**IMMEDIATE
ATTENTION**

SM/10/308
Supplement 2

December 3, 2010

To: Members of the Executive Board

From: The Acting Secretary

Subject: **Democratic Republic of Timor-Leste—Staff Report for the 2010 Article IV
            Consultation—Debt Sustainability Analysis**

The attached debt sustainability analysis for the Democratic Republic of Timor-Leste, prepared
jointly by the staffs of the Fund and the World Bank, is being issued as a supplement to the staff
report for the 2010 Article IV consultation with the Democratic Republic of Timor-Leste
(SM/10/308, 12/3/10), which is being considered on a lapse of time basis. Unless an objection
from the authorities of the Democratic Republic of Timor-Leste is received prior to the
conclusion of the Board's consideration, the document will be published. Any requests for
modifications for publication are expected to be received two days before the Board concludes
its consideration.

Questions may be referred to Mr. Schule (ext. 34563), Ms. Sun (ext. 35371), and Mr. Ochirkhuu
(ext. 37662) in APD.

Unless the Documents Section (ext. 36760) is otherwise notified, the document will be
transmitted, in accordance with the procedures approved by the Executive Board and with the
appropriate deletions, to the Asian Development Bank, following its consideration by the
Executive Board.

This document will shortly be posted on the extranet, a secure website for Executive
Directors and member country authorities.

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INTERNATIONAL DEVELOPMENT ASSOCIATION AND
INTERNATIONAL MONETARY FUND

DEMOCRATIC REPUBLIC OF TIMOR-LESTE

Joint World Bank/IMF 2010 Debt Sustainability Analysis

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

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December 3, 2010

The medium-term fiscal path for Timor-Leste is subject to uncertainties regarding spending commitments and income prospects from petroleum, which complicates the Debt Sustainability Analysis (DSA). The baseline macroeconomic scenario assumes a significant scaling-up of public spending, future petroleum income only from fields with approved development plans, and a moderate borrowing envelope. Under this scenario, the external low income country DSA indicates a low risk of debt distress. The public DSA suggests that overall public sector debt dynamics are sustainable in light of a gradual approach of moderate borrowing and substantial savings in the PF.

I. INTRODUCTION

1. **A young nation with a high incidence of poverty, Timor-Leste has been heavily dependent on petroleum resources since the start of offshore production in 2004.** Proven reserves or production levels stand out in comparison to the non-oil economy. However, they neither make Timor-Leste a major petroleum exporter in the world nor a rich country in per capita income terms. By 2009, petroleum revenue accounted for almost 80 percent of GNI and withdrawals from the Petroleum Fund for about 95 percent of total government revenue (including grants). The Petroleum Fund (PF), established in 2005, is the cornerstone of petroleum resource management and its assets reached $6.5 billion or ten times the non-oil GDP in August 2010, which are invested entirely abroad.

2. **The first joint DSA for Timor-Leste is conducted amid the authorities' quest for double-digit non-oil GDP growth in the next two decades by scaling up public investment.** Currently, Timor-Leste has no public or external debt and withdrawals from the PF have been financing non-oil fiscal deficits. But the government is contemplating external borrowing, as a way to substitute withdrawals from the PF, to meet pressing development needs. Loans from development partners may come with technical assistance, which would be instrumental in strengthening the country's policy and institutional capacity, and in

particular play an instrumental role for the government's planned complex infrastructure investments. At present, Timor-Leste has a weak Country Policy and Institutional Assessment (CPIA) performance rating, corresponding to the lowest set of indicative debt thresholds.

3.   **The authorities' agreed broadly with the DSA assessment.** Given PF resources, there is no immediate financial need for borrowing. However, the authorities see moderate and gradual borrowing as a way to access technical assistance from development partners in particular to address capacity constraints in the appraisal, selection, and implementation of infrastructure projects. The authorities also see borrowing as a way to diversify sources of financing and help build debt management capacity from scratch.

II.   UNDERLYING DSA ASSUMPTIONS

4.   **The first decade of Timor-Leste's independence saw a significant rise in national income, accompanied by large volatility associated with petroleum income.** Thanks to petroleum income, real GNI grew at an annual average of 27 percent, but ranged from a contraction of 25 percent in 2009 to an expansion of over 50 percent each in 2007–08. Non-oil GDP expanded over the decade at an annual average rate of 5 percent with large volatility (standard deviation of 8), reflecting Timor-Leste's post-conflict status.

5.   **The DSA takes account of both the non-oil economy and income from petroleum**. Currently GDP does not include petroleum production that takes place in the joint production area between Timor-Leste and Australia. However, based on Timor-Leste's very small non-oil economy alone, any meaningful borrowing would be unsustainable. Therefore, to reflect the special feature of the economy, the following adjustments are made in measuring Timor-Leste's repayment capacity: (i) GNI is used to capture the size of the wider economy;[1] (ii) wider exports cover exports of non-oil goods and services plus oil-related income, including oil exports (recorded as oil income in the balance of payments) and the PF investment income net of interest payments abroad; and (iii) total public sector revenue equals non-oil revenue plus estimated sustainable income (ESI) from petroleum (Box 1). In essence, Timor-Leste's borrowing capacity depends crucially on petroleum exports, the accumulation of PF assets, and growth of the non-oil economy.

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[1] GNI consists of non-oil GDP and total net income from abroad as recorded in the balance of payments. Unless otherwise indicated, GDP throughout the paper (including tables and charts) refers to GNI.

BOX 1. THE ESTIMATED SUSTAINABLE INCOME

- The Petroleum Fund (PF) Law defines the estimated sustainable income (ESI) as 3 percent of Timor-Leste's total petroleum wealth, including the current PF balance plus the net present value of future petroleum receipts.

- Rather than a rigid fiscal ceiling, the ESI is a benchmark to guide budget withdrawals from the PF and inform policy discussions. Actual withdrawals can exceed the ESI as long as the government delivers a detailed explanation to parliament why doing so is in the long-run interest of country.

- The ESI is calculated every year based on a set of assumptions on petroleum output and prices. The PF Law requires prudent assumptions to be used, as 70 percent of Timor-Leste's oil wealth remains under the sea and there is no diversification across multiple projects.

- Only projects with an approved development plan and firm investment commitment (i.e., the Bayu Undan and Kitan fields) have been included in the ESI calculation. The Greater Sunrise field has been declared a commercial discovery, but does not have an approved development plan, and therefore according to current policy should not be included in ESI. Further, its exclusion appears justified given the material uncertainties surrounding the technical and commercial configuration of the project and the potential for significant delays. However, Sunrise is a confirmed petroleum resource and its exclusion from ESI arguably puts some strain on the credibility of the policy.

- Nevertheless, the Ministry of Finance should begin evaluating its potential effect on petroleum wealth and fiscal financing. Perceived petroleum wealth from Sunrise is already informing wider thinking in government and civil society about sustainable spending levels, and quantification of the potential revenue flows would help to inform and guide that discussion. In particular, this exercise would allow the authorities to manage expectations and encourage a more realistic assessment of the potential addition to petroleum wealth from Sunrise.

- Until 2010, the oil price used for ESI calculation has been the "low" case from the U.S. Energy Information Administration (EIA) Annual Energy Outlook. To address the concern within the government that the low case lies materially below market and other respected forecasters expected prices, the authorities recently explored other alternative methodologies for determining a price forecast more reflective of expectations but still prudent. It came to a conclusion of using the average of the EIA low and reference cases, which balances between being realistic and prudent. For 2011, the average price generates an ESI of $734 million compared to $548 million under the EIA low case price.

6.   **The DSA is based on the macroeconomic framework discussed with the authorities during the 2010 Article IV Consultations** (Box 2). The baseline takes account of the authorities' current policy intentions, which include a significant and front-loaded scaling-up of public investment during the next decade. Financing of the scaling-up is to come from higher withdrawals from the PF, some of which can be substituted by external borrowing. It was also assumed that no new petroleum fields come on stream, such as the Greater Sunrise field, which has a promising potential, but its development plans are currently under negotiation.

Box 2. Baseline Macroeconomic and Petroleum Sector Assumptions (2011–30)

Real sector: real non-oil GDP is projected to grow at close to 9 percent on average over the medium term before gradually reverting to its potential of 6 percent in the long run, slightly above the historical average of 5 percent during 2002–09. Due to a lapse of one-off factors, such as the agricultural rebound from the 2007 drought, as well as bad weather in 2010, staff projects non-oil GDP growth to decelerate from an annual average rate of 11 percent during 2007–09 to about 6–7 percent in 2010–11. Medium-term projections reflect staff's assessment that Timor-Leste's weak policy and institutional capacity will undermine the effectiveness of significant front-loaded public investment scaling-up. As a result, medium-term growth is projected at a rate lower than that being contemplated by the authorities. Given the economy's limited absorptive capacity, inflation is expected to remain high at 6 percent throughout the medium-term before declining gradually to 4 percent in the long run.

Fiscal sector: tax revenue is projected to stay broadly stable at 7½–8½ percent of non-oil GDP. Reflecting front-loaded scaling-up, capital expenditure rises from an average of 33 percent of non-oil GDP in 2009–10 to an average of 54 percent during 2011–15 before declining gradually to 20 percent in the long-run. Despite the government's plans to keep non-capital spending growth in line with inflation growth, staff projects current expenditure to average at 68 percent of non-oil GDP during 2011–15 before declining gradually to about 30 percent by 2030. Unlike the authorities, staff projections include recurrent cost associated with large public investment. Consequently, staff expects the non-oil fiscal deficit to rise from 92 percent of non-oil GDP in 2009 to an average of 105 percent during 2010–15 before declining to 34 percent in 2030. Financing of prolonged large non-oil deficits will require withdrawals from the PF consistently above the ESI.

Petroleum Fund Balance (Millions of US$)

Baseline
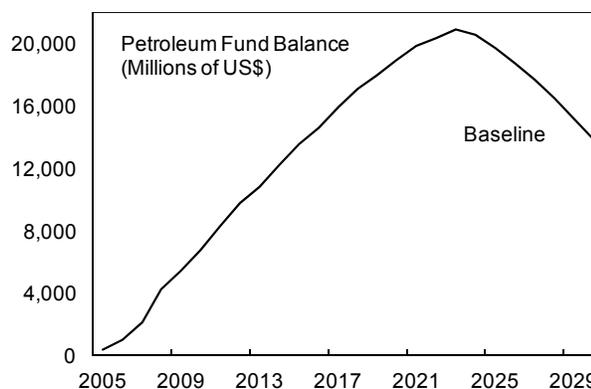
External sector: staff projects exports of non-oil goods and services to grow at an average of about 12 percent annually. However, declining petroleum income will worsen the current

account balance from a surplus of 245 percent of non-oil GDP in 2009 to a deficit of 26 percent of non-oil GDP by 2024. Current account deficits will be financed largely by withdrawals from the PF.

External financing: for this DSA, it is assumed that Timor-Leste will borrow around $900 million during 2011–30 from bilateral and multilateral donors to fund its development program. Around 40 percent of the loans will be on highly concessional terms. Concessional loans are projected to wind down because Timor-Leste's per capita GNI is already above the threshold for Low Income Countries that are eligible for highly concessional loans from several institutions. Other loans are assumed to carry a 5 year grace period, 25 year maturity, and an interest rate of 4½ percent. Eligibility for such loans will be subject to creditworthiness and other assessments depending on the financier. The assumptions are based on very preliminary indications on potential lending and are therefore subject to change.

The financing assumptions in the DSA are driven mostly by Timor-Leste's changing status from Low Income to Middle Income Country, which has implications for access to highly concessional resources. To date Timor-Leste has received only grants from the IFIs (World Bank and Asian Development Bank) on an exceptional basis because of its post-conflict status and fledgling institutions. Ordinarily, as a Low Income Country, Timor-Leste would have received highly concessional credits because the country is not at risk of debt distress. This is likely to be the case from next year. In recent years, however, Timor-Leste's per capita GNI has gone above the eligibility threshold even for highly concessional credits because of the rise in petroleum receipts. The DSA therefore assumes that Timor-Leste will no longer be eligible for highly concessional loans over the medium-term, because the country's GNI per capita makes it a (lower) Middle Income Country.

Petroleum production: projections are based on two active fields, Bayu Undan and the relatively small Kitan field. It is expected that Bayu Undan will cease production by 2025 and Kitan by 2017. Total production is expected to peak at close to 70 million barrels of oil equivalent in year 2012 before winding down by 2025.

Petroleum price: projections are based on an average of EIA's low case and reference case prices, published in May 2010. Except for a 10 percent decline in 2011 from $76 to $68 per barrel, crude oil prices are expected to rise quite smoothly at an average rate of between 3 and 4 percent per year in nominal terms.

7.   **The long-term impact of the rapid scale up in public investment on growth will depend critically on the prioritization and quality of investment.** Since 2006/07, capital investment managed and financed by the government has increased by nearly tenfold. All of it was channeled through the national budget. The rapid scale up, however, has stretched the limited investment management capacity of the public and the private sector with negative implications for the quality of projects, their implementation, and ex post monitoring. To

improve cost and quality control, the government is planning to establish an Infrastructure Fund and a new agency (ADN) that will be responsible for project appraisal, design, and monitoring. Procurement for large projects (more than $1 million) will be managed by a Procurement Technical Secretariat. The government intends to staff these new agencies with well qualified professionals and is also looking at different outsourcing options.

8.   **The impact of investment on growth will also depend on the quality of complementary policies and institutions.**[2] These will affect the ability of the private sector to take advantage of infrastructure development. However, the private sector remains small, relative to the size of planned public sector investment. Timor-Leste also has a very challenging business environment.[3] Key priorities include simplifying business start up, strengthening contract enforcement and increasing access to finance. Other structural reform priorities include investment in skills in the rapidly growing labor market, improving access to land, ensuring access to energy, and liberalization of the telecommunications sector. Finally, public finance management reforms will also play a major role in promoting investment and growth.[4] The government is taking steps in all these areas.

III. EXTERNAL DSA

Baseline Scenario

9.   **The baseline scenario indicates that all debt stock and debt service indicators are below their policy-dependent indicative thresholds throughout the projection period** (Figure 1 and Table 1). Specifically, the PV of debt-to-GDP ratio and the PV of debt-to-revenue ratio are expected to peak at 17 percent and 68 percent respectively by 2025, much below their thresholds of 30 percent and 200 percent, respectively. The PV of debt-to-exports ratio is projected to peak at 67 percent in 2026, below the threshold of 100 percent. The two debt service ratios are projected to rise over time but remain considerably below their thresholds.

Standard Alternative Scenarios and Stress Tests

10.   **Stress tests were conducted to assess the robustness of the baseline scenario to various shocks**. The results are presented in Table 2 and illustrated in Figure 1. Notably, only a shock of lower export growth during 2011–12, which can be interpreted as a shock to

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[2] IMF and World Bank, *A Review of Some Aspects of the Low-Income Country Debt Sustainability Framework*, August 2009; and Era Dabla-Norris and Felipe Zanna, *The Investment and Growth Nexus*, IMF, 2010.

[3] IFC and World Bank, *Doing Business 2011*, November 2010: Timor-Leste ranks 174 out of 183 countries in the overall Ease of Doing Business.

[4] IMF, 2010 *Report on the Observance of Standards and Codes (ROSC) Fiscal Transparency Module* and *Public Financial Management—Performance Report* for Timor-Leste.

petroleum production or prices given the dominance of petroleum exports, would result in some ratios breaching thresholds. Specifically,

- **Two debt stock ratios are expected to breach their indicative thresholds under a very large shock to exports (B2) generated by the standard DSA template**. The PV of debt-to-GDP ratio is projected to peak at 37 percent and breach its threshold during 2018–27, and the PV of debt-to-exports ratio is expected to breach its indicative thresholds from 2024 when oil income winds down.

- **All debt ratios remain below their thresholds under standard shocks to GNI growth, deflator, and non-debt creating flows (B1, B3, and B4).**

- **The stress test of a combination of one-half standard deviation shocks (B5) leads to more favorable debt dynamics.** However, deducting one-half standard deviation from large historical averages is unrealistic and leads to overly optimistic assumptions on growth of GNI and exports during 2011–12.

- **The historical scenario (A1) indicates extremely favorable debt dynamics relative to the baseline.** This is because the baseline scenario expects that petroleum income will steadily wind down by 2025 while the historical scenario applies a counterfactual continuation of large petroleum income from the Bayu Undan field throughout the projection period.

- **Under the scenario of less favorable loan terms (A2), all debt burden and debt services indicators worsen relative to the baseline.** But the ratios remain below their indicative thresholds throughout the projection period.

- The stress test of a one-time 30 percent depreciation is not applicable due to official dollarization.

Customized Export Shock

11.   **The standard DSA stress tests do not take account of Timor-Leste's special situation as a young post-conflict country**. These tests are based on historical volatility of the last eight years, which is particularly high and therefore may not be representative. Specifically, the standard export shock would imply an unrealistic negative shock of about 140 percent. Given the substantial reliance on oil, an appropriate size of the export shock would be one that mimics a realistic oil price shock of 30–40 percent during the last 10 years.

12.   **Under a customized export shock of 60 percent to the baseline, Timor-Leste is found to be at low risk of debt distress**. This size of shock represents a worst case scenario because it almost doubles the typical oil price shock observed in the last 10 years. As shown in Figure 1 and Table 3, all debt stock and debt service ratios are projected to remain under their indicative thresholds throughout the projection period (B6).

IV. PUBLIC DSA

13. **With only external borrowing by the government, the results of public debt DSA mirror the external debt DSA.** In light of substantial asset accumulation in the PF, Timor-Leste's public debt DSA is conducted on a net debt basis (i.e., gross public debt minus the PF assets). Under the baseline scenario (Table 3 and Figure 2), all three debt stock and debt service ratios are projected to rise eventually but stay well within their indicative thresholds.

14. **Timor-Leste's net public debt does not appear to be vulnerable to the standardized DSA stress tests** (Figure 2 and Table 4). This is because the buildup of substantial PF assets provides a significant cushion against shocks. However, Timor-Leste's net public debt is projected to increase significantly around 2025 when oil income winds down. This highlights the importance of keeping borrowing envelope limited and being fiscally prudent with spending from the PF.

V. CONCLUSIONS

15. **With a moderate borrowing envelope, Timor-Leste is at low risk of debt distress.** All debt stock and debt service ratios are projected to stay below their indicative thresholds under baseline and stress tests. The public DSA also suggests that Timor-Leste's overall public sector debt dynamics are sustainable with moderate borrowing. Nevertheless, a range of sensitivity analysis reveals Timor-Leste's vulnerability to shocks, particularly those related to petroleum production and prices, reflecting the country's heavy dependence on one single commodity (petroleum). Therefore, to minimize the risk of debt distress, it is advisable for Timor-Leste to take a gradual and moderate approach to borrowing from development partners and be fiscally prudent.

16. **A key challenge for Timor-Leste is to use its petroleum wealth effectively and sustainably to develop non-oil economy.** Given the flexibility embedded in the PF Law and the calculations of the ESI, a major constraint on boosting growth through scaling-up public investment comes from weak policy and institutional capacity rather than from the availability of financing. Therefore, an appropriate level of public expenditure should be commensurate with the government's capacity to plan, implement, and review investment projects, and with the ability of private sector producers to take advantage of public capital. Close cooperation with the World Bank, the Asian Development Bank, and other development partners would help prioritizing, sequencing, and managing expenditures. The decision of how to finance development projects—through borrowing or more withdrawals from the PF—is of second order. A gradual approach to borrowing is advisable to allow time for building up debt management capacity from scratch. Moreover, preference should be given to concessional loans rather than commercial loans to contain the risk of debt distress.

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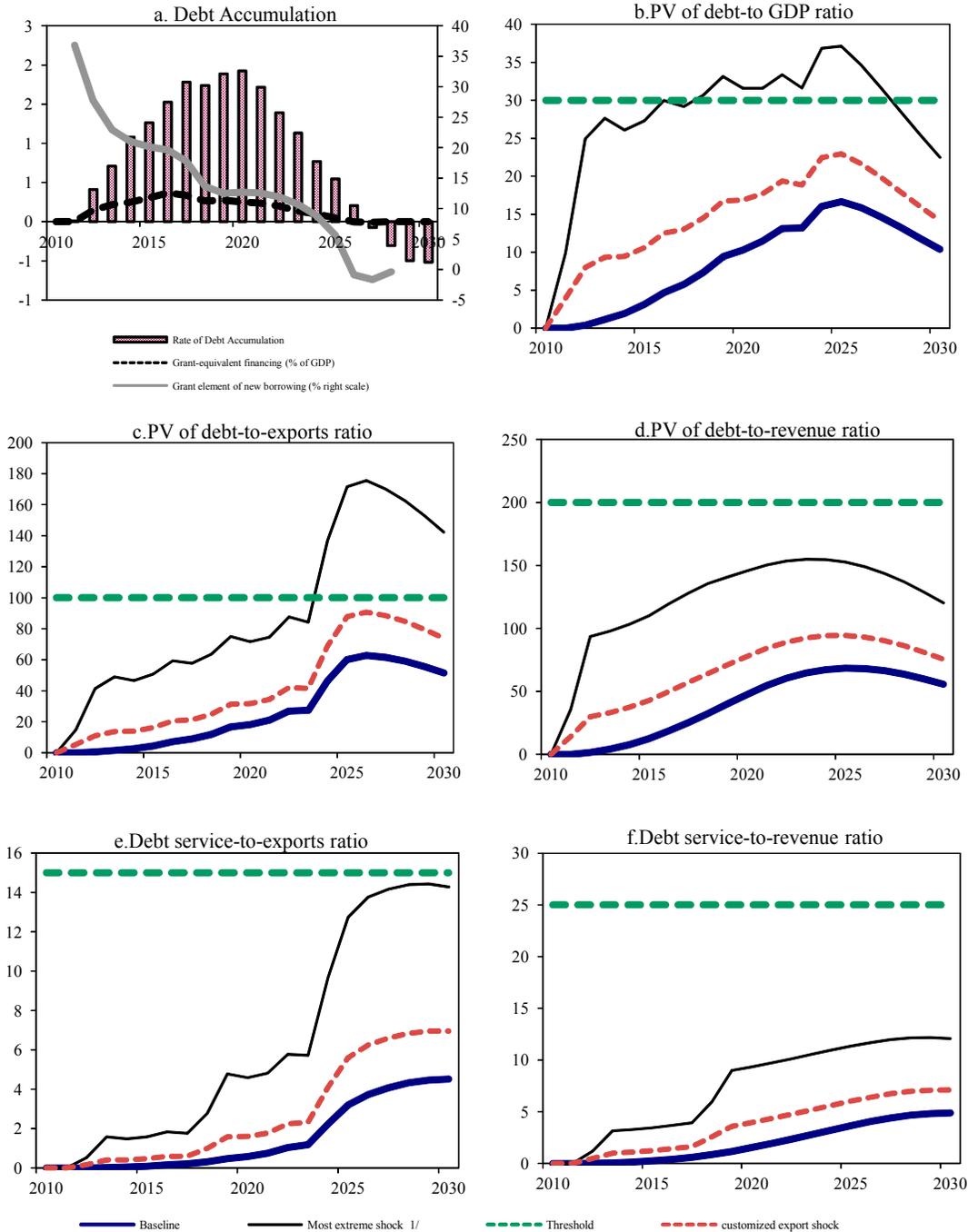
a. Debt Accumulation

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

b.PV of debt-to GDP ratio

c.PV of debt-to-exports ratio

d.PV of debt-to-revenue ratio

e.Debt service-to-exports ratio

f.Debt service-to-revenue ratio

Baseline   Most extreme shock 1/   Threshold   customized export shock

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 Exports shock; in c. to a Exports shock; in d. to a Exports shock; in e. to a Exports shock and in figure f. to a Exports shock.

Figure 2.Timor-Leste: Indicators of Public Debt Under Alternative Scenarios, 2010-2030 1/
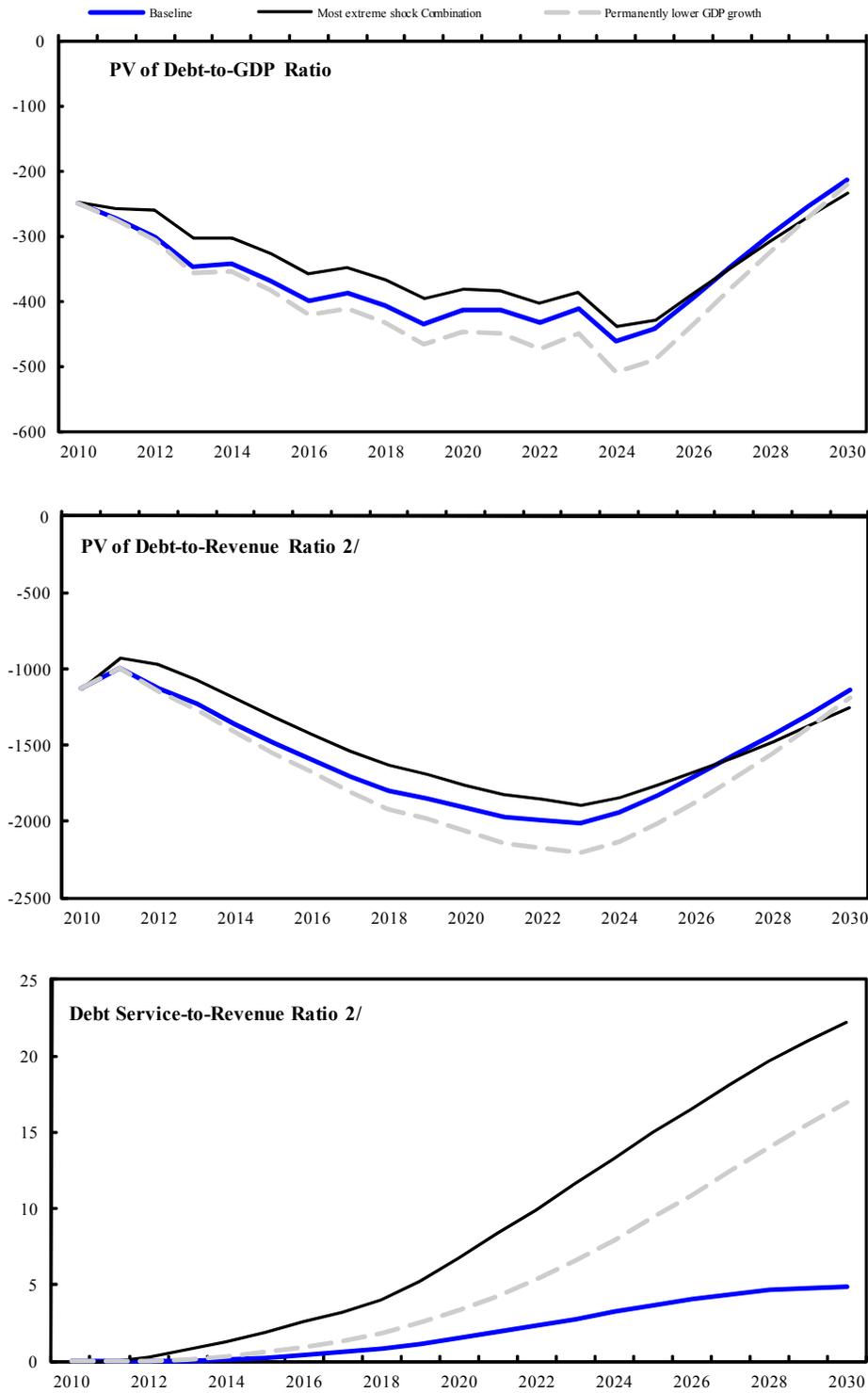
⸺ Baseline	⸺ Most extreme shock Combination	⸺ ⸺ Permanently lower GDP growth

PV of Debt-to-GDP Ratio

PV of Debt-to-Revenue Ratio 2/

Debt Service-to-Revenue Ratio 2/

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

	Actual			Historical Average	Standard Deviation 6/	Projections						2010-2015 Average	2020	2030	2016-2030 Average
	2007	2008	2009			2010	2011	2012	2013	2014	2015				
External debt (nominal) 1/	**0.0**	**0.0**	**0.0**			**0.0**	**0.0**	**0.5**	**1.5**	**2.5**	**4.0**		**12.1**	**11.6**	
o/w public and publicly guaranteed (PPG)	0.0	0.0	0.0			0.0	0.0	0.5	1.5	2.5	4.0		12.1	11.6	
Change in external debt	0.0	0.0	0.0			0.0	0.0	0.5	1.0	1.0	1.4		0.9	-1.6	
Identified net debt-creating flows	...	...	...			...	-47.4	-43.0	-32.6	-35.3	-33.9		-19.2	22.6	
Non-interest current account deficit	**-69.7**	**-71.0**	**-56.8**	**-29.4**	**36.4**	**-52.7**	**-46.2**	**-41.9**	**-31.5**	**-34.3**	**-33.0**		**-15.2**	**32.3**	5.4
Deficit in balance of goods and services	-52.1	-58.2	-40.0			-40.0	-34.9	-31.5	-23.4	-29.2	-28.1		-11.6	35.0	
Exports	81.8	86.2	79.0			78.9	78.6	77.1	72.1	71.5	68.7		56.4	20.2	
Imports	29.7	28.0	39.0			38.9	43.7	45.6	48.7	42.3	40.7		44.8	55.2	
Net current transfers (negative = inflow)	-16.5	-12.5	-16.6	-50.9	46.4	-11.9	-10.5	-9.6	-7.4	-4.4	-4.3		-2.6	-1.0	-1.8
o/w official	-16.6	-12.4	-15.1			-11.9	-10.5	-9.6	-7.4	-4.4	-4.3		-2.6	-1.0	
Other current account flows (negative = net inflow)	-1.1	-0.3	-0.2			-0.8	-0.8	-0.8	-0.7	-0.6	-0.7		-1.0	-1.6	
Net FDI (negative = inflow)	**-0.5**	**-1.4**	**-1.3**	**-2.9**	**2.9**	**-1.3**	**-1.2**	**-1.1**	**-1.1**	**-1.0**	**-1.0**		**-3.6**	**-9.6**	-5.7
Endogenous debt dynamics 2/	**...**	**...**	**...**			**...**	**0.0**	**0.0**	**0.1**	**-0.1**	**0.1**		**-0.3**	**-0.1**	
Contribution from nominal interest rate	...	...	...			...	0.0	0.0	0.0	0.0	0.1		0.3	0.4	
Contribution from real GDP growth	0.0	0.0	0.0			0.0	0.0	0.0	0.0	-0.1	0.0		-0.5	-0.5	
Contribution from price and exchange rate changes	0.0	0.0	0.0			...	...	...	...	...	...		...	...	
Residual (3-4) 3/	**...**	**...**	**...**			**...**	**47.4**	**43.6**	**33.6**	**36.4**	**35.3**		**20.0**	**-24.2**	
o/w exceptional financing	...	...	...			...	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
PV of external debt 4/	...	...	0.0			0.0	0.0	0.4	1.1	2.0	3.1		10.3	10.4	
In percent of exports	...	...	0.0			0.0	0.0	0.5	1.6	2.7	4.5		18.3	51.5	
PV of PPG external debt	**...**	**...**	**0.0**			**0.0**	**0.0**	**0.4**	**1.1**	**2.0**	**3.1**		**10.3**	**10.4**	
In percent of exports	**...**	**...**	**0.0**			**0.0**	**0.0**	**0.5**	**1.6**	**2.7**	**4.5**		**18.3**	**51.5**	
In percent of government revenues	**...**	**...**	**0.0**			**0.0**	**0.0**	**1.5**	**4.1**	**7.8**	**12.6**		**47.5**	**55.6**	
Debt service-to-exports ratio (in percent)	**0.0**	**0.0**	**0.0**			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**		**0.6**	**4.5**	
PPG debt service-to-exports ratio (in percent)	**0.0**	**0.0**	**0.0**			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**		**0.6**	**4.5**	
PPG debt service-to-revenue ratio (in percent)	**0.0**	**0.0**	**0.0**			**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.2**		**1.5**	**4.9**	
Total gross financing need (Billions of U.S. dollars)	-1.2	-2.1	-1.4			-1.5	-1.4	-1.4	-1.0	-1.2	-1.2		-0.8	1.5	
Non-interest current account deficit that stabilizes debt ratio	-69.7	-71.0	-56.8			-52.7	-46.2	-42.5	-32.5	-35.3	-34.4		-16.1	33.9	
Key macroeconomic assumptions															
Real GDP growth (in percent)	57.4	51.0	-24.0	27.0	29.8	5.8	6.1	1.9	-8.7	8.2	-1.7	2.0	5.4	4.1	-0.3
GDP deflator in US dollar terms (change in percent)	10.4	11.8	10.8	5.4	5.0	6.4	5.2	4.8	5.1	5.0	5.1	5.3	4.7	4.2	4.2
Effective interest rate (percent) 5/	...	...	...	...	...		1.2	1.2	2.2	2.4	2.5	1.9	2.8	2.9	2.8
Growth of exports of G&S (US dollar terms, in percent)	103.1	77.9	-22.8	58.6	63.1	12.4	11.2	4.8	-10.2	12.8	-0.7	5.0	10.0	3.1	-3.6
Growth of imports of G&S (US dollar terms, in percent)	50.6	59.5	17.3	10.9	31.0	12.2	25.3	11.7	2.5	-1.3	-0.6	8.3	5.8	6.4	5.8
Grant element of new public sector borrowing (in percent)	...	...	...	...	...	0.0	36.8	27.7	23.0	21.0	20.2	21.5	12.7	0.0	8.2
Government revenues (excluding grants, in percent of GDP)	20.7	16.3	20.8			22.0	27.6	26.6	28.3	25.2	24.8		21.7	18.7	22.1
Aid flows (in Billions of US dollars) 7/	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
o/w Grants	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
o/w Concessional loans	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Grant-equivalent financing (in percent of GDP) 8/	...	...	...			0.0	0.0	0.1	0.2	0.3	0.3		0.3	0.0	0.1
Grant-equivalent financing (in percent of external financing) 8/	...	...	...			100.0	36.8	27.7	23.0	21.0	20.2		12.7	...	9.5
Memorandum items:															
Nominal GDP (Billions of US dollars)	1.7	2.9	2.4			2.7	3.0	3.2	3.1	3.5	3.6		4.4	6.2	
Nominal dollar GDP growth	73.7	68.8	-15.8			12.6	11.6	6.8	-4.0	13.7	3.3	7.3	10.3	8.5	3.8
PV of PPG external debt (in Billions of US dollars)			0.0			0.0	0.0	0.0	0.0	0.1	0.1		0.5	0.6	
(PVt-PVt-1)/GDPt-1 (in percent)						0.0	0.0	0.4	0.7	1.1	1.3	0.6	1.9	-0.5	0.9
Gross workers' remittances (Billions of US dollars)	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
PV of PPG external debt (in percent of GDP + remittances)	...	...	0.0			0.0	0.0	0.4	1.1	2.0	3.1		10.3	10.4	
PV of PPG external debt (in percent of exports + remittances)	...	...	0.0			0.0	0.0	0.5	1.6	2.7	4.5		18.3	51.5	
Debt service of PPG external debt (in percent of exports + remittances)	...	...	0.0			0.0	0.0	0.0	0.0	0.0	0.1		0.6	4.5	

Sources: Country authorities; and staff estimates and projections.

1/ Includes only public 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 changes in the PF balances; and valuation adjustments.
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. Changing all historical averages to a horizon of 8 years does not affect the magnitude of the shocks and, therefore, the outcome of the analysis.
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 2.Timor-Leste: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2010-2030
(In percent)

	Projections							
	2010	2011	2012	2013	2014	2015	**2020**	2030
PV of debt-to GDP ratio								
Baseline	0	0	0	1	2	3	**10**	10
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2010-2030 1/	0	13	20	17	17	16	**-20**	-189
A2. New public sector loans on less favorable terms in 2010-2030 2	0	0	0	1	3	4	**14**	16
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	0	0	0	1	2	4	**12**	12
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	0	10	25	28	26	27	**32**	22
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	0	0	0	1	2	3	**11**	11
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	0	6	12	14	14	15	**21**	16
B5. Combination of B1-B4 using one-half standard deviation shocks	0	-25	-63	-68	-61	-60	**-46**	-22
B6. Customized export shock	0	4	8	9	9	11	**17**	14
PV of debt-to-exports ratio								
Baseline	0	0	1	2	3	5	**18**	51
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2010-2030 1/	0	17	26	23	23	23	**-35**	-935
A2. New public sector loans on less favorable terms in 2010-2030 2	0	0	1	2	4	6	**25**	81
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	0	0	1	2	3	5	**18**	51
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	0	15	41	49	47	51	**72**	142
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	0	0	1	2	3	5	**18**	51
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	0	8	16	19	19	22	**36**	80
B5. Combination of B1-B4 using one-half standard deviation shocks	0	-29	-66	-76	-69	-71	**-66**	-89
B6. Customized export shock	0	5	11	14	14	16	**32**	74
PV of debt-to-revenue ratio								
Baseline	0	0	1	4	8	13	**48**	56
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2010-2030 1/	0	48	76	59	66	63	**-92**	-1010
A2. New public sector loans on less favorable terms in 2010-2030 2	0	0	2	5	10	17	**64**	88
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	0	0	2	5	9	14	**54**	64
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	0	36	94	98	103	110	**146**	120
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	0	0	2	4	8	14	**52**	61
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	0	23	46	49	54	60	**95**	86
B5. Combination of B1-B4 using one-half standard deviation shocks	0	-92	-238	-240	-242	-243	**-213**	-119
B6. Customized export shock	0	14	30	33	37	43	**78**	76

Table 2.Timor-Leste: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2010-2030 (continued)

(In percent)

Debt service-to-exports ratio

Baseline	0	0	0	0	0	0	**1**	5
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2010-2030 1/	0	0	0	1	1	1	**0**	-24
A2. New public sector loans on less favorable terms in 2010-2030 2	0	0	0	0	0	0	**1**	7
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	0	0	0	0	0	0	**1**	5
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	0	0	1	2	1	2	**5**	14
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	0	0	0	0	0	0	**1**	5
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	0	0	0	1	1	1	**2**	8
B5. Combination of B1-B4 using one-half standard deviation shocks	0	0	-1	-3	-2	-2	**-6**	-11
B6. Customized export shock	0	0	0	0	0	0	**2**	7

Debt service-to-revenue ratio

Baseline	0	0	0	0	0	0	**2**	5
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2010-2030 1/	0	0	1	2	2	2	**-1**	-26
A2. New public sector loans on less favorable terms in 2010-2030 2	0	0	0	0	0	0	**3**	8
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	0	0	0	0	0	0	**2**	6
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	0	0	1	3	3	3	**9**	12
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	0	0	0	0	0	0	**2**	5
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	0	0	1	2	2	2	**5**	8
B5. Combination of B1-B4 using one-half standard deviation shocks	0	0	-3	-8	-8	-8	**-19**	-14
B6. Customized export shock	0	0	0	1	1	1	**4**	7

Memorandum item:

Grant element assumed on residual financing (i.e., financing required above baseline) 5/	11	11	11	11	11	11	**11**	11

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/ 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 3.Timor-Leste: Public Sector Debt Sustainability Framework, Baseline Scenario, 2007-2030
(In percent of GDP, unless otherwise indicated)

	Actual			Average	Standard Deviation 5/	Estimate	Projections					2010-15 Average			2016-30 Average
	2007	2008	2009			2010	2011	2012	2013	2014	2015		2020	2030	
Public sector debt 1/	-123.5	-147.2	-223.9			-249.4	-274.0	-301.3	-348.4	-343.4	-367.9		-413.1	-212.4	
o/w foreign-currency denominated	0.0	0.0	0.0			0.0	0.0	0.5	1.5	2.5	4.0		12.1	11.6	
Change in public sector debt	-19.4	-23.7	-76.7			-25.5	-24.6	-27.4	-47.1	5.0	-24.5		20.5	40.8	
Identified debt-creating flows	...	...	...			...	28.1	23.8	-1.9	53.0	21.3		57.1	43.0	
Primary deficit	-7.0	3.2	4.4	1.7	3.9	2.0	2.1	6.3	10.6	11.0	10.1	7.0	16.1	22.5	19.3
Revenue and grants	21.3	16.3	20.8			22.0	27.6	26.6	28.3	25.2	24.8		21.7	18.7	
of which: grants	0.7	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Primary (noninterest) expenditure	14.3	19.5	25.1			24.1	29.7	32.9	38.9	36.3	34.9		37.7	41.2	
Automatic debt dynamics	...	...	...			...	26.0	17.5	-12.5	42.0	11.2		41.1	20.5	
Contribution from interest rate/growth differential	...	...	...			...	26.0	17.5	-12.5	42.0	11.3		41.4	20.8	
of which: contribution from average real interest rate	...	...	...			...	11.5	12.4	16.1	15.5	17.3		19.3	10.8	
of which: contribution from real GDP growth	38.0	41.7	-46.4			12.4	14.4	5.1	-28.5	26.5	-6.1		22.1	10.1	
Contribution from real exchange rate depreciation	...	...	...			...	0.0	0.0	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	
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 the PF asset changes	...	...	...			...	-52.7	-51.1	-45.2	-48.0	-45.8		-36.7	-2.2	
Other Sustainability Indicators															
PV of public sector debt	-123.5	-147.2	-223.9			-249.4	-274.0	-301.5	-348.8	-344.0	-368.7		-414.9	-213.6	
o/w foreign-currency denominated	0.0	0.0	0.0			0.0	0.0	0.4	1.1	2.0	3.1		10.3	10.4	
o/w external	...	...	...			0.0	0.0	0.4	1.1	2.0	3.1		10.3	10.4	
PV of contingent liabilities (not included in public sector debt)	...	...	...			...	...	...	...	...	...		...	...	
Gross financing need 2/	-7.0	3.2	4.4			2.0	2.1	6.3	10.6	11.1	10.1		16.4	23.4	
PV of public sector debt-to-revenue and grants ratio (in percent)	-579.1	-900.6	-1077.9			-1132.9	-991.9	-1131.4	-1233.7	-1362.9	-1487.5		-1914.3	-1141.8	
PV of public sector debt-to-revenue ratio (in percent)	-597.8	-901.8	-1077.9			-1132.9	-991.9	-1131.4	-1233.7	-1362.9	-1487.5		-1914.3	-1141.8	
o/w external 3/	...	...	...			0.0	0.0	1.5	4.1	7.8	12.6		47.5	55.6	
Debt service-to-revenue and grants ratio (in percent) 4/	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.1	0.2		1.5	4.9	
Debt service-to-revenue ratio (in percent) 4/	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.1	0.2		1.5	4.9	
Primary deficit that stabilizes the debt-to-GDP ratio	12.4	26.8	81.1			27.5	26.7	33.6	57.7	6.1	34.6		-4.4	-18.3	
Key macroeconomic and fiscal assumptions															
Real GDP growth (in percent)	57.4	51.0	-24.0	27.0	29.8	5.8	6.1	1.9	-8.7	8.2	-1.7	2.0	5.4	4.1	-0.3
Average nominal interest rate on forex debt (in percent)	...	...	...	...	...	...	1.2	1.2	2.2	2.4	2.5	1.9	2.8	2.9	2.8
Average real interest rate on domestic debt (in percent)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Real exchange rate depreciation (in percent, + indicates depreciation)	-6.5	-7.8	-7.4	-2.5	4.2	-4.5	...	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	10.4	11.8	10.8	-0.9	20.3	6.4	5.2	4.8	5.1	5.0	5.1	5.3	4.7	4.2	4.2
Growth of real primary spending (deflated by GDP deflator, in percent)	1.0	1.1	0.0	0.5	0.6	0.0	0.3	0.1	0.1	0.0	-0.1	0.1	0.0	0.0	0.0
Grant element of new external borrowing (in percent)	...	...	...	...	...	...	36.8	27.7	23.0	21.0	20.2	25.8	12.7	0.0	...

Sources: Country authorities; and staff estimates and projections.
1/ Based on net central government debt (i.e., gross debt minus the PF assets).
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. Changing all historical averages to a horizon of 8 years does not affect the magnitude of the shocks and, therefore, the outcome of the analysis.

Table 4.Timor-Leste: Sensitivity Analysis for Key Indicators of Net Public Debt 2010-2030

	Projections							
	2010	2011	2012	2013	2014	2015	2020	2030
PV of Debt-to-GDP Ratio								
Baseline	-249	-274	-301	-349	-344	-369	-415	-214
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	-249	-229	-204	-173	-148	-123	-42	3
A2. Primary balance is unchanged from 2010	-249	-274	-305	-360	-363	-395	-493	-456
A3. Permanently lower GDP growth 1/	-249	-276	-307	-358	-356	-384	-448	-222
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2011-2012	-249	-297	-339	-389	-381	-407	-447	-195
B2. Primary balance is at historical average minus one standard deviations in 2011-2012	-249	-271	-299	-346	-342	-367	-414	-216
B3. 10 percent of GDP increase in other debt-creating flows in 2011	-249	-265	-293	-340	-336	-360	-408	-210
PV of Debt-to-Revenue Ratio 2/								
Baseline	-1133	-992	-1131	-1234	-1363	-1488	-1914	-1142
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	-1133	-829	-767	-612	-585	-498	-193	15
A2. Primary balance is unchanged from 2010	-1133	-992	-1146	-1275	-1437	-1592	-2277	-2436
A3. Permanently lower GDP growth 1/	-1133	-1001	-1151	-1266	-1409	-1550	-2066	-1189
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2011-2012	-1133	-1075	-1273	-1377	-1511	-1640	-2060	-1043
B2. Primary balance is at historical average minus one standard deviations in 2011-2012	-1133	-981	-1123	-1225	-1354	-1479	-1909	-1153
B3. 10 percent of GDP increase in other debt-creating flows in 2011	-1133	-960	-1099	-1201	-1330	-1454	-1881	-1122
Debt Service-to-Revenue Ratio 2/								
Baseline	0	0	0	0	0	0	2	5
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	0	0	0	0	0	-1	0	1
A2. Primary balance is unchanged from 2010	0	0	0	0	-1	-2	-9	-56
A3. Permanently lower GDP growth 1/	0	0	0	0	0	1	3	17
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2011-2012	0	0	0	1	1	2	7	22
B2. Primary balance is at historical average minus one standard deviations in 2011-2012	0	0	0	0	0	1	2	6
B3. 10 percent of GDP increase in other debt-creating flows in 2011	0	0	1	1	1	1	4	8

Sources: Country authorities; and staff estimates and projections.
1/ Assumes that real GDP growth is one percentage point below the baseline.
2/ Revenues are defined inclusive of grants.