	2.4	3.2	2.8	3.2
Contribution of identified flows	-1.6	-0.9	0.8	2.4	3.2	2.8	3.2
Primary deficit	-0.8	-1.2	0.2	-0.1	0.2	0.4	0.7
Noninterest revenues	21.2	22.5	20.0	19.9	19.5	19.3	18.9
Noninterest expenditures	20.4	21.2	20.3	19.8	19.7	19.7	19.7
Automatic debt dynamics	-2.8	-0.9	-0.7	-0.2	0.7	0.3	0.6
Real interest rate and relative inflation	-1.7	0.1	0.0	1.0	1.2	1.3	1.3
Real interest rate	-2.7	-0.2	-0.6	0.8	1.0	1.0	1.1
Relative inflation	1.0	0.3	0.6	0.2	0.2	0.2	0.2
Real growth rate	-0.8	-1.1	-0.7	-1.2	-0.5	-1.0	-0.7
Real exchange rate	-0.3	...	...	...	...	...	...
Other identified flows	2.0	1.3	1.3	2.7	2.3	2.1	1.8
Contingent liabilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(minus) Interest Revenues	-0.6	-0.6	-0.7	-0.7	-0.7	-0.8	-0.8
Other transactions	2.6	1.9	1.9	3.3	3.1	2.9	2.6
Contribution of residual	0.0	-0.2	-0.3	0.0	0.0	-0.1	0.0
Gross financing needs	1.5	1.8	3.4	3.1	3.1	3.6	4.5
of which: debt service	2.8	3.6	3.8	3.8	3.7	3.9	4.5
Local currency	2.4	1.7	1.9	1.9	2.6	3.2	3.7
Foreign currency	0.4	1.9	1.9	1.9	1.1	0.8	0.8
Memo:							
Real GDP growth (percent)	3.3	4.8	3.1	5.7	2.2	3.6	2.3
Inflation (GDP deflator; percent)	19.7	7.8	12.3	6.1	5.8	5.6	5.2
Nominal GDP growth (percent)	23.6	13.0	15.8	12.1	8.1	9.4	7.7
Effective interest rate (percent)	6.4	7.0	9.1	9.9	10.0	9.6	9.1

Kazakhstan

Public Debt (% of GDP)



Gross Financing Needs (% of GDP)



Triggered stress tests (stress tests not activated in gray)

Banking crisis | Commodity prices | Exchange rate | Contingent liab. | Natural disaster

Kazakhstan

SOVEREIGN DEBT-RELATED RISK ASSESSMENT

Horizon	Mechanical signal	Final assessment	Comments
Overall	…	Low	The overall risk of sovereign stress is low, reflecting low levels of vulnerability at all horizons.
Near term 1/			
Medium term	Moderate	Low	Medium-term risks are assessed as low given low debt levels and large asset buffers at the NFRK.
Fanchart	High	…	
GFN	Low	…	
Stress test	Comm. Prices, FX rate,	…	
Long term	…	Low	Long-term risks are low given the strong fiscal position at present and the authorities' commitment to fiscal prudence. Global transition away from fossil fuels is the main source of risk.

DEBT SUSTAINABILITY ASSESSMENT

Sustainability assessment 2/	Not required for surveillance countries	Not required for surveillance countries
Debt stabilization in the baseline		No

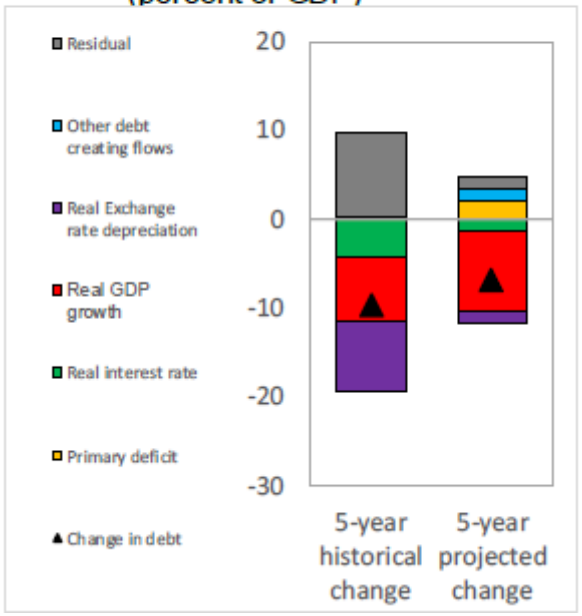
DSA summary assessment

Commentary: [redacted] has low debt, large financial assets accumulated at the [redacted] and fiscal deficits are expected to remain moderate over the medium term. The large buffers can support periods of fiscal deficits, if needed. The projected debt increase reflects the government's decision to simultaneously increase the assets accumulated at the [redacted] The assessment of low debt and financing risks over the medium term and long term, together with the results from the stress scenarios, lead to the final assessment of low risk.

Kyrgyz Rep.

Public Debt

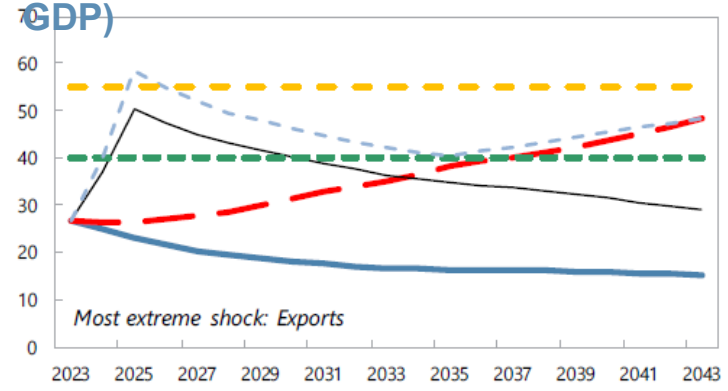
Debt-creating flows
(percent of GDP)



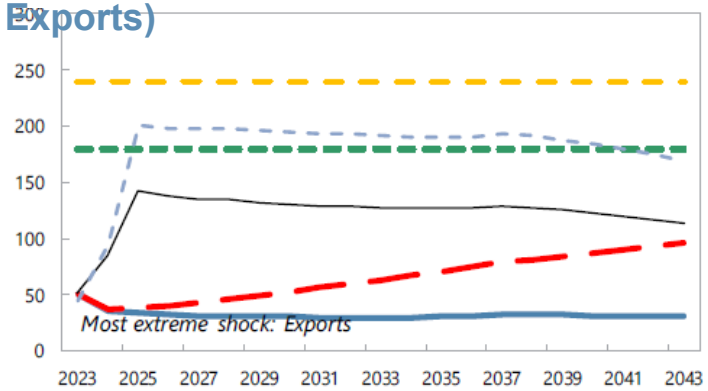
Percent of GDP unless indicated otherwise	Actual			Projections					
	2020	2021	2022	2023	2024	2025	2026	2027	2028
Public sector debt 1/	63.6	56.2	49.2	46.9	44.3	42.7	42.1	42.2	42.9
of which: external debt	54.5	46.7	39.5	37.1	34.4	32.5	30.6	29.0	28.0
Change in public sector debt	14.8	-7.4	-7.0	-2.3	-2.6	-1.6	-0.6	0.1	0.7
Identified debt-creating flows	11.9	-8.2	-9.7	-3.7	-1.5	-1.1	-0.5	0.0	0.3
Primary deficit	2.1	0.0	-0.8	-1.1	0.5	0.6	0.9	1.2	1.3
Revenue and grants	29.0	31.4	36.5	38.5	36.0	35.2	34.6	34.2	33.9
of which: grants	1.9	1.8	2.0	1.2	1.4	1.2	1.1	1.1	1.1
Primary (noninterest) expenditure	31.1	31.3	35.7	37.4	36.6	35.8	35.5	35.3	35.3
Automatic debt dynamics	9.8	-9.9	-10.0	-3.7	-2.2	-1.7	-1.4	-1.2	-1.0
Contribution from interest rate/growth differential	2.2	-2.9	-5.1	-3.7	-2.2	-1.7	-1.4	-1.2	-1.0
of which: contribution from average real interest rate	-1.6	0.5	-1.7	-1.7	-0.2	0.0	0.2	0.4	0.6
of which: contribution from real GDP growth	3.8	-3.3	-3.3	-2.0	-2.0	-1.8	-1.6	-1.6	-1.6
Contribution from real exchange rate depreciation	7.6	-7.0	-4.9	...	...	...	...	...	...
Other identified debt-creating flows	0.0	1.7	1.1	1.1	0.2	0.0	0.0	0.0	0.0
Privatization receipts (negative)	0.0	1.7	1.1	1.1	0.2	0.0	0.0	0.0	0.0
Recognition of contingent liabilities (e.g., bank recapitalization)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Debt relief (HIPC and other)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other debt creating or reducing flow (please specify)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Residual	2.9	0.8	2.7	1.4	-1.1	-0.5	-0.1	0.1	0.3
Gross financing need 4/	4.8	3.9	2.4	3.1	5.3	5.4	5.5	5.9	5.9
Key macroeconomic and fiscal assumptions									
Real GDP growth (in percent)	3.8	5.5	6.3	4.2	4.4	4.2	4.0	4.0	4.0
Average nominal interest rate on external debt (in percent)	1.8	1.4	1.3	1.5	1.5	1.4	1.4	1.4	1.5
Average real interest rate on domestic debt (in percent)	-5.1	-13.8	-14.3	-6.6	0.2	2.7	4.3	5.6	6.5
Real exchange rate depreciation (in percent, + indicates depreciation)	19.9	-13.1	-11.3	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	3.4	16.0	16.7	12.1	8.6	6.6	5.5	4.8	4.0
Growth of real primary spending (deflated by GDP deflator, in percent)	-3.6	6.2	21.1	9.2	2.1	1.9	3.1	3.6	3.8
Primary deficit that stabilizes the debt-to-GDP ratio 5/	-12.7	7.4	6.2	1.2	3.1	2.2	1.5	1.1	0.7
PV of contingent liabilities (not included in public sector debt)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Kyrgyz Rep.

PV of External PPG Debt (% of GDP)

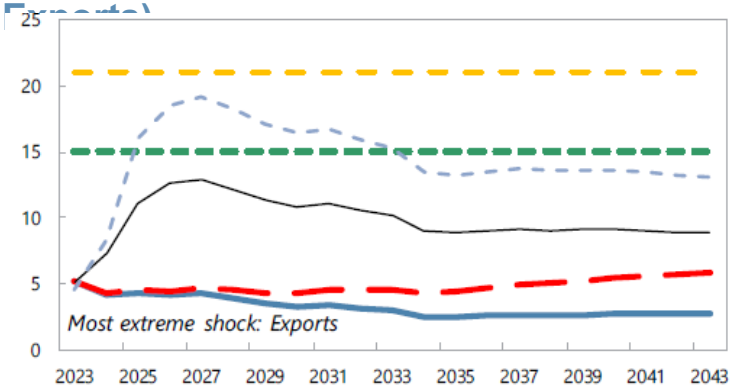


PV of External PPG Debt (% of Exports)

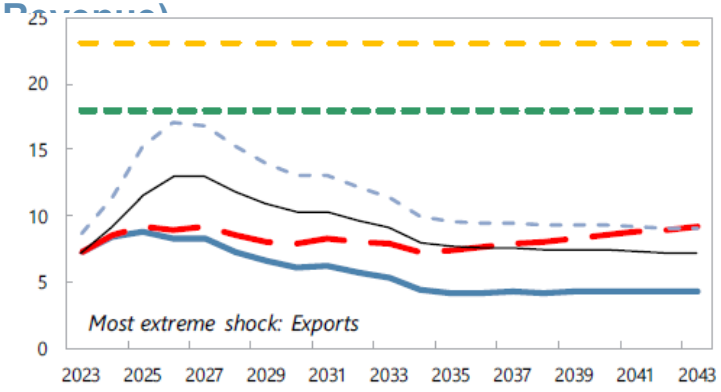


Baseline
Historical scenario
Most extreme shock 1
Threshold
Customized stress test on exports
2022 DSA Th.

Debt Service of External PPG Debt (% of Exports)

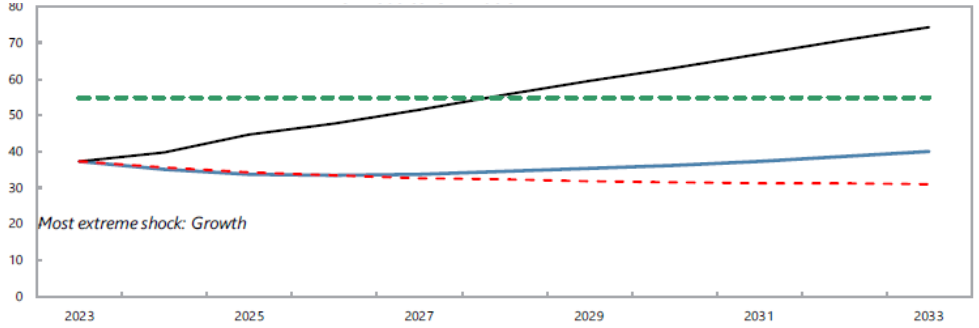


Debt Service of External PPG Debt (% of Revenue)



Baseline
Historical scenario
Most extreme shock 1
Threshold
Customized stress test on exports
2022 DSA Th.

PV of Total PPG Debt (% of GDP)



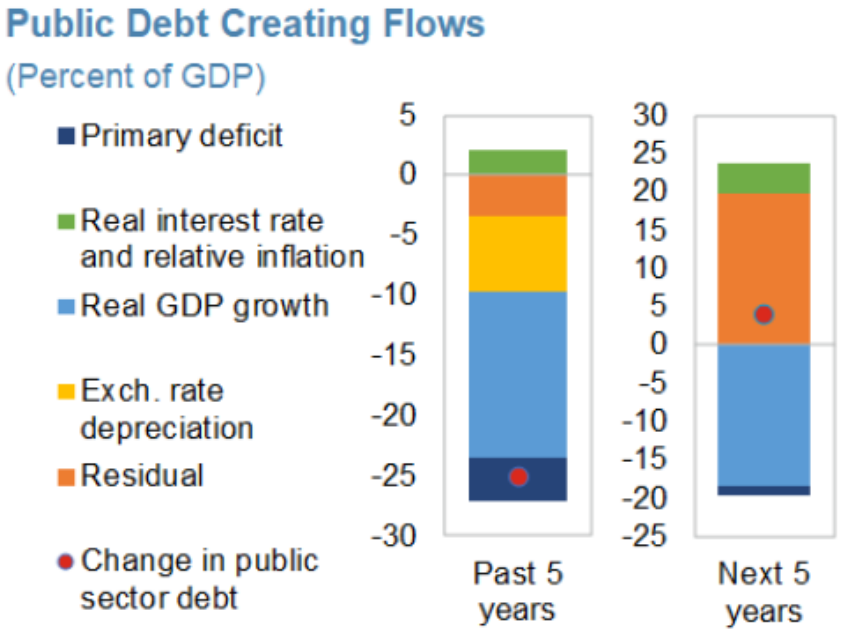
Baseline
Most extreme shock 1/
TOTAL public debt benchmark
Historical scenario

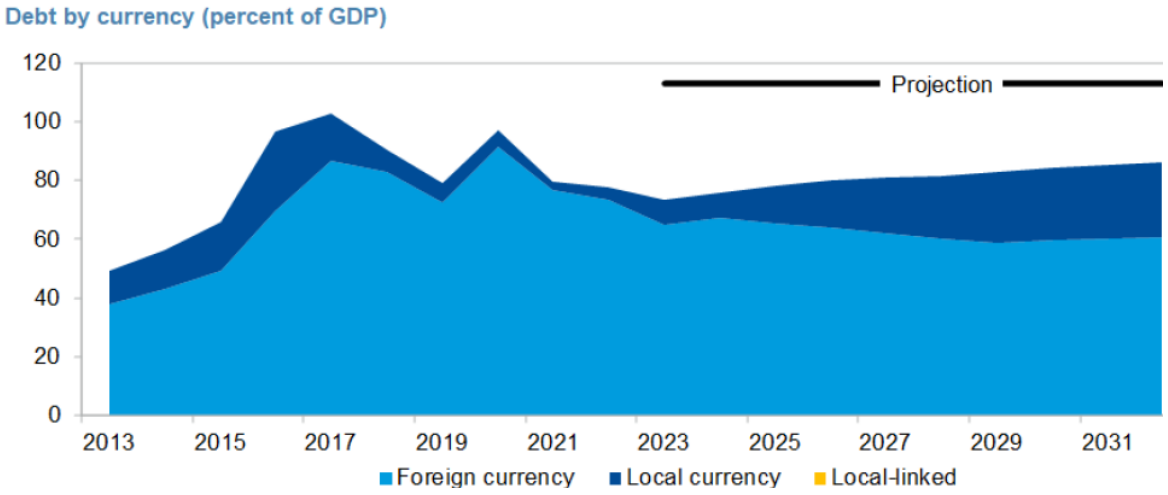
Kyrgyz Rep.

Risk of external debt distress	*Moderate*
Overall risk of debt distress	*Moderate*
Granularity in the risk rating	*Some space to absorb shocks*
Application of judgment	*No*

Staff assesses the [redacted] public debt as sustainable with moderate risks of external and overall debt distress. Because the [redacted] debt carrying capacity has been downgraded to "medium" from "strong,"[1] all relevant thresholds have been lowered, resulting in a breach of the external debt threshold of the PV of debt-to-GDP ratio between 2025 and 2029 under a standard shock to exports. Moreover, the customized stress test that was applied in the 2022 DSA reflecting the discontinuation of gold exports and the collapse in re-exports would still result in a breach of the threshold for the ratio of the PV of external debt-to-GDP had the debt carrying capacity remained "strong." Finally, because external debt burden indicators trend downward and the breaches are limited, staffs judge external public debt to be sustainable, with some space to absorb shocks. The PV of total public debt-to-GDP breaches its benchmark under the baseline scenario in 2028 under a standard shock to growth, resulting in the "moderate" rating for the overall risk of debt distress. Without fiscal discipline, the overall deficit will start increasing after 2026 as interest payments increase, and total public debt continues to rise to 67.2 percent of GDP by 2043. Creating fiscal space and containing debt vulnerabilities will require improving tax collections, reducing the wage bill and energy subsidies, strengthening debt management, seeking concessional financing and improving public investment management.

Mongolia

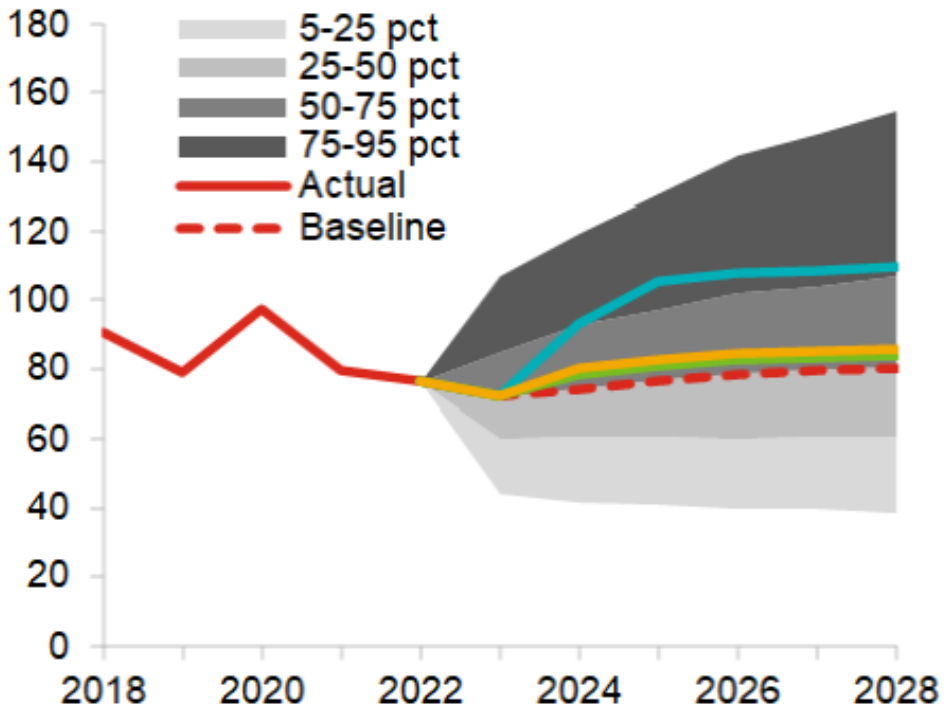




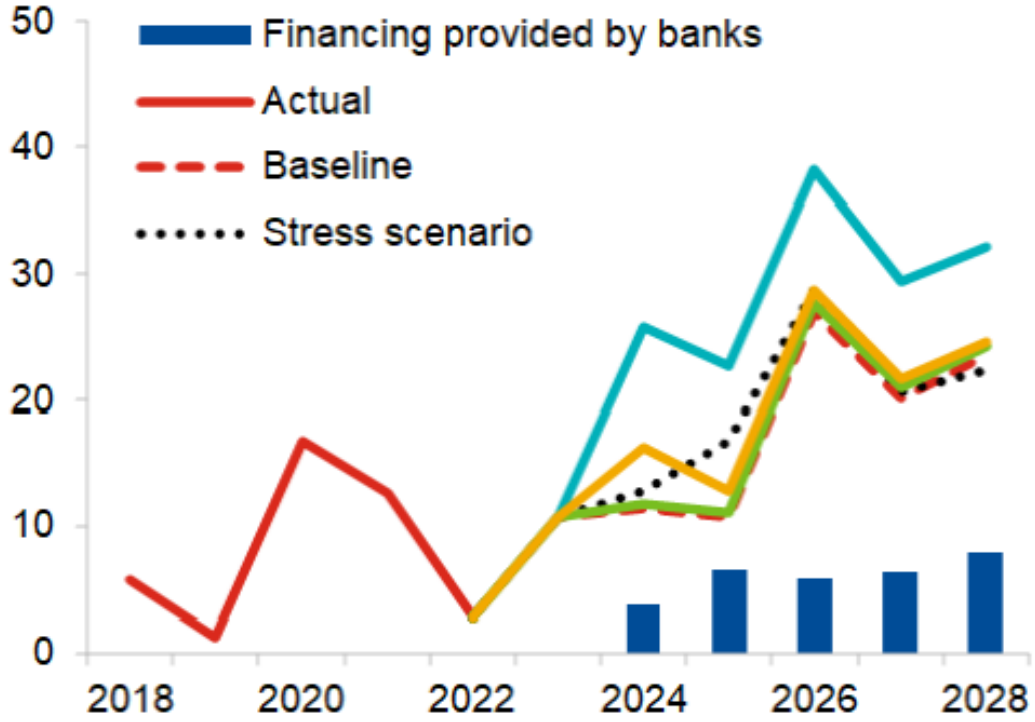
Percent of GDP unless indicated otherwise	Actual	Medium-term projection					
	2022	2023	2024	2025	2026	2027	2028
Public debt	76.3	71.9	74.3	76.8	78.6	79.6	80.4
Change in public debt	-3.5	-4.4	2.4	2.5	1.8	1.0	0.7
Contribution of identified flows	-3.1	-3.3	-0.5	1.7	1.5	1.3	0.9
Primary deficit	-2.1	-1.0	0.7	0.2	-0.1	-0.4	-0.7
Noninterest revenues	34.4	34.7	34.2	34.3	34.2	34.2	34.1
Noninterest expenditures	32.3	33.6	34.9	34.5	34.1	33.7	33.4
Automatic debt dynamics	-3.8	-3.7	-2.8	-2.0	-2.0	-1.8	-1.9
Real interest rate and relative inflation	-0.1	0.3	0.3	0.5	0.6	0.9	1.1
Real interest rate	-9.2	-5.1	-3.6	-4.1	-3.5	-2.8	-1.2
Relative inflation	9.0	5.4	4.0	4.5	4.2	3.7	2.4
Real growth rate	-3.8	-4.0	-3.1	-2.5	-2.6	-2.7	-3.1
Real exchange rate	0.2	...	...	...	...	...	...
Other identified flows	2.8	1.4	1.5	3.6	3.6	3.5	3.4
Contingent liabilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other transactions	2.8	1.4	1.5	3.6	3.6	3.5	3.4
Contribution of residual	-0.5	-1.1	2.8	0.8	0.3	-0.3	-0.1
Gross financing needs	2.8	10.8	11.5	10.8	27.0	20.2	23.5
of which: debt service	4.9	11.8	10.8	10.6	27.1	20.6	24.1
Local currency	0.8	1.6	4.9	6.6	11.2	14.6	17.8
Foreign currency	4.1	10.2	5.8	3.9	15.9	6.0	6.3
Memo:							
Real GDP growth (percent)	5.0	5.5	4.5	3.5	3.5	3.5	4.0
Inflation (GDP deflator; percent)	17.7	11.4	9.6	10.2	9.6	8.6	6.3
Nominal GDP growth (percent)	23.6	17.5	14.5	14.0	13.4	12.4	10.6
Effective interest rate (percent)	3.5	3.6	3.8	3.9	4.4	4.7	4.6

Mongolia

Public Debt (% of GDP)



Gross Financing Needs (% of GDP)



Triggered stress tests (stress tests not activated in gray)

Banking crisis | Commodity prices | Exchange rate | Contingent liab. | Natural disaster

Mongolia

SOVEREIGN DEBT-RELATED RISK ASSESSMENT

Horizon	Mechanical signal	Final assessment	Comments
Overall	...	High	The overall risk of sovereign stress is high reflecting debt-related vulnerabilities across the assessment horizons. The government successfully tapped into international capital markets in early 2023, mitigating sovereign rollover risks — rollover risks for other entities (e.g., the private sector) remain. . Medium-term risks arise from economic volatility and susceptibility to shocks. Long-term risks emerge from large amortizations, pension liabilities, the impact of global transition to lower emissions, and vulnerability to natural disasters.
Medium term	High	High	The medium-term risk is high, reflecting [redacted] history of high economic volatility, elevated public debt levels, and weak institutions. There is a 25 percent probability that public debt could exceed 100 percent of GDP by 2028 as shown in the debt fan chart. The financeability module flags the limited capacity of the domestic banking sector to finance shocks to government's finances under a generalized stress scenario. In addition, GFNs and public debt ratios would increase significantly in a banking crisis scenario. Finally, GFNs present spikes every three years capturing the rollover requirements of the PBOC swap line which has been renewed 2023 until 2026.
Fanchart	High	...	
GFN	Moderate	...	
Stress test	...	...	
Long term	...	High	The long-term risk is high, amplified by pension spending pressures and challenges related to the global transition to lower emission and vulnerability to natural disasters. Alleviating the long-term risk of stress ultimately depends on the government's capacity to effectively implement a comprehensive set of structural reforms to manage fiscal risks and enhance the growth outlook, including by efficiently and equitably exploiting its significant natural resource wealth. Coal dominates the country's export basket and serves as the primary energy source. However, as the global transition towards clean energy progresses, demand for coal is projected to decrease, although the prospects for copper exports could become brighter, offering a compensating factor.

DEBT SUSTAINABILITY ASSESSMENT

DSA Summary Assessment

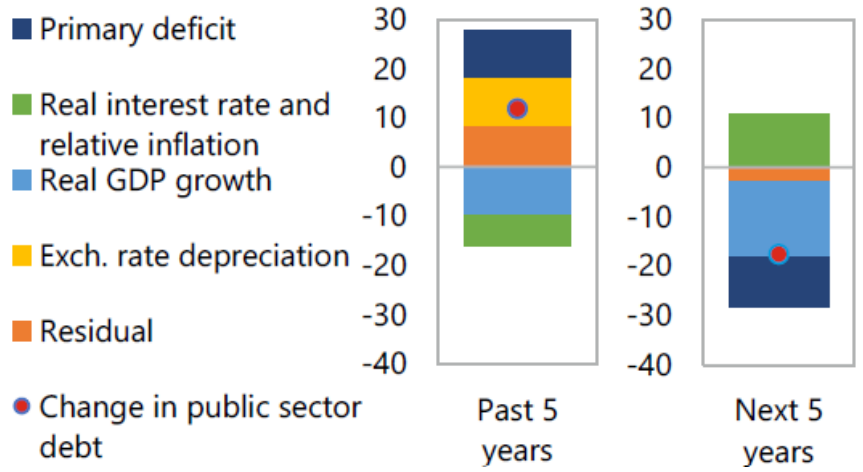
[redacted] *faces a high risk of sovereign stress. The public debt-to-GDP ratio is projected to increase over the forecast horizon, after a brief decline in 2023. In addition, the baseline scenario faces considerable downside risks and there are limited policy instruments to address negative shocks should they arise. A history of pronounced macroeconomic volatility, along with susceptibility to global shocks, is a major contributor to the assessment across all time horizons. Although the projected accumulation of government deposits, partially mandated by law, acts as risk mitigator, current policies do not adequately rebuild buffers, calling for a more ambitious structural fiscal adjustment and measures to tackle long-term growth challenges in a fiscally and externally prudent manner. Implementing structural reforms that promote economic and export diversification, facilitate private sector financing, develop domestic capital markets, enhance public sector efficiency, and improve natural resource management is important for reducing stress risks.*

Sustainability assessment 2/	Not required for surveillance countries	Not required for surveillance countries	...
Debt stabilization in the baseline			No

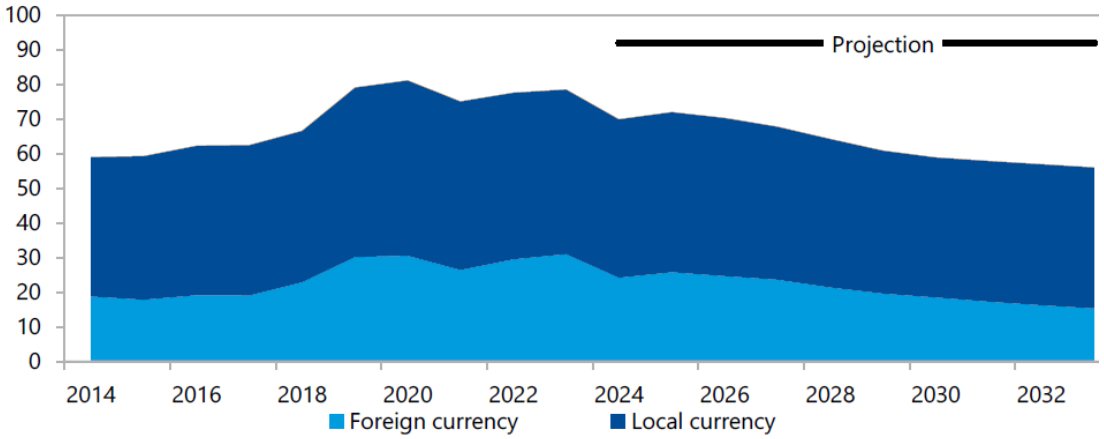
Pakistan

Public Debt Creating Flows

(Percent of GDP)



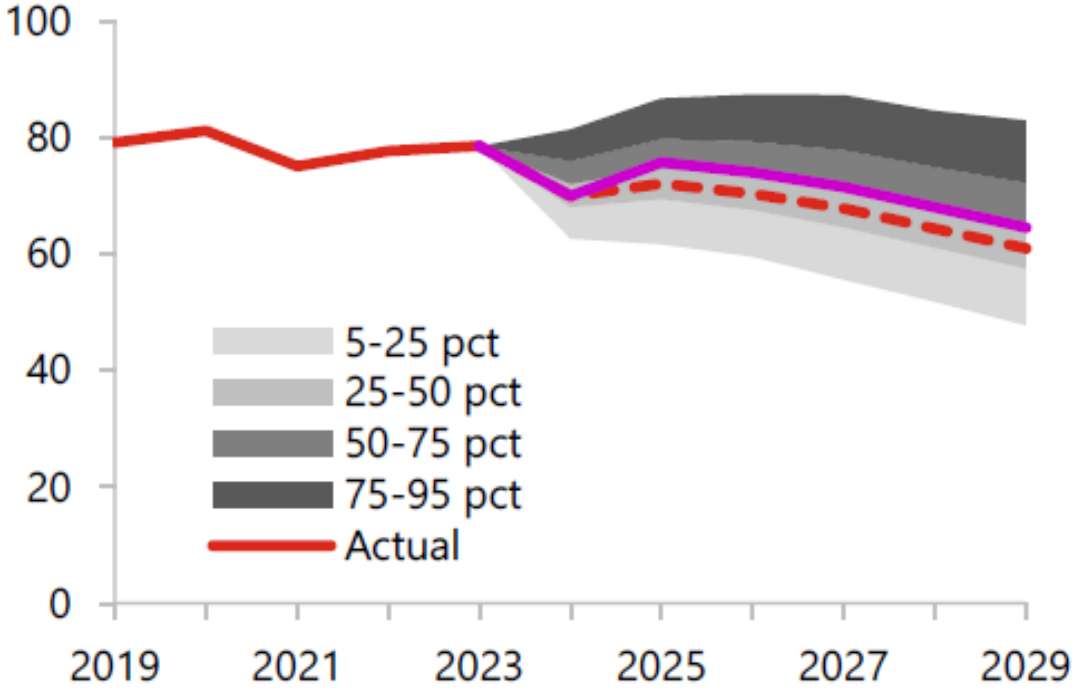
Debt by Currency (Percent of GDP)



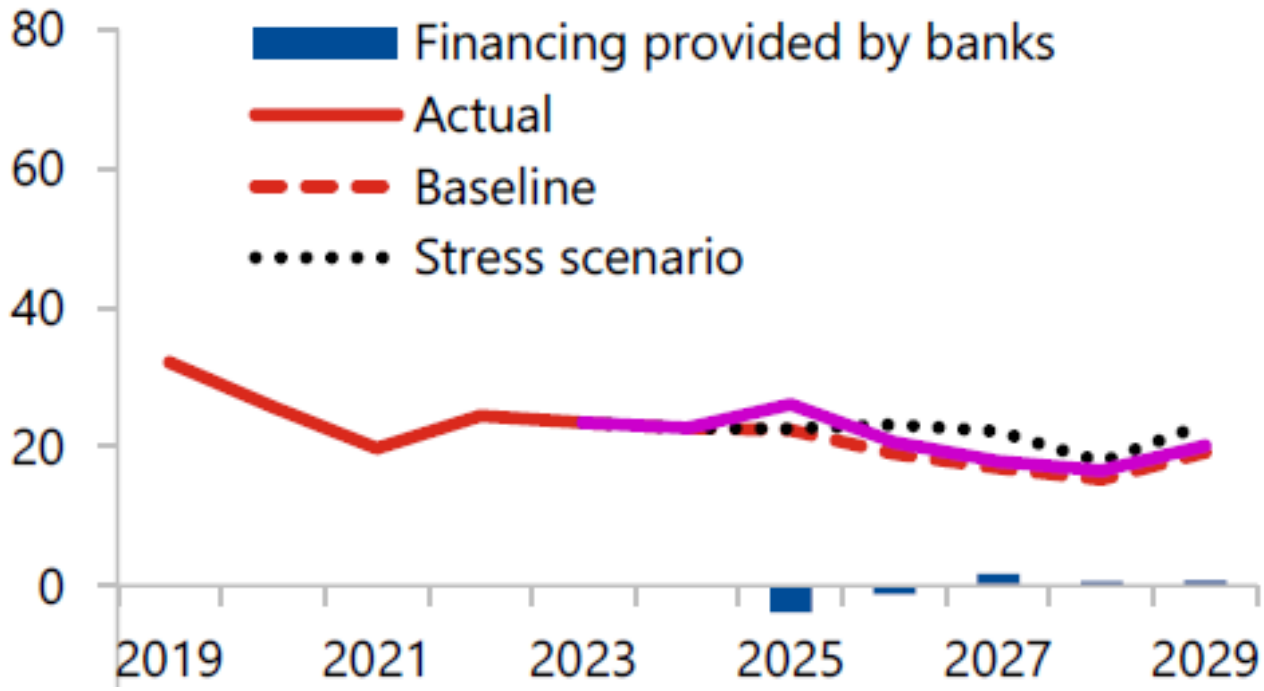
Percent of GDP unless indicated otherwise	Actual	Medium-term projection					
	2023	2024	2025	2026	2027	2028	2029
Public debt	78.6	70.0	72.1	70.4	67.8	64.3	61.0
Change in public debt	0.9	-8.6	2.1	-1.7	-2.6	-3.5	-3.4
Contribution of identified flows	1.3	-3.2	0.6	-1.8	-2.5	-3.3	-3.1
Primary deficit	0.9	-0.4	-2.1	-1.7	-2.0	-2.0	-2.0
Noninterest revenues	11.5	12.4	15.4	15.0	15.5	15.8	15.8
Noninterest expenditures	12.4	12.0	13.3	13.3	13.4	13.8	13.8
Automatic debt dynamics	0.4	-3.4	1.8	-0.1	-0.5	-1.2	-1.1
Real interest rate and relative inflation	-4.1	-1.6	4.0	2.7	2.3	1.7	1.7
Real interest rate	-9.1	-6.6	2.4	1.4	1.3	0.7	0.8
Relative inflation	5.0	5.0	1.6	1.3	1.0	1.0	0.9
Real growth rate	0.2	-1.8	-2.2	-2.8	-2.8	-2.9	-2.8
Real exchange rate	4.3	...	...	...	...	...	...
Other identified flows	0.0	0.6	0.8	0.0	0.0	0.0	0.0
Contingent liabilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(minus) Interest Revenues	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other transactions	0.0	0.6	0.8	0.0	0.0	0.0	0.0
Contribution of residual	-0.4	-5.4	1.5	0.2	-0.1	-0.2	-0.3
Gross financing needs	23.5	22.7	22.5	19.0	17.0	15.3	19.3
of which: debt service	22.6	23.1	24.5	20.7	19.0	17.3	21.2
Local currency	17.9	19.9	21.6	17.6	16.3	13.6	17.5
Foreign currency	4.7	3.2	2.9	3.1	2.8	3.7	3.8
Memo:							
Real GDP growth (percent)	-0.2	2.4	3.2	4.0	4.1	4.5	4.5
Inflation (GDP deflator; percent)	25.8	23.2	9.5	7.8	6.5	6.5	6.5
Nominal GDP growth (percent)	25.8	26.4	14.7	12.5	11.1	11.4	11.3
Effective interest rate (percent)	11.1	12.5	13.4	9.9	8.5	7.7	7.8

Pakistan

Public Debt (% of GDP)



Gross Financing Needs (% of GDP)



Triggered stress tests (stress tests not activated in gray)

Banking crisis | Commodity prices | Exchange rate | Contingent liab. | Natural disaster

Pakistan

SOVEREIGN DEBT-RELATED RISK ASSESSMENT

Horizon	Mechanical signal	Final assessment	Comments
Overall	...	High	The overall risk of sovereign stress is high, reflecting a high level of vulnerability from elevated debt and gross financing needs and low reserve buffers. Risks are mitigated by (i) the fiscal adjustment which commenced under the SBA and is to be safeguarded by the EFF onto the medium term, (ii) financial commitments by bilateral partners, and (iii) the ability of the banking system to rollover existing domestic debt.
Near term 1/	n.a.	n.a.	Not applicable
Medium term	High	High	Medium-term risks are assessed as high (in line with the mechanical signal). Risks include uneven program implementation, political risks, and access to adequate multilateral and bilateral financing in view of the high gross financing needs.
Fanchart	Moderate	...	
GFN	High	...	
Stress test	Cont. Liabty.	...	
Long term	...	Moderate	Insufficient progress with policies and structural reforms could hamper potential growth, yet with its relatively young population [redacted] also bears great potential through leveraging digital technologies. [redacted] is also very exposed to the adverse consequences of climate change, such as more frequent floods and droughts, and the necessary adaptation costs would slow the reduction of debt and financing requirements.

DEBT SUSTAINABILITY ASSESSMENT

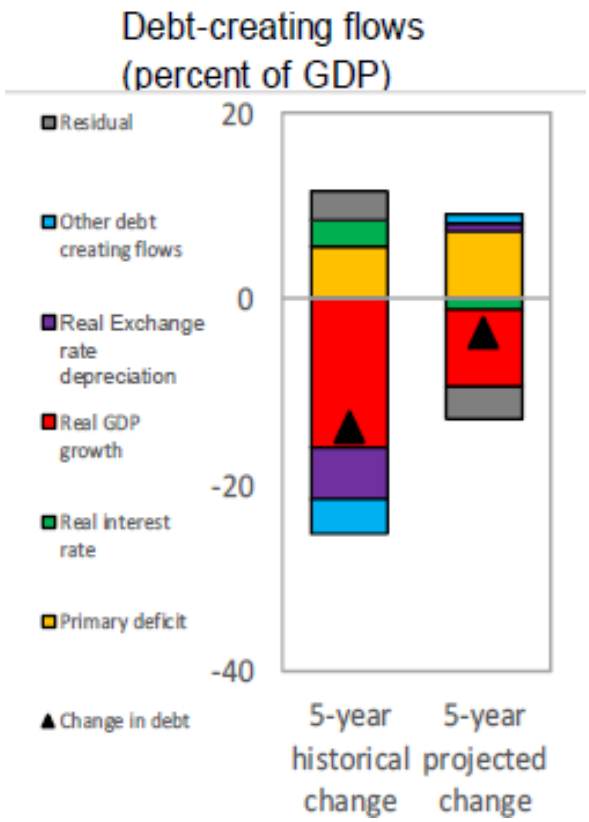
Sustainability assessment 2/	...	Sustainable	If the macroeconomic prudence continues for the medium term as envisioned by the EFF baseline, the debt path is expected to remain on a downward trajectory. The GFNs, although high, would be covered by official bilateral and domestic financing. However, the underlying vulnerabilities and risks are very high, including due to the significant sovereign exposure of domestic banks, and the scope for policy to respond flexibly is extremely limited.
Debt stabilization in the baseline		Yes	

DSA Summary Assessment

Staff commentary: Public debt continues to be assessed as sustainable in the baseline scenario underpinned by steadfast implementation of the proposed EFF policies, with gradual fiscal consolidation continuing in FY25 and beyond, and the gradual resumption of growth in the coming years. Elevated gross financing needs continue to pose high risks to debt sustainability, particularly as fiscal and reserve buffers are very low. In this regard, timely disbursements of committed bilateral and multilateral support is critical in the period ahead. Higher-for-longer interest rates, a prolonged stagnation due to tight macro policies, renewed pressures on the exchange rate, possibly policy reversals, and contingent liabilities related to SOEs pose significant risks to debt sustainability.

Tajikistan

Public debt

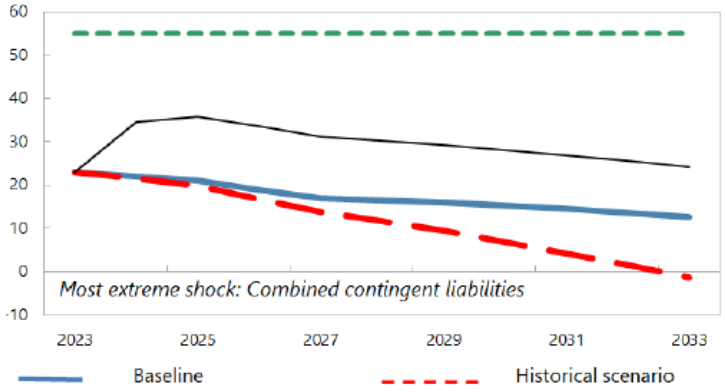


Percent of GDP unless indicated otherwise	Actual	Projections					
	2022	2023	2024	2025	2026	2027	2028
Public sector debt 1/	32.5	30.9	30.8	30.2	29.4	28.8	29.1
of which: external debt	28.5	27.6	27.8	27.1	26.3	25.5	26.0
Change in public sector debt	-9.6	-1.6	-0.1	-0.6	-0.8	-0.6	0.3
Identified debt-creating flows	-9.6	-2.4	0.0	0.4	0.6	0.5	0.5
Primary deficit	-0.5	0.2	1.8	1.7	1.9	1.8	1.9
Revenue and grants	27.7	27.9	27.4	28.4	28.7	28.3	28.0
of which: grants	3.4	3.6	3.5	3.0	2.6	2.1	1.4
Primary (noninterest) expenditure	27.2	28.2	29.2	30.1	30.6	30.1	29.9
Automatic debt dynamics	-8.2	-3.0	-2.0	-1.5	-1.5	-1.4	-1.4
Contribution from interest rate/growth differential	-2.4	-3.0	-2.0	-1.5	-1.5	-1.4	-1.4
of which: contribution from average real interest rate	0.7	-0.5	-0.1	-0.2	-0.2	-0.2	-0.1
of which: contribution from real GDP growth	-3.1	-2.5	-1.9	-1.3	-1.3	-1.3	-1.2
Contribution from real exchange rate depreciation	-5.8	1.6	0.1	-0.4	-0.3	-0.3	-0.1
Other identified debt-creating flows	-1.0	0.3	0.3	0.2	0.2	0.2	0.0
Privatization receipts (negative)	-1.1	0.3	0.3	0.2	0.2	0.2	0.0
Recognition of contingent liabilities (e.g., bank recapitalization)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Debt relief (HIPC and other)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other debt creating or reducing flow (please specify)	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Residual	0.1	0.8	-0.1	-1.0	-1.4	-1.1	-0.2
Gross financing need 4/	0.4	2.8	4.2	5.6	6.0	5.9	4.9

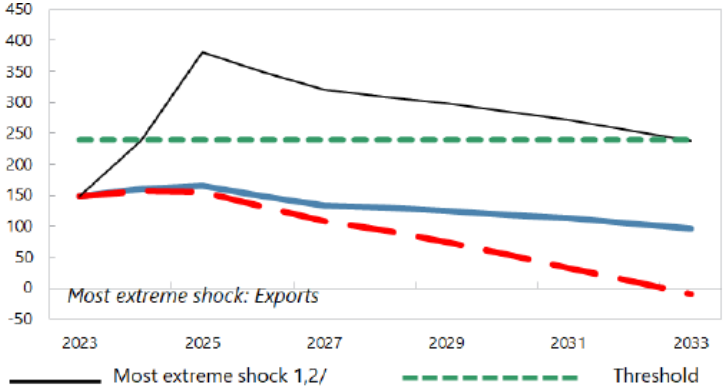
Key macroeconomic and fiscal assumptions							
Real GDP growth (in percent)	8.0	8.3	6.5	4.5	4.5	4.5	4.5
Average nominal interest rate on existing external debt (in percent)	1.1	0.1	2.5	2.4	2.4	2.4	2.4
Average real interest rate on domestic debt (in percent)	-5.5	-1.8	-1.7	-2.0	-1.2	-0.1	-0.4
Real exchange rate depreciation (in percent, + indicates depreciation)	-16.5	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	6.0	3.0	4.4	6.5	6.5	6.5	6.0
Growth of real primary spending (deflated by GDP deflator, in percent)	9.9	12.0	10.1	8.0	6.1	2.8	4.0
Primary deficit that stabilizes the debt-to-GDP ratio 5/	9.1	1.8	1.9	2.3	2.7	2.4	1.6
PV of contingent liabilities (not included in public sector debt)	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Tajikistan

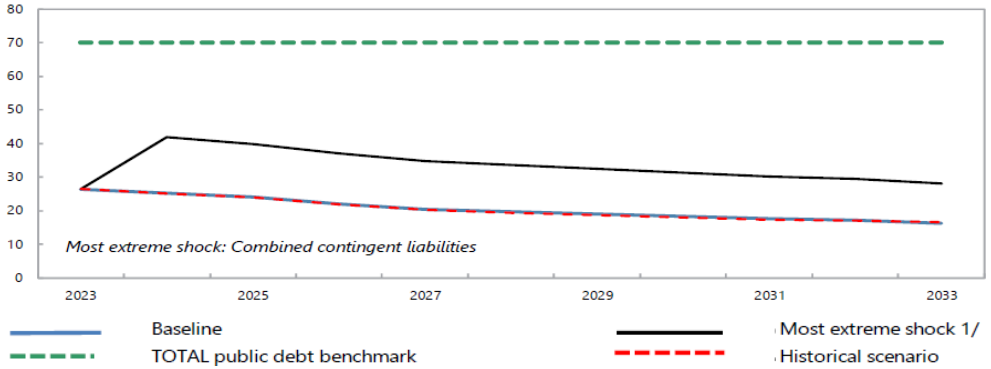
PV of External PPG Debt (% of GDP)



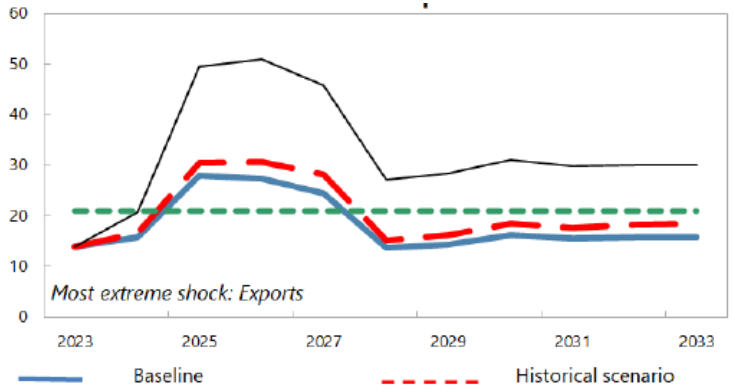
PV of External PPG Debt (% of Exports)



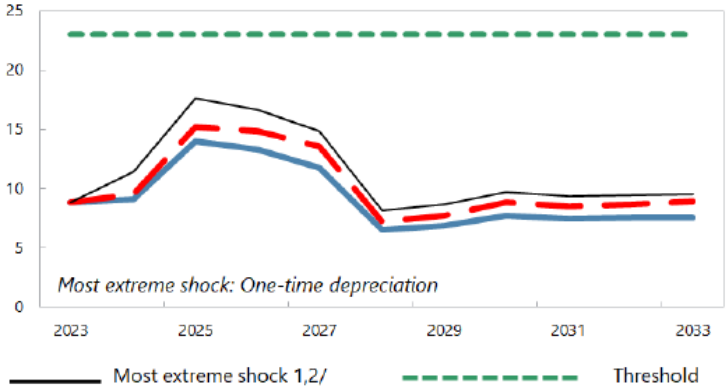
PV of Total PPG Debt (% of GDP)



Debt Service of External PPG Debt (% of Exports)



Debt Service of External PPG Debt (% of Revenue)



Tajikistan

Risk of external debt distress	*High*
Overall risk of debt distress	*High*
Granularity in the risk rating	*Sustainable*
Application of judgment	*No*

This joint World Bank/IMF Debt Sustainability Analysis (DSA) indicates that [redacted] debt is sustainable while the external and overall risk of debt distress remain high (unchanged from the February 2023 DSA).[1] External borrowing has been revised upward compared to the previous DSA to reflect the re-estimated construction costs for the [redacted] hydropower plant [redacted] The composition of borrowing has also been revised to incorporate semi-concessional financing beginning in 2024 as a result of rising global interest rates.[3] Nevertheless, public debt remains on a sustainable path, anchored by the authorities' commitment to maintain a fiscal deficit of 2.5 percent of GDP over the medium term.[4] Under the baseline, the total PPG debt-to-GDP ratio declines from 32.5 percent in 2022 to about 29 percent in 2027 once [redacted] Eurobond is repaid and stabilizes at about 32 percent over the long run.

[redacted] high risk of debt distress mainly results from the breach of external PPG debt service-to-export indicator in 2025-2027. Debt service peaks during this period due to principal repayments due on the Eurobond (US$500 million) and the RCF loan (about USD $183 million). This indicator also shows high vulnerability in stress tests, especially shocks to exports, contingent liabilities, and commodity prices.

Maintaining fiscal discipline, including capping fiscal deficits and containing risks from SOEs, as well as diversifying exports, are key to reduce vulnerabilities and keep debt on a sustainable path.

Turkmenistan

The last Article IV Executive Board Consultation was on June 14, 2024. Listed below are items related to [redacted].

On June 14, 2024, the Executive Board of the International Monetary Fund (IMF) concluded the consideration of Article IV consultation of [redacted].

Under Article IV of its Articles of Agreement, the IMF has a mandate to exercise surveillance over the economic, financial and exchange rate policies of its members in order to ensure the effective operation of the international monetary system. The IMF's appraisal of such policies involves a comprehensive analysis of the general economic situation and policy strategy of each member country. IMF economists visit the member country, usually once a year, to collect and analyze data and hold discussions with government and central bank officials. Upon its return, the staff submits a report to the IMF's Executive Board for discussion. The Board's views are subsequently summarized and transmitted to the country authorities.

The authorities have not consented to publication of the staff report and the related press release.

Case Studies (4)

- Break out in 2 room discussions:
  - Madagascar
  - Ghana
  - Kenya
  - Tonga

European Commission

Group Case Studies

1. Madagascar
2. Ghana
3. Kenya
4. Tonga
5. Zambia

European Commission

Madagascar

European Commission

Case study—Madagascar, Impact of the Pandemic and Request for ECF Arrangement

(CR April 2021)

- The pandemic has severely impacted Madagascar, resulting in significant negative effects on the country's economic prospects in the short and medium term
- There has been reversal of progress made in per capita income and poverty reduction, causing significant scarring in the economy.
- Real GDP has contracted, and there has been a substantial widening of the current account deficit
- In response to the challenges posed by the pandemic, the authorities have requested an Extended Credit Facility (ECF) arrangement
- The objective of the ECF arrangement is to support the country's recovery efforts, anchor reform implementation, and catalyze aid commitments.
- Although substantial progress was achieved during the previous ECF arrangement from 2016-20, the reform agenda remains unfinished and has been slowed by the impact of the pandemic.

Case study—Madagascar, Program Design and Objectives

- The program design takes into account the specific vulnerabilities faced by Madagascar, particularly its high exposure to climate-related shocks.
- The primary focus of the program is to mitigate the economic impact of the pandemic, maintain macroeconomic stability, and reignite the momentum for reforms.
- The overarching goal is to promote sustained economic growth and reduce poverty in the country.
- Given the significant infrastructure needs, the program will facilitate the scaling up of foreign-financed investments.
- External financing for the program will primarily be sought on concessional terms and through grants.

Case Study—Madagascar

Text Table 4. Madagascar: Baseline Macroeconomic Assumptions for DSA

	2020			2025			2030		
(In percent of GDP, unless otherwise indicated)	Article IV	Aug 2020	Current	Article IV	Aug 2020	Current	Article IV	Aug 2020	Current
Real GDP growth (percent)	5.2	-1.0	-4.2	5.5	5.5	5.0	5.2	5.2	5.0
Inflation, GDP Deflator (percent)	7.2	4.6	4.2	5.4	5.4	5.5	5.1	5.2	5.2
Non-interest CA deficit	0.9	3.1	6.1	1.6	2.6	3.2	1.8	3.3	3.6
Primary deficit	1.9	4.3	3.5	2.8	3.4	2.6	2.9	2.8	2.9

Sources: Malagasy authorities, World Bank and IMF.

- Macroeconomic assumptions:

1. What was the projected GDP contraction for Madagascar in 2020, and how does it compare to previous projections?
2. When is Madagascar expected to surpass its pre-shock forecasted output levels?
3. How is the fiscal deficit expected to evolve in the medium term, and what impact will it have on public debt?

Case Study—Madagascar

1. How does Madagascar's PV of external public and publicly guaranteed (PPG) debt level change from 2020 to 2040 under the baseline scenario?
2. How does endogenous debt dynamics affect the changes in Madagascar's external debt? What factors, such as nominal interest rate, real GDP growth, contribute to these dynamics?
3. How does the projected debt service to exports ratio change over the forecast period?
4. What is the grant element of new public sector borrowing in Madagascar? How does this element contribute to the financing mix and debt sustainability?

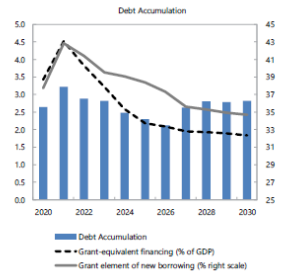
Table 1. Madagascar: External Debt Sustainability Framework, Baseline Scenario, 2017-2040

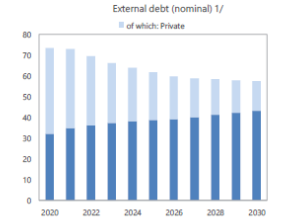
(In percent of GDP; unless otherwise indicated)

	Actual			Projections							Average 8/	
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2030	2040	Historical	Projections
External debt (nominal) 1/	**50.2**	**69.4**	**65.4**	**73.3**	**73.0**	**69.4**	**66.1**	**63.9**	**61.7**	**57.4**	**54.3**	**45.0**	**63.5**
of which: public and publicly guaranteed (PPG)	**25.7**	**26.4**	**26.6**	**32.0**	**34.7**	**36.1**	**37.3**	**38.1**	**38.6**	**43.2**	**47.9**	**24.6**	**38.4**
Change in external debt	-0.8	19.2	-3.9	7.8	-0.3	-3.6	-3.3	-2.3	-2.2	-0.3	-1.0		
Identified net debt-creating flows	**-7.4**	**-7.1**	**-2.9**	**7.7**	**0.5**	**-1.4**	**-1.9**	**-2.2**	**-2.2**	**-1.2**	**-0.6**	**-2.2**	**-0.7**
Non-interest current account deficit	**0.0**	**-1.2**	**1.7**	**6.1**	**4.5**	**3.9**	**3.8**	**3.4**	**3.2**	**3.6**	**3.6**	**2.9**	**3.8**
Deficit in balance of goods and services	3.3	3.4	4.6	9.1	8.8	6.9	6.9	6.6	6.6	6.7	6.9	**6.0**	**7.0**
Exports	30.9	31.2	27.8	18.3	23.1	26.3	27.6	28.0	28.6	26.8	24.3		
Imports	34.2	34.6	32.4	27.4	31.8	33.2	34.5	34.6	35.2	33.6	31.3		
Net current transfers (negative = inflow)	-5.6	-6.9	-5.5	-5.5	-5.3	-5.1	-5.1	-5.0	-5.1	-4.6	-4.2	**-5.5**	**-5.0**
of which: official	-2.5	-2.6	-3.0	-3.1	-2.3	-1.8	-1.3	-0.9	-0.6	-0.1	0.0		
Other current account flows (negative = net inflow)	2.3	2.3	2.6	2.5	1.1	2.1	2.0	1.8	1.7	1.5	0.9	**2.5**	**1.7**
Net FDI (negative = inflow)	**-2.7**	**-3.6**	**-2.6**	**-1.8**	**-2.2**	**-2.4**	**-2.8**	**-2.9**	**-3.0**	**-3.1**	**-3.2**	**-4.0**	**-2.8**
Endogenous debt dynamics 2/	**-4.8**	**-2.4**	**-2.1**	**3.4**	**-1.8**	**-2.9**	**-2.9**	**-2.6**	**-2.4**	**-1.7**	**-1.0**		
Contribution from nominal interest rate	0.4	0.5	0.5	0.5	0.4	0.5	0.5	0.6	0.6	1.0	1.4		
Contribution from real GDP growth	-1.8	-1.5	-2.9	2.9	-2.2	-3.4	-3.4	-3.2	-3.0	-2.7	-2.4		
Contribution from price and exchange rate changes	-3.3	-1.4	0.3	...	...	...	...	...	...	...	...		
Residual 3/	**6.6**	**26.3**	**-1.0**	**0.1**	**-0.8**	**-2.1**	**-1.4**	**-0.1**	**0.0**	**0.9**	**-0.4**	**5.9**	**0.0**
of which: exceptional financing	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0		
Sustainability indicators													
PV of PPG external debt-to-GDP ratio	...	...	**15.6**	**19.2**	**21.0**	**22.0**	**23.0**	**23.7**	**24.4**	**28.6**	**34.5**		
PV of PPG external debt-to-exports ratio	...	...	**56.1**	**104.4**	**91.1**	**83.7**	**83.3**	**84.8**	**85.3**	**106.8**	**141.9**		
PPG debt service-to-exports ratio	**5.6**	**2.9**	**2.8**	**4.4**	**3.9**	**4.2**	**4.9**	**4.9**	**4.9**	**7.3**	**10.6**		
PPG debt service-to-revenue ratio	**16.7**	**8.9**	**7.3**	**8.9**	**8.7**	**9.8**	**11.0**	**10.8**	**10.6**	**14.1**	**17.4**		
Gross external financing need (Million of U.S. dollars)	12.5	-488.0	699.5	1253.2	787.7	1168.5	1182.2	842.0	817.1	1149.6	2171.7		
Key macroeconomic assumptions													
Real GDP growth (in percent)	3.9	3.2	4.4	-4.2	3.2	5.0	5.4	5.2	5.0	5.0	4.6	**3.0**	**4.1**
GDP deflator in US dollar terms (change in percent)	7.0	2.8	-0.5	-0.5	3.2	3.1	2.7	1.9	1.7	1.6	1.7	**1.4**	**1.8**
Effective interest rate (percent) 4/	0.8	1.1	0.7	0.7	0.6	0.7	0.8	1.0	1.1	1.8	2.7	**1.0**	**1.1**
Growth of exports of G&S (US dollar terms, in percent)	21.6	7.0	-7.2	-37.2	33.9	23.7	13.3	8.7	9.1	5.1	5.6	**8.0**	**7.1**
Growth of imports of G&S (US dollar terms, in percent)	26.2	7.1	-2.5	-19.4	23.7	13.0	12.3	7.5	8.7	5.9	6.6	**2.5**	**6.7**
Grant element of new public sector borrowing (in percent)	...	...	...	37.7	42.9	41.4	39.5	39.1	38.4	34.7	31.4	...	**37.9**
Government revenues (excluding grants, in percent of GDP)	10.3	10.4	10.5	9.2	10.3	11.4	12.2	12.8	13.3	14.0	14.8	**9.3**	**12.6**
Aid flows (in Million of US dollars) 5/	588.5	615.5	733.4	436.7	853.1	889.3	903.7	846.2	831.4	1078.7	1412.8		
Grant-equivalent financing (in percent of GDP) 6/	...	...	...	3.4	4.5	3.8	3.2	2.6	2.2	1.8	1.3	...	**2.7**
Grant-equivalent financing (in percent of external financing) 6/	...	...	...	55.4	60.0	57.7	52.4	49.7	47.0	35.7	31.4	...	**46.8**
Nominal GDP (Million of US dollars)	13,176	13,974	14,519	13,837	14,746	15,972	17,283	18,524	19,776	27,295	51,511		
Nominal dollar GDP growth	11.2	6.1	3.9	-4.7	6.6	8.3	8.2	7.2	6.8	6.7	6.4	**4.4**	**6.0**
Memorandum items:													
PV of external debt 7/	...	...	54.5	60.4	59.3	55.4	51.8	49.5	47.5	42.8	40.9		
In percent of exports	...	...	195.6	329.4	257.1	210.2	187.7	176.9	165.9	159.5	168.1		
Total external debt service-to-exports ratio	9.0	4.1	20.3	25.9	13.2	22.2	21.1	14.6	13.8	13.8	15.6		
PV of PPG external debt (in Million of US dollars)			2267.8	2650.8	3095.4	3521.0	3970.2	4398.7	4824.2	7816.0	17784.3		
(PVt-PVt-1)/GDPt-1 (in percent)				2.6	3.2	2.9	2.8	2.5	2.3	2.8	2.1		
Non-interest current account deficit that stabilizes debt ratio	0.9	-20.4	5.7	-1.7	4.8	7.5	7.1	5.6	5.3	3.9	4.6		

Sources: Country authorities; and staff estimates and projections.

Definition of external/domestic debt	Currency-based
Is there a material difference between the two criteria?	No





European Commission

Case Study—Madagascar

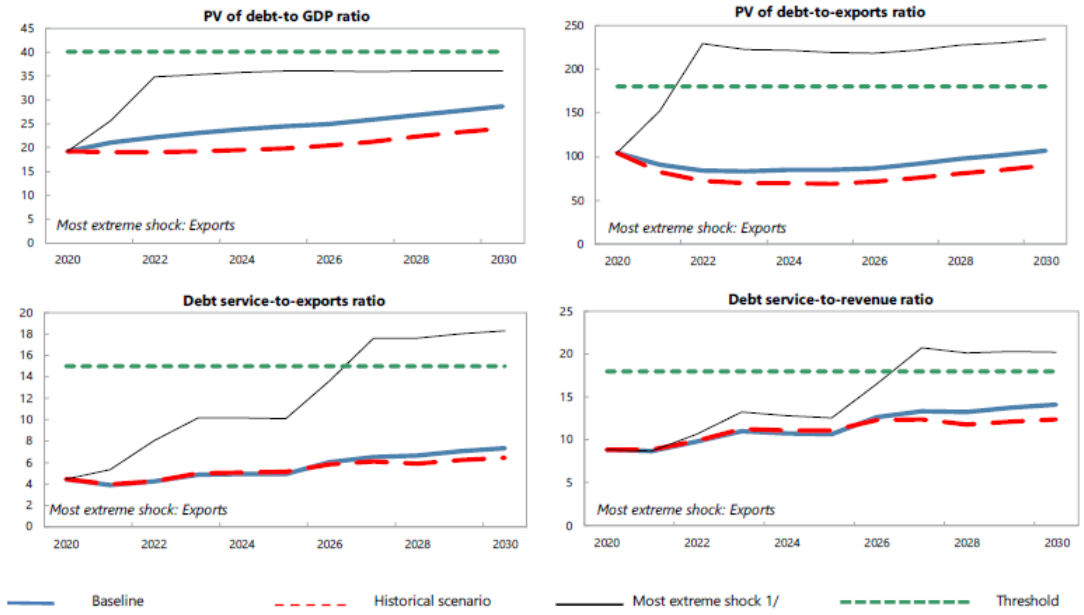
1. How do debt service indicators, such as the debt service to exports ratio, change over the projection period, and how do they compare to applicable thresholds for Madagascar?

2. Which specific debt indicators breach the external medium-carrying capacity thresholds for Madagascar under the exports shock scenario?

3. How does the exports shock scenario impact Madagascar's external debt-to-GDP ratio in 2022? Does it breach the indicated threshold of 40 percent?

4. In terms of external risk rating, how would you classify Madagascar's risk of debt distress based on the analysis? How does the breach of the external PPG debt thresholds contribute to this assessment?

Figure 1. Madagascar: Indicators of Public and Publicly Guaranteed External Debt Under Alternatives Scenarios, 2020-2030



European Commission

Ghana

European Commission

Case Study—Ghana

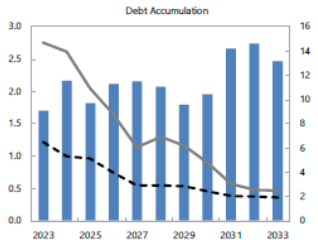
- Ghana faced significant challenges in its macroeconomic situation in recent years leading to the loss of international market access in late 2021,
- The year 2022 witnessed further difficulties characterized by substantial losses in international reserves, a sharp depreciation of the exchange rate, and soaring inflation
- Domestic financing conditions also deteriorated significantly, adding to the economic pressures faced by Ghana
- The Covid-19 pandemic, combined with the tightening in global financial conditions and the war in Ukraine, contributed to the deterioration of Ghana's fiscal and external positions.
- These external shocks, coupled with pre-existing fiscal and debt vulnerabilities, resulted in a notable increase in both public and external debt levels.
- To address these challenges, the Ghanian authorities requested support from the IMF and launched a comprehensive debt restructuring strategy in December 2022

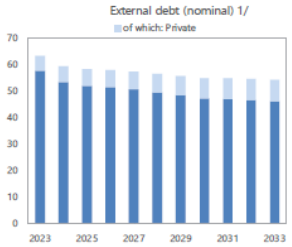
Case Study—Ghana

Table 1. Ghana: External Debt Sustainability Framework, Baseline Scenario, 2022–43
(In percent of GDP, unless otherwise indicated)

	Actual	Projections								Average 8/	
	2022	2023	2024	2025	2026	2027	2028	2033	2043	Historical	Projections
External debt (nominal) 1/	**47.8**	**63.2**	**59.2**	**58.2**	**57.9**	**57.3**	**56.6**	**54.4**	**49.6**	**41.7**	**56.9**
of which: public and publicly guaranteed (PPG)	**42.4**	**57.5**	**53.3**	**52.0**	**51.4**	**50.5**	**49.6**	**46.0**	**39.6**	**37.3**	**49.9**
Change in external debt	-0.8	15.4	-4.0	-1.0	-0.4	-0.6	-0.7	-0.3	-1.0		
Identified net debt-creating flows	**2.1**	**0.1**	**-2.2**	**-3.7**	**-3.2**	**-3.1**	**-3.0**	**-2.5**	**-1.8**	**-2.0**	**-2.6**
Non-interest current account deficit	**-0.2**	**0.0**	**-0.4**	**-0.2**	**0.4**	**0.5**	**0.6**	**0.9**	**1.3**	**2.0**	**0.4**
Deficit in balance of goods and services	0.8	0.6	0.3	0.0	0.2	0.4	0.4	0.5	0.1	**4.2**	**0.4**
Exports	35.3	39.1	40.2	39.7	39.3	38.3	37.3	37.2	37.4		
Imports	36.1	39.7	40.6	39.7	39.4	38.7	37.7	37.7	37.5		
Net current transfers (negative = inflow)	-4.9	-5.5	-5.5	-5.3	-5.1	-4.9	-4.7	-4.1	-3.2	**-4.2**	**-4.8**
of which: official	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Other current account flows (negative = net inflow)	3.9	4.8	4.7	5.1	5.3	5.0	4.9	4.5	4.3	**2.0**	**4.8**
Net FDI (negative = inflow)	**-2.0**	**-2.0**	**-2.8**	**-3.5**	**-3.5**	**-3.4**	**-3.4**	**-3.4**	**-3.4**	**-4.5**	**-3.2**
Endogenous debt dynamics 2/	**4.3**	**2.1**	**1.0**	**0.0**	**-0.1**	**-0.2**	**-0.2**	**0.0**	**0.4**		
Contribution from nominal interest rate	2.3	2.8	2.8	2.7	2.6	2.5	2.5	2.6	2.7		
Contribution from real GDP growth	-1.7	-0.8	-1.7	-2.6	-2.7	-2.7	-2.7	-2.6	-2.4		
Contribution from price and exchange rate changes	3.7	...	...	...	...	...	...	...	...		
Residual 3/	**-2.6**	**15.3**	**-1.8**	**2.7**	**2.8**	**2.5**	**2.3**	**2.2**	**0.8**	**4.4**	**3.2**
of which: exceptional financing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Sustainability indicators											
PV of PPG external debt-to-GDP ratio	**42.8**	**48.7**	**50.1**	**49.1**	**48.2**	**47.3**	**46.3**	**43.2**	**37.4**		
PV of PPG external debt-to-exports ratio	**121.1**	**124.7**	**124.4**	**123.6**	**122.8**	**123.3**	**124.1**	**116.1**	**100.1**		
PPG debt service-to-exports ratio	**12.3**	**13.8**	**12.7**	**16.8**	**14.9**	**14.2**	**12.7**	**17.5**	**13.1**		
PPG debt service-to-revenue ratio	**28.1**	**32.5**	**29.9**	**37.9**	**31.6**	**29.6**	**25.7**	**35.2**	**26.4**		
Gross external financing need (Million of U.S. dollars)	2554.8	3186.2	2275.5	3197.7	3300.2	3397.9	3149.8	7188.0	11870.4		
Key macroeconomic assumptions											
Real GDP growth (in percent)	3.2	1.5	2.8	4.7	5.0	5.0	5.0	5.0	5.0	**4.6**	**4.4**
GDP deflator in US dollar terms (change in percent)	-10.9	-10.0	-1.1	0.9	1.2	1.4	1.6	1.6	1.7	**-1.5**	**0.2**
Effective interest rate (percent) 4/	4.3	5.4	4.4	4.8	4.7	4.6	4.6	5.1	5.8	**5.6**	**4.8**
Growth of exports of G&S (US dollar terms, in percent)	7.7	1.0	4.7	4.3	5.0	4.0	3.7	6.7	6.9	**4.8**	**5.1**
Growth of imports of G&S (US dollar terms, in percent)	1.4	0.3	3.9	3.3	5.5	4.7	3.8	6.7	6.6	**2.0**	**5.0**
Grant element of new public sector borrowing (in percent)	...	14.7	13.9	10.9	8.8	6.0	6.9	2.5	2.2	**...**	**7.3**
Government revenues (excluding grants, in percent of GDP)	15.5	16.6	17.1	17.6	18.4	18.5	18.5	18.5	18.5	**13.6**	**18.1**
Aid flows (in Million of US dollars) 5/	132.4	884.0	932.9	942.0	875.6	845.2	883.8	692.8	842.9		
Grant-equivalent financing (in percent of GDP) 6/	...	1.2	1.0	1.0	0.7	0.6	0.5	0.4	0.3	**...**	**0.6**
Grant-equivalent financing (in percent of external financing) 6/	...	17.4	17.3	13.8	12.1	9.7	11.0	5.3	6.0	**...**	**10.6**
Nominal GDP (Million of US dollars)	72,839	66,499	67,621	71,480	75,920	80,851	86,225	119,188	228,880		
Nominal dollar GDP growth	-8.0	-8.7	1.7	5.7	6.2	6.5	6.6	6.7	6.8	**3.0**	**4.7**
Memorandum items:											
PV of external debt 7/	48.2	54.4	56.0	55.3	54.7	54.0	53.3	51.6	47.4		
In percent of exports	136.2	139.1	139.1	139.2	139.2	140.8	142.9	138.6	126.8		
Total external debt service-to-exports ratio	16.1	17.4	16.3	20.6	18.9	18.5	17.3	23.0	19.7		
PV of PPG external debt (in Million of US dollars)	31165.9	32404.8	33846.3	35080.0	36591.8	38223.2	39901.6	51510.3	85666.2		
(PVt-PVt-1)/GDPt-1 (in percent)		1.7	2.2	1.8	2.1	2.1	2.1	2.5	1.6		
Non-interest current account deficit that stabilizes debt ratio	0.6	-15.4	3.5	0.8	0.8	1.1	1.3	1.2	2.3		

Definition of external/domestic debt	Residency-based
Is there a material difference between the two criteria?	Yes





Sources: Country authorities; and staff estimates and projections.

1/ Includes both public and private sector external debt.

2/ Derived as [r - g - ρ(1+g) + εα (1+r)]/(1+g+ρ+gρ) times previous period debt ratio, with r = nominal interest rate; g = real GDP growth rate, ρ = growth rate of GDP deflator in U.S. dollar terms, ε=nominal appreciation of the local currency, and α= share of local currency-denominated external debt in total external debt.

3/ Includes exceptional financing (i.e., changes in arrears and debt relief); changes in gross foreign assets; and valuation adjustments. For projections also includes contribution from price and exchange rate changes.

4/ Current-year interest payments divided by previous period debt stock.

5/ Defined as grants, concessional loans, and debt relief.

6/ Grant-equivalent financing includes grants provided directly to the government and through new borrowing (difference between the face value and the PV of new debt).

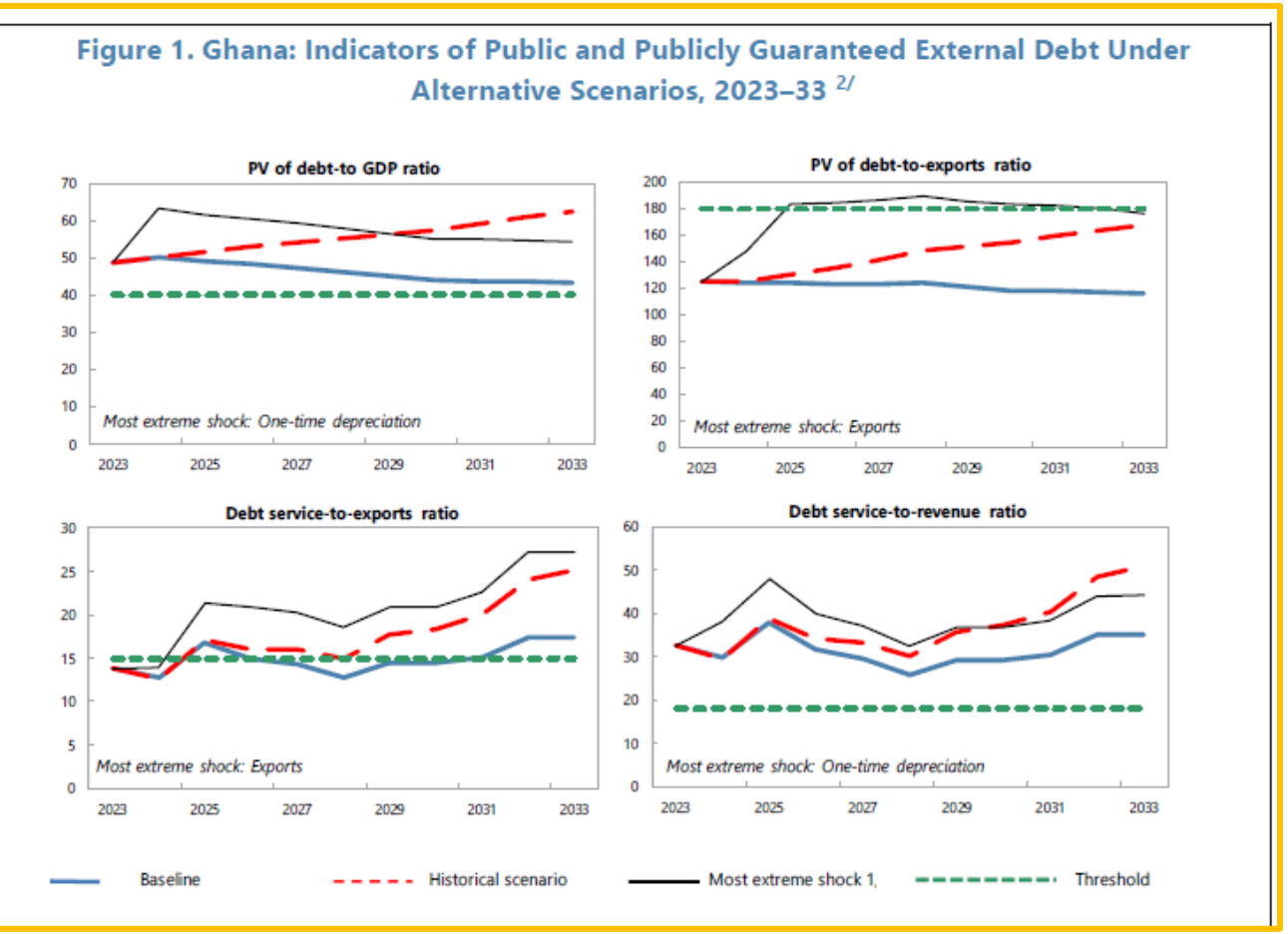
7/ Assumes that PV of private sector debt is equivalent to its face value.

8/ Historical averages are generally derived over the past 10 years, subject to data availability, whereas projections averages are over the first year of projection and the next 10 years.

1. What is the projected trend for Ghana's external debt-to-GDP ratio from 2022 to 2043?
2. What are the major factors contributing to the increase in external debt from 47.8% of GDP in 2022 to 63.2% projected at the end of 2023 in Ghana?
3. How does the contribution from nominal interest rate impact Ghana's debt dynamics?
4. How does the grant element of new public sector borrowing change from 2023 to 2028?

European Commission

Case Study—Ghana



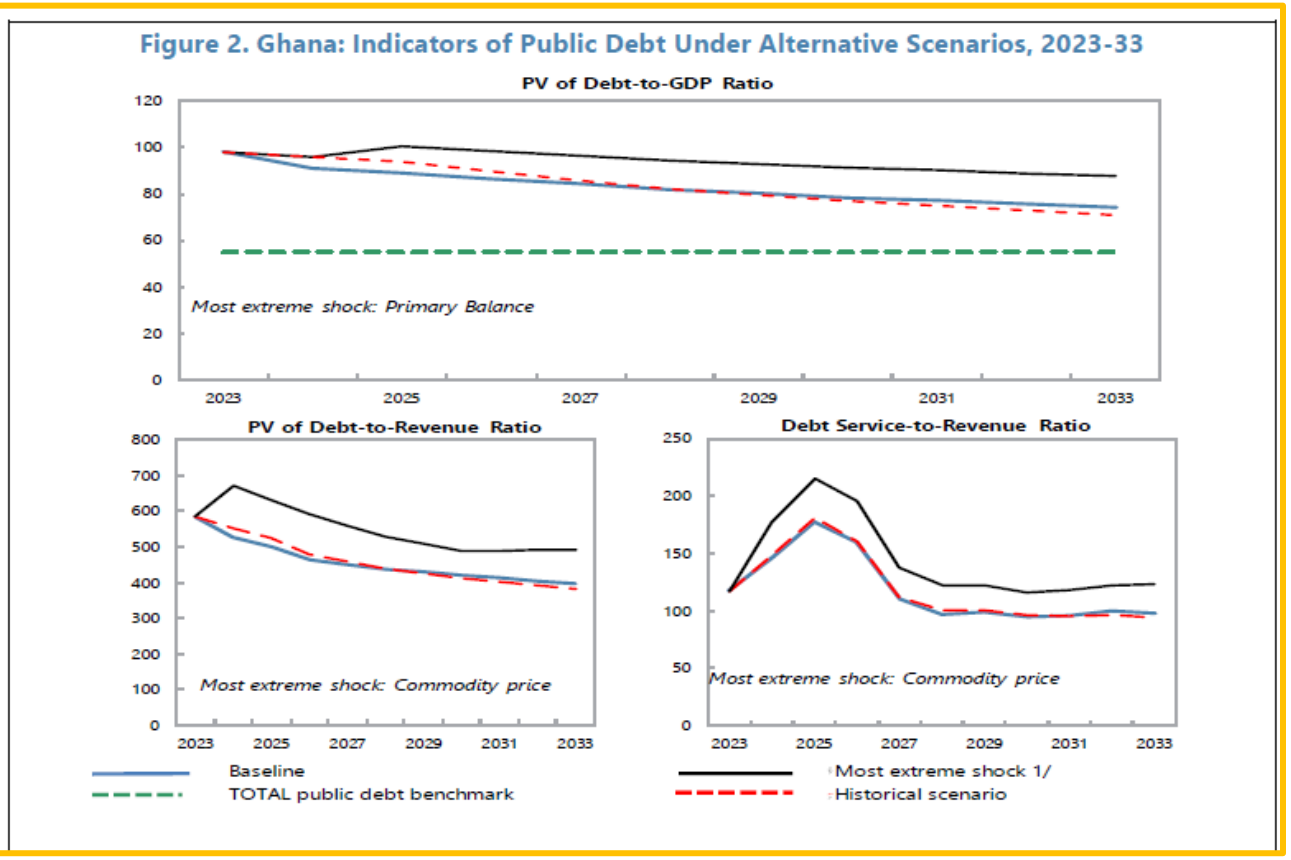
1. What are the implications of breaching the thresholds for the debt service-to-revenue ratio, PV of PPG external debt-to-GDP, and debt service-to-exports ratio? How do these breaches impact Ghana's debt sustainability and ability to meet its financial obligations?

2. How does the one-off 30% nominal depreciation of the cedi impact the present value of PPG external debt-to-GDP and debt service-to-revenue ratios?

3. Can you describe the underlying debt dynamics that influenced this assessment? , particularly in relation to breaches or vulnerabilities?

4. Based on the provided charts and background information, would you classify Ghana’s debt as sustainable or unsustainable? Please provide an explanation for your assessment

Case Study—Ghana



1. How does a one standard deviation deterioration in the primary balance affect the public debt-to-GDP indicator in Ghana?
2. What is the significance of the commodity price shock on other public debt indicators
3. Considering the breaches in the PV of total PPG debt-to-GDP throughout the medium and long term, what are the main challenges in reducing Ghana's public debt to GDP below the 55 percent benchmark?
4. How would you assess the risk rating of public debt? Please explain the basis for your assessment.
5. Would you say that the overall risk of debt distress is?
6. Do you think there is room for the application of judgement in this case?

European Commission

Kenya

European Commission

Case Study—Kenya: Background and Financing Request

- Kenya, a ‘frontier’ economy, has been significantly impacted by the COVID-19 pandemic, exacerbating the country’s pre-existing fiscal vulnerabilities.
- Prior to the pandemic, one of the key challenges was a steady **decline in government revenues** as a share of GDP, coupled with substantial infrastructure investments and increased **reliance on non-concessional borrowing**, leading to higher fiscal deficits and debt vulnerabilities.
- While the economy is in the process of recovering, sizable fiscal and balance-of **payments financing needs** persist over the medium term.

Case Study—Kenya: Program Objectives and Structural Reforms

- In response, the authorities have requested financing under an Extended Fund Facility (EFF) and an Extended Credit Facility (ECF) arrangement, aiming to address balance-of-payments and budget-support needs and while catalyzing support from official lenders and capital market financing.
- The program's primary objective is to reduce debt vulnerabilities through a multi-year fiscal consolidation effort, centered on raising tax revenues and tightly controlling spending.
- Additionally, the program seeks to advance the structural reform and governance agenda, including addressing weaknesses in state-owned enterprises (SOEs).

Table 2. Kenya: Public Sector Debt Sustainability Framework, Baseline Scenario, 2018

(In percent of GDP, unless otherwise indicated)

	Actual			Projections								Average 6/	
	2018	2019	2020	2021	2022	2023	2024	2025	2026	2031	2041	Historical	Projections
Public sector debt 1/	60.2	62.1	68.7	71.5	72.9	72.3	71.8	70.0	68.2	53.7	29.4	45.9	65.8
of which: external debt	30.6	31.5	35.6	37.8	37.6	36.7	35.7	35.0	34.3	31.5	24.1	19.0	34.7
Change in public sector debt	3.4	1.9	6.5	2.8	1.5	-0.7	-0.5	-1.8	-1.8	-2.7	-1.8		
Identified debt-creating flows	3.2	2.6	5.9	1.8	0.7	-1.5	-2.5	-3.1	-3.5	-2.7	-1.6	3.3	-2.0
Primary deficit	3.7	3.6	4.1	3.7	2.0	0.4	-0.3	-0.9	-1.3	-0.9	-0.4	3.7	-0.1
Revenue and grants	18.2	17.7	17.3	16.9	17.3	18.2	18.5	18.9	19.2	19.3	20.6	18.8	18.7
of which: grants	0.3	0.2	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3		
Primary (noninterest) expenditure	21.9	21.3	21.4	20.6	19.3	18.6	18.2	18.0	17.9	18.4	20.2	22.5	18.5
Automatic debt dynamics	-0.5	-1.0	1.8	-1.9	-1.3	-1.9	-2.1	-2.3	-2.3	-1.7	-1.2		
Contribution from interest rate/growth differential	0.0	-0.1	1.4	-2.6	-1.9	-2.2	-2.2	-2.3	-2.3	-2.3	-1.7		
of which: contribution from average real interest rate	3.4	2.9	1.4	2.2	2.0	2.1	1.9	1.8	1.7	0.9	0.1		
of which: contribution from real GDP growth	-3.4	-3.1	0.1	-4.8	-3.9	-4.2	-4.1	-4.1	-4.0	-3.2	-1.8		
Contribution from real exchange rate depreciation	-0.5	-0.8	0.3	...	...	...	...	...	...	...	...		
Other identified debt-creating flows	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Privatization receipts (negative)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Recognition of contingent liabilities (e.g., bank recapitalization)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Debt relief (HIPC and other)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Other debt creating or reducing flow (please specify)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Residual	0.2	-0.7	0.7	1.7	1.3	1.1	2.1	1.4	1.8	0.5	0.2	1.0	1.1
Sustainability indicators													
PV of public debt-to-GDP ratio 2/	...	...	62.4	63.0	64.2	63.4	62.9	61.1	59.5	45.4	22.6		
PV of public debt-to-revenue and grants ratio	...	...	360.0	372.6	370.8	348.7	339.2	324.0	309.3	234.8	110.0		
Debt service-to-revenue and grants ratio 3/	46.2	56.1	52.2	47.6	61.9	68.3	79.3	72.0	69.8	46.6	16.5		
Gross financing need 4/	12.1	13.5	13.2	11.8	12.7	12.9	14.4	12.7	12.1	8.1	3.0		
Key macroeconomic and fiscal assumptions													
Real GDP growth (in percent)	6.3	5.4	-0.1	7.6	5.7	6.1	6.1	6.1	6.1	6.0	6.0	5.0	6.2
Average nominal interest rate on external debt (in percent)	3.4	3.9	3.6	3.0	2.7	2.7	2.4	2.5	2.4	2.4	1.9	4.3	2.5
Average real interest rate on domestic debt (in percent)	8.5	6.9	2.6	5.8	5.6	5.4	5.2	4.8	4.7	3.4	1.8	2.5	4.6
Real exchange rate depreciation (in percent, + indicates depreciation)	-2.6	-3.2	1.1	...	...	...	...	...	...	...	...	-2.5	...
Inflation rate (GDP deflator, in percent)	2.4	4.0	8.2	3.9	4.6	5.0	5.1	5.1	5.1	5.1	5.1	7.5	5.0
Growth of real primary spending (deflated by GDP deflator, in percent)	2.5	2.4	0.7	3.5	-0.9	2.2	3.6	4.9	5.7	6.4	8.2	4.8	4.7
Primary deficit that stabilizes the debt-to-GDP ratio 5/	0.3	1.7	-2.5	0.9	0.6	1.1	0.2	0.9	0.5	1.8	1.5	-0.1	1.2
PV of contingent liabilities (not included in public sector debt)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		

Sources: Country authorities; and staff estimates and projections.

1/ Coverage of debt: The central government plus social security, central bank, government-guaranteed debt. Definition of external debt is Currency-based.

2/ The underlying PV of external debt-to-GDP ratio under the public DSA differs from the external DSA with the size of differences depending on exchange rates projections.

3/ Debt service is defined as the sum of interest and amortization of medium and long-term, and short-term debt.

4/ Gross financing need is defined as the primary deficit plus debt service plus the stock of short-term debt at the end of the last period and other debt creating/reducing flows.

5/ Defined as a primary deficit minus a change in the public debt-to-GDP ratio ((-): a primary surplus), which would stabilizes the debt ratio only in the year in question.

6/ Historical averages are generally derived over the past 10 years, subject to data availability, whereas projections averages are over the first year of projection and the next 10 years.

Case Study—Kenya

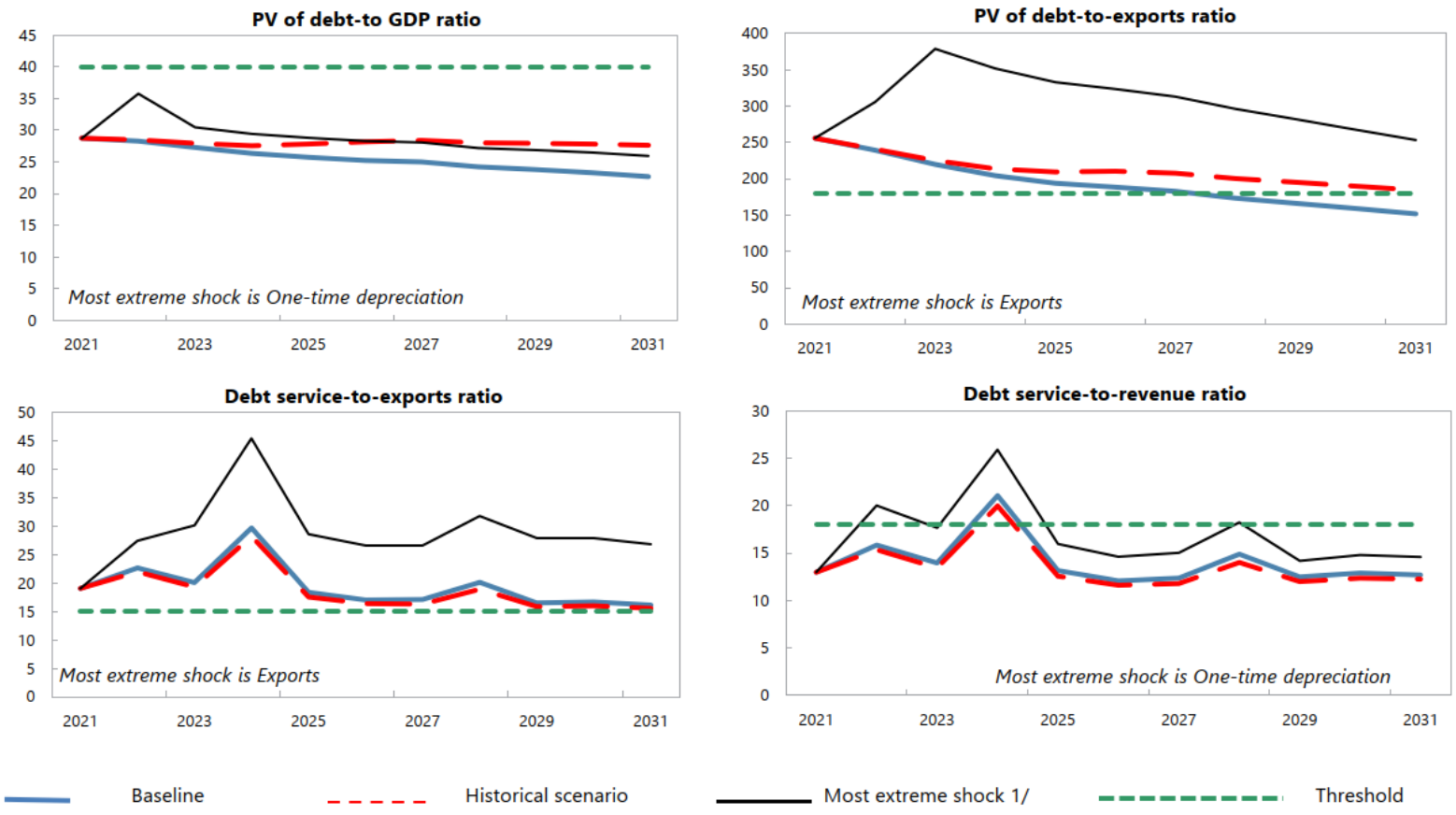
1. What factors contribute to the projected increase in the public sector debt-to-GDP ratio from 60.2 percent in 2018 to 68.7 percent in 2020 in Kenya?

2. What are the main factors contributing to the increase in the present value (PV) of Kenya's debt-to-GDP ratio during the period 2020-2025

European Commission

Case Study– Kenya

Figure 1. Kenya: Indicators of Public and Publicity Guaranteed External Debt under Alternatives Scenarios, 2021–31

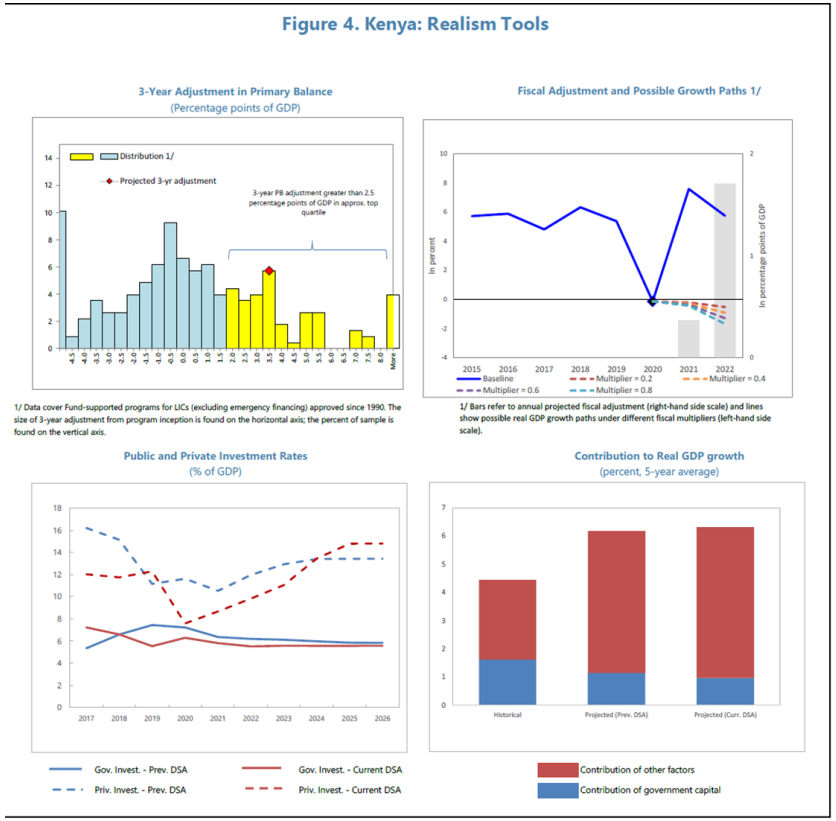


1. How does the most extreme shock scenario impact the PV of debt-to-exports ratio and the debt service-to-exports ratio over the projection period?
2. What is the trend of the debt service-to-revenue ratio, and how does it compare to the threshold throughout the projection period?
3. How does the risk of export and exchange rate depreciation shocks contribute to Kenya's susceptibility to debt vulnerabilities and potential debt distress?

European Commission

Case Study– Kenya

1. How does the projected improvement of the primary balance of 3.7 percentage points of GDP over the next three years compare to historical performance and the fiscal consolidation efforts of other countries with similar income levels?



European Commission

Tonga

European Commission

Case Study—Tonga

- Economic challenges: Tonga, a small developing country prone to natural disasters, faces limitations due its remote location, which hampers economic activity.
- Impact of Natural Disasters: The country incurs large economic costs and hampers growth potential through the destruction of infrastructure and agricultural land.
- Unsustainable growth model: Tonga's heavy reliance on labor exports and being the world's largest recipient of remittances raises concerns about the long-term sustainability of its growth model.

Case Study—Tonga

- Fiscal consolidation efforts: The government has demonstrated a strong commitment to fiscal consolidation, achieving consecutive budget surpluses with donor support.
- Financing needs: Tonga faces large financing needs, driven by the costs of achieving climate-resilience (140% of GDP) and sustainable development goals.
- Shocks and challenges: In 2020, Tonga experienced a dual shock from the COVID-19 pandemic and Cyclone Harold, resulting in economic contraction and a deterioration of external balances

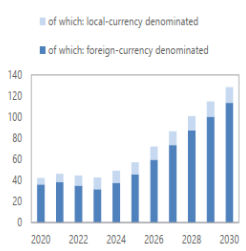
Table 2. Tonga. Public Sector Debt Sustainability Framework, Baseline Scenario, FY2017–2040

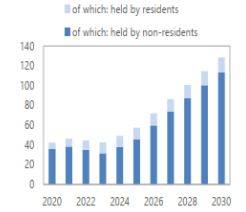
(In percent of GDP, unless otherwise indicated)

	Actual			Projections											Average 6/	
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2040	Historical	Projections
Public sector debt 1/	43.6	45.9	41.3	42.3	46.3	44.6	42.7	49.1	57.3	72.0	86.5	100.8	114.7	128.4	156.0	47.9	71.3
of which: external debt	38.7	40.5	36.4	36.2	38.5	35.1	31.6	37.8	45.7	59.6	73.6	87.3	100.5	113.5	143.1	41.7	59.9
Change in public sector debt	-5.8	2.2	-4.6	1.0	3.9	-1.7	-1.9	6.4	8.2	14.7	14.5	14.3	13.9	13.7	-1.4		
Identified debt-creating flows	-8.0	-4.5	-5.6	-4.0	4.5	-2.2	-2.8	6.3	8.3	15.0	15.0	15.1	14.8	14.5	-0.4	-2.4	7.7
Primary deficit	-4.4	-3.7	-3.9	-5.2	4.0	-0.4	-1.5	7.4	9.3	16.0	16.4	16.7	16.7	16.7	2.7	-1.3	8.7
Revenue and grants	43.2	42.6	41.7	45.7	45.7	42.0	44.4	34.6	32.3	25.1	25.1	25.0	25.0	25.0	36.7	35.3	33.6
of which: grants	19.3	17.8	18.3	21.0	22.9	18.1	20.1	10.5	8.1	0.8	0.8	0.7	0.7	0.7	0.5		
Primary (noninterest) expenditure	38.8	38.9	37.8	40.6	49.8	41.7	42.8	42.0	41.5	41.1	41.5	41.8	41.7	41.6	39.4	34.0	42.4
Automatic debt dynamics	-3.6	-0.8	-1.8	1.2	0.4	-1.8	-1.3	-1.0	-0.9	-1.1	-1.4	-1.7	-1.9	-2.1	-3.1		
Contribution from interest rate/growth differential	-1.8	-0.2	-0.3	1.2	0.4	-1.8	-1.3	-1.0	-0.9	-1.1	-1.4	-1.7	-1.9	-2.1	-3.1		
of which: contribution from average real interest rate	-0.2	-0.1	0.1	0.1	-1.1	-0.1	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.3		
of which: contribution from real GDP growth	-1.6	-0.1	-0.3	1.0	1.5	-1.8	-1.3	-1.1	-0.9	-1.0	-1.3	-1.5	-1.8	-2.0	-2.8		
Contribution from real exchange rate depreciation	-1.7	-0.6	-1.5	...	...	...	...	...	...	...	...	...	...	...	...		
Other identified debt-creating flows	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Privatization receipts (negative)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Recognition of contingent liabilities (e.g., bank recapitalization)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Debt relief (HIPC and other)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Other debt creating or reducing flow (please specify)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Residual	2.2	6.7	1.0	5.0	-0.5	0.5	1.0	0.0	-0.1	-0.2	-0.5	-0.8	-0.9	-0.8	-1.0	2.5	0.2
Sustainability indicators																	
PV of public debt-to-GDP ratio 2/	...	...	30.6	32.0	36.9	36.6	36.1	39.0	43.3	51.2	58.9	66.8	75.2	83.9	101.8		
PV of public debt-to-revenue and grants ratio	...	...	73.3	69.9	80.7	87.1	81.3	112.8	134.3	204.1	235.0	266.9	300.6	335.8	277.2		
Debt service-to-revenue and grants ratio 3/	6.3	6.0	8.7	7.4	5.9	8.2	13.3	21.5	23.6	35.8	33.1	33.4	36.6	32.1	35.3		
Gross financing need 4/	-1.7	-1.1	-0.2	-1.8	6.7	3.1	4.4	14.8	16.9	25.0	24.7	25.1	25.8	24.7	15.6		
Key macroeconomic and fiscal assumptions																	
Real GDP growth (in percent)	3.3	0.3	0.7	-2.5	-3.5	4.0	3.0	2.5	1.8	1.8	1.8	1.8	1.8	1.8	1.8	2.3	1.3
Average nominal interest rate on external debt (in percent)	1.7	1.6	2.3	1.5	-2.1	1.3	1.2	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.2	1.7	0.9
Average real interest rate on domestic debt (in percent)	-2.9	-1.5	-4.3	3.0	4.1	0.6	1.1	1.4	1.1	1.1	0.8	0.9	1.3	1.5	1.1	-1.8	1.5
Real exchange rate depreciation (in percent, + indicates depreciation)	-4.3	-1.6	-3.7	...	...	...	...	...	...	...	...	...	...	...	...	-0.7	...
Inflation rate (GDP deflator, in percent)	5.6	5.1	7.7	0.4	-0.9	2.1	2.0	1.9	2.3	2.4	2.7	2.6	2.2	1.9	2.3	3.7	1.8
Growth of real primary spending (deflated by GDP deflator, in percent)	10.4	0.5	-2.1	4.6	18.5	-12.9	5.8	0.5	0.7	0.7	2.7	2.6	1.6	1.7	1.7	8.1	2.4
Primary deficit that stabilizes the debt-to-GDP ratio 5/	1.4	-5.9	0.7	-6.2	0.1	1.4	0.4	1.0	1.0	1.3	1.9	2.5	2.8	2.9	4.1	-1.3	0.8
PV of contingent liabilities (not included in public sector debt)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		

Definition of external/domestic debt	Residency-based
Is there a material difference between the two criteria?	Yes

Public sector debt 1/





Sources: Country authorities; and staff estimates and projections.

1/ Coverage of debt: The general government, central bank . Definition of external debt is Residency-based.

2/ The underlying PV of external debt-to-GDP ratio under the public DSA differs from the external DSA with the size of differences depending on exchange rates projections.

3/ Debt service is defined as the sum of interest and amortization of medium and long-term, and short-term debt.

4/ Gross financing need is defined as the primary deficit plus debt service plus the stock of short-term debt at the end of the last period and other debt creating/reducing flows.

5/ Defined as a primary deficit minus a change in the public debt-to-GDP ratio ((-): a primary surplus), which would stabilizes the debt ratio only in the year in question.

6/ Historical averages are generally derived over the past 10 years, subject to data availability, whereas projections averages are over the first year of projection and the next 10 years.

"Other debt creating or reducing flow" is the net acquisition of financial assets.

Case Study—Tonga

1. How has Tonga's public sector debt evolved from 2017 to 2027, and what impact does it have on debt sustainability starting in 2026?
2. What factors can be attributed to the sudden jump in public sector debt observed in Tonga?
3. Considering the increase in debt, what strategies do you think the authorities could implement to mitigate this situation in Tonga?

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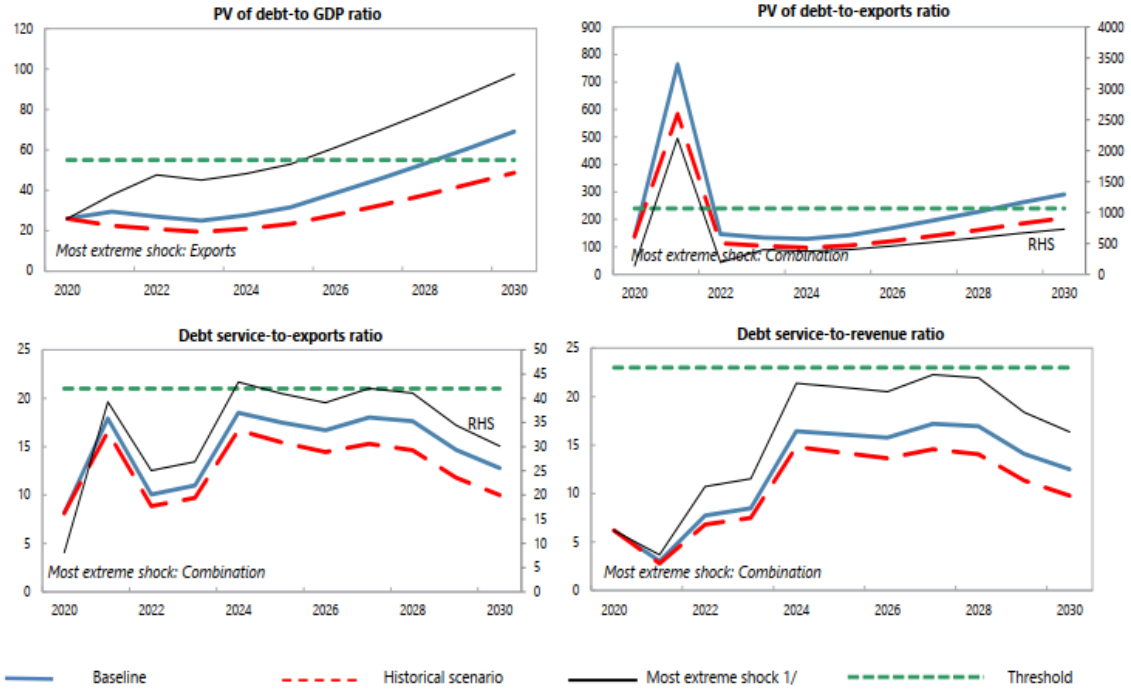
Figure 1. Tonga. Indicators of Public and Publicly Guaranteed External Debt under Alternatives Scenarios, FY2020–2030



Customization of Default Settings	Size	Interactions
Tailored Stress		
Combined CL	No	
Natural disaster	Yes	Yes
Commodity price 2/	n.a.	n.a.
Market financing	n.a.	n.a.

Note: "Yes" indicates any change to the size or interactions of the default settings for the stress tests. "n.a." indicates that the stress test does not apply.

Borrowing assumptions on additional financing needs resulting from the stress tests*	Default	User defined
Shares of marginal debt		
External PPG MLT debt	100%	
Terms of marginal debt		
Avg. nominal interest rate on new borrowing in USD	1.3%	1.3%
USD Discount rate	5.0%	5.0%
Avg. maturity (incl. grace period)	30	30
Avg. grace period	10	10

* Note: All the additional financing needs generated by the shocks under the stress tests are assumed to be covered by PPG external MLT debt in the external DSA. Default terms of marginal debt are based on baseline 10-year projections.

Sources: Country authorities; and staff estimates and projections.

1/ The most extreme stress test is the test that yields the highest ratio in or before 2030. The stress test with a one-off breach is also presented (if any), while the one-off breach is deemed away for mechanical signals. When a stress test with a one-off breach happens to be the most exterme shock even after disregarding the one-off breach, only that stress test (with a one-off breach) would be presented.

2/ The magnitude of shocks used for the commodity price shock stress test are based on the commodity prices outlook prepared by the IMF research department.

Case Study—Tonga

1. How would you evaluate Tonga's debt-carrying capacity, considering its current debt levels and projected trends?
2. How do you assess the risk of debt distress for Tonga
3. What can you infer from the changes in solvency indicators for Tonga's public debt, and what factors do you believe contribute to these changes?

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Questions and Answers

E1

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Post-Course Questionnaire (Test-out)

Participants’ feedback

Takeaways

- Understanding solvency and liquidity concepts is essential for grasping the main principles and concepts of debt sustainability.
- Debt Sustainability Analysis (DSA) plays a crucial role in assessing public debt dynamics and evaluating the sustainability of a country's debt.
- Unsustainable debt can have significant implications and may require debt default or restructuring measures to address the situation.
- Policy adjustments and reforms are necessary to ensure sustainable debt levels and mitigate the risks associated with excessive debt.
- Familiarizing yourself with the terminology used in DSA enables better comprehension and communication of debt-related concepts and assessments.
- Grasping the theoretical concepts underlying debt dynamics in the LIC IMF/WB Debt Sustainability Framework/Analysis enhances the understanding of debt sustainability issues.
- Learning to interpret and analyze outputs in IMF/WB reports, including country case studies, helps in gaining insights into the practical application of DSA and its implications for different countries.

Thank you

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Annex I: Issues in DSA

HOW IS DEBT SUSTAINABILITY ASSESSED? SOLVENCY, LIQUIDITY, AND SUSTAINABILITY

- **Public debt is sustainable when the government can (and is willing to) service financial liabilities** maturing in the foreseeable future **within the current policy framework and economic outlook**, without ever having to:

  (i) Borrow systematically to fund budget imbalances, debt repayments and other net financing needs
  (ii) Undertake major fiscal adjustments, which may be socially or politically unfeasible or unduly painful
  (iii) Restructure obligations owed to its financiers, thus unilaterally imposing a debt-service moratorium or outright default

- **Public debt is unsustainable** when the government debtor is not solvent and/or not liquid. Public debt is deemed unsustainable **when the government cannot (and/or is not willing to) service the financial liabilities that are due within the current policy framework and economic outlook, because both elements are not conducive to generate sufficient own resources now or later for the government to honor the obligations owed to its financiers**.

  An unsustainable public debt also results when the government cannot (and/or is not willing to) service financial liabilities because it has no access to borrowed funds to roll over debts maturing in the near future.

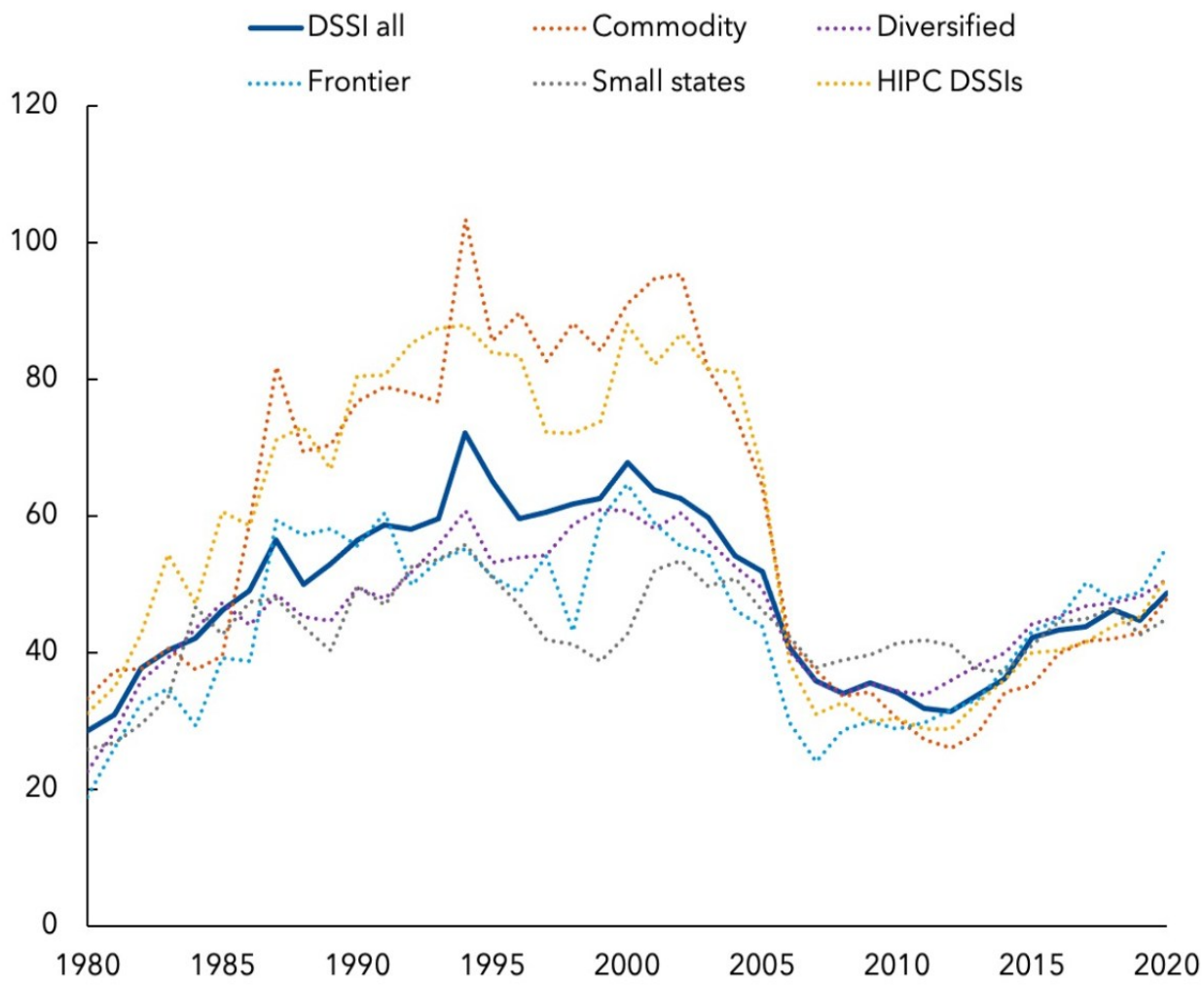
  In such challenging circumstances, the government may decide to:
  (i) Undertake a budgetary adjustment to slow the pace of borrowing
  (ii) Declare a default and stop servicing maturing debt
  (iii) Both (i) and (ii)

Debt Trends in LICs

- Debt levels and accumulation of arrears have improved compared to the 1990s, thanks to initiatives like the HIPC initiative
- However, debt levels have been **on the rise in the last decade** due to low interest rates, high investment needs, limited progress in domestic revenue mobilization, and constraints in public financial management capacity.
- Approximately 20 percent of HIPC/MDRI recipients now have higher public debt-to-GDP ratios compared to one year before the HIPC completion/MDRI point
- The recent COVID-19 crisis and the fallout of the war in Ukraine have **further aggravated** the debt **challenges**

Public Debt-to-GDP Ratio in DSSI Countries

(Median, percent of GDP)

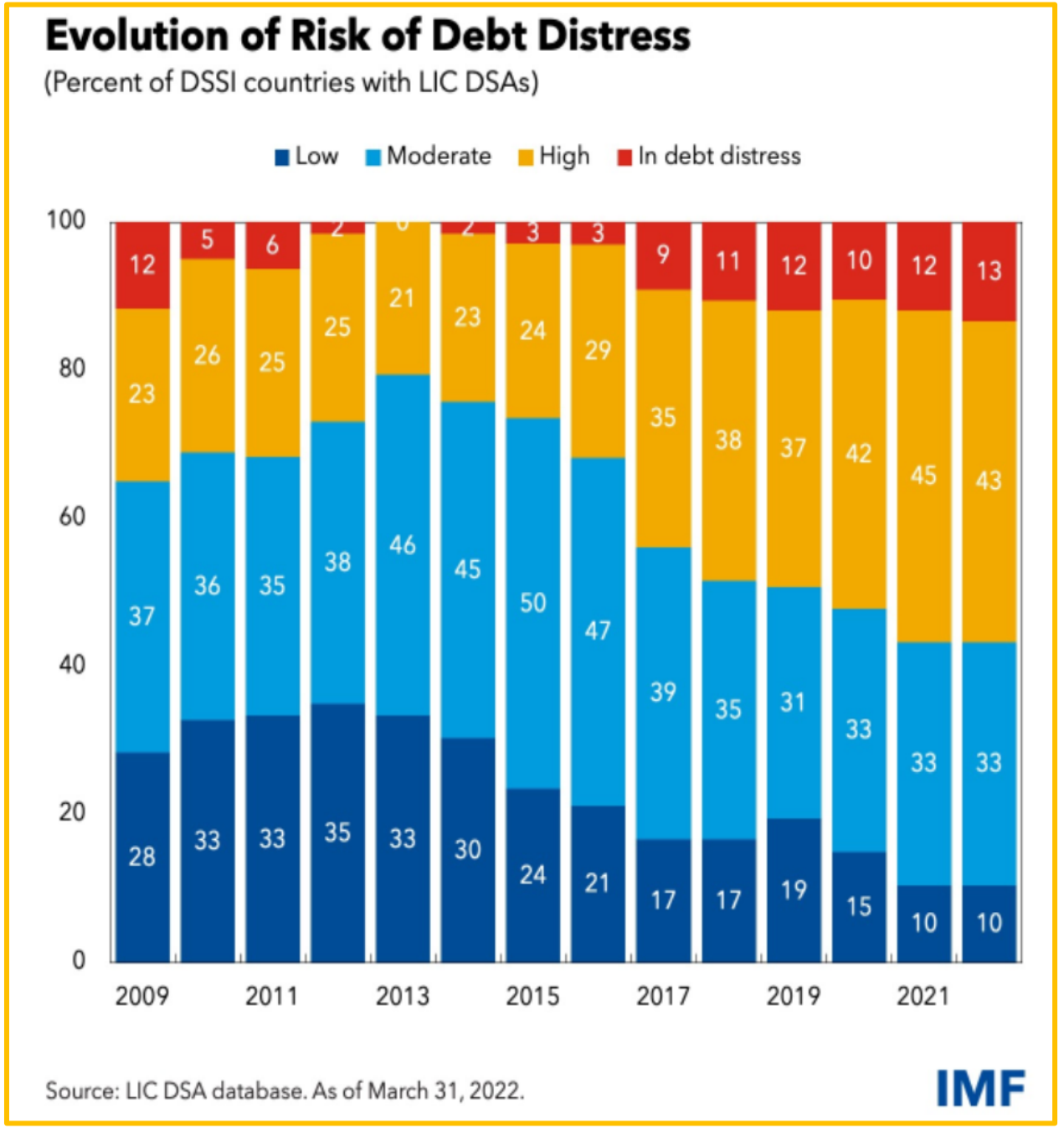


Source: IMF Global Debt Database and staff calculations.

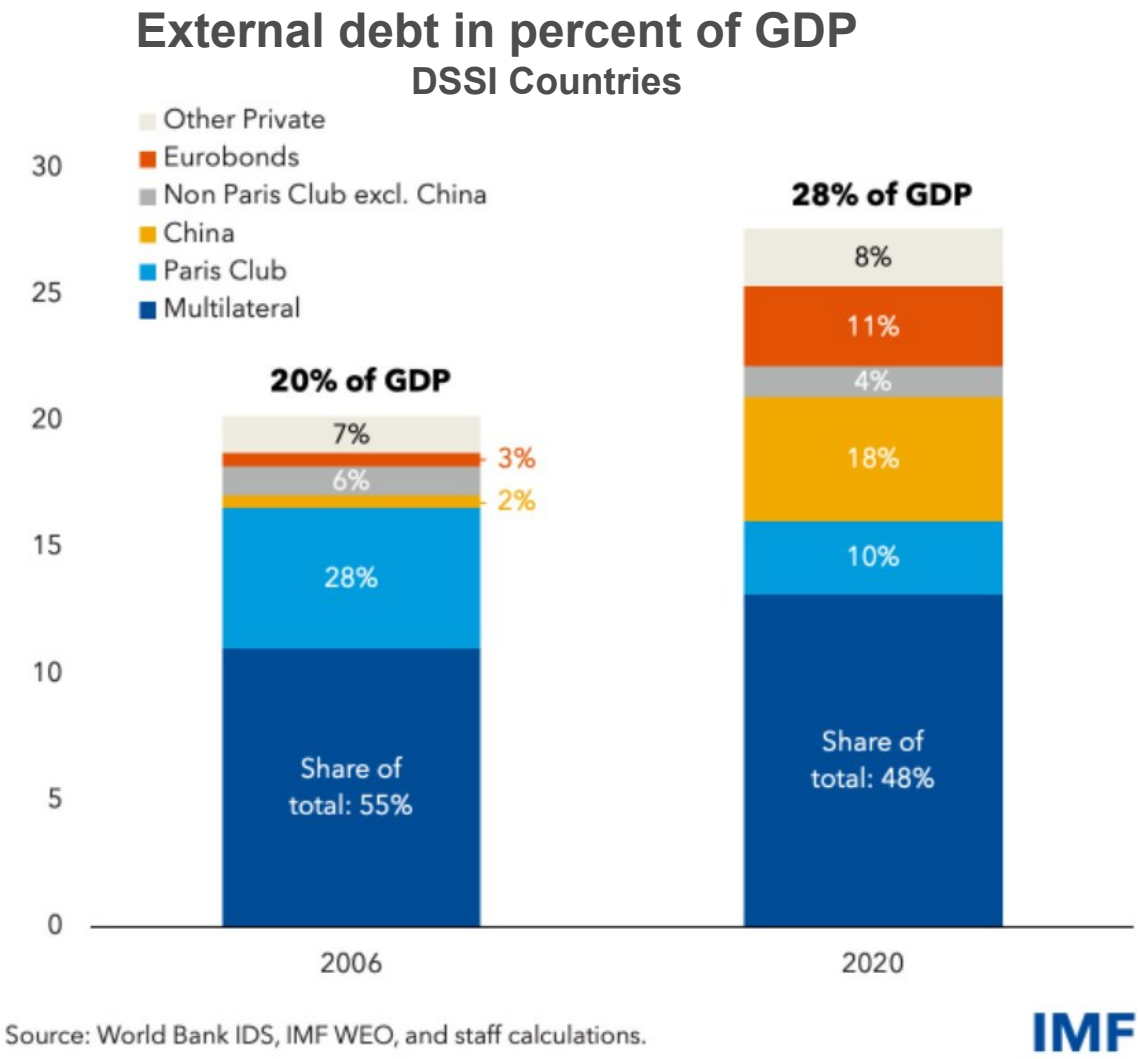
IMF

Debt Trends in LICs

- **Debt vulnerabilities in LICs have increased i**n recent years,
- **Around 60 percent of low-income developing countries are now at high risk of or already in debt distress,** compared to less than 30 percent in 2015
- Low-income countries, which limited debt-carrying capacity, are experiencing a median debt level almost double that of 2013



Debt Trends in LICs



- As borrowing levels have risen, there has been a notable change in the sources of external financing for countries
- One significant development is the increased role of **China** as a creditor, which has become a key player in providing financing to LICs
- Additionally, the role of **bondholders has also increased as a source of external financing for LICs**

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Chad—Debt Restructuring

- Chad faced multiple challenges, including the pandemic, oil shock, and food crisis, which led to unsustainable public debt. The country sought support under the G20 Common Framework to restore debt sustainability.
- **Chad's** DSA revealed that its public debt was unsustainable, primarily due to a front-loaded repayment schedule to its largest private creditor
- In response, Chad requested support with an IMF ECF to support economic recovery and restore debt sustainability
- The approach included a multi-year fiscal consolidation program, donor support, and **debt restructuring** under the G20 **Common Framework**
- In Nov. 2022, Chad reached an agreement with external creditors, OCC (China, France, India, Saudi Arabia as well as private creditors) which will reduce the risk of debt distress

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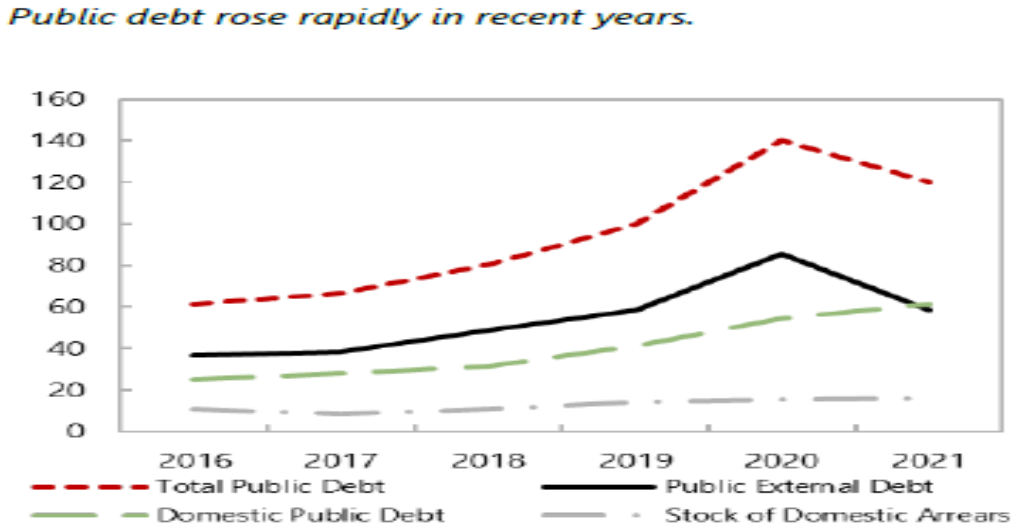
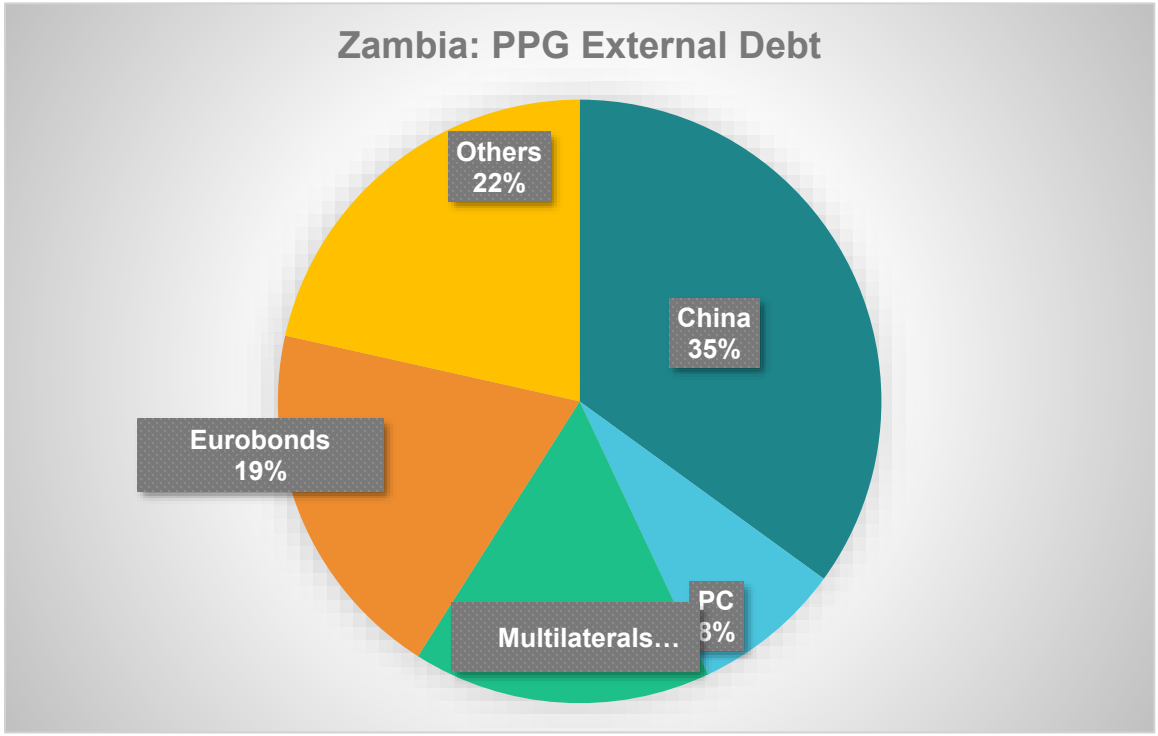
Zambia—Debt Restructuring

- Zambia experienced large fiscal and external imbalances, compounded by an ambitious public investment program that failed to generate expected boost in growth and revenues
- External shocks, including the drought in 2019 and the pandemic, further intensified Zambia's challenges
- In November 2020, **Zambia entered debt distress** and defaulted on Eurobonds.
- **China emerged as the largest** creditor, followed by **Eurobond holders with significant involvement in the** copper mining sector and other sectors of the economy
- **Domestic debt represents** 50% of total debt
- China, together with France, co-chairs the Official Creditor Committee reflecting China's significant role as a creditor
- The debt restructuring process under CF adopted the PC's **comparability of treatment** standard for all creditors
- Deal represents a landmark for the IMF in addressing debt distress cases involving substantial borrowing from China

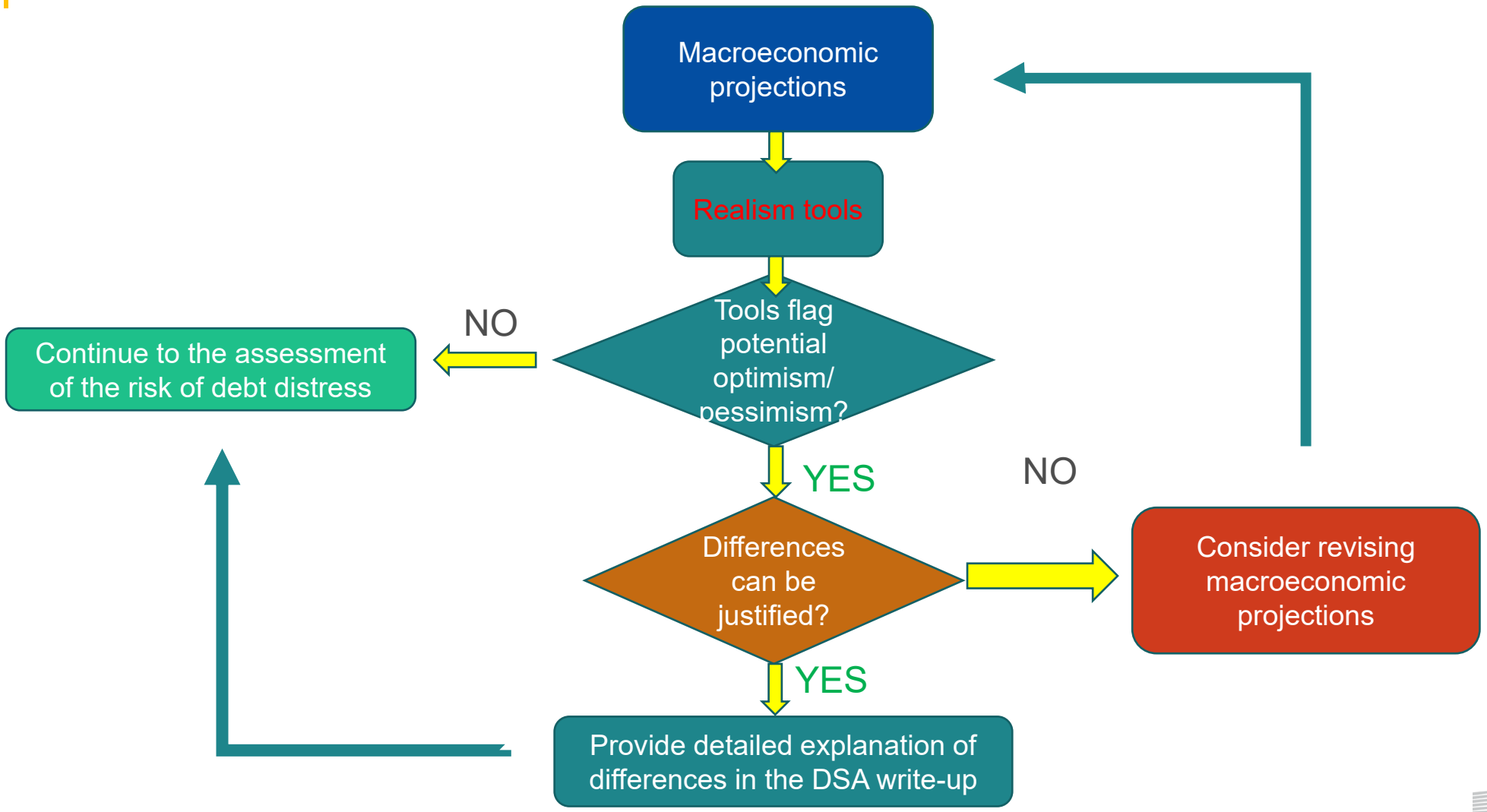




Annex II: Issues in LIC DSF

How Does the LIC DSF Template Work?

Realism


Macroeconomic projections
Realism tools
Tools flag potential optimism/ pessimism?
NO
Continue to the assessment of the risk of debt distress
YES
NO
Differences can be justified?
Consider revising macroeconomic projections
YES
Provide detailed explanation of differences in the DSA write-up

Annex III: Issues in SR DSF

MAC SR DSF: SOVEREIGN RISK AND DEBT SUSTAINABILITY

SRDSF provides two assessments: **sovereign debt-related stress risk** and **debt sustainability**.

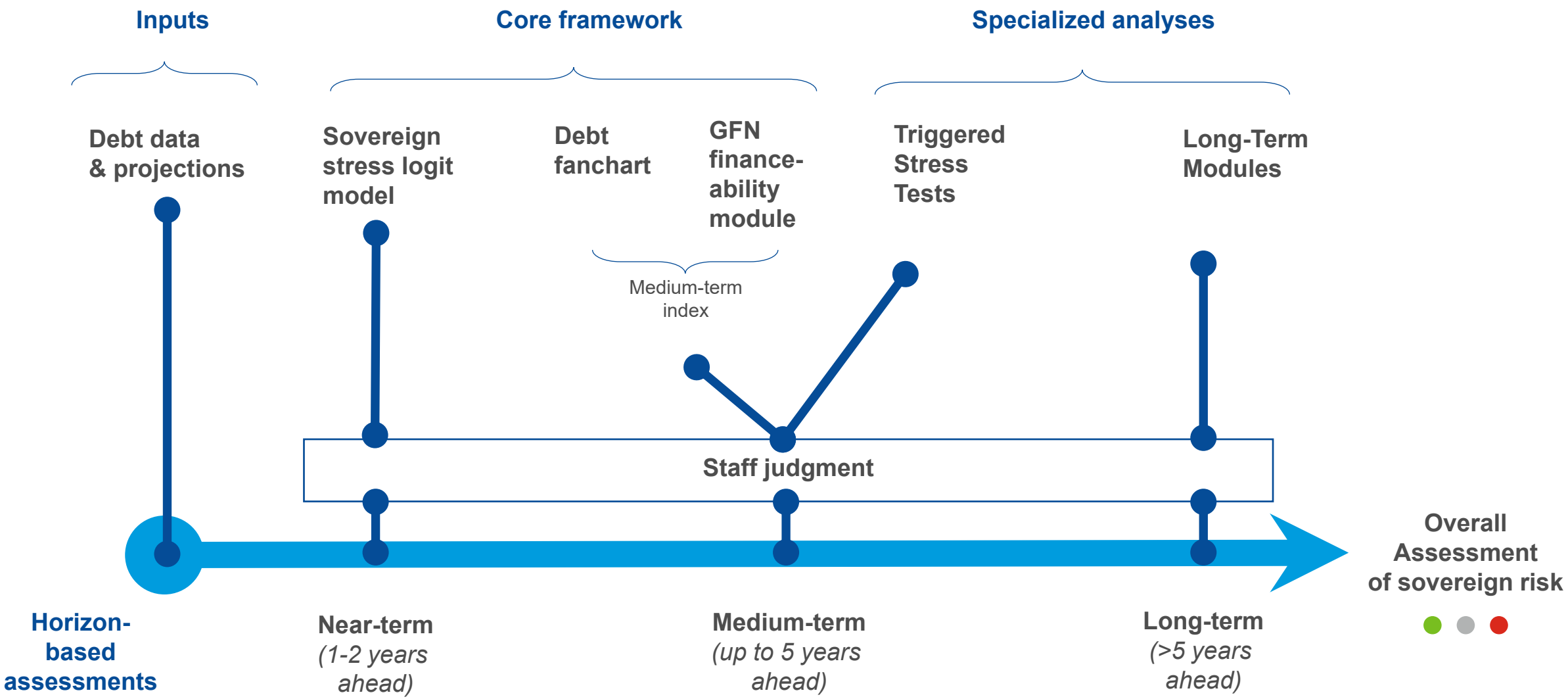
Sovereign Risk Assessment	Debt Sustainability Assessment
Critical for IMF's **surveillance** function: ("Early Warning System" for alerting sovereigns to the risk of falling into debt-related stress").	Critical to support IMF **lending** decisions: Underpin the Fund's judgments on whether debt is sustainable (or sustainable with high probability, in exceptional access cases).

The IMF uses this definition for debt sustainability:

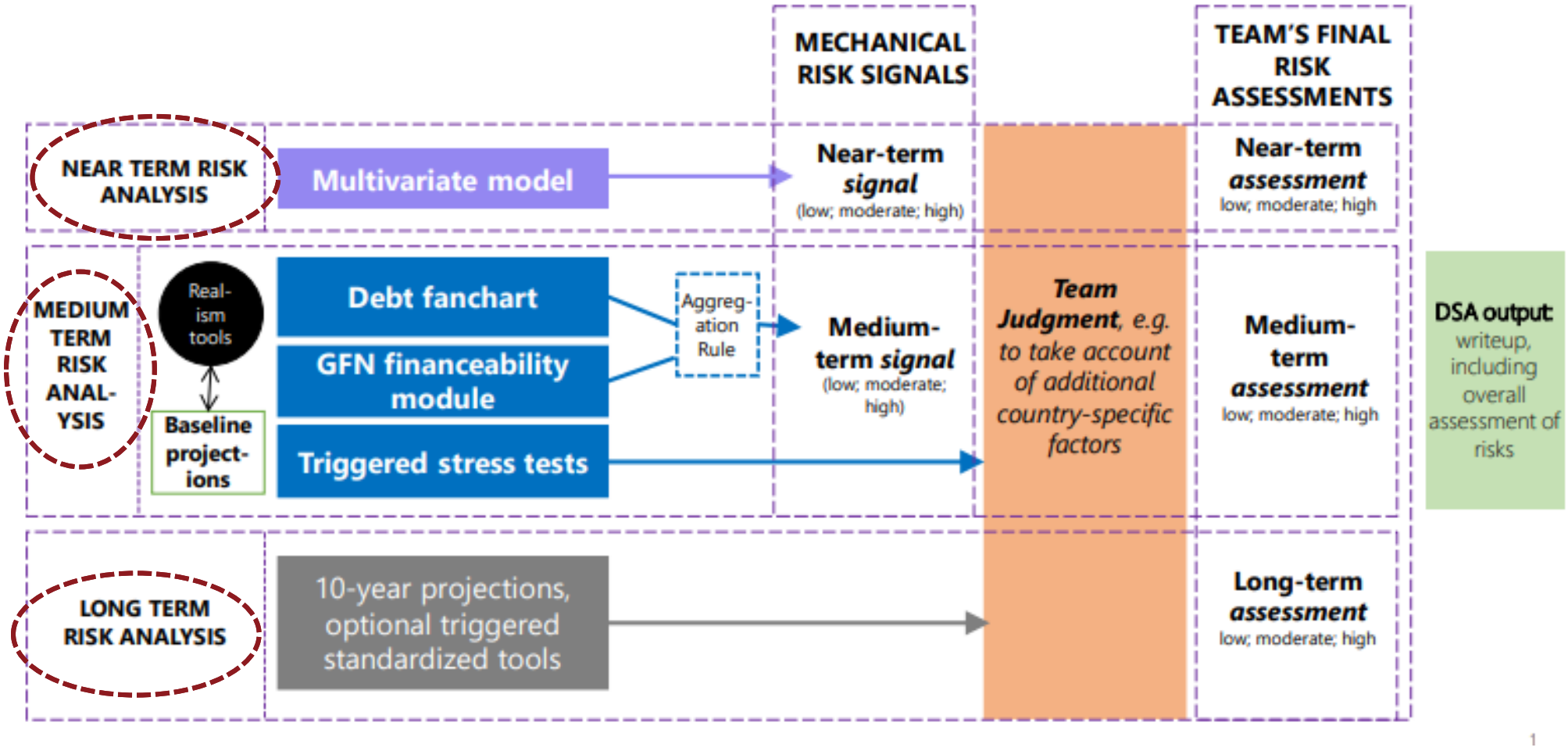
In general terms, public debt can be regarded as sustainable when the primary balance needed to at least stabilize debt under both the baseline and realistic shock scenarios is economically and politically feasible, such that the level of debt is consistent with an acceptably low rollover risk and with preserving potential growth at a satisfactory level.

Stock and flow concepts	Feasibility of options	Accounting for Uncertainty	Balance other macro outcomes
Covers both solvency and liquidity concepts. In practice it is often difficult to disentangle these two risks Academic literature often focuses on stabilization instead of rollover risk	If there are feasible options to avoid explosive debt and unmanageable rollovers, then debt is sustainable Debt is unsustainable when there are no options except default/ restructuring	It is important to consider alternative scenarios when assessing debt sustainability It is aligned with modern methodologies for debt sustainability, which often focus on probabilistic techniques	This criterion aims to avoid potential destructive policies to service debt It is also related to feasibility as it is often difficult to implement such policies over a sustained period of time

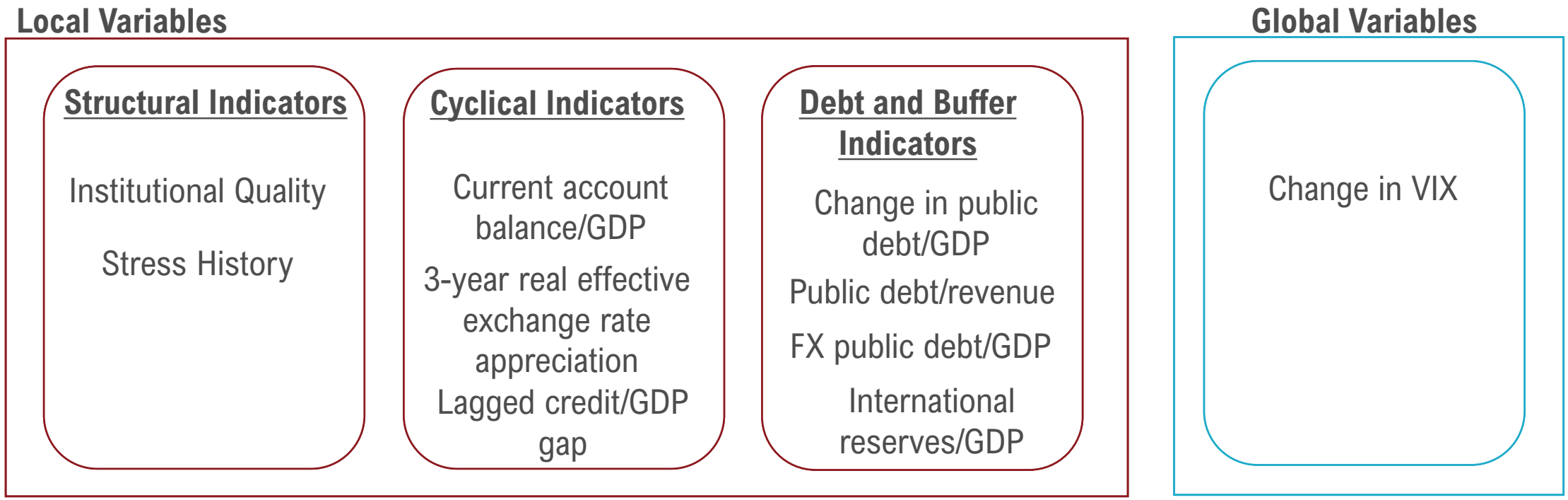
MAC SR DSF: ANALYTICAL FRAMEWORK



MAC SR DSF: ANALYTICAL FRAMEWORK FOR SOVEREIGN RISK



MAC SR DSF: ANALYTICAL FRAMEWORK FOR SOVEREIGN RISK NEAR TERM ASSESSMENT



MAC SR DSF: ANALYTICAL FRAMEWORK FOR SOVEREIGN RISK MEDIUM TERM ASSESSMENT

GOAL MOTIVATION

Assess the prospects for medium-term debt stabilization and the volume of GFN to be met (including rollover risk that may cause a **debt stress** event).

Formulate projections of public debt and GFN, and produce stochastic simulations and fan charts.

Debt Fanchart Index

1. Degree of uncertainty surrounding the medium-term dynamics of the public debt, measured by the dispersion of the fan chart.
2. Probability of the public debt ratio not being stabilized over the medium-term, derived from the shock-driven realizations of the debt-stabilizing primary balance.
3. Interaction between the medium-term median value of the public debt ratio and a proxy indicator for the country's capacity to manage government debt.

GFN Financeabilit y Index

1. Volume of GFN to be covered in the baseline scenario, measured by the projected GFN-to-GDP ratio.
2. Variation in bank holdings of government debt in baseline case.
3. Variation in bank holdings of government debt induced by shocks in stress-tests scenarios

SIGNAL DERIVATIO N

Values of both indices are confronted against thresholds.
A medium tern index is calculated and split into low, moderate, and high-risk zones (thresholds are calibrated for acceptable risk).

MAC SR DSF: ANALYTICAL FRAMEWORK FOR SOVEREIGN RISK MEDIUM TERM ASSESSMENT

DEBT FANCHART INDEX

Historical Fanchart

- No optimism found → Standard Fanchart
- Optimism found → Adjusted, asymmetric Fanchart

Fanchart width	Probability that the debt does not stabilize in the medium-term	Debt level at t+5, controlling for debt-carrying capacity

GFN FINANCEABILITY INDEX

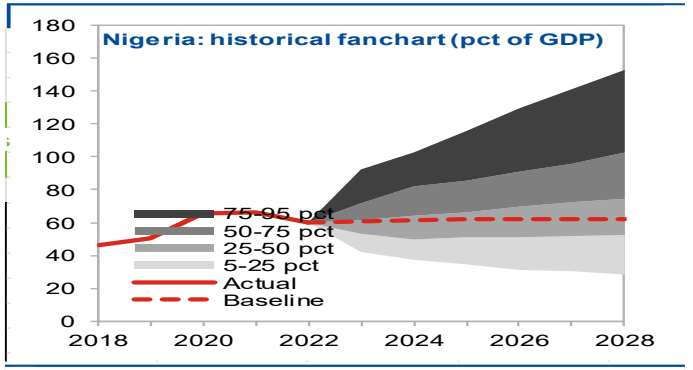
Average projected GFN/GDP in baseline	Initial bank claims on government	Maximum cumulative change in bank claims over projection period under a generalized stress scenario

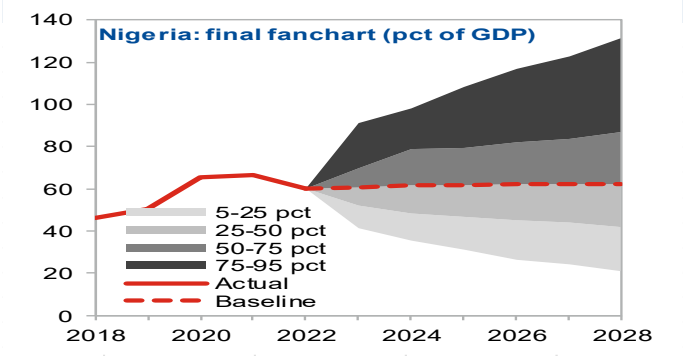
MAC SR DSF: ANALYTICAL FRAMEWORK FOR SOVEREIGN RISK MEDIUM TERM ASSESSMENT

Sheet FAN

Historical fanchart	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Actual	45.9	50.5	65.7	66.4	60.1						
Baseline					60.1	60.4	61.5	61.8	62.1	62.2	62.1
0-5 pct					60.1	42.4	37.1	34.9	31.4	30.4	28.3
5-25 pct					0.0	10.5	12.9	15.9	19.8	21.6	24.1
25-50 pct					0.0	8.5	14.0	15.7	18.3	20.1	22.4
50-75 pct					0.0	10.0	17.9	19.3	21.5	24.0	28.1
75-95 pct					0.0	21.1	20.6	30.2	38.7	45.0	50.0

Final fanchart	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Actual	45.9	50.5	65.7	66.4	60.1						
Baseline					60.1	60.4	61.5	61.8	62.1	62.2	62.1
0-5 pct					60.1	41.3	35.2	31.2	26.5	24.3	21.0
5-25 pct					0.0	10.6	13.1	15.4	18.6	19.9	21.0
25-50 pct					0.0	8.5	13.1	15.2	17.1	18.0	20.1
50-75 pct					0.0	9.6	17.4	17.8	19.7	21.6	24.5
75-95 pct					0.0	21.4	19.5	28.5	35.2	38.8	44.8





Deriving the debt fanchart index and mechanical signal						
Indicator	Raw value	Transform	Final value	AUC	Weight	Index
Fanchart width	110.4%	0.22	4.91	0.71	0.33	1.60
Prob of debt non-stabilization	45.9%	0.38	1.22	0.69	0.32	0.38
Debt(t+5) x institutions	34.6%	0.16	2.10	0.78	0.36	0.75
Debt fanchart index						2.74
Signal						High
Memo:						
Debt(t+5)	62.1%					
Institutional quality index (scaled)	0.56					

Thresholds:	Low-Moderate	Moderate-high
Debt fanchart index	1.13	2.08

MAC SR DSF: ANALYTICAL FRAMEWORK FOR SOVEREIGN RISK MEDIUM TERM ASSESSMENT

Sheet GFN

Average GFN-to-GDP ratio in the baseline

	Avg 2023-28	2023	2024	2025	2026	2027	2028
GFN/GDP	6.8%	8.1%	7.1%	6.0%	8.4%	6.7%	4.7%

Initial bank claims on the government in percent of banking system assets

	Bank claims on gen. govt.		Banking system assets	
	Pct. of assets	Billion Nigerian	Pct of GDP	Billion Nigerian Nairas
2022	20.8%	40	103.8%	192

Change in bank claims in stress

Changes relative to year:	2023	2024	2025	2026	2027	2028
2021	0.0%	1.9%	3.9%	3.8%	3.7%	3.5%
2022		0.0%	2.0%	1.9%	1.8%	1.5%
2023			0.0%	-0.1%	-0.2%	-0.5%
2024				0.0%	-0.1%	-0.4%
2025					0.0%	-0.2%
2026						0.0%
Maximum change:						3.9%

Deriving the GFN financeability index and mechanical signal

Indicator	Weight	Value
Average GFN-to-GDP ratio in the baseline	0.34	6.8%
Initial bank claims on the govt (pct of assets)	0.32	20.8%
Change in bank claims on govt, stress scenario (pct of assets)	0.33	3.9%
GFN financeability index		10.4
Signal		**Moderate**
Thresholds:		
Moderate-high		17.9
Low-Moderate		7.6

MAC SR DSF: ANALYTICAL FRAMEWORK FOR SOVEREIGN RISK LONG TERM ASSESSMENT (optional)

- A rating for sovereign stress risk in the long term is computed using a combination of alternative scenarios with the key economic and policy variables calibrated to represent the phenomena pertinent to the country under analysis.
- No mechanical signals are associated with the long-term tools.
- The modules cover the following risk categories:
  - Population aging:
    - the demographic changes and age-related public expenditures such as pensions and health.
  - Scaling up/down of natural resources:
    - the discoveries or exhaustion of natural resources that would affect government revenues.
  - Large debt amortizations:
    - sizable debt redemptions in the long term that imply significant rollover risks.
  - Climate change:
    - the public investments to build resilience and cope with climate change though adaptation and mitigation

MAC SR DSF: ANALYTICAL FRAMEWORK FOR DEBT SUSTAINABILITY

Debt sustainability assessment consists of a comparison between debt projections under baseline and various scenarios. Depends on both solvency (debt stabilization) and liquidity (rollover risk).

- Determining the economic and political feasibility of delivering a debt-stabilizing primary balance often involves judgment

- Debt sustainability assessments can be further expressed in probabilistic terms
  - The near- and medium-term tools can be used to provide a mechanical assessment of debt sustainability
- Signal is derived as follows:
  - Sustainability logit model.
  - Debt fanchart: The debt fanchart index (DFI) quantifies prospects for medium-term debt stabilization. Its calculation is unchanged from the metric used for sovereign stress analysis.
  - GFN module.

- Signal on debt sustainability: The probability of unsustainable debt, the DFI, and the GFI are combined into a numerical sustainability index, which can be compared against thresholds to derive the mechanical sustainability assessment.

MAC SR DSF: ANALYTICAL FRAMEWORK FOR DEBT SUSTAINABILITY