

INTERNATIONAL DEVELOPMENT ASSOCIATION
INTERNATIONAL MONETARY FUND

REPUBLIC OF MADAGASCAR

Joint Bank-Fund Debt Sustainability Analysis 2014 Update

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and the International Monetary Fund

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Using the joint IDA-IMF debt sustainability framework for low income countries, the debt sustainability analysis (DSA) assesses Madagascar's risk of external debt distress to be 'low'. This is unchanged from the last DSA carried out in 2008. The public DSA suggests that Madagascar's total public and publically guaranteed (PPG) debt dynamics are sustainable, although weak fiscal revenue generation is a source of vulnerability. The authorities agreed with the assessment.

I. INTRODUCTION

1. **This DSA has been prepared jointly by IMF and World Bank staff.** It is based on the framework for low-income countries approved by the respective Executive Boards. The framework takes into account indicative thresholds for debt burden indicators determined by the quality of the country's policies and institutions¹. The assessment comprises a baseline scenario and a set of alternative scenarios.

II. RECENT DEVELOPMENTS AND CURRENT DEBT SITUATION

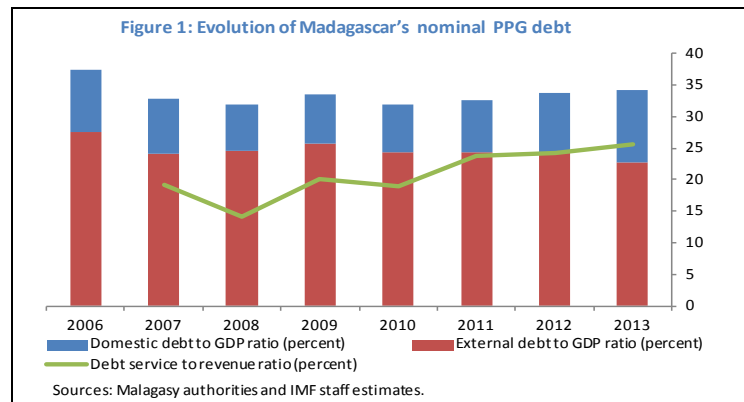
2. **Since HIPC Completion in 2006, Madagascar's external PPG debt as a proportion of GDP has been on a modest downward trend.** At end-2013, PPG nominal external debt was 23 percent of GDP, below Madagascar's post-HIPC average of 25 percent (Figure 1). This was partly as a result of reduced donor inflows during the crisis period. Around 80 percent of external debt is owed to multilateral creditors, mainly the World Bank.

3. **Domestic PPG debt has risen since 2008,** partly to compensate for fewer external financing opportunities. In 2008, domestic debt was 7 percent of GDP, which increased to 11 percent by end-2013 (Table 1). This debt includes domestic budgetary arrears, which increased sharply in 2013.

4. **Overall, the debt strategy of the authorities has been prudent over the crisis.** Total PPG debt was stable around 33 percent of GDP throughout the transition, and the authorities refrained from borrowing externally on non-concessional terms. However, the debt service to revenue ratio has increased due to a greater reliance on domestic financing and declining fiscal revenues (Figure 1).

5. **This DSA includes public debt and guarantees of the general**

government. Local governments do not formally issue debt liabilities, but may have arrears to domestic counterparties, for which data are not available. The measure of debt is on a *gross* rather than *net* basis.



¹ According to the World Bank Country and Policy Institutional Assessment (CPIA) Index, Madagascar is rated as a 'low' performer, a downgrade since the last DSA in 2008. The indicative thresholds for external debt applicable for that category of countries are: (i) 30 percent for the PV of debt-to-GDP ratio; (ii) 100 percent for PV of debt-to-exports ratio; (iii) 200 percent for the PV of debt to fiscal revenues ratio; (iv) 15 percent for the debt service to exports ratio; and (v) 18 percent for the debt service to revenue ratio. The indicative threshold for the PV of total PPG debt is 38 percent of GDP.

Table 1 Madagascar: Break-Down of Total PPG Debt (End-2013)

Creditor	Amount (US\$m)	Percent of GDP	Percent of total
Domestic debt, of which:	1,214	11.4	33.3
Bonds	513	4.8	14.1
Other inc arrears	701	6.6	19.2
External debt, of which:	2,427	22.8	66.7
Multilateral	1,884	17.7	51.7
Paris Club	108	1.0	3.0
Non-Paris Club	416	3.9	11.4
Commercial	18	0.2	0.5
Total PPG debt	3,641	34.2	100.0

6. Private external debt is mainly issued by subsidiaries of multinational companies.

According to the authorities, external debt owed by *domestically* owned companies and households is negligible (around US\$15 million). There are, however, a number of multinational companies—for instance in the mining, banking, telecommunication sector—whose wholly owned local subsidiaries have issued external debt. The authorities do not have comprehensive data on these obligations. But by far the largest of these debtors is the Nickel/Cobalt mine and processing facility near Antananarivo, where, reflecting the financial structure of the initial capital investment in the project, the local subsidiary has external debt of around US\$2 billion (20 percent of GDP). This obligation accounts for the bulk of the increase in total external debt from 24 percent of GDP in 2007 to 44 percent at end-2013. This commercial loan is scheduled to be fully repaid by 2030.

III. UNDERLYING ASSUMPTIONS

7. The key variables driving the debt dynamics are forecast to improve over the coming years, but remain more conservative than the medium-term projections in the 2008 DSA (Box 1). The strengthening economic recovery forecast in the macroeconomic framework will provide space for the authorities to invest in much needed infrastructure. Much of this investment will be financed through concessional external borrowing and grants, although the latter will decline over the longer-term. The average grant element of new borrowing is projected to decline from 50 percent today to around 35 percent in 2034.

Box 1: Baseline Macroeconomic Assumptions

Real GDP growth. Growth is expected to recover to around 4.5 percent over the medium term, compared to an average of 3.2 percent over the last decade (which includes the crisis years). This is driven by improved confidence, a re-engagement of development partners, and increased mining exports.

Inflation and interest rates. Inflation as measured by the GDP deflator in US dollar terms is likely to stay low and stable, averaging around 2 percent. The highly concessional terms of the external PPG debt implies a real effective interest rate of around -0.8 percent over 2014–19. This gradually increases as the degree of concessionality is assumed to decline.

Current account. Mining exports are expected to gradually increase as the two major projects reach full production capacity. This will be accompanied by a bounce back in imports, as domestic consumption and investment recover. These two factors are projected to largely offset each other, leading to a relatively stable non-interest current account of around 3.5 percent of GDP.

Tax revenues. This is an area of vulnerability for debt sustainability. Fiscal revenues have fallen from (a relatively modest) 11.8 percent of GDP in 2008, to 9.3 in 2013. The DSA assumes the authorities will be able to reach 2008 levels by around 2017–18; rising further to over 15.5 percent by 2034.

Grants. Donor support is projected to rapidly increase in 2014 to around pre-crisis levels, and then stabilize over the medium term. Over the long-run, grants are assumed to decline to zero by 2034.

Total expenditure. Government spending will initially fall with the removal of the fuel subsidy over the next 12 months but then gradually increase as the government raises social and infrastructure spending.

IV. EXTERNAL DEBT SUSTAINABILITY ANALYSIS

A. Baseline Scenario

8. **The level of PPG external debt, which is currently a little over US\$2.4 billion, is projected to gradually grow throughout the forecast horizon.** It is forecast to increase from 23 percent of GDP in 2013 to 30 percent by 2034, as the government supports much needed infrastructure investment and social spending. A persistent trade deficit and outflows from the mining sector² are balanced with increasing grant inflows (over the next decade) and relatively strong growth. FDI inflows are assumed to be lower than that experienced over the last few years, during which major mining projects were being constructed. As the Malagasy economy develops, non-concessional borrowing is projected to increase, especially after 2020 (Table 3).

² The large residual in Table 4 is partly related to mining activity. Mining exports are recorded in full in the balance of payment statistics. However, only a fraction of these receipts actually return to Madagascar, with the remainder being repatriated to the parent companies. Another contribution to the residual relates to discrepancies in the authorities' debt database between the sum of amortizing debt and the debt stock.

Table 2. Madagascar: Baseline Macroeconomic Assumptions

	2014	2015	2016	2017	2018	2008 DSA*
Real GDP growth (percent)	3.0	4.0	4.5	4.5	4.5	6.2
GDP deflator in US\$ terms (percent)	2.0	2.0	2.5	2.2	2.0	3.0
Non-interest current account (percent GDP)	-3.1	-5.4	-5.2	-5.0	-4.3	-5.3
Total revenues (percent of GDP)	11.1	11.3	12.3	12.0	12.3	14.1
Grants (percent of GDP)	3.7	3.7	3.7	3.7	3.7	4.1
Expenditure inc. interest (percent of GDP)	17.3	17.2	17.5	17.8	18.2	21.0

*Projected medium-term values in the 2008 DSA.

Source: IMF staff projections.

Table 3. Madagascar: Projected Disbursements of PPG External Debt

	2014	2015	2014–19 Average	2020–34 Average
Concessional (Millions of US\$)	280	304	338	684
<i>Percent of GDP</i>	2.5	2.6	2.6	2.6
Non-concessional (Millions of US\$)	0	0	3.71	123
<i>Percent of GDP</i>	0	0	0.0	0.4
Total (Millions of US\$)	280	304	341	807
<i>Percent of GDP</i>	2.5	2.6	2.6	3.0

Sources: Mlalagasy authorities and IMF staff projections.

9. **Under the baseline projection, all PPG external debt indicators remain below the policy-dependent debt burden thresholds** (Figure 2). The present value (PV) of the current level of PPG external debt, 11.9 percent of GDP, is projected to increase to 17.6 percent by 2034. This projection is broadly consistent with the medium term forecast from the last DSA conducted in 2008.

10. **Private external debt is projected to slowly decline, as the mining project loans are repaid.** Given the exceptional nature of this project, the DSA does not forecast substantial new external borrowing from the private sector. As the ultimate liability of the existing loans is to the multinational shareholders, rather than resident entities (such as domestic banks or the government), these do not constitute a threat to external sustainability.

B. Alternative Scenarios

11. **Three alternative scenarios are constructed to stress-test the baseline external PPG debt projection.** First, the standard bounds tests, which apply pre-defined shocks to the key macroeconomic variables that drive external debt³. Second, a historical scenario where macroeconomic variables are assumed to equal their average over 2004–13. Third, a customized scenario, focused on non-concessional borrowing. These shocks are illustrated in Figure 2 and Table 5.

12. **None of the standard bounds tests cause a breach of the thresholds for PPG external debt.** The historical scenario⁴ projects a rapid increase in all debt metrics, and causes a breach for four of the five external debt thresholds. But there are two reasons to put less weight on this scenario. First, the very large current account deficit in 2008 and 2009 (over 20 percent of GDP in both years) was mainly driven by substantial imports associated with large mining investments, which were partly financed through non-debt creating FDI. Second, the historical averages are calculated over a period of crisis in Madagascar, where key variables such as growth are unlikely to persist at such levels for a long period of time.

13. **The third scenario is based on a customized set-up.** It assumes that, on top of the baseline projections, the authorities contract a US\$400 million non-concessional loan, disbursed over 2014–16. While this expanded baseline does not lead to breaches of any threshold as shown in Figure 2, it could lead to a deterioration in the risk of debt distress as stress tests may push debt indicators above relevant thresholds. The authorities need to remain vigilant on debt sustainability pressures if they embark on contracting non-concessional borrowing.

V. PUBLIC DSA

A. Baseline Scenario

14. **Domestic PPG debt as a proportion of GDP is projected to decline over the next decade,** with the authorities substituting away from local financing into concessional borrowing, as donor relations normalize, and with the clearance of domestic arrears. Domestic PPG debt is expected to grow as a proportion of GDP over the long-term, as domestic markets deepen.

15. **The *present value* of total PPG debt is projected to increase from 23 percent of GDP at present to 25 percent by 2034 - well below the threshold** (Table 7). Madagascar's relatively weak revenue to GDP ratio, leaves the authorities somewhat vulnerable on the debt service to revenue measure, which is likely to increase through time as higher interest payments (associated with less concessional financing) increase at a faster rate than revenue mobilization.

³ Summarized in footnote 1 of Figure 2.

⁴ Key macroeconomic variables (non-interest current account, growth, GDP deflator, growth of exports, current official transfers and net FDI) remain fixed at the average of the 2004–13 period.

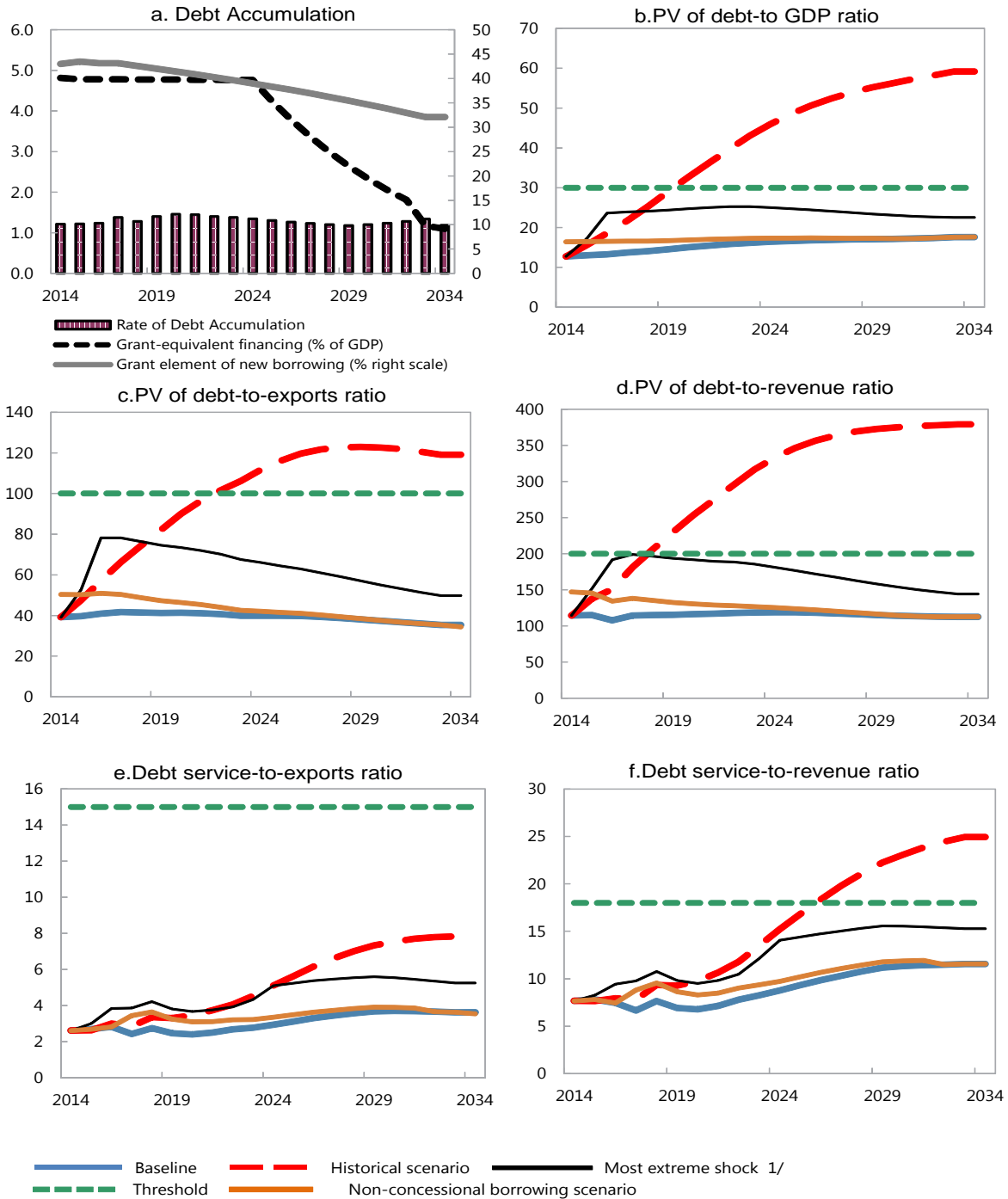
B. Alternative Scenarios

16. **Of the three alternative scenarios used to stress-test the baseline, one causes a breach of the threshold in 2032** (Figure 3). This breach is the scenario whereby the primary deficit as a proportion of GDP remains unchanged throughout the forecast, generating the highest debt to GDP ratio trajectory. However, staff and authorities agree that reducing the current gap between revenue and spending is a priority, thus this scenario is not viewed as sufficient to motivate a change in the overall debt sustainability risk rating.

VI. CONCLUSIONS

17. **The authorities agree with the overall assessment that the risk of external distress is low.** And also that the risks from private external debt and public domestic debt do not justify a change in the overall debt sustainability assessment. The authorities plan to use this DSA to help develop their medium-term debt strategy. Furthermore, they hope that the upcoming World Bank funded DSA training will help strengthen their capacity to take greater ownership of this analysis themselves. Staff and the authorities will also seek to gather more data and gain a deeper understanding of Madagascar's private external debt stock.

Figure 2. Madagascar: Indicators of Public and Publicly Guaranteed External Debt under Alternative Scenarios, 2014-2034 1/



Sources: Country authorities; and staff estimates and projections.

1/ The most extreme stress test is the test that yields the highest ratio on or before 2024. In figure b. it corresponds to a Combination shock; in c. to a Exports shock; in d. to a Combination shock; in e. to a Exports shock and in figure f. to a Combination shock

Table 5. Madagascar: Sensitivity Analysis For Key Indicators Of Public and Publicly Guaranteed External Debt, 2014–34

(In Percent)

							Projections												
	2014	2015	2016	2017	2018	2019	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034		
PV of debt-to GDP ratio																			
Baseline	13	13	13	14	14	15	16	17	17	17	17	17	17	17	17	18	18		
A. Alternative Scenarios																			
A1. Key variables at their historical averages in 2014-2034 1/	13	16	19	22	25	29	46	49	51	52	54	55	56	57	58	59	60		
A2. New public sector loans on less favorable terms in 2014-2034 2	13	13	14	16	17	18	23	24	25	26	27	28	28	29	30	31	32		
B. Bound Tests																			
B1. Real GDP growth at historical average minus one standard deviation in 2015-2016	13	13	14	14	15	15	17	17	17	18	18	18	18	18	18	18	18		
B2. Export value growth at historical average minus one standard deviation in 2015-2016 3/	13	15	20	20	21	21	22	21	21	21	21	20	20	20	20	20	19		
B3. US dollar GDP deflator at historical average minus one standard deviation in 2015-2016	13	14	17	17	18	18	21	21	21	21	21	21	21	22	22	22	22		
B4. Net non-debt creating flows at historical average minus one standard deviation in 2015-2016 4/	13	17	22	22	22	22	23	22	22	22	21	21	21	20	20	20	20		
B5. Combination of B1-B4 using one-half standard deviation shocks	13	17	24	24	24	24	25	25	24	24	24	23	23	23	23	23	22		
B6. One-time 30 percent nominal depreciation relative to the baseline in 2015 5/	13	18	19	19	20	20	23	23	23	24	24	24	24	24	24	24	24		
PV of debt-to-exports ratio																			
Baseline	39	40	41	42	41	41	40	40	40	39	39	38	37	37	36	35	34		
A. Alternative Scenarios																			
A1. Key variables at their historical averages in 2014-2034 1/	39	48	57	66	74	82	112	116	120	122	123	123	123	122	121	119	117		
A2. New public sector loans on less favorable terms in 2014-2034 2	39	41	45	48	49	50	56	58	59	60	61	61	62	62	63	63	63		
B. Bound Tests																			
B1. Real GDP growth at historical average minus one standard deviation in 2015-2016	39	39	41	41	41	41	39	39	39	39	38	38	37	36	35	35	34		
B2. Export value growth at historical average minus one standard deviation in 2015-2016 3/	39	53	78	78	76	75	66	64	63	61	59	57	55	53	51	50	48		
B3. US dollar GDP deflator at historical average minus one standard deviation in 2015-2016	39	39	41	41	41	41	39	39	39	39	38	38	37	36	35	35	34		
B4. Net non-debt creating flows at historical average minus one standard deviation in 2015-2016 4/	39	52	67	66	65	63	55	54	52	50	49	47	45	43	42	40	39		
B5. Combination of B1-B4 using one-half standard deviation shocks	39	51	68	68	66	65	57	55	54	52	51	49	47	45	44	42	41		
B6. One-time 30 percent nominal depreciation relative to the baseline in 2015 5/	39	39	41	41	41	41	39	39	39	39	38	38	37	36	35	35	34		
PV of debt-to-revenue ratio																			
Baseline	115	115	108	115	115	116	119	119	118	118	117	115	114	114	113	113	113		
A. Alternative Scenarios																			
A1. Key variables at their historical averages in 2014-2034 1/	115	138	151	182	206	230	333	347	357	364	369	373	375	377	378	379	382		
A2. New public sector loans on less favorable terms in 2014-2034 2	115	119	118	130	136	141	168	172	176	180	183	186	189	193	196	201	204		
B. Bound Tests																			
B1. Real GDP growth at historical average minus one standard deviation in 2015-2016	115	117	113	120	120	121	124	124	123	122	121	120	119	118	117	117	116		
B2. Export value growth at historical average minus one standard deviation in 2015-2016 3/	115	136	164	171	169	166	157	153	149	145	141	137	134	131	128	126	124		
B3. US dollar GDP deflator at historical average minus one standard deviation in 2015-2016	115	128	136	144	145	145	149	149	148	147	146	144	143	142	141	141	140		
B4. Net non-debt creating flows at historical average minus one standard deviation in 2015-2016 4/	115	152	175	182	179	176	164	159	155	150	146	141	138	134	131	128	126		
B5. Combination of B1-B4 using one-half standard deviation shocks	115	152	192	199	197	194	181	177	172	168	163	158	154	150	147	144	142		
B6. One-time 30 percent nominal depreciation relative to the baseline in 2015 5/	115	161	151	160	161	162	166	166	165	164	162	161	159	158	157	157	156		

Table 5. Madagascar: Sensitivity Analysis For Key Indicators of Public and Publicly Guaranteed External Debt, 2014–34 (concluded)

	Projections																
	2014	2015	2016	2017	2018	2019	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Debt service-to-exports ratio																	
Baseline	3	3	3	2	3	2	3	3	3	3	4	4	4	4	4	4	4
A. Alternative Scenarios																	
A1. Key variables at their historical averages in 2014-2034 1/	3	3	3	3	3	3	5	6	6	7	7	7	8	8	8	8	8
A2. New public sector loans on less favorable terms in 2014-2034 2	3	3	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4
B. Bound Tests																	
B1. Real GDP growth at historical average minus one standard deviation in 2015-2016	3	3	3	2	3	2	3	3	3	3	4	4	4	4	4	4	4
B2. Export value growth at historical average minus one standard deviation in 2015-2016 3/	3	3	4	4	4	4	5	5	5	5	6	6	6	5	5	5	5
B3. US dollar GDP deflator at historical average minus one standard deviation in 2015-2016	3	3	3	2	3	2	3	3	3	3	4	4	4	4	4	4	4
B4. Net non-debt creating flows at historical average minus one standard deviation in 2015-2016 4/	3	3	3	3	3	3	4	4	4	5	5	5	5	4	4	4	4
B5. Combination of B1-B4 using one-half standard deviation shocks	3	3	3	3	4	3	4	5	5	5	5	5	5	5	5	4	4
B6. One-time 30 percent nominal depreciation relative to the baseline in 2015 5/	3	3	3	2	3	2	3	3	3	3	4	4	4	4	4	4	4
Debt service-to-revenue ratio																	
Baseline	8	8	7	7	8	7	9	9	10	10	11	11	11	11	11	12	12
A. Alternative Scenarios																	
A1. Key variables at their historical averages in 2014-2034 1/	8	8	8	8	9	9	15	17	18	20	21	22	23	24	24	25	25
A2. New public sector loans on less favorable terms in 2014-2034 2	8	8	7	7	8	8	9	10	11	11	12	12	13	13	14	14	14
B. Bound Tests																	
B1. Real GDP growth at historical average minus one standard deviation in 2015-2016	8	8	8	7	8	7	9	10	10	11	11	12	12	12	12	12	12
B2. Export value growth at historical average minus one standard deviation in 2015-2016 3/	8	8	8	8	9	8	12	12	13	13	13	13	13	13	13	13	13
B3. US dollar GDP deflator at historical average minus one standard deviation in 2015-2016	8	9	9	8	10	9	11	12	13	13	14	14	14	15	15	15	15
B4. Net non-debt creating flows at historical average minus one standard deviation in 2015-2016 4/	8	8	9	9	10	9	13	13	13	14	14	14	14	14	14	14	13
B5. Combination of B1-B4 using one-half standard deviation shocks	8	8	9	10	11	10	14	14	15	15	15	16	16	15	15	15	15
B6. One-time 30 percent nominal depreciation relative to the baseline in 2015 5/	8	11	11	9	11	10	12	13	14	15	15	16	16	16	16	16	16
<i>Memorandum item:</i>																	
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30

Sources: Country authorities; and staff estimates and projections.

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

2/ Assumes that the interest rate on new borrowing is by 2 percentage points higher than in the baseline, while grace and maturity periods are the same as in the baseline.

3/ Exports values are assumed to remain permanently at the lower level, but the current account as a share of GDP is assumed to return to its baseline level after the shock (implicitly assuming an offsetting adjustment in import levels).

4/ Includes official and private transfers and FDI.

5/ Depreciation is defined as percentage decline in dollar/local currency rate, such that it never exceeds 100 percent.

6/ Applies to all stress scenarios except for A2 (less favorable financing) in which the terms on all new financing are as specified in footnote 2.

Table 6. Madagascar: Public Sector Debt Sustainability Framework, Baseline Scenario, 2008–34

(In Percent of GDP, unless otherwise indicated)

	Actual						Average ^{5/}	Standard Deviation ^{5/}	Projections									
	2008	2009	2010	2011	2012	2013			2014	2015	2016	2017	2018	2019	2014-19 Average	2024	2034	2020-34 Average
Public sector debt 1/	31.8	33.4	32.0	32.6	33.8	34.2	45.0	24.4	34.5	34.3	34.2	34.0	34.0	33.9	34.1	35.1	37.4	35.8
<i>of which: foreign-currency denominated</i>	24.5	25.7	24.4	24.3	24.3	22.8	35.7	23.3	24.1	24.3	24.7	25.1	25.6	26.2	25.0	28.5	30.2	29.0
Change in public sector debt	-1.0	1.6	-1.5	0.6	1.2	0.4			0.3	-0.2	-0.1	-0.2	-0.1	-0.1		0.4	0.0	
Identified debt-creating flows	...	3.1	0.5	1.2	0.9	3.1			0.8	-0.6	-1.1	-0.3	-0.1	-0.2		0.4	0.3	
Primary deficit	1.6	2.1	0.0	2.0	2.5	5.3	1.8	1.8	1.7	1.4	0.7	1.4	1.3	1.3	1.3	1.8	1.8	1.7
Revenue and grants	15.5	11.5	13.2	11.7	10.9	10.9	14.9	3.9	14.9	15.0	16.0	15.7	15.9	16.3	15.6	17.5	15.8	16.6
<i>of which: grants</i>	3.4	1.7	1.9	2.0	1.2	1.3	4.1	3.2	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	0.1	2.2
Primary (noninterest) expenditure	17.0	13.6	13.2	13.7	13.4	16.2	16.8	3.5	16.6	16.4	16.7	17.1	17.2	17.5	16.9	19.3	17.6	18.3
Automatic debt dynamics	...	1.0	0.5	-0.8	-1.6	-2.2			-0.9	-2.0	-1.8	-1.7	-1.4	-1.5		-1.5	-1.5	
Contribution from interest rate/growth differential	...	1.5	-0.1	-0.5	-0.8	-0.8			-1.3	-1.6	-1.7	-1.6	-1.4	-1.6		-1.6	-1.6	
<i>of which: contribution from average real interest rate</i>	...	0.3	0.0	-0.1	0.0	0.0			-0.3	-0.3	-0.2	-0.2	0.1	-0.1		-0.1	0.0	
<i>of which: contribution from real GDP growth</i>	-2.2	1.2	0.0	-0.5	-0.8	-0.8			-1.0	-1.3	-1.5	-1.5	-1.5	-1.5		-1.5	-1.6	
Contribution from real exchange rate depreciation	...	-0.5	0.6	-0.3	-0.7	-1.3			0.5	-0.4	-0.1	0.0	0.0	0.1		...	...
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	
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	
Recognition of implicit or contingent liabilities	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	
Reduction of domestic arrears	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, including asset changes	...	-1.5	-2.0	-0.6	0.3	-2.7	-1.3	1.2	-0.5	0.5	1.0	0.1	0.0	0.1	0.2	0.0	-0.3	0.0
Other Sustainability Indicators																		
PV of public sector debt	...	...	...	...	...	23.3			23.1	23.0	22.8	22.7	22.4	22.2		23.0	24.8	
<i>of which: foreign-currency denominated</i>	...	...	...	...	...	11.9			12.8	13.0	13.3	13.7	14.1	14.6		16.4	17.6	
<i>of which: external</i>	...	...	...	...	...	11.9			12.8	13.0	13.3	13.7	14.1	14.6		16.4	17.6	
PV of contingent liabilities (not included in public sector debt)	...	...	...	...	...	...			...	...	...	...	...	...		...	...
Gross financing need 2/	7.0	7.6	5.7	7.8	8.6	12.2	16.7	17.3	9.6	8.7	7.8	8.2	7.9	7.4	8.3	7.2	8.2	7.5
PV of public sector debt-to-revenue and grants ratio (in percent)	...	...	...	...	...	214.5			155.5	153.5	142.8	144.8	140.9	136.8		131.6	156.7	
PV of public sector debt-to-revenue ratio (in percent)	...	...	...	...	...	242.6			207.7	203.3	185.3	189.0	183.0	176.5		166.6	157.7	
<i>of which: external 3/</i>	...	...	...	...	...	123.8			114.7	115.2	107.9	114.5	115.2	115.5		119.1	112.2	
Debt service-to-revenue and grants ratio (in percent) 4/	11.1	17.2	16.2	19.7	21.4	22.7	56.2	80.4	18.2	17.9	16.6	15.8	16.0	14.5	16.5	14.0	20.0	16.5
Debt service-to-revenue ratio (in percent) 4/	14.2	20.1	19.0	23.7	24.1	25.7	93.0	149.3	24.3	23.8	21.5	20.7	20.8	18.8	21.6	17.7	20.1	18.8
Primary deficit that stabilizes the debt-to-GDP ratio	...	...	...	...	...	...	2.5	2.1	1.4	1.6	0.8	1.6	1.3	1.3	1.3	1.4	1.8	1.4
																		0.0
																		0.0
Key macroeconomic and fiscal assumptions																		
Real GDP growth (in percent)	7.2	-3.5	0.1	1.5	2.5	2.4	3.2	3.3	3.0	4.0	4.5	4.5	4.5	4.5	4.2	4.5	4.5	4.5
Average nominal interest rate on forex debt (in percent)	0.0	0.0	1.0	1.3	1.2	1.2	0.5	0.6	1.0	1.1	1.3	0.8	1.8	1.5	1.2	1.8	2.0	1.8
Average real interest rate on domestic debt (in percent)	-0.5	0.3	0.3	1.5	1.0	0.0	1.1	3.3	-1.8	-1.2	0.2	1.2	1.9	1.9	0.4	1.9	1.9	1.9
Real exchange rate depreciation (in percent, + indicates depreciation)	...	-1.8	2.3	-1.2	-3.0	-5.7	-1.9	2.9	2.1	...	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	9.0	7.8	8.6	8.0	6.0	5.8	9.8	3.8	7.4	7.3	5.7	5.3	5.0	5.0	5.9	5.0	5.0	5.0
Growth of real primary spending (deflated by GDP deflator, in percent)	0.0	-0.2	0.0	5.7	-0.2	23.7	2.9	7.5	5.7	2.7	6.5	7.1	5.2	6.5	5.6	6.1	0.9	4.3
Grant element of new external borrowing (in percent)	...	...	...	...	...	...	...	...	43.0	43.5	43.1	43.1	42.6	42.0	42.9	39.0	32.1	36.8

Sources: Country authorities; and staff estimates and projections.

1/ General government gross debt

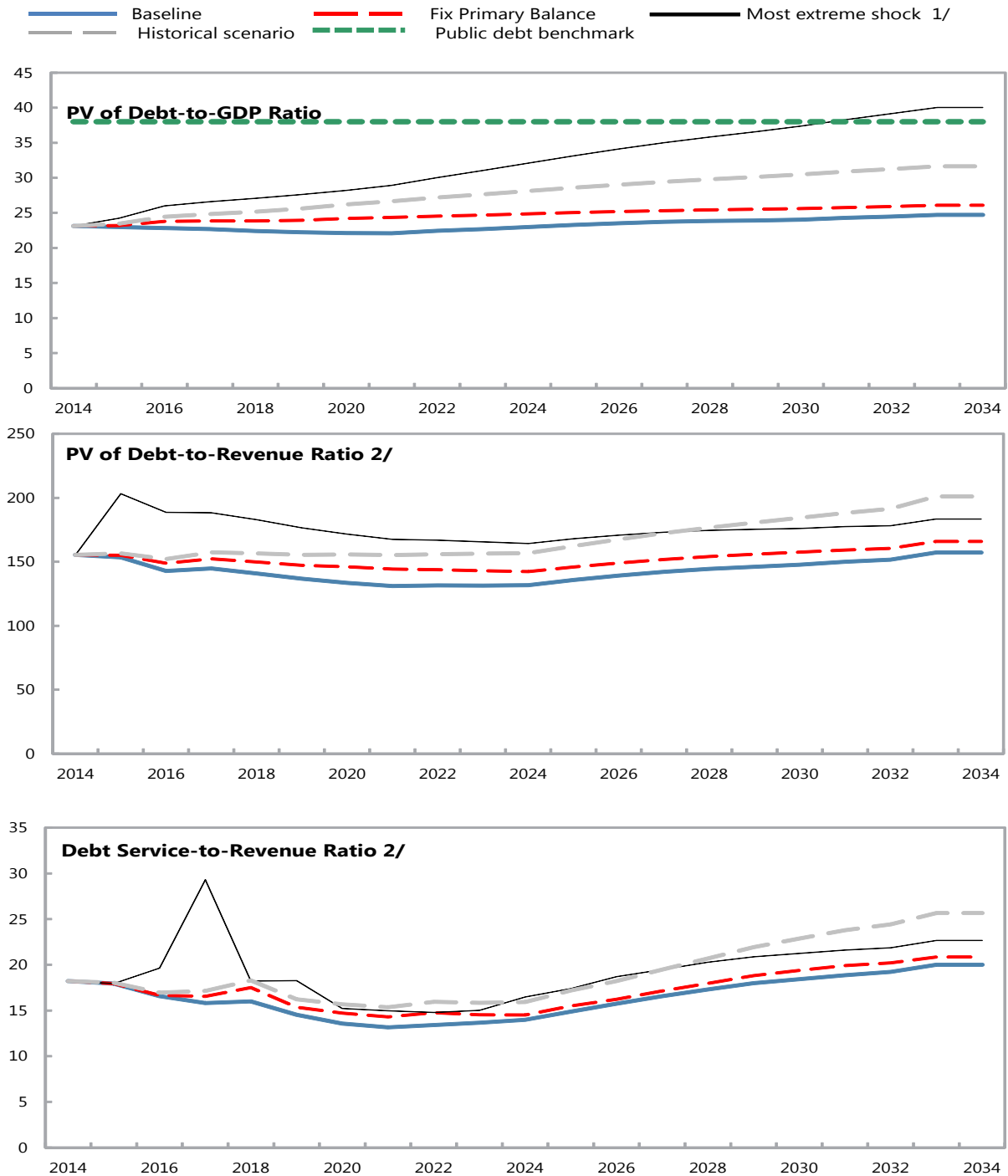
2/ Gross financing need is defined as the primary deficit plus debt service plus the stock of short-term debt at the end of the last period.

3/ Revenues excluding grants.

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

5/ Historical averages and standard deviations are generally derived over the past 10 years, subject to data availability.

Figure 3. Madagascar: Indicators Of Public Debt Under Alternative Scenarios, 2014–34



Sources: Country authorities; and staff estimates and projections.

1/ The most extreme stress test is the test that yields the highest ratio on or before 2024.

2/ Revenues are defined inclusive of grants.

Table 7. Madagascar: Sensitivity Analysis for Key Indicators of Public Debt, 2014–34

	Projections							
	2014	2015	2016	2017	2018	2019	2024	2034
PV of Debt-to-GDP Ratio								
Baseline	23	23	23	23	22	22	23	25
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	23	23	24	25	25	26	28	32
A2. Primary balance is unchanged from 2014	23	23	24	24	24	24	25	26
A3. Permanently lower GDP growth 1/	23	23	23	24	24	24	28	43
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2015-20	23	24	26	27	27	28	32	41
B2. Primary balance is at historical average minus one standard deviations in 2015-201	23	25	27	26	26	26	26	27
B3. Combination of B1-B2 using one half standard deviation shocks	23	24	27	27	27	27	30	35
B4. One-time 30 percent real depreciation in 2015	23	28	27	27	26	25	25	27
B5. 10 percent of GDP increase in other debt-creating flows in 2015	23	30	30	30	29	29	29	29
PV of Debt-to-Revenue Ratio 2/								
Baseline	156	154	143	145	141	137	132	157
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	156	157	152	157	157	155	157	201
A2. Primary balance is unchanged from 2014	156	155	149	152	150	147	142	165
A3. Permanently lower GDP growth 1/	156	155	146	149	148	146	159	270
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2015-20	156	160	159	166	167	166	180	258
B2. Primary balance is at historical average minus one standard deviations in 2015-201	156	165	167	169	163	158	149	170
B3. Combination of B1-B2 using one half standard deviation shocks	156	163	164	169	167	165	169	224
B4. One-time 30 percent real depreciation in 2015	156	188	171	170	162	155	143	169
B5. 10 percent of GDP increase in other debt-creating flows in 2015	156	203	189	188	183	177	164	182
Debt Service-to-Revenue Ratio 2/								
Baseline	18	18	17	16	16	15	14	20
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	18	18	17	17	18	16	16	26
A2. Primary balance is unchanged from 2014	18	18	17	17	18	15	15	21
A3. Permanently lower GDP growth 1/	18	18	17	16	17	15	16	30
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2015-20	18	18	18	18	19	18	18	29
B2. Primary balance is at historical average minus one standard deviations in 2015-201	18	18	17	20	20	16	15	21
B3. Combination of B1-B2 using one half standard deviation shocks	18	18	18	19	20	17	17	26
B4. One-time 30 percent real depreciation in 2015	18	19	19	19	19	18	18	29
B5. 10 percent of GDP increase in other debt-creating flows in 2015	18	18	20	29	18	18	16	23

Sources: Country authorities; and staff estimates and projections.

1/ Assumes that real GDP growth is at baseline minus one standard deviation divided by the square root of the length of the projection period.

2/ Revenues are defined inclusive of grants.