INTERNATIONAL MONETARY FUND
and INTERNATIONAL DEVELOPMENT ASSOCIATION

HAITI

Joint Bank-Fund Staff Debt Sustainability Analysis 2010

Prepared by the Staffs of the International Monetary Fund
and the International Development Association

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The updated DSA was prepared jointly by the Fund and Bank staffs in accordance with the revised Joint Fund-Bank Debt Sustainability Framework (DSF) for low-income countries (LICs). Under the baseline scenario that does not include any debt relief provided or committed by official creditors following the January 2010 catastrophic earthquake, the updated DSA shows that Haiti's risk of debt distress remains high due to the deterioration of the macroeconomic outlook and new borrowing. Although HIPC and MDRI relief have substantially reduced Haiti's debt burden since June 2009, the updated DSA findings indicate that the net present value (NPV) of the debt-to-exports ratio would breach the relevant policy-dependent threshold in the baseline scenario for the medium term.[1] Haiti's weaker near-term macroeconomic outlook following the January 2010 earthquake, a narrow export base, together with new and projected borrowing, are key factors in the risk of debt distress.[2] An alternative scenario shows that delivery of announced debt relief by multilateral and bilateral creditors would improve the debt sustainability outlook. That scenario also stresses the need for new borrowing to remain limited and on highly concessional terms. Staff will continue to closely monitor the evolution of external debt and the government's ability to secure highly concessional financing and mobilize domestic resources.

I. Background

1. **Haiti reached the completion point in June 2009 and qualified for US$1.2 billion in debt relief under the HIPC Initiative and MDRI.** Debt service savings amounted to US$265 million under the HIPC Initiative and US$972.7 million under MDRI. The debt

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[1] Haiti is classified as a weak performer based on its three-year average score of 2.86 on the World Bank's Country Policy and Institutional Assessment (CPIA). For a weak performer (defined as those with three-year average CPIA ratings below 3.25), the indicative thresholds for external debt sustainability are PV of debt-to-GDP ratio of 30 percent, PV of debt-to-exports ratio of 100 percent, PV of debt-to-revenue ratio of 200 percent, debt service-to-exports ratio of 15 percent, and debt service-to-revenue ratio of 25 percent. Haiti is currently classified as in high risk of debt distress.

[2] Country Report No. 09/288, Appendix II, June 16, 2009.

stock in NPV terms was reduced from US$1,320 million at end-September 2008 to US$641 million at end-September 2009.[3] While most relief has been provided, conclusion of bilateral agreements with some Paris Club creditors is still pending.[4] As a result of the debt relief initiatives, Haiti's nominal external public and publicly guaranteed debt stock reached US$1.24 billion at end-September 2009 (about 19 percent of GDP), down from US$1.88 billion at end-September 2008 (Text Table 1). Assuming full delivery of Paris Club debt relief, debt stock at end-September 2009 would stand at US$1.06 billion (16.6 percent of GDP).

2. **Haiti's public debt as of end-September 2009 was estimated at about 24.8 percent of GDP**. Most of the public and publicly guaranteed (PPG) debt is owed to external creditors (about 67 percent), and the rest is domestic debt (equivalent to about 8.2 percent of GDP). The domestic debt corresponds to credit to the government from the central bank (BRH).

Text Table 1. Haiti: Debt Stock as of end-September 2009 and end-March 2010
(In millions of U.S. dollars, unless otherwise specified)

	September 2009 *		March 2010		
	Amount	Share (percent of total)	Amount	Share (percent of total)	Creditors Providing Full Debt Relief (percent of March debt stock excl. IMF)
Multilateral creditors	**676.7**	**54.4**	**828.9**	**56.0**	**45.4**
IBRD/IDA 2/	38.8	3.1	***37.2***	2.5	3.1
IMF	165.6	13.3	273.6	18.5	
IDB 2/	417.5	33.6	***452.5***	30.6	37.5
IFAD 2/	48.3	3.9	***57.8***	3.9	4.8
OPEC	6.6	0.5	7.8	0.5	
Bilateral creditors	**566.5**	**45.6**	**650.9**	**44.0**	**46.6**
Paris Club 1/	***181.6***	***14.6***	***167.0***	**11.3**	13.8
Canada	2.1	0.2	0.0	**0.0**	
France	81.5	6.6	69.2	**4.7**	5.7
Spain	39.7	3.2	39.5	**2.7**	3.3
Italy	58.3	4.7	58.3	**3.9**	4.8
Non-Paris Club	***384.9***	***31.0***	***483.9***	**32.7**	**32.7**
Taiwan, Province of China	89.7	7.2	88.9	6.0	
Venezuela 2/	295.2	23.7	***395.0***	26.7	32.7
Total	**1,243**	**100.0**	**1,480**	**100.0**	**92.0**

Source: Haitian authorities; and IMF staff calculations.
* Haitian fiscal year ending September.
1/ Debt to be cancelled as part of Paris Club agreement in June 2009 but for which some bilateral agreements have yet to be concluded.
2/ Creditors that have announced debt relief initiatives on Haiti's outstanding debt stock.

[3] Haiti's fiscal year ends in September.

[4] Bilateral agreements for Italy, Spain, and France have been prepared and are awaiting signature by the Haitian authorities. Staff will continue to follow up with the authorities on the status of this process.

3. **The level of external PPG debt at end-September 2009 rose by more than previously projected at the time of the Completion Point in June 2009.**[5] In nominal terms, Haiti's debt was expected to reach 13.2 percent of GDP in 2009 under the Completion Point DSA—3 ½ percentage points lower than actual debt stock. The larger-than-expected increase reflects higher bilateral debt between 2008 and 2009 due to new borrowing (on concessional terms) from Venezuela under the PetroCaribe agreement, on which no relief was provided under the HIPC initiative.[6] Haiti's external debt rose to US$1.48 billion at end-March 2010, reflecting the IMF emergency augmentation of January 2010, new IDB borrowing, and further PetroCaribe financing.

4. **Haiti's debt situation is being reassessed in light of the catastrophic damage to the economy.** Damages and losses from the earthquake are estimated at more than 120 percent of 2009 GDP. A multi-year reconstruction and growth strategy has been developed by the Haitian authorities in conjunction with the international community, for which a total of US$9.9 billion have been pledged at the New York Donors' Conference in March 2010. Several creditors have announced their intentions to provide debt relief on Haiti's outstanding debt stocks, as part of a broader initiative to alleviate debt service constraints. These include:

- The **World Bank** provided debt relief on Haiti's outstanding debt of SDR 24.3 million (about US$36 million as of May 21, 2010). Debt relief became effective in May 2010 when the 14 donors to the Debt Relief Trust Fund agreed to allocate the resources needed to cover the debt cancellation.

- The **IDB** would provide US$479 million to cancel Haiti's outstanding debt as of end-December 2009 and convert the undisbursed loans in the existing project portfolio into grants. Debt relief, which was approved in March 2010 by the Board of Governors, will become effective in the near future, as soon as the committed donor financing is available.

- **IFAD** announced in April that it would cancel about US$50.7 million in outstanding debt (in NPV terms) to be delivered in the form of grants against debt service due, on a pay-as-you-go basis.

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[5] The Completion Point DSA prepared in June 2009 is deemed a more reliable comparator in terms of macroeconomic assumptions (Country Report No. 09/288), given that the January DSA Update was based on very uncertain data immediately following the earthquake (Country Report No. 10/35). The January 2010 DSA Update also found Haiti's risk of debt distress to have increased markedly, reflecting both a worsened near-term outlook and new higher borrowing. The updated DSA also reflects a lower discount rate, which increases the PV of debt.

[6] In the Completion Point DSA, resources accumulated under the PetroCaribe agreement (US$104 million) were treated as private debt on the understanding that the binational company (Société Mixte) would be set up in early 2009, in which case financing from PetroCaribe flows would become the debt of the binational company and not of the government. The binational company is yet to be established, and total PetroCaribe flows, including new flows accumulated as of end-FY2009, in the amount of US$295 are now considered part of government debt.

- **Venezuela** officially confirmed it would provide debt relief on Haiti's outstanding debt as of January 25, 2010 in the amount of US$395 million. Modalities for debt relief have yet to be clarified.[7]

- **Taiwan, Province of China,** has offered to pay about US$12 million in interest and to provide a five-year moratorium on principal payments on Haiti's outstanding debt.

5. **In June 2010, the IMF Executive Board approved the establishment of the Post-Catastrophe Debt Relief (PCDR) Trust.** The PCDR is a dedicated instrument to assist countries affected by catastrophic natural disasters like Haiti. Such a mechanism would enable the Fund to provide debt relief to Haiti and would also be available to other low-income countries that are hit by similar catastrophic disasters in the future. Debt relief from the Fund would complement a concerted international effort to cancel Haiti's remaining debt. Official creditors accounting for about 92 percent of Haiti's outstanding debt as of end-March 2010 (excluding the Fund) have already delivered or are firmly committed to providing debt relief on outstanding debt stocks (Text Table 1). If Haiti's eligibility for assistance under the PCDR is approved, debt stock relief could be provided on Haiti's outstanding obligations to the Fund in the amount of SDR 178.13 million.

6. **The current DSA framework includes new borrowing accumulated since the Completion Point in June 2009, as well as projected new borrowing through FY 2015**. In particular, accumulated concessional trade financing from Venezuela under the PetroCaribe agreement of US$295 million is now included. The treatment of this portion of debt follows the same approach as in the January 2010 DSA Update.[8] The framework also incorporates the new airport loan (US$33 million) contracted in December 2009 with the Development Bank of Venezuela (BANDES).[9] In terms of new flows, the framework includes projected ECF disbursements through FY 2013, together with accumulated PetroCaribe flows of US$160 million in FY 2010 and projected future PetroCaribe borrowing in the range of US$230-250 million a year through FY 2015.

II. External Debt Sustainability Outlook, 2010-2030

Baseline Scenario

7. **The baseline macroeconomic framework for the long-term debt sustainability analysis has been revised to take into account recent developments as well as the macroeconomic impact of the 2010 earthquake.** Key macroeconomic assumptions are

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[7] The DSA scenario with debt relief assumes cancellation of US$295 million outstanding as of end-September 2009, plus US$100 million in subsequent (future) flows in 2010.

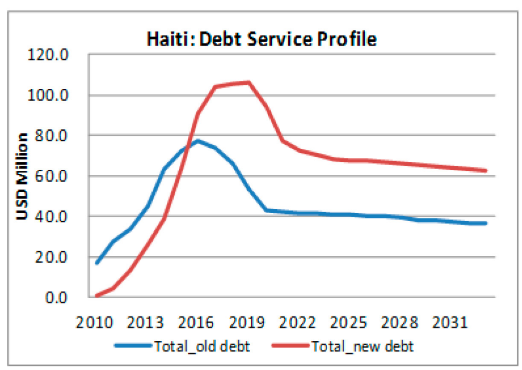
[8] In the January 2010 DSA Update, resources accumulated under the PetroCaribe agreement were considered part of government debt.

[9] The terms of the airport loan from BANDES did not meet the minimum concessionality criteria required under the ECF arrangement and therefore a waiver on the performance criterion on contracting of external non-concessional debt was requested at the time of the Sixth Review under the ECF (Country Report No. 10/14).

summarized in Box 1 and Text Table 2. Long-term assumptions are somewhat more optimistic compared to those used in the completion point DSA. Specifically, long-run growth is now assumed to be slightly higher, reflecting the massive reconstruction effort projected to take place over the medium-term. Government revenues (excluding grants) are also projected to increase, in line with the new ECF's objectives. Exports of goods and services would grow by 10–12 percent a year, but decline in percent of GDP until FY 2013. They would subsequently recover gradually to their pre-earthquake levels and rise to more than 17 percent of GDP by 2030. Imports would surge by more than 60 percent in FY 2011, in line with the reconstruction plan. Imports are expected to remain somewhat elevated in the medium-term and revert to about 35 percent of GDP in 2030.

8. **Given a weaker near-term macroeconomic outlook compared to the Completion Point DSA and higher borrowing, Haiti remains at high risk of debt distress after the earthquake** (Figure 1). Haiti's present value (PV) of external debt relative to exports breaches the indicative threshold until 2022, reaching a peak of 187 percent in 2013 before declining gradually to less than 100 percent in 2022. Despite higher average GDP growth between FY 2011 and FY 2013 compared to the Completion Point, exports (in percent of GDP) are projected to be lower and imports and government expenditure much higher. The PV of the debt-to-revenue ratio is slightly below the relevant policy threshold in 2010 (at 23.5 percent) but declines steadily over the projection period.

9. **Higher borrowing in 2009, and projected continued borrowing under the PetroCaribe arrangement through 2015, substantially raises risks to debt sustainability.** Haiti's debt sustainability outlook has worsened since reaching the HIPC Completion Point in June 2009, mainly due to new bilateral borrowing. Based on the January 2010 DSA Update, accumulated PetroCaribe debt of US$295 million alone raised the PV of external debt by more than 45 percentage points of exports in FY 2010. Although the terms of PetroCaribe financing are highly concessional, the continued accumulation of PetroCaribe borrowing, which is expected to increase by about US$230–250 million a year based on current projections of oil imports, poses a risk to medium-term debt servicing capacity.[10] However, the terms of future PetroCaribe borrowing have yet to be clarified. The possibility of creating a private binational corporation that would use accumulated inflows to finance energy and social projects is still on the table. If and when that happens, future PetroCaribe flows would become private liabilities and no longer add to public debt. On the other hand, at the June 2nd donor summit in the Dominican Republic, Venezuela indicated



[10] Under the PetroCaribe arrangement, financing of oil imports is provided on concessional terms, namely, two-year grace period, 25-year maturity and 1 percent interest. The size of the portion financed is determined based on prevailing oil prices and varies between 30 percent of total shipments for oil prices US$40-50 per barrel to 70 percent for oil prices US$150 and above.

that a large share of future PetroCaribe inflows over the coming years could be converted into grants.

10. **Based on the sensitivity analysis, Haiti's debt situation remains vulnerable to a combination of shocks, but in particular to less favorable export performance.** With the exception of the debt service-to-revenues ratio, the alternative and shock scenarios worsen all of Haiti's debt stock and service indicators. Importantly, the ratios would exceed the relevant thresholds in the case of the PV of debt-to-exports, debt-to-revenue, as well as debt-to-GDP ratios. In the particular case of the PV of the debt-to-exports ratio, Haiti is most vulnerable to a combined shock to growth, exports, and non-debt creating flows. Together, these shocks could push the PV of debt-to-exports ratios up to 400 percent in FY 2012 before declining, although it would remain above the threshold for the projection period.

11. **The prolonged nature of the breach in the baseline scenario precludes a modification of Haiti's risk of debt distress rating using the remittance-based framework**. The revised debt sustainability framework (DSF) for low-income countries approved in August 2009 allows for the effect of remittances in the determination of a country's risk of debt distress. Under the new guidelines, however, taking into consideration remittances can change the risk of debt distress only if breaches to the thresholds under the baseline or stress tests (i.e. before taking into account remittances) are not very protracted. A benchmark for the maximum permissible length of the breach of the thresholds could be 10 years starting from the current year (i.e. about half of the projection period) (SM/10/16). In the case of Haiti, the debt-to-exports ratio is breached until 2022 in the baseline scenario, and all indicators except for the debt service-to-revenues ratio sustain a protracted breach under the stress tests.

Debt Relief Scenario

12. **Delivery of announced debt relief would significantly improve long run debt sustainability** (Figure 2). The debt relief scenario assumes delivery of relief on debt stocks as of end-September 2009 as outlined in paragraph 5 by the World Bank, IDB, IFAD, and PetroCaribe. The scenario also assumes debt relief on outstanding credit to the Fund as of end-January 2010 (i.e. SDR 178.13 million).[11] This would translate into a debt stock relief of about US$965 million in nominal terms as of end-2009. The debt relief scenario maintains the assumption in the baseline regarding the projected accumulation of PetroCaribe borrowing outlined in paragraph 6. Based on these assumptions, all debt indicators remain below the policy relevant threshold in the baseline scenario, with the exception of the debt-to-exports indicator which temporarily breaches the policy relevant threshold between 2014 and 2018.

13. **Debt dynamics would however remain sensitive to external shocks.** Breaches would persist under the most extreme shock scenario (the combination shock) for the three

[11] This includes SDR 105 million outstanding as of end-September 2009 in addition to SDR 73.13 million disbursed in January 2010.

stock indicators: (a) PV of debt-to-GDP; (b) PV of debt-to-exports; and (c) PV of debt-to-revenue. The breach is particularly protracted for the debt-to-exports indicator (peaking to 297 percent in 2012 and remaining above 100 percent until 2027). This highlights Haiti's continued external debt vulnerability, in part stemming from its very narrow export base.

III. Public Debt Sustainability Analysis

14. **In the baseline scenario, public debt indicators remain somewhat unchanged over the projection period** (Figure 3). The PV of public debt-to-GDP remains at about 30 percent throughout the projection period. This stability reflects a decrease in the level of external debt that is offset by an increase in domestic borrowing, which increases from 8 percent of GDP in FY 2010 to 20 percent of GDP by 2030. The PV of the debt-to-revenue ratio rises gradually to about 160 percent by 2016 and remains at that level over the projection period.

15. **Shock scenarios put public debt on a sharper rising trajectory over the projection period.** Public debt indicators are particularly sensitive to growth shocks and to debt-creating flows. Moreover, a combination of a growth shock and lower primary balance would significantly raise the PV of debt-to-GDP and debt-to-revenue ratios well above the baseline scenario.

IV. Debt Management

16. **The earthquake is thought to have severely disrupted existing debt management systems.** The Ministry of Finance building has been damaged. Based on an assessment of the damages, further technical and financial support will be needed to recover data, set up a working computer system, and rehabilitate physical infrastructure.

17. **The earthquake is a major setback, given recent steady progress.** Debt management capacity had improved in Haiti since the decision point was reached in December 2006. In the area of debt recording, the BRH and the MEF had completed the installation of the most recent version of UNCTAD DMFAS system, version 5.3, which allows for improvements in the availability, quality and security of debt data. In part resulting from the upgrade to the latest DMFAS system, debt reporting by the government had also improved.

18. **Prior to the earthquake, satisfactory progress had also been made in establishing the debt unit at the Ministry of Finance**, although the finalization of the draft operations manual, and the legal and institutional framework for debt management did depend on the results of ongoing technical assistance by UNCTAD and CEMLA.

V. Conclusions

19. **Haiti's risk of external debt distress remains high even after HIPC and MDRI debt relief.** The PV of debt-to-exports ratio breaches the 100 percent threshold for a prolonged period, even though other debt indicators remain below their relevant thresholds.

The analysis, however, shows that implementation of debt relief commitments would significantly improve the debt sustainability outlook and contribute to the reconstruction effort, provided donors meet Haiti's large and immediate financing needs through grants and highly concessional loans.

Box 1: Macroeconomic Assumptions

Growth and inflation. After contracting by 8.5 percent in FY 2010 following the devastation of the earthquake, growth is expected to rebound to almost 10 percent in FY 2011, averaging about 7.5 percent a year between FY2011 and FY2015 on the back of significant reconstruction related aid inflows, before reverting to its long-run trend. Long-run growth is projected to be slightly higher than the rate assumed in the Completion Point (CP) DSA (5 percent against 4.5 percent), assuming effective utilization of the surge in aid-inflows and reforms to expand to absorptive capacity of the economy. Inflation is projected to increase to about 8 percent in FY 2011 and FY 2012 on account of increased domestic demand and short-run supply side bottlenecks associated with large reconstruction aid inflows. Inflation is expected to revert to about 6.5 percent starting FY 2014.

Fiscal policy. Revenue, which reached 11 percent of GDP in FY 2009, is projected at about 10 percent of GDP due to severe losses in government administrative and physical capacities. Government revenues are expected to recover gradually, in line with the rebound in economic activity, and to increase to 14 percent of GDP in 2015. Primary spending is projected to peak to about 32 percent of GDP in 2011 and 2012 in line with the surge in reconstruction-based aid inflows before falling to about 22 percent of GDP in the long run. The fiscal deficit is expected to peak at 5 percent of GDP in 2012, and to average 3.4 percent of GDP from 2016 onwards.

Grants and financing. Grants are assumed to peak to about US$1.5 billion per year in FY 2011-12 as reconstruction and economic activity rebound and average about US$1.1 billion per year through FY 2015. It is assumed that Haiti would remain eligible for concessional assistance from IDA and IDB which would cover most of Haiti's external borrowing needs from 2018 onwards. The assumed grant element of new external borrowing is 35 percent. Following the introduction of a Treasury-bill market during 2011, domestic financing will remain capped to maintain medium-term public debt sustainability.

Current account. After contracting by 20 percent in FY 2010 due to damage in textile production capacity and to distribution infrastructure, exports of goods and services are projected to rebound and grow by an average of 12 percent in FY 2011–15 and reach their pre-earthquake value by 2016. Exports are assumed to increase to about 18 percent of GDP by 2030, slightly higher than CP assumption. Imports of goods and services, on the other hand, are projected to surge to about 52 percent of GDP in FY 2011–12 reflecting reconstruction related imports, and to revert to about 37 percent of GDP by 2030. The current account deficit excluding grants in percent of GDP is projected to widen significantly in FY 2010 and FY 2011 to about 29 percent and 24 percent, respectively, before declining to about 13 percent by FY 2015. The current account deficit is expected to be covered largely by grants and is projected to average 3.5 percent of GDP in FY 2013–15 and 4.4 percent through 2030.

Text Table 2. Haiti: Long-Term Macroeconomic Assumptions, FY 2010-2030

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2030	Averages 2010-19	2020-30
							(Annual percentage change)							
National income and prices														
GDP at constant prices	2.9	-8.5	9.8	8.4	6.9	6.2	6.0	5.5	5.2	5.0	5.0	5.0	5.0	5.0
GDP deflator	3.2	8.0	9.7	8.6	7.4	6.5	5.0	5.0	5.0	5.0	5.0	5.0	6.5	5.0
Real GDP per capita (local currency)	1.2	-7.9	5.6	6.7	5.2	4.6	4.9	3.9	3.7	3.5	3.5	3.7	3.4	3.6
Consumer prices (period average)	3.4	5.0	8.7	8.6	7.3	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.9	6.5
External sector (value in USD)														
Exports of goods and non-factor services	12.0	-19.5	11.9	11.8	12.1	14.8	12.3	11.1	11.1	10.8	10.6	10.2	8.7	10.5
Imports of goods and non-factor services	0.4	38.3	4.5	3.4	4.3	3.3	2.8	7.7	7.2	7.0	7.0	7.0	8.5	7.0
Central government (value in Gourdes)														
Total revenue and grants	25.9	34.6	41.0	5.5	7.6	5.7	8.0	6.7	6.6	10.5	10.6	9.9	13.7	9.8
Central government revenue 1/	11.3	-12.1	29.5	34.4	23.5	16.1	16.8	13.7	12.8	12.5	12.4	10.9	15.9	11.2
Central government primary expenditure	30.9	21.3	43.9	10.9	5.3	5.9	6.2	8.6	6.8	9.3	9.3	8.3	12.8	9.3
							(In percent of GDP, unless otherwise indicated)							
National income														
Nominal GDP (Gourdes, billions)	267	264	318	374	429	485	543	601	665	733	808	2,363	468	1,461
Nominal GDP (USD billions)	6.6	6.5	7.7	9.1	10.5	11.8	12.8	13.6	14.6	15.6	16.7	35.3	10.9	24.9
GDP per capita (US dollars)	661	656	740	868	981	1,082	1,157	1,226	1,295	1,366	1,441	2,642	1,003	1,983
External sector														
Non-interest current account deficit 2/, 3/	-4.7	-3.4	-1.8	-3.0	-3.7	-4.1	-4.0	-3.7	-4.8	-5.3	-5.3	-4.0	-3.9	-4.9
Exports of goods and non-factor services	14.2	11.6	11.0	10.3	10.0	10.3	10.6	11.1	11.5	11.9	12.3	17.5	11.3	14.8
Imports of goods and non-factor services	43.9	61.3	54.3	47.1	42.8	39.4	37.3	37.8	37.8	37.8	37.7	37.5	43.9	37.6
External current account balance (excl grants) 1/	-10.6	-28.7	-24.2	-19.6	-16.8	-14.3	-12.4	-10.9	-11.1	-11.2	-10.9	-6.9	-16.0	-9.0
External current account balance (incl grants) 2/	-3.2	-2.1	-3.7	-4.1	-4.1	-3.7	-3.3	-3.5	-4.5	-4.9	-4.9	-3.6	-3.7	-4.4
Liquid gross reserves (in months of imports of G&S	2.8	3.1	2.9	3.0	3.1	3.2	3.5	3.3	3.3	3.2	3.2	2.7	3.2	2.9
Central government														
Central government overall balance (incl grants) 2/	-4.4	-2.9	-3.9	-4.9	-4.2	-4.1	-3.6	-3.8	-3.8	-3.6	-3.4	-2.6	-3.9	-3.1
Total revenue and grants	17.9	24.3	28.5	25.6	24.0	22.4	21.6	20.8	20.1	20.2	20.2	19.3	22.5	19.8
Central government revenue (excl grants) 1/	11.2	10.0	10.7	12.2	13.1	13.5	14.1	14.5	14.8	15.1	15.4	16.9	12.9	16.3
Central government primary expenditure	21.7	26.6	31.8	30.0	27.5	25.7	24.4	24.0	23.2	23.0	22.8	20.7	25.8	21.9

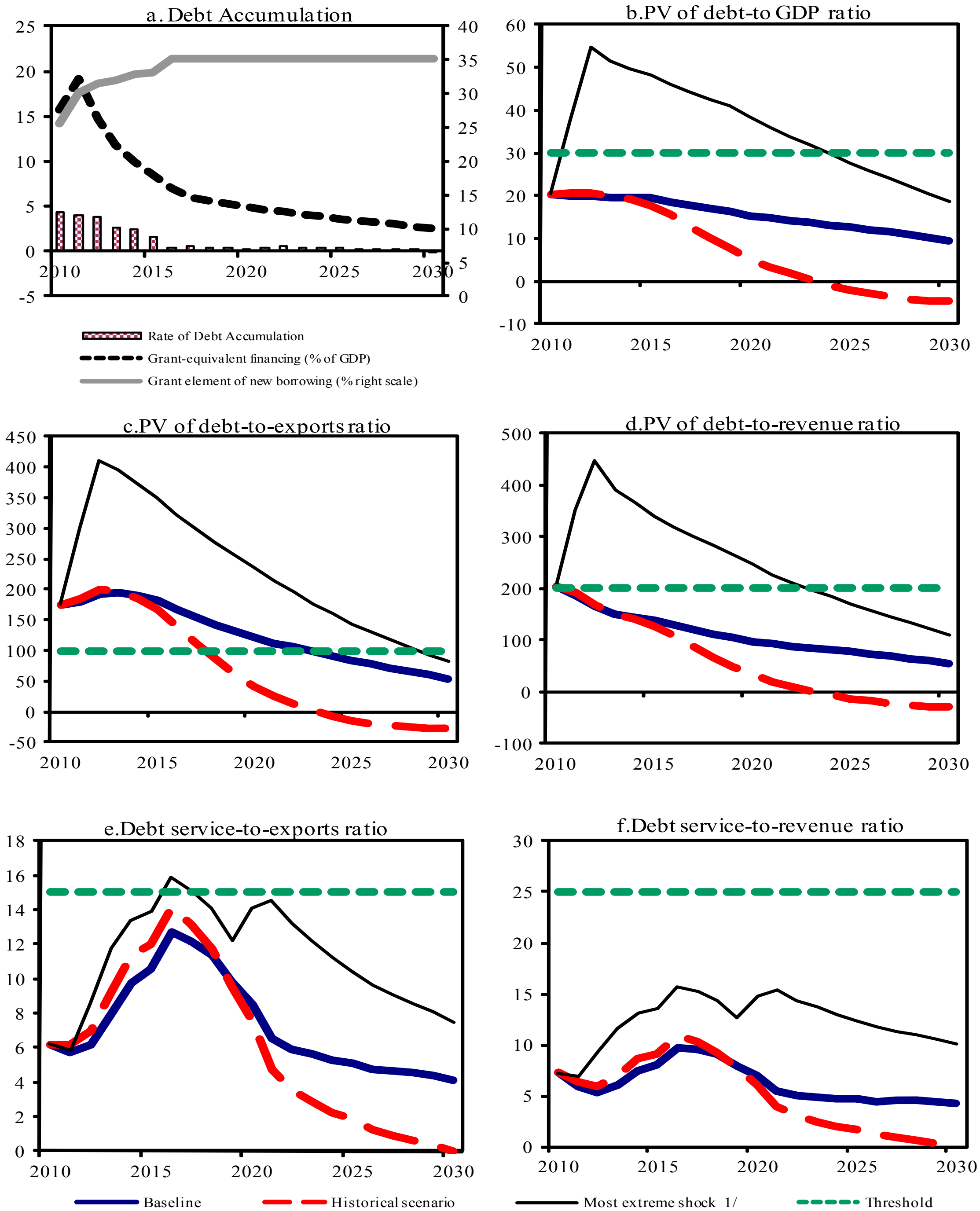
Sources: Country authorities; and staff estimates and projections.

1/ Excluding grants

2/ Including grants

3/ Includes interest earned on foreign exchange reserves.

Figure 1. Haiti: Indicators of Public and Publicly Guaranteed External Debt under Alternatives Scenarios, 2010-2030 1/



Sources: Country authorities; and staff estimates and projections.

1/ The most extreme stress test is the test that yields the highest ratio in 2020. In figure b. it corresponds to a Combination shock; in c. to a Combination shock; in d. to a Combination shock; in e. to a Combination shock and in figure f. to a Combination shock

Table 1a. Haiti: External Debt Sustainability Framework, Baseline Scenario, 2007-2030 1/
(In percent of GDP, unless otherwise indicated)

	Actual			Historical Average	Standard Deviation	Projections																						
	2007	2008	2009			2010	2011	2012	2013	2014	2015	2010-2015 Average	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2016-203 Average
External debt (nominal) 1/	**25.6**	**29.5**	**16.6**			**22.0**	**21.6**	**21.9**	**21.6**	**21.6**	**21.9**		**21.1**	**20.4**	**19.7**	**18.9**	**18.1**	**17.4**	**16.9**	**16.4**	**15.8**	**15.1**	**14.5**	**13.8**	**13.0**	**12.2**	**11.4**	
o/w public and publicly guaranteed (PPG)	25.6	29.5	16.6			22.0	21.6	21.9	21.6	21.6	21.9		21.1	20.4	19.7	18.9	18.1	17.4	16.9	16.4	15.8	15.1	14.5	13.8	13.0	12.2	11.4	
Change in external debt	-2.9	3.9	-12.9			5.4	-0.4	0.3	-0.3	0.0	0.3		-0.8	-0.7	-0.7	-0.7	-0.9	-0.6	-0.5	-0.5	-0.6	-0.6	-0.7	-0.7	-0.8	-0.8	-0.8	
Identified net debt-creating flows	-6.3	1.3	2.7			2.4	0.5	1.5	1.8	1.6	1.2		1.4	2.4	2.8	2.7	2.6	2.5	2.4	2.4	2.2	2.1	1.9	1.7	1.5	1.3	1.0	
Non-interest current account deficit	**0.1**	**4.2**	**3.0**	**1.5**	**1.8**	**1.5**	**3.2**	**3.6**	**3.6**	**3.2**	**2.9**		**3.1**	**4.1**	**4.5**	**4.5**	**4.5**	**4.5**	**4.5**	**4.5**	**4.4**	**4.3**	**4.1**	**4.0**	**3.8**	**3.6**	**3.4**	4.1
Deficit in balance of goods and services	26.3	31.0	29.7			50.0	43.7	37.1	33.1	29.5	27.1		26.7	26.3	25.8	25.4	25.0	24.6	24.2	23.6	23.1	22.6	22.1	21.6	21.0	20.5	20.0	
Exports	13.4	12.7	14.2			11.6	11.0	10.3	10.1	10.4	10.7		11.1	11.5	11.9	12.3	12.7	13.1	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0	17.5	
Imports	39.6	43.7	43.9			61.6	54.7	47.4	43.2	39.8	37.8		37.8	37.8	37.8	37.7	37.7	37.7	37.7	37.7	37.6	37.6	37.6	37.6	37.6	37.5	37.5	
Net current transfers (negative = inflow)	-25.9	-26.3	-26.3	-27.4	2.7	-47.9	-40.1	-32.8	-28.5	-25.1	-23.1		-21.6	-20.8	-20.4	-20.0	-19.6	-19.2	-18.8	-18.4	-18.0	-17.7	-17.3	-17.0	-16.7	-16.5	-16.2	-18.5
o/w official	-6.7	-7.2	-7.4			-26.7	-20.7	-15.7	-12.8	-10.7	-9.2		-7.4	-6.6	-6.4	-6.1	-5.7	-5.4	-5.1	-4.8	-4.6	-4.3	-4.1	-3.9	-3.7	-3.5	-3.4	
Other current account flows (negative = net inflow)	-0.2	-0.5	-0.3			-0.6	-0.4	-0.6	-1.0	-1.1	-1.1		-2.0	-1.4	-1.0	-0.9	-1.0	-0.9	-0.9	-0.7	-0.7	-0.7	-0.6	-0.6	-0.5	-0.5	-0.4	
Net FDI (negative = inflow)	**-1.3**	**-0.5**	**-0.6**	**-0.9**	**1.1**	**-1.1**	**-1.3**	**-1.0**	**-0.9**	**-0.8**	**-0.8**		**-1.0**	**-1.1**	**-1.2**	**-1.3**	**-1.4**	**-1.5**	**-1.6**	**-1.6**	**-1.7**	**-1.7**	**-1.8**	**-1.8**	**-1.9**	**-1.9**	**-2.0**	-1.5
Endogenous debt dynamics 2/	**-5.2**	**-2.5**	**0.2**			**2.0**	**-1.4**	**-1.2**	**-1.0**	**-0.8**	**-0.9**		**-0.7**	**-0.6**	**-0.6**	**-0.6**	**-0.5**	**-0.5**	**-0.5**	**-0.5**	**-0.5**	**-0.5**	**-0.5**	**-0.4**	**-0.4**	**-0.4**	**-0.4**	
Contribution from nominal interest rate	0.1	0.2	0.2			0.6	0.4	0.4	0.4	0.4	0.4		0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	
Contribution from real GDP growth	-0.8	-0.2	-0.9			1.4	-1.8	-1.5	-1.3	-1.2	-1.3		-1.1	-1.0	-1.0	-0.9	-0.9	-0.8	-0.8	-0.8	-0.8	-0.7	-0.7	-0.7	-0.6	-0.6	-0.6	
Contribution from price and exchange rate changes	-4.5	-2.6	0.9			…	…	…	…	…	…		…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	
Residual (3-4) 3/	**3.4**	**2.6**	**-15.6**			**3.0**	**-0.9**	**-1.1**	**-2.1**	**-1.6**	**-0.9**		**-2.2**	**-3.0**	**-3.5**	**-3.4**	**-3.4**	**-3.2**	**-3.0**	**-2.9**	**-2.9**	**-2.7**	**-2.6**	**-2.4**	**-2.3**	**-2.1**	**-1.8**	
o/w exceptional financing	-0.4	-0.3	-15.6			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	0.0	0.0	0.0	0.0	
PV of external debt 4/	...	...	15.5			19.6	18.8	19.1	18.9	18.9	18.8		17.9	17.1	16.4	15.6	14.8	14.3	13.8	13.3	12.8	12.3	11.7	11.1	10.5	9.9	9.2	
In percent of exports	...	...	108.8			169.2	170.0	184.1	187.2	182.7	176.0		161.3	149.0	137.5	126.9	116.7	108.8	102.2	95.1	88.3	81.8	75.7	69.6	63.8	58.0	52.5	
PV of PPG external debt	**...**	**...**	**15.5**			**19.6**	**18.8**	**19.1**	**18.9**	**18.9**	**18.8**		**17.9**	**17.1**	**16.4**	**15.6**	**14.8**	**14.3**	**13.8**	**13.3**	**12.8**	**12.3**	**11.7**	**11.1**	**10.5**	**9.9**	**9.2**	
In percent of exports	**...**	**...**	**108.8**			**169.2**	**170.0**	**184.1**	**187.2**	**182.7**	**176.0**		**161.3**	**149.0**	**137.5**	**126.9**	**116.7**	**108.8**	**102.2**	**95.1**	**88.3**	**81.8**	**75.7**	**69.6**	**63.8**	**58.0**	**52.5**	
In percent of government revenues	**...**	**...**	**138.3**			**197.0**	**175.9**	**156.4**	**143.3**	**139.7**	**133.1**		**124.0**	**116.2**	**108.7**	**101.8**	**94.7**	**89.4**	**86.0**	**82.5**	**78.8**	**75.1**	**71.3**	**67.3**	**63.2**	**58.9**	**54.6**	
Debt service-to-exports ratio (in percent)	**6.8**	**5.8**	**3.7**			**6.2**	**5.7**	**5.9**	**7.6**	**9.5**	**10.3**		**12.5**	**12.0**	**11.2**	**9.7**	**8.4**	**6.5**	**5.8**	**5.6**	**5.2**	**5.0**	**4.6**	**4.6**	**4.4**	**4.3**	**4.1**	
PPG debt service-to-exports ratio (in percent)	**6.8**	**5.8**	**3.7**			**6.2**	**5.7**	**5.9**	**7.6**	**9.5**	**10.3**		**12.5**	**12.0**	**11.2**	**9.7**	**8.4**	**6.5**	**5.8**	**5.6**	**5.2**	**5.0**	**4.6**	**4.6**	**4.4**	**4.3**	**4.1**	
PPG debt service-to-revenue ratio (in percent)	**8.5**	**6.9**	**4.7**			**7.2**	**5.9**	**5.0**	**5.8**	**7.3**	**7.8**		**9.6**	**9.4**	**8.9**	**7.7**	**6.8**	**5.3**	**4.9**	**4.8**	**4.7**	**4.6**	**4.4**	**4.4**	**4.4**	**4.3**	**4.2**	
Total gross financing need (Billions of U.S. dollars)	0.0	0.3	0.2			0.1	0.2	0.3	0.4	0.4	0.4		0.5	0.6	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	
Non-interest current account deficit that stabilizes debt ratio	3.0	0.4	15.9			-3.9	3.6	3.3	4.0	3.2	2.6		3.9	4.7	5.2	5.2	5.3	5.2	5.0	5.1	5.0	4.9	4.8	4.7	4.6	4.4	4.2	
Key macroeconomic assumptions																												
Real GDP growth (in percent)	3.3	0.8	2.9	0.8	2.0	-8.5	9.8	8.4	6.9	6.2	6.0	4.8	5.5	5.2	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.1
GDP deflator in US dollar terms (change in percent)	18.8	11.2	-3.0	9.1	13.9	7.8	6.8	10.0	7.4	5.4	1.9	6.6	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
Effective interest rate (percent) 5/	0.5	1.0	0.7	-0.4	1.4	3.6	2.2	2.0	1.9	2.0	2.0	2.3	2.1	2.0	2.0	2.0	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.7	1.7	1.7	1.7	1.8
Growth of exports of G&S (US dollar terms, in percent)	12.1	6.5	12.0	11.5	4.4	-19.6	11.6	11.8	12.1	14.8	12.2	7.2	11.6	11.1	10.8	10.6	10.5	10.4	10.3	11.0	10.9	10.7	10.6	10.5	10.4	10.3	10.2	10.7
Growth of imports of G&S (US dollar terms, in percent)	8.7	23.6	0.4	13.0	7.7	38.2	4.2	3.3	4.5	3.3	3.1	9.4	7.5	7.2	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Grant element of new public sector borrowing (in percent)	...	...	...	...	...	25.6	30.3	31.5	31.6	32.8	33.0	30.8	35.2	34.5	34.3	34.1	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.0
Government revenues (excluding grants, in percent of GDP)	10.6	10.7	11.2			10.0	10.7	12.2	13.2	13.5	14.2		14.5	14.8	15.1	15.4	15.7	16.0	16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	16.0
Aid flows (in Billions of US dollars) 7/	0.3	0.3	0.4			0.9	1.4	1.3	1.2	1.1	1.0		1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	
o/w Grants	0.3	0.3	0.4			0.9	1.4	1.2	1.1	1.0	1.0		0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	
o/w Concessional loans	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Grant-equivalent financing (in percent of GDP) 8/	...	...	...			15.7	19.2	14.8	11.8	9.9	8.5		7.0	6.0	5.6	5.3	4.9	4.7	4.4	4.1	3.9	3.6	3.4	3.2	3.0	2.8	2.6	4.3
Grant-equivalent financing (in percent of external financing) 8/	...	...	...			80.9	87.6	84.3	85.7	83.6	82.3		86.5	83.8	84.4	85.4	87.4	86.9	85.8	85.7	86.2	86.4	86.6	87.3	87.4	88.5	88.9	86.5
Memorandum items:																												
Nominal GDP (Billions of US dollars)	5.9	6.6	6.6			6.5	7.6	9.0	10.4	11.6	12.6		13.6	14.6	15.6	16.7	17.9	19.1	20.5	21.9	23.4	25.1	26.9	28.8	30.8	32.9	35.3	
Nominal dollar GDP growth	22.8	12.2	-0.2			-1.4	17.3	19.2	14.8	12.0	8.6	11.7	7.6	7.3	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.1
PV of PPG external debt (in Billions of US dollars)			1.0			1.2	1.4	1.7	2.0	2.2	2.4		2.4	2.5	2.6	2.6	2.7	2.7	2.8	2.9	3.0	3.1	3.2	3.2	3.3	3.3	3.3	
(PVt-PVt-1)/GDPt-1 (in percent)						3.6	3.2	3.9	2.7	2.3	1.5	2.9	0.4	0.5	0.4	0.4	0.3	0.4	0.5	0.5	0.4	0.3	0.3	0.2	0.1	0.0	0.0	0.3
Gross remittances (Billions of US dollars)	1.1	1.3	1.2			1.4	1.5	1.6	1.6	1.7	1.8		1.9	2.0	2.1	2.3	2.4	2.5	2.6	2.8	2.9	3.1	3.3	3.4	3.6	3.8	4.0	
PV of PPG external debt (in percent of GDP + remittances)	...	...	13.0			16.2	15.7	16.3	16.4	16.5	16.5		15.7	15.0	14.4	13.8	13.1	12.6	12.2	11.8	11.4	10.9	10.5	10.0	9.4	8.8	8.3	
PV of PPG external debt (in percent of exports + remittances)	...	...	46.7			59.7	61.7	69.3	73.5	76.3	75.2		71.0	67.4	63.8	60.4	56.9	54.3	52.2	49.8	47.4	44.9	42.4	39.9	37.3	34.5	31.9	
Debt service of PPG external debt (in percent of exports + remitt	...	...	1.6			2.2	2.1	2.2	3.0	4.0	4.4		5.5	5.4	5.2	4.6	4.1	3.2	3.0	2.9	2.8	2.7	2.6	2.6	2.6	2.5	2.5	

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)]/(1+g+ρ+gρ) 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/ Assumes that PV of private sector debt is equivalent to its face value.

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

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

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

8/ 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).

Table 1b. Haiti: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2010-2030
(In percent)

	Projections																				
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	**2020**	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
PV of debt-to GDP ratio																					
Baseline	20	19	19	19	19	19	18	17	16	16	**15**	14	14	13	13	12	12	11	11	10	9
A. Alternative Scenarios																					
A1. Key variables at their historical averages in 2010-2030 1/	20	19	20	19	18	17	15	12	9	7	**4**	3	1	0	-2	-3	-3	-4	-5	-5	-5
A2. New public sector loans on less favorable terms in 2010-2030 2	20	20	21	21	22	22	21	21	21	20	**19**	19	19	18	18	18	17	16	16	15	14
B. Bound Tests																					
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	20	21	23	23	23	23	22	21	20	19	**18**	18	17	16	16	15	14	14	13	12	11
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	20	19	20	20	20	20	19	18	17	16	**15**	15	14	14	13	13	12	11	11	10	9
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	20	21	25	25	25	25	23	22	21	20	**19**	19	18	17	17	16	15	15	14	13	12
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	20	30	35	33	32	32	30	29	28	27	**25**	24	22	21	20	18	17	16	15	14	13
B5. Combination of B1-B4 using one-half standard deviation shocks	20	36	53	51	49	47	45	44	42	40	**38**	35	33	31	29	27	25	24	22	20	18
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	20	26	27	26	26	26	25	24	23	22	**21**	20	19	19	18	17	16	16	15	14	13
PV of debt-to-exports ratio																					
Baseline	169	170	184	187	183	176	161	149	137	127	**117**	109	102	95	88	82	76	70	64	58	53
A. Alternative Scenarios																					
A1. Key variables at their historical averages in 2010-2030 1/	169	174	189	187	174	157	131	104	77	55	**35**	20	8	-2	-11	-17	-22	-26	-28	-29	-29
A2. New public sector loans on less favorable terms in 2010-2030 2	169	179	201	209	209	206	193	183	173	163	**153**	145	139	131	124	117	110	103	96	89	83
B. Bound Tests																					
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	169	171	185	188	184	177	162	150	138	128	**117**	109	103	96	89	82	76	70	64	58	53
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	169	181	210	212	207	199	182	168	156	144	**132**	123	115	107	99	92	85	78	71	65	59
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	169	171	185	188	184	177	162	150	138	128	**117**	109	103	96	89	82	76	70	64	58	53
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	169	273	340	331	312	295	272	252	233	217	**198**	180	165	150	136	123	112	101	90	81	72
B5. Combination of B1-B4 using one-half standard deviation shocks	169	290	401	388	364	344	317	293	272	253	**231**	210	191	173	157	141	127	114	102	91	81
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	169	171	185	188	184	177	162	150	138	128	**117**	109	103	96	89	82	76	70	64	58	53
PV of debt-to-revenue ratio																					
Baseline	197	176	156	143	140	133	124	116	109	102	**95**	89	86	83	79	75	71	67	63	59	55
A. Alternative Scenarios																					
A1. Key variables at their historical averages in 2010-2030 1/	197	180	161	143	133	119	101	81	61	44	**28**	16	7	-2	-10	-16	-21	-25	-28	-29	-30
A2. New public sector loans on less favorable terms in 2010-2030 2	197	185	171	160	160	156	149	143	137	131	**124**	119	117	114	111	107	104	99	95	91	86
B. Bound Tests																					
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	197	197	192	176	171	163	152	143	134	125	**116**	110	106	101	97	92	88	83	78	72	67
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	197	180	164	150	145	138	129	121	113	106	**99**	93	89	85	81	77	73	69	65	60	56
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	197	199	204	186	182	173	161	151	142	132	**123**	116	112	107	103	98	93	88	82	77	71
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	197	283	289	253	239	223	209	196	185	174	**160**	148	139	130	121	113	105	97	90	82	75
B5. Combination of B1-B4 using one-half standard deviation shocks	197	338	439	383	359	335	314	295	278	261	**242**	222	208	194	180	167	155	143	131	119	108
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	197	246	219	200	195	186	173	162	152	142	**132**	125	120	115	110	105	100	94	88	82	76

Table 1b. Haiti: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2010-2030 (continued)

(In percent)

											Debt service-to-exports ratio										
Baseline	6	6	6	8	9	10	12	12	11	10	**8**	6	6	6	5	5	5	5	4	4	4
A. Alternative Scenarios																					
A1. Key variables at their historical averages in 2010-2030 1/	6	6	7	9	11	12	14	13	12	9	**7**	5	3	3	2	2	1	1	0	0	0
A2. New public sector loans on less favorable terms in 2010-2030 2	6	6	6	8	11	13	12	13	12	11	**10**	9	9	8	7	7	6	6	6	6	5
B. Bound Tests																					
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	6	6	6	8	9	10	12	12	11	10	**8**	6	6	6	5	5	5	5	4	4	4
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	6	6	6	8	10	11	14	13	12	11	**9**	7	7	6	6	6	5	5	5	5	5
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	6	6	6	8	9	10	12	12	11	10	**8**	6	6	6	5	5	5	5	4	4	4
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	6	6	8	10	12	12	14	14	13	11	**13**	12	11	10	9	9	8	8	7	7	6
B5. Combination of B1-B4 using one-half standard deviation shocks	6	6	8	12	13	14	16	15	14	12	**14**	14	13	12	11	10	10	9	8	8	7
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	6	6	6	8	9	10	12	12	11	10	**8**	6	6	6	5	5	5	5	4	4	4
											Debt service-to-revenue ratio										
Baseline	7	6	5	6	7	8	10	9	9	8	**7**	5	5	5	5	5	4	4	4	4	4
A. Alternative Scenarios																					
A1. Key variables at their historical averages in 2010-2030 1/	7	6	6	7	8	9	11	10	9	7	**6**	4	3	2	2	2	1	1	0	0	0
A2. New public sector loans on less favorable terms in 2010-2030 2	7	6	5	6	8	10	10	10	9	9	**8**	8	7	7	7	6	6	6	6	6	5
B. Bound Tests																					
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	7	7	6	7	9	10	12	11	11	9	**8**	6	6	6	6	6	5	5	5	5	5
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	7	6	5	6	7	8	10	9	9	8	**7**	6	5	5	5	5	5	5	5	4	4
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	7	7	6	7	9	10	12	12	11	10	**9**	7	6	6	6	6	6	6	6	6	5
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	7	6	7	8	9	9	11	11	10	9	**10**	10	9	9	8	8	8	7	7	7	7
B5. Combination of B1-B4 using one-half standard deviation shocks	7	7	9	11	13	13	15	15	14	12	**15**	15	14	14	13	12	12	11	11	10	10
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	7	8	7	8	10	11	13	13	12	11	**9**	7	7	7	6	6	6	6	6	6	6
Memorandum item:																					
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	33	33	33	33	33	33	33	33	33	33	**33**	33	33	33	33	33	33	33	33	33	33

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.

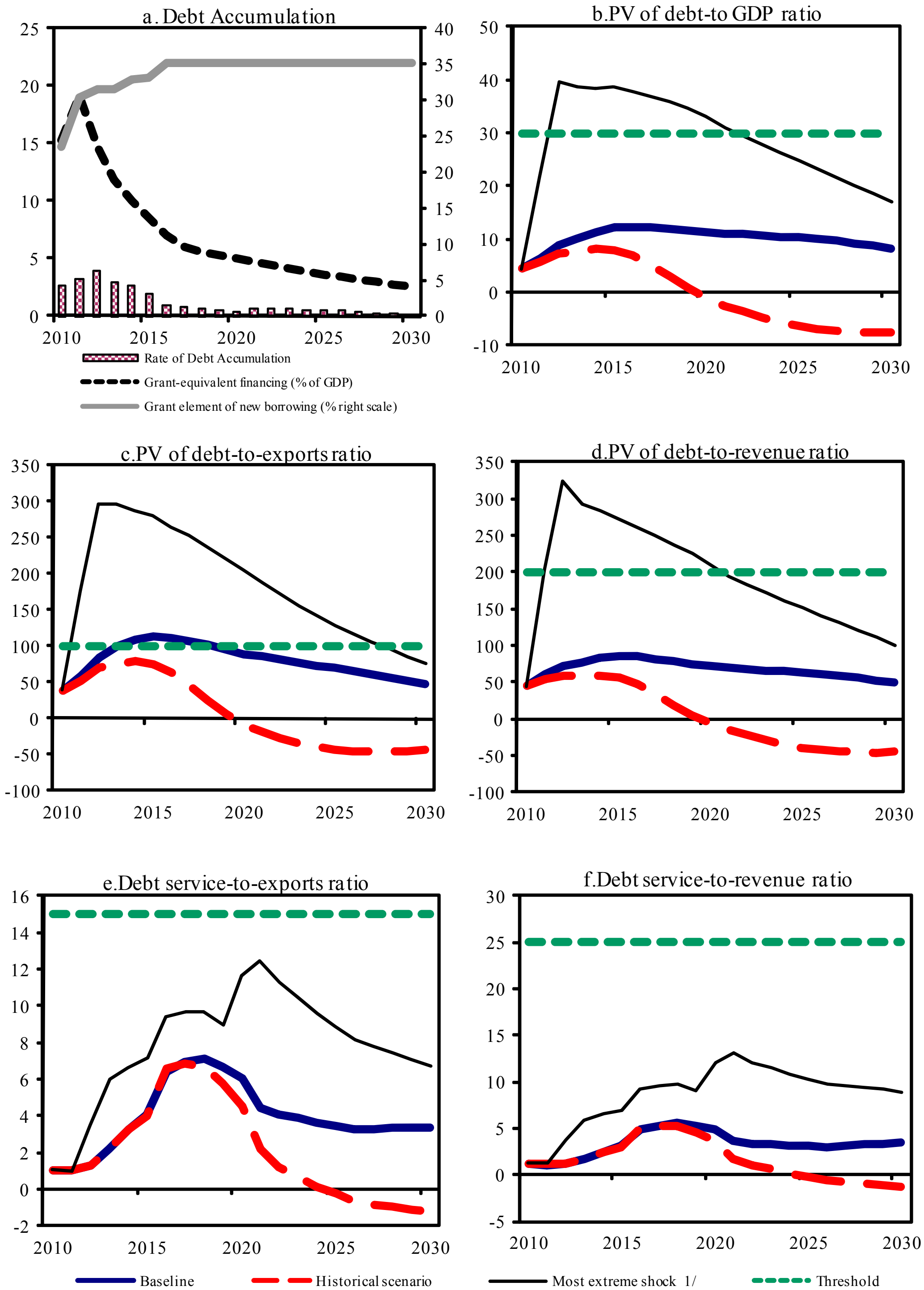
3/ Exports values are assumed to remain permanently at the lower level, but the current account as a share of GDP is assumed to return to its baseline level after the shock (implicitly assuming an offsetting adjustment in import levels).

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.

Figure 2. Haiti--Debt Relief Scenario: Indicators of Public and Publicly Guaranteed External Debt under Alternatives Scenarios, 2010-2030 1/



Sources: Country authorities; and staff estimates and projections.

1/ The most extreme stress test is the test that yields the highest ratio in 2020. In figure b. it corresponds to a Combination shock; in c. to a Combination shock; in d. to a Combination shock; in e. to a Combination shock and in figure f. to a Combination shock

Table 2a. Haiti--Debt Relief Scenario: External Debt Sustainability Framework, Baseline Scenario, 2007-2030 1/
(In percent of GDP, unless otherwise indicated)

	Actual			Historical Average	Standard Deviation	Projections																						
	2007	2008	2009			2010	2011	2012	2013	2014	2015	2010-2015 Average	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2016-203 Average
External debt (nominal) 1/	**25.6**	**29.5**	**16.6**			**5.1**	**8.0**	**10.7**	**12.1**	**13.5**	**15.0**		**15.1**	**15.1**	**15.0**	**14.7**	**14.3**	**14.1**	**13.9**	**13.8**	**13.5**	**13.2**	**12.8**	**12.4**	**11.9**	**11.2**	**10.6**	
o/w public and publicly guaranteed (PPG)	25.6	29.5	16.6			5.1	8.0	10.7	12.1	13.5	15.0		15.1	15.1	15.0	14.7	14.3	14.1	13.9	13.8	13.5	13.2	12.8	12.4	11.9	11.2	10.6	
Change in external debt	-2.9	3.9	-12.9			-11.5	2.9	2.7	1.4	1.4	1.4		0.1	0.1	-0.1	-0.3	-0.4	-0.2	-0.1	-0.2	-0.3	-0.3	-0.4	-0.5	-0.5	-0.6	-0.7	
Identified net debt-creating flows	-6.3	1.3	2.7			2.3	1.8	2.3	2.3	2.0	1.6		1.8	2.8	3.2	3.1	3.0	2.9	2.8	2.7	2.6	2.4	2.2	2.0	1.8	1.5	1.3	
Non-interest current account deficit	**0.1**	**4.2**	**3.0**	**1.5**	**1.8**	**1.9**	**3.4**	**3.8**	**3.8**	**3.3**	**3.0**		**3.3**	**4.4**	**4.8**	**4.8**	**4.8**	**4.8**	**4.8**	**4.8**	**4.7**	**4.5**	**4.4**	**4.2**	**4.0**	**3.8**	**3.6**	4.4
Deficit in balance of goods and services	26.3	31.0	29.7			50.0	43.7	37.1	33.1	29.5	27.1		26.8	26.5	26.0	25.6	25.2	24.8	24.4	23.8	23.3	22.8	22.3	21.8	21.2	20.7	20.2	
Exports	13.4	12.7	14.2			11.6	11.0	10.3	10.1	10.4	10.7		11.0	11.3	11.7	12.1	12.5	12.9	13.3	13.8	14.3	14.8	15.3	15.8	16.3	16.8	17.3	
Imports	39.6	43.7	43.9			61.6	54.7	47.4	43.2	39.8	37.8		37.8	37.8	37.8	37.7	37.7	37.7	37.7	37.7	37.6	37.6	37.6	37.6	37.6	37.5	37.5	
Net current transfers (negative = inflow)	-25.9	-26.3	-26.3	-27.4	2.7	-47.9	-40.1	-32.8	-28.5	-25.1	-23.1		-21.6	-20.8	-20.4	-20.0	-19.6	-19.2	-18.8	-18.4	-18.0	-17.7	-17.3	-17.0	-16.7	-16.5	-16.2	-18.5
o/w official	-6.7	-7.2	-7.4			-26.7	-20.7	-15.7	-12.8	-10.7	-9.2		-7.4	-6.6	-6.4	-6.1	-5.7	-5.4	-5.1	-4.8	-4.6	-4.3	-4.1	-3.9	-3.7	-3.5	-3.4	
Other current account flows (negative = net inflow)	-0.2	-0.5	-0.3			-0.2	-0.2	-0.4	-0.8	-1.0	-1.0		-1.9	-1.3	-0.8	-0.8	-0.8	-0.8	-0.8	-0.7	-0.7	-0.6	-0.6	-0.6	-0.5	-0.5	-0.4	
Net FDI (negative = inflow)	**-1.3**	**-0.5**	**-0.6**	**-0.9**	**1.1**	**-1.1**	**-1.3**	**-1.0**	**-0.9**	**-0.8**	**-0.8**		**-1.0**	**-1.1**	**-1.2**	**-1.3**	**-1.4**	**-1.5**	**-1.6**	**-1.6**	**-1.7**	**-1.7**	**-1.8**	**-1.8**	**-1.9**	**-1.9**	**-2.0**	-1.5
Endogenous debt dynamics 2/	**-5.2**	**-2.5**	**0.2**			**1.5**	**-0.4**	**-0.5**	**-0.5**	**-0.5**	**-0.6**		**-0.5**	**-0.5**	**-0.5**	**-0.5**	**-0.5**	**-0.5**	**-0.4**	**-0.4**	**-0.4**	**-0.4**	**-0.4**	**-0.4**	**-0.4**	**-0.4**	**-0.4**	
Contribution from nominal interest rate	0.1	0.2	0.2			0.1	0.1	0.1	0.1	0.2	0.2		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
Contribution from real GDP growth	-0.8	-0.2	-0.9			1.4	-0.4	-0.6	-0.6	-0.7	-0.8		-0.8	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.5	
Contribution from price and exchange rate changes	-4.5	-2.6	0.9			…	…	…	…	…	…		…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	
Residual (3-4) 3/	**3.4**	**2.6**	**-15.6**			**-13.7**	**1.1**	**0.4**	**-0.9**	**-0.6**	**-0.1**		**-1.6**	**-2.7**	**-3.3**	**-3.4**	**-3.4**	**-3.1**	**-2.9**	**-2.9**	**-2.8**	**-2.7**	**-2.5**	**-2.4**	**-2.3**	**-2.1**	**-1.9**	
o/w exceptional financing	-0.4	-0.3	-15.6			-13.7	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	0.0	0.0	0.0	
PV of external debt 4/	...	...	1.8			4.5	6.4	8.7	10.1	11.4	12.3		12.2	12.2	11.9	11.6	11.2	11.0	10.9	10.8	10.6	10.3	10.1	9.7	9.3	8.8	8.3	
In percent of exports	...	...	12.3			38.9	58.1	84.3	99.9	109.8	114.7		111.2	107.5	101.9	95.8	89.7	85.4	82.0	77.9	73.7	69.7	65.7	61.4	57.1	52.6	48.2	
PV of PPG external debt	**...**	**...**	**1.8**			**4.5**	**6.4**	**8.7**	**10.1**	**11.4**	**12.3**		**12.2**	**12.2**	**11.9**	**11.6**	**11.2**	**11.0**	**10.9**	**10.8**	**10.6**	**10.3**	**10.1**	**9.7**	**9.3**	**8.8**	**8.3**	
In percent of exports	**...**	**...**	**12.3**			**38.9**	**58.1**	**84.3**	**99.9**	**109.8**	**114.7**		**111.2**	**107.5**	**101.9**	**95.8**	**89.7**	**85.4**	**82.0**	**77.9**	**73.7**	**69.7**	**65.7**	**61.4**	**57.1**	**52.6**	**48.2**	
In percent of government revenues	**...**	**...**	**15.7**			**45.2**	**60.2**	**71.6**	**76.5**	**84.0**	**86.8**		**84.7**	**82.4**	**79.2**	**75.5**	**71.7**	**69.1**	**67.9**	**66.6**	**64.9**	**63.1**	**61.1**	**58.7**	**55.9**	**52.8**	**49.5**	
Debt service-to-exports ratio (in percent)	**6.8**	**5.8**	**3.7**			**1.1**	**1.0**	**1.3**	**2.2**	**3.3**	**4.1**		**6.5**	**7.0**	**7.1**	**6.6**	**6.0**	**4.5**	**4.0**	**3.9**	**3.6**	**3.4**	**3.3**	**3.3**	**3.4**	**3.4**	**3.3**	
PPG debt service-to-exports ratio (in percent)	**6.8**	**5.8**	**3.7**			**1.1**	**1.0**	**1.3**	**2.2**	**3.3**	**4.1**		**6.5**	**7.0**	**7.1**	**6.6**	**6.0**	**4.5**	**4.0**	**3.9**	**3.6**	**3.4**	**3.3**	**3.3**	**3.4**	**3.4**	**3.3**	
PPG debt service-to-revenue ratio (in percent)	**8.5**	**6.9**	**4.7**			**1.3**	**1.0**	**1.1**	**1.7**	**2.5**	**3.1**		**4.9**	**5.3**	**5.5**	**5.2**	**4.8**	**3.6**	**3.4**	**3.3**	**3.2**	**3.1**	**3.0**	**3.2**	**3.3**	**3.4**	**3.4**	
Total gross financing need (Billions of U.S. dollars)	0.0	0.3	0.2			0.1	0.2	0.3	0.3	0.3	0.3		0.4	0.6	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
Non-interest current account deficit that stabilizes debt ratio	3.0	0.4	15.9			13.4	0.5	1.1	2.3	1.9	1.6		3.1	4.3	5.0	5.1	5.2	5.0	4.9	5.0	4.9	4.8	4.7	4.7	4.6	4.4	4.2	
Key macroeconomic assumptions																												
Real GDP growth (in percent)	3.3	0.8	2.9	0.8	2.0	-8.5	9.8	8.4	6.9	6.2	6.0	4.8	5.5	5.2	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.1
GDP deflator in US dollar terms (change in percent)	18.8	11.2	-3.0	9.1	13.9	7.8	6.8	10.0	7.4	5.4	1.9	6.6	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
Effective interest rate (percent) 5/	0.5	1.0	0.7	-0.4	1.4	0.4	1.4	1.3	1.5	1.7	1.7	1.3	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.5	1.5	1.5	1.5	1.6
Growth of exports of G&S (US dollar terms, in percent)	12.1	6.5	12.0	11.5	4.4	-19.6	11.6	11.8	12.1	14.8	12.2	7.2	10.6	10.2	10.8	10.7	10.6	10.5	10.4	11.1	10.9	10.8	10.7	10.5	10.4	10.3	10.2	10.6
Growth of imports of G&S (US dollar terms, in percent)	8.7	23.6	0.4	13.0	7.7	38.2	4.2	3.3	4.5	3.3	3.1	9.4	7.5	7.2	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Grant element of new public sector borrowing (in percent)	...	...	...	...	...	23.5	30.3	31.5	31.6	32.8	33.0	30.5	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2
Government revenues (excluding grants, in percent of GDP)	10.6	10.7	11.2			10.0	10.7	12.2	13.2	13.5	14.2		14.5	14.8	15.1	15.4	15.7	16.0	16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	16.0
Aid flows (in Billions of US dollars) 7/	0.3	0.3	0.4			0.9	1.4	1.3	1.2	1.1	1.0		1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	
o/w Grants	0.3	0.3	0.4			0.9	1.4	1.2	1.1	1.0	1.0		0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	
o/w Concessional loans	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Grant-equivalent financing (in percent of GDP) 8/	...	...	...			15.3	19.2	14.8	11.8	9.9	8.5		7.0	5.9	5.6	5.3	4.9	4.7	4.4	4.1	3.9	3.6	3.4	3.2	3.0	2.8	2.6	4.3
Grant-equivalent financing (in percent of external financing) 8/	...	...	...			85.2	87.6	84.3	85.7	83.6	82.3		86.5	84.6	85.5	86.7	87.4	86.9	85.8	85.7	86.2	86.4	86.6	87.3	87.4	88.5	88.9	86.7
Memorandum items:																												
Nominal GDP (Billions of US dollars)	5.9	6.6	6.6			6.5	7.6	9.0	10.4	11.6	12.6		13.6	14.6	15.6	16.7	17.9	19.1	20.5	21.9	23.4	25.1	26.9	28.8	30.8	32.9	35.3	
Nominal dollar GDP growth	22.8	12.2	-0.2			-1.4	17.3	19.2	14.8	12.0	8.6	11.7	7.6	7.3	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.1
PV of PPG external debt (in Billions of US dollars)			0.1			0.3	0.5	0.8	1.1	1.3	1.6		1.7	1.8	1.9	1.9	2.0	2.1	2.2	2.4	2.5	2.6	2.7	2.8	2.9	2.9	3.0	
(PVt-PVt-1)/GDPt-1 (in percent)						2.6	3.2	4.0	2.9	2.7	2.0	2.9	0.9	0.8	0.6	0.5	0.4	0.6	0.6	0.6	0.5	0.5	0.4	0.3	0.3	0.2	0.1	0.5
Gross remittances (Billions of US dollars)	1.1	1.3	1.2			1.4	1.5	1.6	1.6	1.7	1.8		1.9	2.0	2.1	2.3	2.4	2.5	2.6	2.8	2.9	3.1	3.3	3.4	3.6	3.8	4.0	
PV of PPG external debt (in percent of GDP + remittances)	...	...	1.5			3.7	5.4	7.4	8.7	9.9	10.7		10.7	10.7	10.5	10.2	9.9	9.7	9.7	9.5	9.4	9.2	9.0	8.7	8.3	7.9	7.5	
PV of PPG external debt (in percent of exports + remittances)	...	...	5.3			13.7	21.1	31.7	39.2	45.8	49.0		48.7	48.1	46.9	45.2	43.4	42.3	41.5	40.5	39.3	38.0	36.6	35.0	33.2	31.2	29.1	
Debt service of PPG external debt (in percent of exports + remitta	...	...	1.6			0.4	0.4	0.5	0.9	1.4	1.7		2.8	3.1	3.3	3.1	2.9	2.2	2.1	2.0	1.9	1.9	1.8	1.9	2.0	2.0	2.0	

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)]/(1+g+ρ+gρ) 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/ Assumes that PV of private sector debt is equivalent to its face value.

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

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

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

8/ 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).

Table 2b.Haiti--Debt Relief Scenario: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2010-2030
(In percent)

	Projections																				
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	**2020**	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
											PV of debt-to GDP ratio										
Baseline	5	6	9	10	11	12	12	12	12	12	**11**	11	11	11	11	10	10	10	9	9	8
A. Alternative Scenarios																					
A1. Key variables at their historical averages in 2010-2030 1/	5	6	7	8	8	8	7	5	3	1	**-1**	-2	-4	-5	-6	-6	-7	-7	-8	-8	-8
A2. New public sector loans on less favorable terms in 2010-2030 2	5	7	10	12	14	16	16	16	16	16	**16**	16	16	16	16	15	15	15	15	14	14
B. Bound Tests																					
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	5	7	11	12	14	15	15	15	15	14	**14**	14	13	13	13	13	12	12	11	11	10
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	5	7	10	11	12	13	13	13	13	12	**12**	12	11	11	11	11	10	10	10	9	9
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	5	7	11	13	15	16	16	16	16	15	**15**	14	14	14	14	13	13	13	12	12	11
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	5	18	25	25	25	25	25	24	23	23	**22**	20	19	18	17	17	16	15	14	13	12
B5. Combination of B1-B4 using one-half standard deviation shocks	5	22	40	39	38	39	38	37	36	35	**33**	31	29	28	26	25	23	22	20	19	17
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	5	9	12	14	16	17	17	17	17	16	**16**	15	15	15	15	14	14	14	13	12	12
											PV of debt-to-exports ratio										
Baseline	39	58	84	100	110	115	111	108	102	96	**90**	85	82	78	74	70	66	61	57	53	48
A. Alternative Scenarios																					
A1. Key variables at their historical averages in 2010-2030 1/	39	52	70	76	78	75	63	45	25	7	**-8**	-19	-27	-34	-39	-43	-45	-46	-46	-45	-44
A2. New public sector loans on less favorable terms in 2010-2030 2	39	67	101	122	136	145	143	142	138	132	**126**	122	118	114	109	105	100	95	89	84	78
B. Bound Tests																					
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	39	59	85	100	110	115	112	108	102	96	**90**	86	82	78	74	70	66	62	57	53	48
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	39	64	101	117	127	132	128	123	117	110	**103**	97	93	88	83	79	74	69	64	59	54
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	39	59	85	100	110	115	112	108	102	96	**90**	86	82	78	74	70	66	62	57	53	48
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	39	161	240	243	239	234	223	212	199	187	**172**	158	146	133	122	112	102	93	84	76	68
B5. Combination of B1-B4 using one-half standard deviation shocks	39	175	297	297	288	280	266	253	237	222	**205**	187	172	156	142	129	118	106	96	86	77
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	39	59	85	100	110	115	112	108	102	96	**90**	86	82	78	74	70	66	62	57	53	48
											PV of debt-to-revenue ratio										
Baseline	45	60	72	76	84	87	85	82	79	76	**72**	69	68	67	65	63	61	59	56	53	49
A. Alternative Scenarios																					
A1. Key variables at their historical averages in 2010-2030 1/	45	54	59	58	60	57	48	34	19	5	**-7**	-16	-23	-29	-34	-39	-42	-44	-45	-45	-45
A2. New public sector loans on less favorable terms in 2010-2030 2	45	69	86	93	104	110	109	109	107	104	**101**	99	98	97	96	95	93	90	88	84	81
B. Bound Tests																					
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	45	67	88	94	103	107	104	101	97	93	**88**	85	83	82	80	77	75	72	69	65	61
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	45	63	79	82	89	92	89	87	83	80	**75**	73	71	69	67	65	63	61	58	54	51
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	45	68	93	100	109	113	110	107	103	98	**93**	90	88	87	85	82	80	76	73	69	64
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	45	166	204	186	183	177	169	162	155	147	**137**	128	121	114	107	101	95	89	82	76	69
B5. Combination of B1-B4 using one-half standard deviation shocks	45	204	325	293	284	273	261	250	238	226	**211**	195	183	172	161	151	141	131	121	111	101
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	45	84	100	107	117	121	118	115	111	106	**100**	97	95	93	91	88	85	82	78	74	69

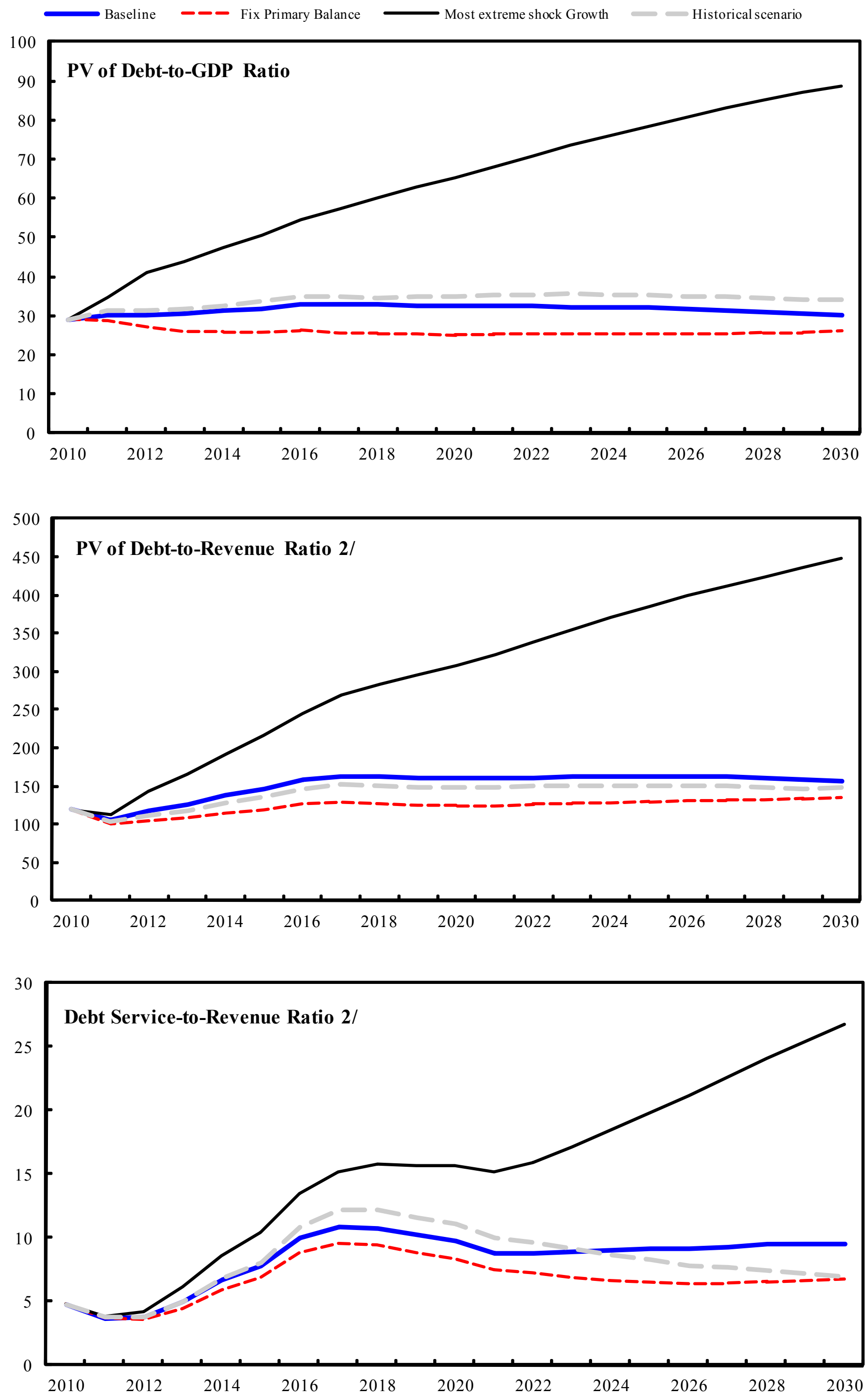
Table 2b.Haiti--Debt Relief Scenario: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2010-2030 (continued)
(In percent)

	Debt service-to-exports ratio																				
Baseline	1	1	1	2	3	4	6	7	7	7	**6**	4	4	4	4	3	3	3	3	3	3
A. Alternative Scenarios																					
A1. Key variables at their historical averages in 2010-2030 1/	1	1	1	2	3	4	7	7	7	6	**5**	2	1	1	0	0	-1	-1	-1	-1	-1
A2. New public sector loans on less favorable terms in 2010-2030 2	1	1	2	3	4	7	7	9	8	9	**8**	8	7	7	6	6	6	5	5	5	5
B. Bound Tests																					
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	1	1	1	2	3	4	6	7	7	7	**6**	4	4	4	4	3	3	3	3	3	3
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	1	1	2	3	4	5	7	8	8	7	**7**	5	5	5	4	4	4	4	4	4	4
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	1	1	1	2	3	4	6	7	7	7	**6**	4	4	4	4	3	3	3	3	3	3
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	1	1	3	5	6	6	8	9	9	8	**10**	10	9	9	8	7	7	7	6	6	6
B5. Combination of B1-B4 using one-half standard deviation shocks	1	1	3	6	7	7	9	10	10	9	**12**	12	11	11	10	9	8	8	7	7	7
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	1	1	1	2	3	4	6	7	7	7	**6**	4	4	4	4	3	3	3	3	3	3
	Debt service-to-revenue ratio																				
Baseline	1	1	1	2	3	3	5	5	6	5	**5**	4	3	3	3	3	3	3	3	3	3
A. Alternative Scenarios																					
A1. Key variables at their historical averages in 2010-2030 1/	1	1	1	2	2	3	5	5	5	5	**4**	2	1	1	0	0	-1	-1	-1	-1	-1
A2. New public sector loans on less favorable terms in 2010-2030 2	1	1	1	2	3	5	6	7	6	7	**7**	6	6	6	6	5	5	5	5	5	5
B. Bound Tests																					
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	1	1	1	2	3	4	6	7	7	6	**6**	4	4	4	4	4	4	4	4	4	4
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	1	1	1	2	3	3	5	5	6	5	**5**	4	4	4	3	3	3	3	3	4	4
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	1	1	1	2	3	4	6	7	7	7	**6**	5	4	4	4	4	4	4	4	4	4
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	1	1	3	4	4	5	6	7	7	6	**8**	8	8	7	7	7	6	6	6	6	6
B5. Combination of B1-B4 using one-half standard deviation shocks	1	1	4	6	7	7	9	10	10	9	**12**	13	12	12	11	10	10	10	9	9	9
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	1	1	2	2	3	4	7	7	8	7	**7**	5	5	5	4	4	4	4	5	5	5
Memorandum item:																					
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	33	33	33	33	33	33	33	33	33	33	**33**	33	33	33	33	33	33	33	33	33	33

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.

Figure 3. Haiti: Indicators of Public Debt Under Alternative Scenarios, 2010-2030 1/



Sources: Country authorities; and staff estimates and projections.
1/ The most extreme stress test is the test that yields the highest ratio in 2020.
2/ Revenues are defined inclusive of grants.

Table 3a.Haiti: Public Sector Debt Sustainability Framework, Baseline Scenario, 2007-2030
(In percent of GDP, unless otherwise indicated)

	Actual			Average	Standard Deviation	Estimate	Projections								
	2007	2008	2009			2010	2011	2012	2013	2014	2015	2010-15 Average	2020	2030	2016-30 Average
Public sector debt 1/	34.9	37.7	24.8			30.7	31.7	32.3	32.4	33.2	34.2		35.1	32.1	
o/w foreign-currency denominated	25.6	29.5	16.6			22.0	21.6	21.9	21.6	21.6	21.9		18.1	11.4	
Change in public sector debt	-4.4	2.7	-12.9			5.9	1.0	0.5	0.2	0.8	1.0		-0.3	-0.6	
Identified debt-creating flows	-5.9	0.8	3.5			3.4	-1.6	0.0	0.0	0.6	0.8		0.5	-0.2	
Primary deficit	-1.1	2.5	3.8	1.9	1.6	1.9	3.1	4.3	3.4	3.3	2.8	3.1	2.0	1.2	2.0
Revenue and grants	15.8	15.1	17.9			24.4	28.7	25.7	24.1	22.5	21.8		20.2	19.3	
of which: grants	5.3	4.4	6.7			14.5	18.0	13.5	10.9	9.0	7.6		4.6	2.4	
Primary (noninterest) expenditure	14.7	17.6	21.7			26.3	31.8	29.9	27.5	25.8	24.5		22.2	20.5	
Automatic debt dynamics	-4.7	-1.7	-0.3			1.5	-4.7	-4.3	-3.4	-2.7	-2.0		-1.5	-1.4	
Contribution from interest rate/growth differential	-1.8	1.9	-1.0			2.6	-2.9	-2.8	-2.3	-2.0	-1.9		-1.5	-1.7	
of which: contribution from average real interest rate	-0.5	2.2	0.0			0.3	-0.1	-0.4	-0.3	-0.1	0.1		0.2	-0.2	
of which: contribution from real GDP growth	-1.3	-0.3	-1.1			2.3	-2.7	-2.5	-2.1	-1.9	-2.0		-1.7	-1.6	
Contribution from real exchange rate depreciation	-2.9	-3.6	0.7			-1.1	-1.8	-1.4	-1.1	-0.7	0.0		...	...	
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	
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 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	
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 (specify, 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	
Residual, including asset changes	1.5	1.9	-16.4			2.4	2.6	0.6	0.2	0.1	0.2		-0.7	-0.4	
Other Sustainability Indicators															
PV of public sector debt	9.4	8.2	23.7			28.3	28.9	29.4	29.7	30.5	31.2		31.8	30.0	
o/w foreign-currency denominated	0.0	0.0	15.5			19.6	18.8	19.1	18.9	18.9	18.8		14.8	9.2	
o/w external	...	...	15.5			19.6	18.8	19.1	18.9	18.9	18.8		14.8	9.2	
PV of contingent liabilities (not included in public sector debt)	...	...	...			...	...	...	...	...	...		...	...	
Gross financing need 2/	10.3	11.7	12.5			11.4	11.4	13.8	13.6	14.4	14.8		18.8	21.7	
PV of public sector debt-to-revenue and grants ratio (in percent)	59.0	54.4	132.5			116.0	100.6	114.5	123.3	135.5	143.1		157.5	155.4	
PV of public sector debt-to-revenue ratio (in percent)	88.3	76.8	211.6			284.5	270.6	241.3	225.4	225.4	220.1		203.3	177.8	
o/w external 3/	…	…	138.3			197.0	175.9	156.4	143.3	139.7	133.1		94.7	54.6	
Debt service-to-revenue and grants ratio (in percent) 4/	10.6	7.1	5.4			4.8	3.6	3.6	4.9	6.6	7.7		9.7	9.5	
Debt service-to-revenue ratio (in percent) 4/	15.8	10.1	8.5			11.8	9.8	7.6	8.9	11.0	11.9		12.5	10.8	
Primary deficit that stabilizes the debt-to-GDP ratio	3.2	-0.2	16.7			-4.0	2.0	3.7	3.2	2.5	1.7		2.3	1.8	
Key macroeconomic and fiscal assumptions															
Real GDP growth (in percent)	3.3	0.8	2.9	0.8	2.0	-8.5	9.8	8.4	6.9	6.2	6.0	4.8	5.0	5.0	5.1
Average nominal interest rate on forex debt (in percent)	0.5	1.0	0.7	-0.4	1.4	3.6	2.2	2.0	1.9	2.0	2.0	2.3	1.9	1.7	1.8
Average real interest rate on domestic debt (in percent)	0.7	-8.5	2.3	-8.9	7.9	-2.4	-3.6	-4.5	-2.7	-1.1	0.5	-2.3	1.0	1.0	1.0
Real exchange rate depreciation (in percent, + indicates depreciation)	-10.9	-12.6	2.6	-7.0	13.8	-5.9	...	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	7.2	13.8	3.2	15.0	8.1	8.0	9.7	8.6	7.4	6.5	5.0	7.5	5.0	5.0	5.0
Growth of real primary spending (deflated by GDP deflator, in percent)	0.0	0.2	0.3	0.1	0.2	0.1	0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Grant element of new external borrowing (in percent)	...	...	...	…	…	25.6	30.3	31.5	31.6	32.8	33.0	30.8	35.2	35.2	...

Sources: Country authorities; and staff estimates and projections.
1/ Includes gross external debt of or guaranteed by the central government and central bank, and gross domestic debt of the central government.
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.

Table 3b. Haiti: Sensitivity Analysis for Key Indicators of Public Debt 2010-2030

	Projections							
	2010	2011	2012	2013	2014	2015	2020	2030
PV of Debt-to-GDP Ratio								
Baseline	28	29	29	30	31	31	32	30
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	28	30	30	30	31	32	34	33
A2. Primary balance is unchanged from 2010	28	28	26	25	25	25	24	26
A3. Permanently lower GDP growth 1/	28	29	30	30	32	33	36	45
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2011-2012	28	33	40	43	46	50	65	88
B2. Primary balance is at historical average minus one standard deviations in 2011-2012	28	29	29	29	30	31	32	30
B3. Combination of B1-B2 using one half standard deviation shocks	28	31	32	35	39	43	57	78
B4. One-time 30 percent real depreciation in 2011	28	35	35	35	35	35	36	35
B5. 10 percent of GDP increase in other debt-creating flows in 2011	28	39	38	38	38	38	38	35
PV of Debt-to-Revenue Ratio 2/								
Baseline	116	101	114	123	135	143	157	155
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	116	99	107	114	123	131	143	142
A2. Primary balance is unchanged from 2010	116	97	102	105	111	115	121	133
A3. Permanently lower GDP growth 1/	116	101	115	125	139	149	178	232
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2011-2012	116	108	139	161	189	212	305	446
B2. Primary balance is at historical average minus one standard deviations in 2011-2012	116	102	113	122	134	142	157	155
B3. Combination of B1-B2 using one half standard deviation shocks	116	102	114	135	161	183	268	397
B4. One-time 30 percent real depreciation in 2011	116	124	136	144	155	162	178	181
B5. 10 percent of GDP increase in other debt-creating flows in 2011	116	135	149	156	168	175	187	179
Debt Service-to-Revenue Ratio 2/								
Baseline	5	4	4	5	7	8	10	9
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	5	4	4	5	7	8	11	7
A2. Primary balance is unchanged from 2010	5	4	3	4	6	7	8	7
A3. Permanently lower GDP growth 1/	5	4	4	5	7	8	10	13
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2011-2012	5	4	4	6	8	10	16	27
B2. Primary balance is at historical average minus one standard deviations in 2011-2012	5	4	4	5	7	8	10	9
B3. Combination of B1-B2 using one half standard deviation shocks	5	4	4	5	7	9	14	23
B4. One-time 30 percent real depreciation in 2011	5	4	5	6	8	10	12	13
B5. 10 percent of GDP increase in other debt-creating flows in 2011	5	4	5	6	8	9	11	12

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.