

INTERNATIONAL DEVELOPMENT ASSOCIATION
INTERNATIONAL MONETARY FUND

REPUBLIC OF MADAGASCAR

Joint World Bank-IMF Debt Sustainability Analysis

July 2020

Prepared jointly by the staffs of the International Development Association (IDA)
and the International Monetary Fund (IMF)

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Republic of Madagascar: Joint Bank-Fund Debt Sustainability Analysis	
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
Macroeconomic projections	This DSA update accounts for the expected severe economic impact of the COVID-19 pandemic—namely, a sizable decline in growth, tourism, and goods trade, with an accompanying increase in fiscal and current account deficits in 2020. Compared to the COVID-19 shock scenario included in the April 2020 expedited DSA, the baseline assumes a more persistent shock in 2020 and a partial rebound in 2021. In particular, relative to the prior baseline, 2020 growth has been revised down by -2.6 ppts to -1.0 percent, with a decline in the domestic primary balance ¹ from -1.4 to -3.3 percent of GDP. In addition, the current account deficit is expected to reach -3.6 percent of GDP vs. -2.5 percent of GDP in the prior baseline. Over the medium term, we project some fallout on exports as firm closures and supply chain disruptions result in more protracted negative effects on exports (especially textiles) and remain conservative with respect to tax revenue projections.
Financing strategy	For external financing, the share of external to total debt does not exceed the authorities' upper limit of 85 percent and, while use of concessional loans is maximized in the near term, the portfolio of new external financing is expected to shift towards a more balanced distribution of concessional and non-concessional debt over the medium to long term. For domestic financing, short-term local currency treasury bills will remain the main source of financing over the long term. However, medium-term local currency bond issuance is expected to scale up over time, but from a low base (15 percent of locally issued debt).
Realism tools flagged	n/a
Mechanical risk rating under the external DSA	Moderate
Mechanical risk rating under the public DSA	Moderate
<p>¹ Primary balance excl. foreign-financed investment and grants. Commitment basis.</p>	

Madagascar, classified as having a medium debt carrying capacity, is assessed at moderate risk of external debt distress with some space to absorb shocks and moderate risk of overall debt distress. This assessment is a change from Madagascar's prior risk assessment of low risk of external debt distress and moderate risk of overall debt distress in the DSA that was published in March 2020 (and subsequently confirmed in the April 2020 expedited DSA).²¹ In this assessment:

- While the COVID-19 adjusted baseline does not breach any external public and publicly guaranteed (PPG) debt thresholds, under an export shock the debt service-to-revenue ratio breaches the 18 percent threshold in 2026, rising to 21 percent. This corresponds to a peak in debt service to the IMF (with planned RCF and ECF repayments), projected to reach more than 4.5 percent of government revenue in 2026 and 2027 before decreasing to 2 percent in 2029. The default settings are applied for the export shock, whose size and impact on growth broadly match the effect of the simultaneous global financial and domestic political crises in Madagascar in 2009, hence delivering the most severe stress scenario in this DSA.
- The overall (external plus domestic) risk of debt distress remains moderate. Total public debt is below the benchmark under baseline, but a commodity price shock drives the present value of debt to GDP above the benchmark at the end of the projection period.³²² Moreover, shocks could introduce liquidity problems, as the debt-service-to-revenue ratio could exceed 70 percent over the long term under the growth shock.⁴³
- The current assessment also reflects the authorities' participation in the Debt Service Suspension Initiative (DSSI), supported by the G-20 and Paris Club. The estimated amount of delayed bilateral official debt servicing is estimated to be less than 0.1 percent of GDP and the authorities intend to adhere to the commitments associated with the DSSI. Finally, this assessment assumes debt relief to the IMF under the Catastrophe Containment window of the CCRT through April 2022 (subject to the availability of CCRT resources for the next 18 months).

Despite the change in risk rating, the breaches of the threshold and benchmark occur fairly late in the forecast horizon and these assessments continue to support Madagascar's plans to gradually scale up its borrowing over the medium term to meet its development and investment needs. Updates with respect to COVID-19's economic impact (both domestically and externally) and

² Madagascar has a Composite Indicator score of 2.81. The DSA covers public and publicly guaranteed external and domestic debt, including State-owned Enterprises' domestic debt and central bank external liabilities. The March 2020 DSA can be found in [Country Report No. 20/61](#). An expedited DSA, with an unadjusted baseline and a customized COVID-19 shock, featured in the April 2020 Rapid Credit Facility ([Country Report No. 20/100](#)) and had the same assessment as the March 2020 DSA. This DSA uses 2019 as its projection year as end-2019 data are still considered preliminary; the next DSA will feature 2020 as the first projection year.

³ As in the prior DSA, for the commodity price shock we assume an illustrative fall in prices equivalent to 10 percent of commodity exports, with no mitigating effect on imports, alongside declines in real GDP growth and in fiscal revenue. The shock occurs in 2020 and unwinds gradually by 2029.

⁴ The magnitude of the growth shock was adjusted upwards to match the size of the growth shock considered during the March 2020 DSA. In addition to supporting the comparability of the two exercises, the high degree of downside risks warrants adopting a conservative approach to the stress tests.

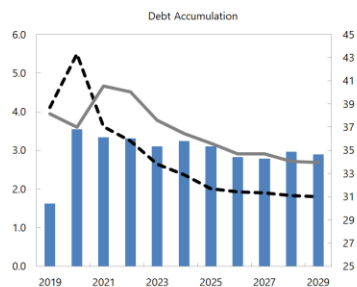
policy response are rapidly evolving and risks are still tilted to the downside, including the heightened risk of the materialization of contingent liabilities, which could lead to a faster than expected deterioration in external and public debt indicators. However, distance to risk thresholds under current baseline projections suggests space to absorb additional shocks.

Table 1. Madagascar: External Debt Sustainability Framework, Baseline Scenario, 2016–2039

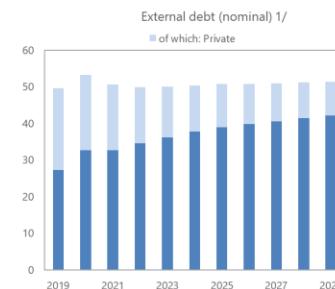
(In percent of GDP; unless otherwise indicated)

	Actual			Projections							Average 8/		
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2029	2039	Historical	Projections
External debt (nominal) 1/	51.0	50.2	50.6	49.5	53.2	50.5	49.9	49.9	50.3	51.4	52.7	39.3	50.8
<i>of which: public and publicly guaranteed (PPG)</i>	25.3	25.7	26.7	27.3	32.6	32.7	34.5	36.1	37.7	42.1	44.9	24.8	36.7
Change in external debt	-1.9	-0.8	0.5	-1.1	3.7	-2.7	-0.7	0.1	0.4	0.2	-0.4	-0.4	-1.5
Identified net debt-creating flows	-6.6	-7.4	-5.7	-2.5	2.0	-1.6	-2.3	-2.2	-2.1	-1.1	-1.6	-0.4	-1.5
Non-interest current account deficit	-0.8	0.0	-1.2	2.0	3.1	2.6	2.6	2.7	2.6	3.2	2.2	4.5	2.7
Deficit in balance of goods and services	1.9	3.3	3.4	5.0	6.2	5.4	5.3	5.6	5.7	6.5	5.5	7.7	5.8
Exports	28.3	30.9	31.5	28.4	20.4	24.8	26.2	26.4	27.2	27.8	28.0		
Imports	30.2	34.2	34.9	33.3	26.6	30.2	31.6	32.1	32.8	34.3	33.5		
Net current transfers (negative = inflow)	-5.8	-5.6	-7.0	-5.7	-5.7	-4.9	-4.6	-4.6	-4.6	-4.4	-4.0	-5.3	-4.8
<i>of which: official</i>	-2.9	-2.5	-2.6	-3.0	-3.4	-1.6	-1.2	-0.8	-0.5	-0.2	0.0		
Other current account flows (negative = net inflow)	3.1	2.3	2.4	2.7	2.5	2.1	1.9	1.7	1.6	1.2	0.7	2.1	1.7
Net FDI (negative = inflow)	-3.8	-2.7	-2.6	-2.6	-2.1	-2.7	-2.8	-2.8	-2.8	-2.8	-2.8	-4.4	-2.7
Endogenous debt dynamics 2/	-2.0	-4.8	-1.9	-1.8	1.0	-1.5	-2.1	-2.0	-1.9	-1.5	-1.0		
Contribution from nominal interest rate	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.7	1.0	1.3		
Contribution from real GDP growth	-2.0	-1.8	-2.2	-2.4	0.5	-2.0	-2.6	-2.6	-2.6	-2.5	-2.3		
Contribution from price and exchange rate changes	-0.3	-3.3	-0.3	...	...	...	...	...	...	...	...
Residual 3/	4.7	6.6	6.2	1.3	1.7	-1.1	1.6	2.2	2.5	1.3	1.2	3.0	1.6
<i>of which: exceptional financing</i>	0.0	0.0	0.0	0.0	-0.2	-0.1	0.0	0.0	0.0	0.0	0.0		
Sustainability indicators													
PV of PPG external debt-to-GDP ratio	...	...	15.0	16.3	19.6	20.8	21.4	22.7	24.1	28.5	32.4		
PV of PPG external debt-to-exports ratio	...	...	47.6	57.4	96.0	83.9	81.7	85.9	88.6	102.4	115.8		
PPG debt service-to-exports ratio	3.1	5.6	2.6	2.7	3.9	3.3	3.8	4.6	4.8	6.4	8.1		
PPG debt service-to-revenue ratio	9.3	16.7	7.9	7.2	8.6	8.1	9.3	11.0	11.2	13.6	15.6		
Gross external financing need (Million of U.S. dollars)	-425.0	12.5	-349.7	449.6	678.5	546.4	580.4	633.5	626.3	1050.2	1639.6		
Key macroeconomic assumptions													
Real GDP growth (in percent)	4.0	3.9	4.6	4.8	-1.0	4.2	5.8	5.7	5.6	5.2	4.6	2.2	4.7
GDP deflator in US dollar terms (change in percent)	0.6	7.0	0.5	-2.7	2.2	5.9	6.2	2.2	2.1	2.1	2.2	0.6	2.4
Effective interest rate (percent) 4/	0.7	0.8	1.1	1.0	1.0	1.1	1.2	1.3	1.5	2.2	2.6	1.0	1.5
Growth of exports of G&S (US dollar terms, in percent)	7.2	21.6	7.0	-8.1	-27.2	34.0	19.0	8.9	10.7	7.3	5.9	6.3	7.1
Growth of imports of G&S (US dollar terms, in percent)	3.3	26.2	7.1	-2.6	-19.3	25.2	17.5	9.8	10.4	7.6	4.1	0.9	7.6
Grant element of new public sector borrowing (in percent)	...	...	...	38.2	37.0	40.5	40.0	37.6	36.4	34.0	33.7	...	36.6
Government revenues (excluding grants, in percent of GDP)	9.5	10.3	10.5	10.8	9.2	10.0	10.7	11.1	11.5	13.2	14.6	9.1	11.5
Aid flows (in Million of US dollars) 5/	606.2	606.6	634.9	669.0	781.3	884.3	980.7	960.8	1008.2	1108.9	1766.9		
Grant-equivalent financing (in percent of GDP) 6/	...	...	...	4.1	5.5	3.6	3.2	2.6	2.4	1.8	1.4	...	2.8
Grant-equivalent financing (in percent of external financing) 6/	...	...	...	71.6	61.2	55.1	51.9	46.0	42.1	36.0	33.8	...	46.8
Nominal GDP (Million of US dollars)	11,849	13,176	13,851	14,124	14,286	15,766	17,714	19,137	20,629	29,670	59,202		
Nominal dollar GDP growth	4.6	11.2	5.1	2.0	1.1	10.4	12.4	8.0	7.8	7.4	6.9	2.9	7.2
Memorandum items:													
PV of external debt 7/	...	...	38.9	38.5	40.2	38.6	36.8	36.6	36.7	37.7	40.2		
In percent of exports	...	...	123.8	135.6	197.2	156.0	140.3	138.2	135.1	135.5	143.5		
Total external debt service-to-exports ratio	3.8	9.0	4.1	13.4	18.4	14.2	13.2	13.0	11.8	11.3	12.1		
PV of PPG external debt (in Million of US dollars)	...	...	2073.6	2298.3	2798.5	3275.5	3796.2	4346.5	4965.4	8457.4	19193.5		
(PVt-PVt-1)/GDPt-1 (in percent)	...	...	1.6	3.5	3.3	3.3	3.1	3.2	2.9	2.1	2.1		
Non-interest current account deficit that stabilizes debt ratio	1.1	0.9	-1.7	3.2	-0.7	5.3	3.2	2.6	2.3	3.0	2.6		

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



Debt Accumulation
 ■ Debt Accumulation
 - - - Grant-equivalent financing (% of GDP)
 — Grant element of new borrowing (% right scale)



External debt (nominal) 1/
 ■ of which: Private

Sources: Country authorities; and staff estimates and projections.

1/ Includes both public and private sector external debt.

2/ Derived as $[r - g - \rho(1+g)] / (1+g+\rho+g_0)$ times previous period debt ratio, with r = nominal interest rate; g = real GDP growth rate, and ρ = growth rate of GDP deflator in U.S. dollar terms.

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).

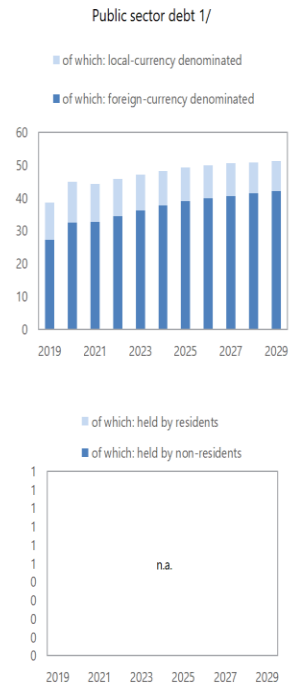
7/ Assumes that PV of private sector debt is equivalent to its face value.

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.

Table 2. Madagascar: Public Sector Debt Sustainability Framework, Baseline Scenario, 2016–2039
(In percent of GDP; unless otherwise indicated)

	Actual			Projections								Average 6/	
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2029	2039	Historical	Projections
Public sector debt 1/	40.3	40.0	39.9	38.7	44.8	44.3	45.7	47.0	48.2	51.1	55.1	36.6	47.3
of which: external debt	25.3	25.7	26.7	27.3	32.6	32.7	34.5	36.1	37.7	42.1	44.9	24.8	36.7
Change in public sector debt	-3.8	-0.2	-0.1	-1.2	6.2	-0.5	1.4	1.3	1.2	0.3	-0.4		
Identified debt-creating flows	-3.5	-2.6	-1.9	-1.9	5.3	-0.3	1.5	1.3	1.2	0.6	-0.5	-0.2	1.0
Primary deficit	0.4	1.4	0.6	0.7	4.3	4.0	4.0	3.7	3.7	3.0	1.8	1.3	3.3
Revenue and grants	12.4	12.8	12.9	13.9	12.6	11.6	12.0	11.9	12.0	13.3	14.6	10.9	12.6
of which: grants	2.9	2.5	2.5	3.1	3.4	1.6	1.2	0.8	0.5	0.2	0.0		
Primary (noninterest) expenditure	12.8	14.2	13.5	14.6	16.9	15.6	16.0	15.6	15.7	16.3	16.4	12.3	15.8
Automatic debt dynamics	-3.9	-4.0	-2.5	-2.2	0.5	-4.7	-3.0	-2.8	-2.8	-2.8	-2.7		
Contribution from interest rate/growth differential	-3.1	-2.4	-3.0	-2.3	0.4	-2.2	-2.8	-2.8	-2.8	-2.8	-2.6		
of which: contribution from average real interest rate	-1.4	-0.9	-1.3	-0.5	0.0	-0.4	-0.3	-0.3	-0.3	-0.3	-0.2		
of which: contribution from real GDP growth	-1.7	-1.5	-1.7	-1.8	0.4	-1.8	-2.4	-2.5	-2.5	-2.5	-2.5		
Contribution from real exchange rate depreciation	-0.8	-1.5	0.6	...	...	...	...	...	...	...	...
Other identified debt-creating flows	0.0	0.0	0.0	-0.5	0.5	0.4	0.5	0.5	0.4	0.4	0.4	0.0	0.4
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	-0.5	0.5	0.4	0.5	0.5	0.4	0.4	0.4		
Residual	-0.3	2.3	1.8	0.8	0.9	-2.7	-0.3	-0.1	0.0	-0.3	0.1	1.8	-0.1
Sustainability indicators													
PV of public debt-to-GDP ratio 2/	...	...	28.8	27.7	32.3	32.0	32.9	34.0	34.9	37.9	43.1		
PV of public debt-to-revenue and grants ratio	...	...	222.9	198.7	255.6	275.9	275.3	285.2	290.1	283.9	295.8		
Debt service-to-revenue and grants ratio 3/	7.0	7.0	6.4	39.9	42.5	50.5	52.7	57.0	57.5	49.2	53.4		
Gross financing need 4/	1.2	2.3	1.4	5.7	10.3	10.3	10.8	10.9	10.9	10.0	10.0		
Key macroeconomic and fiscal assumptions													
Real GDP growth (in percent)	4.0	3.9	4.6	4.8	-1.0	4.2	5.8	5.7	5.6	5.2	4.6	2.2	4.7
Average nominal interest rate on external debt (in percent)	0.8	0.9	1.1	1.0	0.9	0.9	0.9	1.0	1.1	1.4	1.6	0.7	1.1
Average real interest rate on domestic debt (in percent)	-8.2	-4.7	-7.0	-2.7	-0.6	-1.9	-0.5	0.0	0.1	0.0	0.3	-6.7	-0.5
Real exchange rate depreciation (in percent, + indicates depreciation)	-3.0	-6.3	2.3	...	...	...	...	...	...	...	...	1.0	...
Inflation rate (GDP deflator, in percent)	9.0	5.0	7.6	5.6	4.6	6.0	5.7	5.5	5.5	5.2	5.0	7.3	5.4
Growth of real primary spending (deflated by GDP deflator, in percent)	8.0	15.6	-1.0	13.7	14.5	-3.8	8.0	3.3	6.3	5.4	3.7	1.7	6.6
Primary deficit that stabilizes the debt-to-GDP ratio 5/	4.1	1.7	0.7	2.0	-1.9	4.6	2.6	2.4	2.5	2.7	2.2	2.2	2.2
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		

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



Sources: Country authorities; and staff estimates and projections.

1/ Coverage of debt: The central, state, and local governments, central bank, government-guaranteed debt, non-guaranteed SOE 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.

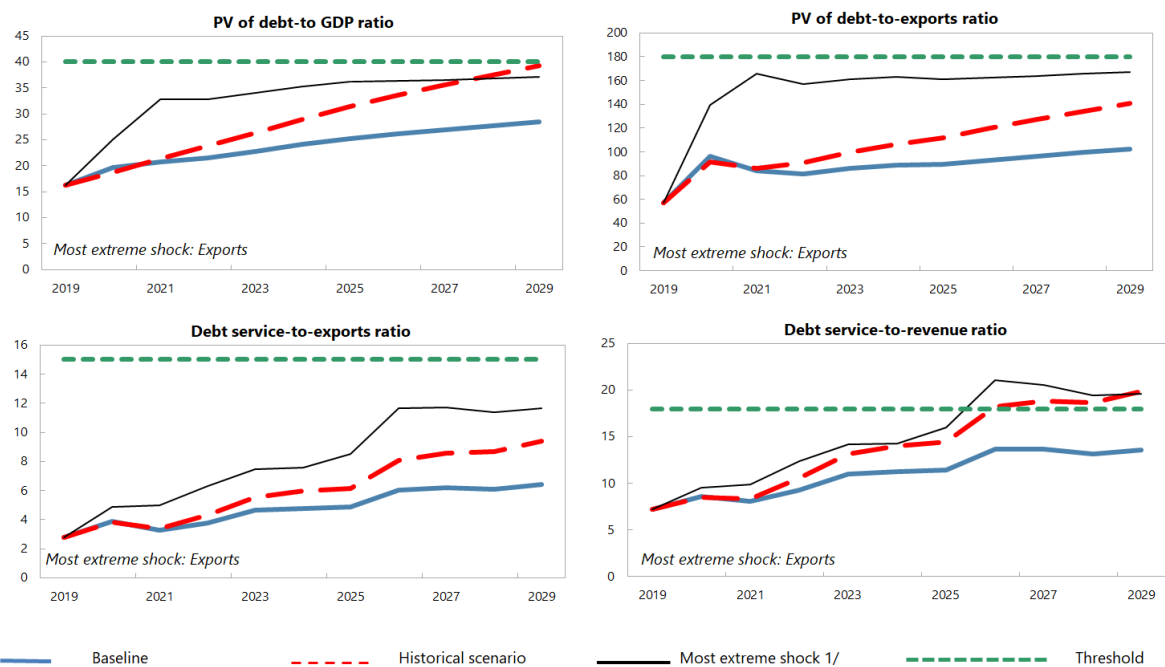
3/ Debt service is defined as the sum of interest and amortization of medium and long-term, and short-term debt.

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 stabilize 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.

Figure 1. Madagascar: Indicators of Public and Publicly Guaranteed External Debt Under Alternatives Scenarios, 2019–2029



Customization of Default Settings		
	Size	Interactions
Standardized Tests	Yes	
Tailored Stress		
Combined CL	No	
Natural disaster	No	No
Commodity price	Yes	Yes
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.

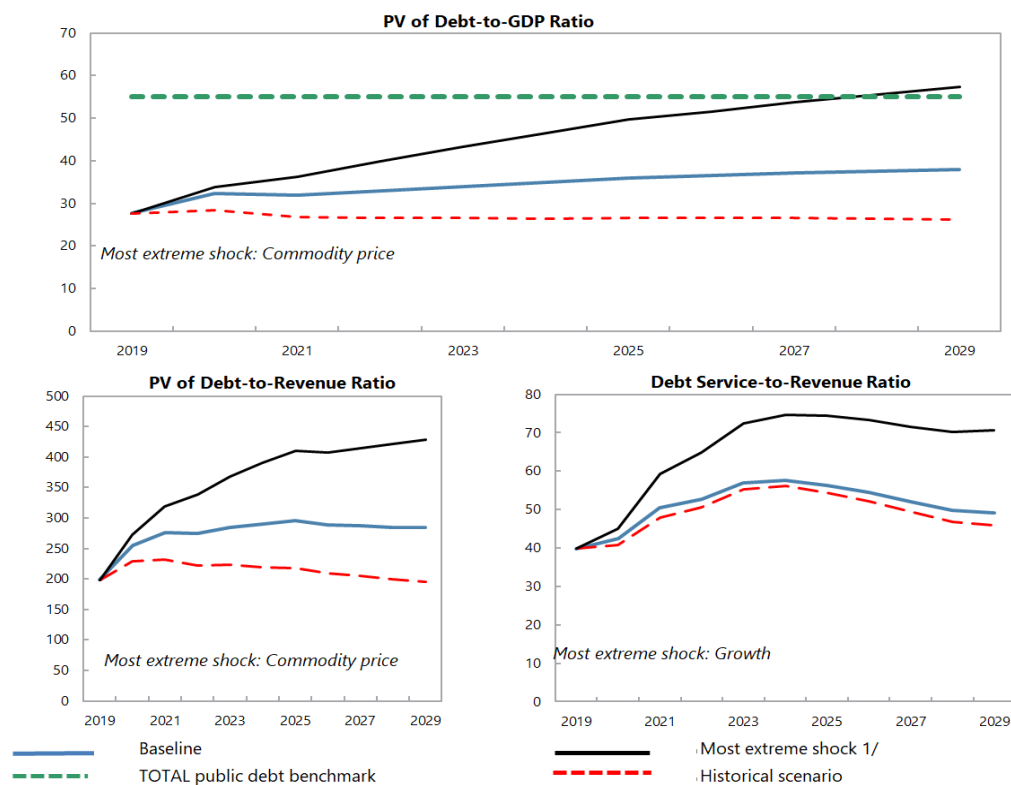
Borrowing assumptions on additional financing needs resulting from the stress tests*		
	Default	User defined
Shares of marginal debt		
External PPG MLT debt	100%	
Terms of marginal debt		
Avg. nominal interest rate on new borrowing in USD	1.4%	1.8%
USD Discount rate	5.0%	5.0%
Avg. maturity (incl. grace period)	26	20
Avg. grace period	4	4

* 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 2029. 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 extreme shock even after disregarding the one-off breach, only that stress test (with a one-off breach) would be presented.

Figure 2. Madagascar: Indicators of Public Debt Under Alternative Scenarios, 2019–2029



Borrowing assumptions on additional financing needs resulting from the stress tests*	Default	User defined
Shares of marginal debt		
External PPG medium and long-term	48%	65%
Domestic medium and long-term	9%	15%
Domestic short-term	43%	20%
Terms of marginal debt		
External MLT debt		
Avg. nominal interest rate on new borrowing in USD	1.4%	1.8%
Avg. maturity (incl. grace period)	26	20
Avg. grace period	4	4
Domestic MLT debt		
Avg. real interest rate on new borrowing	4.8%	4.8%
Avg. maturity (incl. grace period)	2	2
Avg. grace period	1	1
Domestic short-term debt		
Avg. real interest rate	3.0%	3.5%

* Note: The public DSA allows for domestic financing to cover the additional financing needs generated by the shocks under the stress tests in the public 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 2029. 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 extreme shock even after disregarding the one-off breach, only that stress test (with a one-off breach) would be presented.

Table 3. Madagascar: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2019–2029
(In percent)

	Projections 1/										
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
PV of debt-to GDP ratio											
Baseline	16	20	21	21	23	24	25	26	27	28	29
A. Alternative Scenarios											
A1. Key variables at their historical averages in 2019-2029 2/	16	19	21	24	26	29	31	34	36	37	39
B. Bound Tests											
B1. Real GDP growth	16	21	24	25	27	28	30	31	31	32	33
B2. Primary balance	16	20	22	22	24	25	26	27	28	29	29
B3. Exports	16	25	33	33	34	35	36	36	36	37	37
B4. Other flows 3/	16	22	25	25	26	27	28	29	29	30	30
B5. Depreciation	16	25	23	24	26	28	30	31	32	33	34
B6. Combination of B1-B5	16	26	27	28	29	31	32	32	33	34	34
C. Tailored Tests											
C1. Combined contingent liabilities	16	23	25	26	27	28	29	30	31	31	32
C2. Natural disaster	16	25	27	28	29	31	32	33	34	34	35
C3. Commodity price	16	20	22	22	24	25	26	27	28	28	29
C4. Market Financing	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Threshold	40	40	40	40	40	40	40	40	40	40	40
PV of debt-to-exports ratio											
Baseline	57	96	84	82	86	89	90	93	96	99	102
A. Alternative Scenarios											
A1. Key variables at their historical averages in 2019-2029 2/	57	91	86	91	100	107	112	120	127	134	141
B. Bound Tests											
B1. Real GDP growth	57	96	84	82	86	89	90	93	96	99	102
B2. Primary balance	57	98	87	85	90	92	93	96	99	102	105
B3. Exports	57	140	166	157	161	163	161	163	164	166	167
B4. Other flows 3/	57	107	99	95	99	101	101	103	105	107	109
B5. Depreciation	57	96	75	74	79	82	83	87	91	95	98
B6. Combination of B1-B5	57	125	96	109	114	116	116	119	122	125	127
C. Tailored Tests											
C1. Combined contingent liabilities	57	112	99	97	102	104	104	107	110	113	116
C2. Natural disaster	57	125	111	110	115	117	118	121	124	128	131
C3. Commodity price	57	100	89	86	91	93	94	97	99	102	105
C4. Market Financing	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Threshold	180	180	180	180	180	180	180	180	180	180	180
Debt service-to-exports ratio											
Baseline	3	4	3	4	5	5	5	6	6	6	6
A. Alternative Scenarios											
A1. Key variables at their historical averages in 2019-2029 2/	3	4	3	4	6	6	6	8	9	9	9
B. Bound Tests											
B1. Real GDP growth	3	4	3	4	5	5	5	6	6	6	6
B2. Primary balance	3	4	3	4	5	5	5	6	6	6	7
B3. Exports	3	5	5	6	7	8	8	12	12	11	12
B4. Other flows 3/	3	4	3	4	5	5	6	7	7	7	7
B5. Depreciation	3	4	3	4	4	5	5	5	6	6	6
B6. Combination of B1-B5	3	4	4	5	6	6	7	8	8	8	8
C. Tailored Tests											
C1. Combined contingent liabilities	3	4	4	4	5	5	5	6	6	6	7
C2. Natural disaster	3	4	4	4	5	6	6	7	7	7	7
C3. Commodity price	3	4	3	4	5	5	5	6	7	6	7
C4. Market Financing	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Threshold	15	15	15	15	15	15	15	15	15	15	15
Debt service-to-revenue ratio											
Baseline	7	9	8	9	11	11	11	14	14	13	14
A. Alternative Scenarios											
A1. Key variables at their historical averages in 2019-2029 2/	7	8	8	11	13	14	14	18	19	19	20
B. Bound Tests											
B1. Real GDP growth	7	9	9	11	13	13	13	16	16	15	16
B2. Primary balance	7	9	8	9	11	11	12	14	14	14	14
B3. Exports	7	10	10	12	14	14	16	21	21	19	20
B4. Other flows 3/	7	9	9	10	12	12	13	16	16	15	15
B5. Depreciation	7	11	10	11	13	14	14	16	16	15	16
B6. Combination of B1-B5	7	10	10	11	13	13	15	18	18	17	17
C. Tailored Tests											
C1. Combined contingent liabilities	7	9	9	10	12	12	12	14	14	14	14
C2. Natural disaster	7	9	9	10	12	12	13	15	15	14	14
C3. Commodity price	7	9	8	10	12	12	12	14	14	14	14
C4. Market Financing	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Threshold	18	18	18	18	18	18	18	18	18	18	18

Sources: Country authorities; and staff estimates and projections.

1/ A bold value indicates a breach of the threshold.

2/ Variables include real GDP growth, GDP deflator (in U.S. dollar terms), non-interest current account in percent of GDP, and non-debt creating flows.

3/ Includes official and private transfers and FDI.

Table 4. Madagascar: Sensitivity Analysis for Key Indicators of Public Debt, 2019–2029 (In percent)

	Projections 1/										
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
PV of Debt-to-GDP Ratio											
Baseline	28	32	32	33	34	35	36	37	37	38	38
A. Alternative Scenarios											
A1. Key variables at their historical averages in 2019-2029 2/	28	28	27	27	27	26	27	27	27	26	26
B. Bound Tests											
B1. Real GDP growth	28	36	40	42	45	47	50	52	54	55	57
B2. Primary balance	28	33	33	34	35	36	37	38	38	38	39
B3. Exports	28	35	40	41	41	42	43	43	43	42	42
B4. Other flows 3/	28	35	36	37	37	38	39	39	40	40	40
B5. Depreciation	28	34	32	32	32	32	32	32	32	31	31
B6. Combination of B1-B5	28	32	32	32	33	34	35	36	36	37	37
C. Tailored Tests											
C1. Combined contingent liabilities	28	38	37	38	39	39	40	41	41	41	42
C2. Natural disaster	28	41	40	41	42	42	43	44	44	45	45
C3. Commodity price	28	34	36	40	43	46	50	52	54	56	57
C4. Market Financing	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
TOTAL public debt benchmark	55	55	55	55	55	55	55	55	55	55	55
PV of Debt-to-Revenue Ratio											
Baseline	199	256	276	275	285	290	295	289	287	285	284
A. Alternative Scenarios											
A1. Key variables at their historical averages in 2019-2029 2/	199	229	232	222	223	219	218	210	206	200	196
B. Bound Tests											
B1. Real GDP growth	199	276	333	345	370	387	405	406	413	420	427
B2. Primary balance	199	261	287	285	295	299	304	297	295	292	290
B3. Exports	199	280	345	340	348	350	351	338	330	323	317
B4. Other flows 3/	199	274	308	305	314	318	321	311	307	302	299
B5. Depreciation	199	279	283	271	270	266	263	251	244	238	232
B6. Combination of B1-B5	199	254	276	271	280	284	289	283	281	279	278
C. Tailored Tests											
C1. Combined contingent liabilities	199	301	320	315	324	327	330	322	318	315	312
C2. Natural disaster	199	324	345	339	348	351	355	346	343	340	338
C3. Commodity price	199	273	319	339	368	390	411	408	415	422	429
C4. Market Financing	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Debt Service-to-Revenue Ratio											
Baseline	40	42	50	53	57	58	56	54	52	50	49
A. Alternative Scenarios											
A1. Key variables at their historical averages in 2019-2029 2/	40	41	48	51	55	56	54	52	49	47	46
B. Bound Tests											
B1. Real GDP growth	40	45	59	65	73	75	75	73	72	70	71
B2. Primary balance	40	42	52	55	59	58	57	55	53	51	50
B3. Exports	40	42	51	54	58	59	59	59	56	54	53
B4. Other flows 3/	40	42	51	53	58	58	58	57	54	52	51
B5. Depreciation	40	41	49	51	55	56	55	54	51	49	48
B6. Combination of B1-B5	40	42	50	53	57	57	55	53	51	49	48
C. Tailored Tests											
C1. Combined contingent liabilities	40	42	64	64	62	61	58	56	53	51	50
C2. Natural disaster	40	43	71	70	65	64	61	58	55	53	52
C3. Commodity price	40	44	56	64	72	74	74	72	70	69	70
C4. Market Financing	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Sources: Country authorities; and staff estimates and projections.

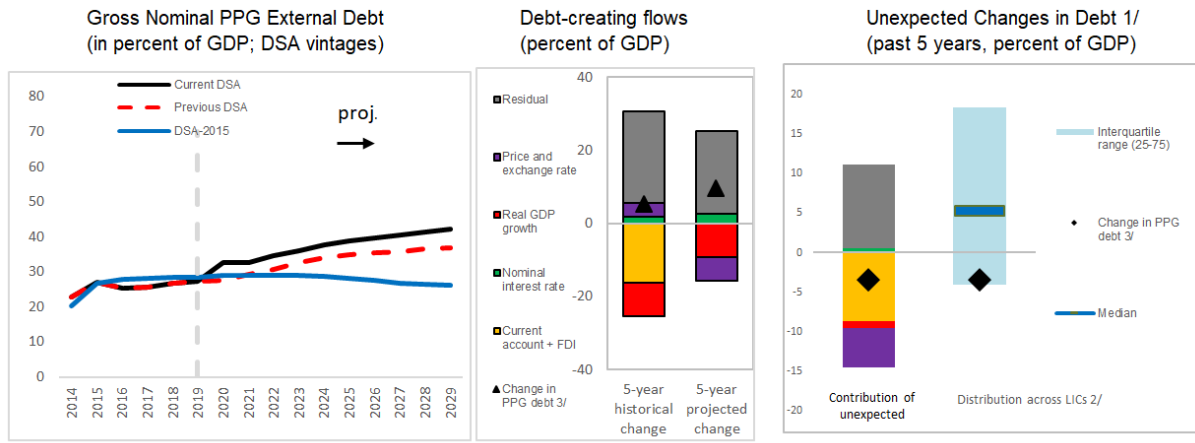
1/ A bold value indicates a breach of the benchmark.

2/ Variables include real GDP growth, GDP deflator and primary deficit in percent of GDP.

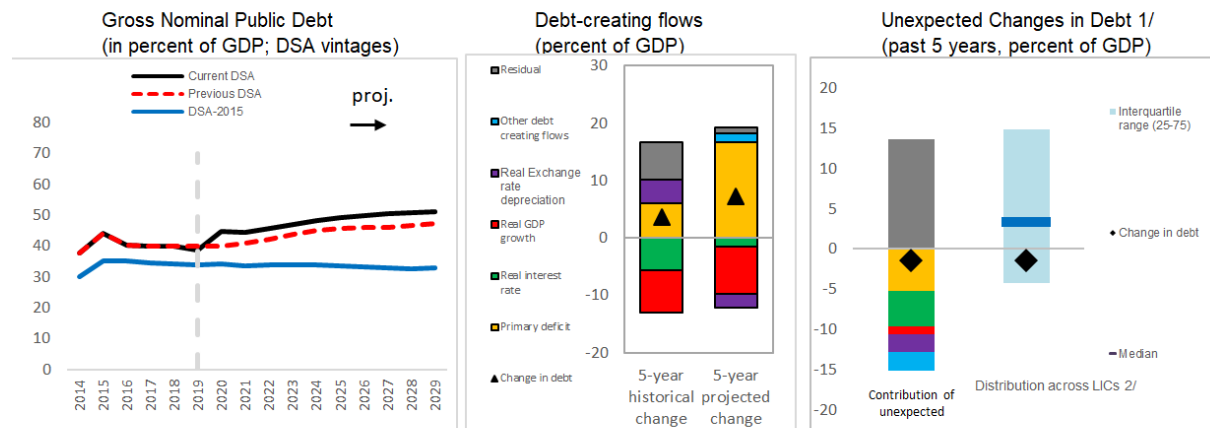
3/ Includes official and private transfers and FDI.

Figure 3. Madagascar: Drivers of Debt Dynamics – Baseline Scenario

External Debt



Public debt



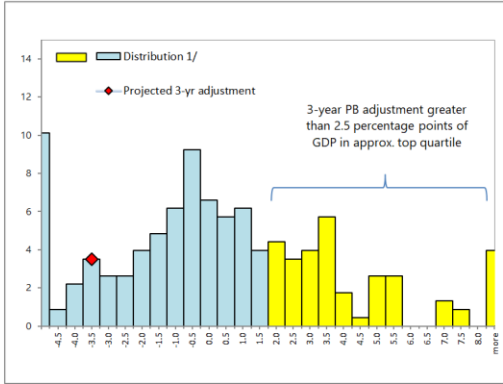
1/ Difference between anticipated and actual contributions on debt ratios.

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

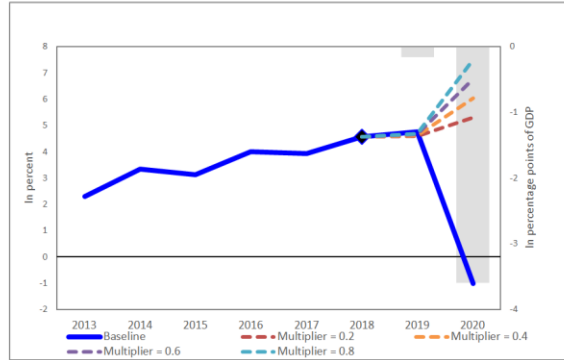
3/ Given the relatively low private external debt for average low-income countries, a ppt change in PPG external debt should be largely explained by the drivers of the external debt dynamics equation.

Figure 4. Madagascar: Realism Tools

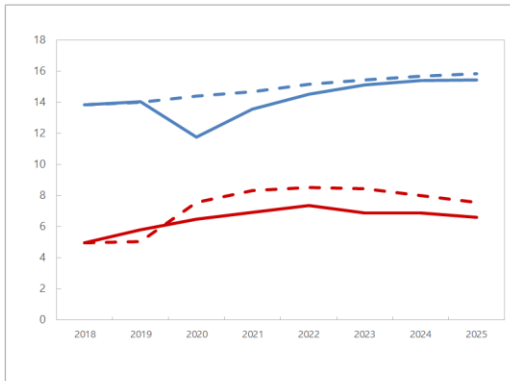
**3-Year Adjustment in Primary Balance
(Percentage points of GDP)**



Fiscal Adjustment and Possible Growth Paths 1/

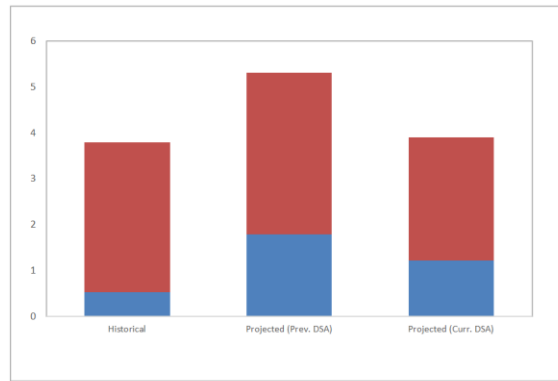


**Public and Private Investment Rates
(percent of GDP)**



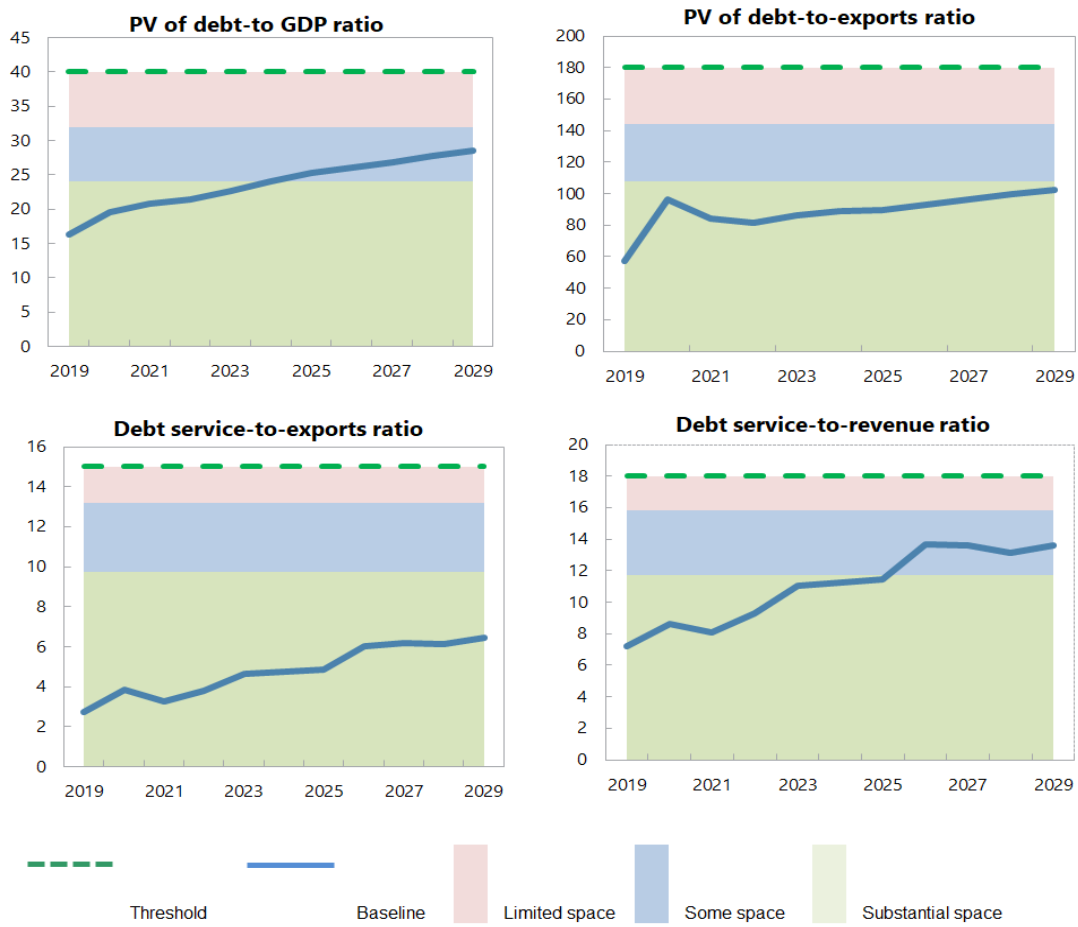
— Private Investment (Current DSA) — Public Investment (Current DSA)
 - - - Private Investment (Previous DSA) - - - Public Investment (Previous DSA)

**Contribution to Real GDP growth
(percent, 5-year average)**



■ Contribution of other factors
 ■ Contribution of government capital

Figure 5. Madagascar: Qualification of the Moderate Category, 2019-2029 1/



Sources: Country authorities; and staff estimates and projections.

1/ For the PV debt/GDP and PV debt/exports thresholds, x is 20 percent and y is 40 percent. For debt service/Exports and debt service/revenue thresholds, x is 12 percent and y is 35 percent.