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LAO PEOPLE'S DEMOCRATIC REPUBLIC

# Joint IMF/World Bank Debt Sustainability Analysis Under the Debt Sustainability Framework for Low-Income Countries[1]

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*Lao P.D.R.'s risk of debt distress[2] is still assessed to be high, as two public external debt stock indicators are expected to remain above policy-dependent indicative thresholds over the medium term, notwithstanding the recent downward trend in debt indicators and projected strong growth in the medium term. However, debt service ratios remain comfortably within the policy-dependent indicative thresholds, even under the stress tests, due to the high level of concessionality of official borrowing. Continued prudent debt management, including the management of quasi-fiscal liabilities, as well as cautious assessment and monitoring of large-scale projects will be required to mitigate the risks posed to external and public debt sustainability.*

## I. Background

1. **The results of this DSA are similar to those of the previous DSA[3] but the improved outlook for revenue and exports has lowered related debt-burden indicators.** The primary difference between the two is that the present value (PV) of debt to exports ratio no longer exceeds the threshold level beyond the first projection year under the baseline

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[1] This DSA was prepared jointly by the IMF and World Bank, in consultation with the Asian Development Bank (AsDB). The debt data underlying this exercise were provided by the Lao P.D.R. authorities.

[2] The low-income country debt sustainability framework (LIC DSF) recognizes that better policies and institutions allow countries to manage higher levels of debt, and thus the threshold levels for debt indicators are policy-dependent. In the LIC-DSF, the quality of a country's policies and institutions is measured by the World Bank's Country Policy and Institutional Assessment (CPIA) index and classified into three categories: strong, medium, and weak. Lao P.D.R.'s policies and institutions, as measured by the CPIA, averaged 3.21 over the past three years, placing it in the "weak performer" category, defined as countries with a three year average CPIA below or at 3.25. The relevant indicative thresholds for this category are: 30 percent for the PV of debt-to-GDP ratio, 100 percent for the PV of debt-to-exports ratio, 200 percent for the PV of debt-to-revenue ratio, 15 percent for the debt service-to-exports ratio, and 25 percent for the debt service-to-revenue ratio. These thresholds are applicable to public and publicly-guaranteed external debt.

[3] IMF Country Report No. 09/284.

scenario. Compared to the previous DSA, the baseline assumptions for economic growth, revenues, and exports are more optimistic, and the projected rate of external debt accumulation is somewhat lower. Longer-term debt dynamics are positively affected by the higher growth, revenue, and exports assumptions and the lower projected rate of debt accumulation. However, the lower discount rate—4 percent, down from 5 percent in the 2009 DSA as a result of lower global interest rates—raises the PV of external debt across the board.

2. **Lao P.D.R.'s external public and publicly-guaranteed (PPG) debt stock remains elevated.** The PV of debt at end-2009 was 43 percent of GDP or 129 percent of exports. Strong economic growth, appreciation of the kip, and favorable external conditions contributed to a decline in the ratio of external PPG debt to GDP over the past few years. The stock of external PPG debt declined to 55 percent of GDP at end-2009 from 82 percent of GDP in 2005, but it increased in nominal terms to US$3.1 billion from US$2.2 billion over the same period. The debt of state-owned enterprises (SOEs), to the extent possible, is included into the PPG debt. The private external debt—which totaled 46 percent of GDP at end-2009—is mostly related to projects in mining, hydropower and construction sectors.

**Lao P.D.R.: External Public Debt Indicators at End-2009**

| | Indicative Thresholds | End-2009 |
|---|---|---|
| Present value of debt, as a percent of: | | |
| GDP | 30 | 43 |
| Exports | 100 | 129 |
| Revenue | 200 | 283 |
| Debt service, as a percent of: | | |
| Exports | 15 | 5 |
| Revenue | 25 | 11 |

Source: IMF staff estimates.

3. **Around 66 percent of external PPG debt in Lao P.D.R. is held by multilateral creditors**, mainly the Asian Development Bank (AsDB, 37 percent) and the International Development Association (IDA, 22 percent). About 31 percent is held by bilateral creditors—mainly Russia, China, Thailand, and Japan.[4] Last year India, Korea, and Thailand increased their lending to Lao P.D.R. The remaining 3 percent of PPG external debt comprises external debt incurred by public entities on nonconcessional terms and guaranteed by the government, mainly for hydropower development and electricity generation, including financing equity stakes. The increasing presence of emerging-market creditors underscores the need to strengthen debt management capacity, particularly to ensure that debt sustainability considerations are taken into account when new debt is contracted.
A mitigating factor for Lao P.D.R.'s external debt burden lies in the prospective returns on the hydropower projects that have been financed in part by external PPG debt. While the projects face construction and implementation challenges, the long-term power purchase

[4] The Soviet-era debt owed to the Russian Federation has been under negotiation since 2007. The Lao P.D.R.'s authorities reported significant progress in the negotiations since last year's DSA. On this basis, and unlike the no-repayments assumptions used in last year's DSA, this year's DSA assumes that the debt to Russia will be serviced from 2011 onward.

agreements that are signed for these projects and resulting government revenues in the form of royalties, dividends, and profit tax payments arguably reduce the risk of debt distress.

**Lao P.D.R.: Stock of Public and Publicly-Guaranteed External Debt at End-2009**

| | In billions of U.S. Dollars | As a Share of Total External Debt | In percent of GDP |
|---|---|---|---|
| Total | 3.1 | 100 | 55.5 |
| Multilateral | 2.05 | 66 | 36.7 |
| Bilateral | 0.95 | 31 | 17.0 |
| Commercial 1/ | 0.1 | 3 | 1.8 |

Sources: Lao P.D.R. authorities; and IMF and World Bank staffs' estimates.

1/ Includes direct borrowing by state-owned enterprises on nonconcessional terms.

4. **Domestic public debt, while still relatively small, rose in 2009 as the central bank extended sizable direct credit to local governments.** At end-2009, the stock of recorded domestic public debt amounted to 6.1 percent of GDP, up from 3.0 percent of GDP at end-2008, driven mainly by the Bank of Lao P.D.R.'s (BoL) direct lending to finance local government's off-budget infrastructure projects, which added kip 1,628 billion (US$192 million or 3.4 percent of GDP) to domestic debt in 2009. Total PPG domestic and external debt stood at 61.5 percent of GDP in 2009. The stock of BoL lending to local governments is expected to peak in 2010, with total commitment of over kip 3 trillion likely fully disbursed by September and repayments from the central government budget kicking in.

## II. Underlying Debt Sustainability Analysis Assumptions

5. **Box 1 summarizes the medium-term macroeconomic framework underlying the DSA.** Most notably, the baseline scenario—which is based on current policies—projects annual average growth for the next six years at 7.6 percent, in line with the average for the last five years and only slightly below the authorities' growth projections in the draft seventh five-year plan (2011–15). Continuing recent trends, growth would be increasingly supported by large resource (mostly mining and power) projects, some of which are already under development. The economy is also projected to be supported by an expansion of the nontradable sector (tourism and construction), followed by the nonresource tradable sector (agriculture and manufacturing). Stable macroeconomic conditions and continuing reforms to further the transition to a market economy will contribute to steady growth. The recovery of copper prices and strong demand for electricity in neighboring countries are bringing forward expansion plans in mining and hydropower sectors that were delayed in the aftermath of the global financial crisis—hence the upward revision of the growth projections compared to the previous DSA. Activity outside the resource sectors continues to be buoyed by the expansionary fiscal and monetary policies.

## III. Debt Sustainability

### A. External Debt Sustainability Analysis

6. **Under the baseline scenario, the three public external debt stock indicators remain above the policy-dependent indicative debt burden thresholds in the first part of**

**the projection period** (Figure 1 and Table 1). Unlike in last year's DSA, mainly reflecting the recovery of copper prices, the PV of debt-to-exports ratio exceeds the threshold level only in 2010 under the baseline scenario. All three external debt stock indicators are projected to be on a declining trend from 2010 onward, reflecting prudent borrowing and strong economic growth. Debt service ratios (both as a share of exports and government revenues) remain well below indicative thresholds throughout the 20-year projection period, despite falling concessionality.

7. **External debt sustainability is most vulnerable to a depreciation of the nominal exchange rate and lower export growth** (Table 3).[5] Table 3 and Figure 1 illustrate how a one-off 30 percent depreciation of the kip would lead to a sharp rise in the PV of debt-to-GDP and the PV of debt-to-revenue ratios.[6] A decline in export growth (by one standard deviation in 2011–12) would push the PV of debt-to-exports up to double its baseline level through 2017 and in excess of the policy-dependent indicative threshold throughout the 20-year projection period. The latter scenario illustrates the likely impact of a sharp decline in copper and gold prices on debt sustainability.

8. **Debt dynamics are worse under an alternative scenario in which key variables are at their historical averages especially as FDI flows are expected to accelerate under the baseline** (see Box 1). Through 2014, debt dynamics are more favorable under this "historical scenario" as it takes into account the stronger increase in the GDP deflator in U.S. dollar terms (reflecting the nominal appreciation of the kip) experienced during 2000–2009. In later years, this effect is outweighed by the lower historical average for FDI inflows (3.3 percent of GDP per annum) compared to the higher medium-term baseline assumptions (e.g., 14.8 percent of GDP in 2015), which would require additional debt financing. In case of a significant decline in FDI, all debt stock indicators would remain more elevated and in two of the three cases remain above the relevant indicative thresholds. However, the comparatively optimistic baseline scenario is justified by the government's track record of reforms and macroeconomic stability that has encouraged substantial FDI inflows in recent years.

9. **Lao P.D.R.'s external debt dynamics are highly sensitive to assumptions regarding investment and performance of the resource sector.** Large resource-related projects now account for some 10 percent of GDP, with this share expected to nearly double over the medium term. Under the baseline, the global economic recovery is assumed to result in previously-delayed projects being brought forward as well as the expansion of existing projects.

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[5] The most extreme stress test is defined as the bound test resulting in the most extreme deterioration of the debt burden indicator after 10 years.

[6] It should be noted that the improved revenue outlook results in a more benign time profile of the PV of debt-to-revenue ratio. In response to a 30 percent depreciation of the nominal exchange rate, the ratio would remain above the indicative threshold over the first half of the projection period as opposed to throughout the projection period in last year's DSA.

The Lao P.D.R. economy remains exposed to fluctuations in international copper and gold prices as well as the economic outlook in neighboring countries (e.g., Thailand, Vietnam, and China). Lower growth in Lao P.D.R. and a weaker balance of payments would obviously worsen debt dynamics. Cautious assessment and monitoring of large-scale projects will be required to mitigate the risks posed to external and public debt sustainability, especially if some of these projects may be financed from commercial sources such as bonds backed by future revenues.

10. **A recent study by the staff of the IMF and the World Bank found that Lao P.D.R. is one of the countries that is currently judged to be at a high risk of debt distress where modest but sustained improvements in policies and institutions could significantly reduce debt vulnerabilities** (see http://www.imf.org/external/np/pp/eng/2010/040110.pdf). Lao P.D.R.'s CPIA score has improved considerably in recent years. A modest further increase would place the country as a "medium performer."

## B. Public Sector Debt Sustainability

11. **Under the baseline scenario, the PV of total PPG debt in percent of GDP and in percent of revenue are both projected to decline over the medium term** (Figure 2 and Table 2). This result differs from last year's DSA, which projected an initial rise in the PV of debt to GDP and PV of debt to revenue ratios reflecting a deterioration of the fiscal position and rising quasi-fiscal liabilities. The projected buildup of domestic debt is now smaller,[7] building on the strong revenue performance in FY2009 and the phasing out of the direct central bank lending to local governments, which contributed importantly to the 7.2 percent of GDP overall fiscal deficit in FY2009. Domestic debt is projected to increase to 6.7 percent of GDP in 2010 from 6.1 percent in 2009 and decline thereafter to 1.8 percent of GDP in 2015.

12. **The debt service-to-GDP ratio is projected to rise in 2011 before tapering off over the remainder of the projection period.** The impact of expiring grace periods and falling concessionality are offset by assumed fiscal adjustment, causing the PV of debt service-to-revenue ratio to decline over the projection period.

13. **Public debt ratios are particularly sensitive to real kip depreciation over the medium term** (Figure 2, Table 4). A one-time 30 percent real depreciation of the kip in 2011 would immediately raise the PV of public debt-to-GDP ratio and the PV of public debt-to-revenue ratio to 64 and 330 percent, respectively, before both indicators taper off. The impact on the debt service-to-revenue ratio is relatively mild, leading to an increase to around 17 percent in 2012; however, the impact would be more sustained over the longer term. It should be noted that this scenario is likely to overstate risks given that a significant share of GDP, including most of the resource GDP, is earned in foreign currency.

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[7] Last year's DSA did not include direct BoL lending in domestic debt. Hence, a comparison with last year's DSA would require some adjustments.

14. **Alternative scenarios point to less positive debt dynamics, especially over the longer term.** The first alternative scenario puts key variables (real GDP growth and the primary balance) at historical averages, and hence primary fiscal deficits about 2 percentage points of GDP higher than in the baseline scenario. In this scenario, the PV of public debt rises above 50 percent of GDP over the longer term (grey dashed line in Figure 2). The second alternative scenario keeps the primary balance unchanged from the level projected for 2010 (red dashed line in Figure 2). Given that this level is almost identical to the 10-year average of the primary deficit (3.4 percent of GDP) used in the first alternative scenario, it is not surprising that both scenarios result in virtually the same public debt dynamics. Under such circumstances, the debt-to-GDP ratio is put on a rising trajectory indicating the need for fiscal consolidation.

15. **Under the baseline it is assumed that the BoL phases out its quasi-fiscal activities.** During 2009 and so far during 2010, the BoL has played an active role in financing local governments' infrastructure expenditures. Should the envisaged phasing out not materialize, for instance if FDI and ODA come in lower than envisaged in the government's new five-year plan (2011–15) and the government calls again on the BoL to fill the resulting "investment financing gap," the public debt dynamics would be significantly worse.

## IV. THE AUTHORITIES' VIEW

16. **The authorities concurred with the overall assessment.** They acknowledged that the relatively high debt level requires fiscal consolidation and a strengthening of debt management. However, the authorities believe that the relatively long maturity profile of the loans and the large share of borrowed resources deployed to viable[8] natural resource projects significantly mitigate risks of debt distress.

## V. CONCLUSION

17. **While Lao P.D.R. has made progress in reducing its external and public debt burden, it still faces a high risk of debt distress.** Debt dynamics reflect current and planned large-scale investments in hydropower and mining projects that will only deliver returns over the medium term. The outlook is particularly sensitive to large swings of the exchange rate, highlighting the importance of maintaining macroeconomic stability and deepening structural reforms. It is also sensitive to fluctuations in exports earnings, and in particular commodity prices. That said, the high level of concessionality of official borrowing keeps debt service ratios relatively contained.

[8] Viable projects are projects in which the rate of return exceeds the cost of financing or the net present value of future income exceeds the net present value of borrowing.

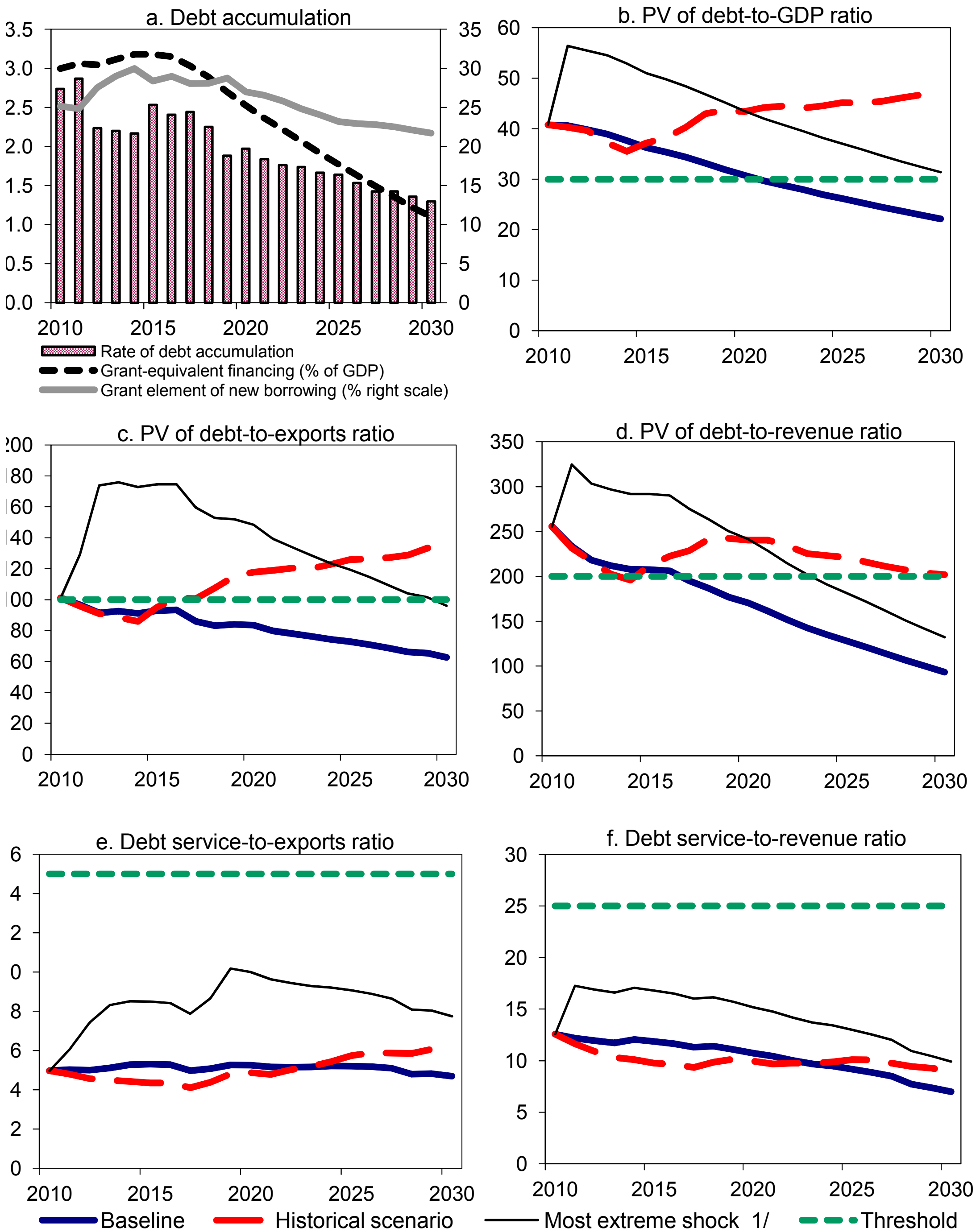
18. **External borrowing should be obtained on concessional terms and fiscal and quasi-fiscal liabilities should be carefully managed, to further guard against vulnerabilities.** Continued prudent debt management, as well as cautious assessment and monitoring of large-scale projects, will be required to mitigate the risks posed to external and public debt sustainability. Fiscal risk could arise if these projects fail to generate the expected returns, including to the government's own equity stakes. The BoL's planned exit from direct lending to local governments is a welcome development. Improving debt management capacity and developing a medium-term borrowing strategy for the government, including for resource sector activity, as well as greater disclosure of borrowing plans, would substantially enhance the assessment of debt sustainability. In view of the high risk of debt distress, recourse to nonconcessional external financing should be strictly limited to viable projects.

## Box 1: Baseline Scenario—Underlying Assumptions (2010–30)

*The baseline macroeconomic framework assumes that the economy will be underpinned by further development of Lao P.D.R.'s potential in hydropower and mining, supported by reforms to further the transition to a market economy and a strengthening of macroeconomic policy frameworks.*

- **Real GDP growth** is projected to average 7.6 percent in 2010–15 as new resource sector-related projects come on stream. The near-term outlook is boosted by the start of operations of the 1,070 MW Nam Theun II hydropower station in March 2010. Overall growth is relatively volatile as resource sector output is subject to discrete changes as new projects come online or existing mines are exhausted. Over the longer term, assumed structural changes and reforms would create an enabling environment, broadening the sources of growth. Real GDP growth is expected to moderate to 6.6 percent on average in 2016–30 as the resource sector matures. Over time, the share of agriculture in GDP declines, as the transition to a market-based economy leads to an increasing share of industry and services. Graduation from low-income status could be achieved in the second half of the projection period.
- The **copper and gold price** projections through 2015 are based on the WEO projections as of June 2010 and are assumed constant in real terms afterwards.
- **Inflation** is projected to average about 5 percent during 2010–11, as exchange rate stability contains external inflationary pressures. Over the longer term, inflation is expected to moderate to 3 percent.
- The **balance of payments** will go through large swings, reflecting development of the resource sector. The external current account deficit is projected to narrow considerably in the long run. The nonresource current account would deteriorate over the next decade reflecting the increasing cost of industrialization, before moderating over the longer term. This would increasingly be offset by a shift to surplus in the resource current account as large projects transition from construction to operation phase. The assumed pick up in nonresource exports and services is driven by strengthened competitiveness and regional integration, supported by improvements in the investment climate, a streamlining of business regulations, and meeting trade commitments. Notwithstanding its recent weakening, the overall external position is expected to strengthen over time, reflecting strong private capital and official inflows, and increasing international reserve accumulation in the outer years as the resource sector matures and industrialization takes hold. Private capital inflows in the form of FDI are expected to increase through the first half of the projection period as large new projects get underway.
- **External financing** is assumed to remain largely on concessional terms over the medium term. Over the long term, grant financing decreases with economic development.
  - ***Multilateral creditors:*** Projected loan disbursements in the medium term are relatively low since IDA and the AsDB have a pipeline of operations financed on grant terms. Over the longer term, grant financing decreases with economic development, leading once again to a moderate increase in project loans.
  - ***Bilateral creditors:*** For 2010–11, projected loan disbursements increase as donors provide support to the government's development agenda. Over the medium and longer term, greater participation by new emerging market creditors leads bilateral finance to take on an increasing role, including for onlending purposes to SOEs.
  - ***Commercial creditors:*** Over the medium term, commercial disbursements are relatively small, principally used to finance a portion of the government's equity stake participation in new hydropower projects. The US$70 million bond issue backed by royalties from the Theun-Hinboun and Houay Ho projects has been repeatedly postponed and is not assumed to materialize in the current DSA. The 2011 debt projection assumes government's borrowing to finance its equity stake in the Hongsa Lignite project (coal mine and power plant).
- **Fiscal policy** is projected to remain on a consolidation path from the 7.2 percent of GDP overall deficit recorded in FY09. The deficit is projected to narrow to about 4.9 percent of GDP in FY10 and to decline further in subsequent years. The consolidation is expected to be supported by rising resource sector revenues thanks to strong commodity prices.
- **Domestic debt** decreases over the medium term driven by repayments of the lending from the BoL. It increases in the long term as net external financing in percent of GDP declines and a larger share of budget deficits is financed domestically.

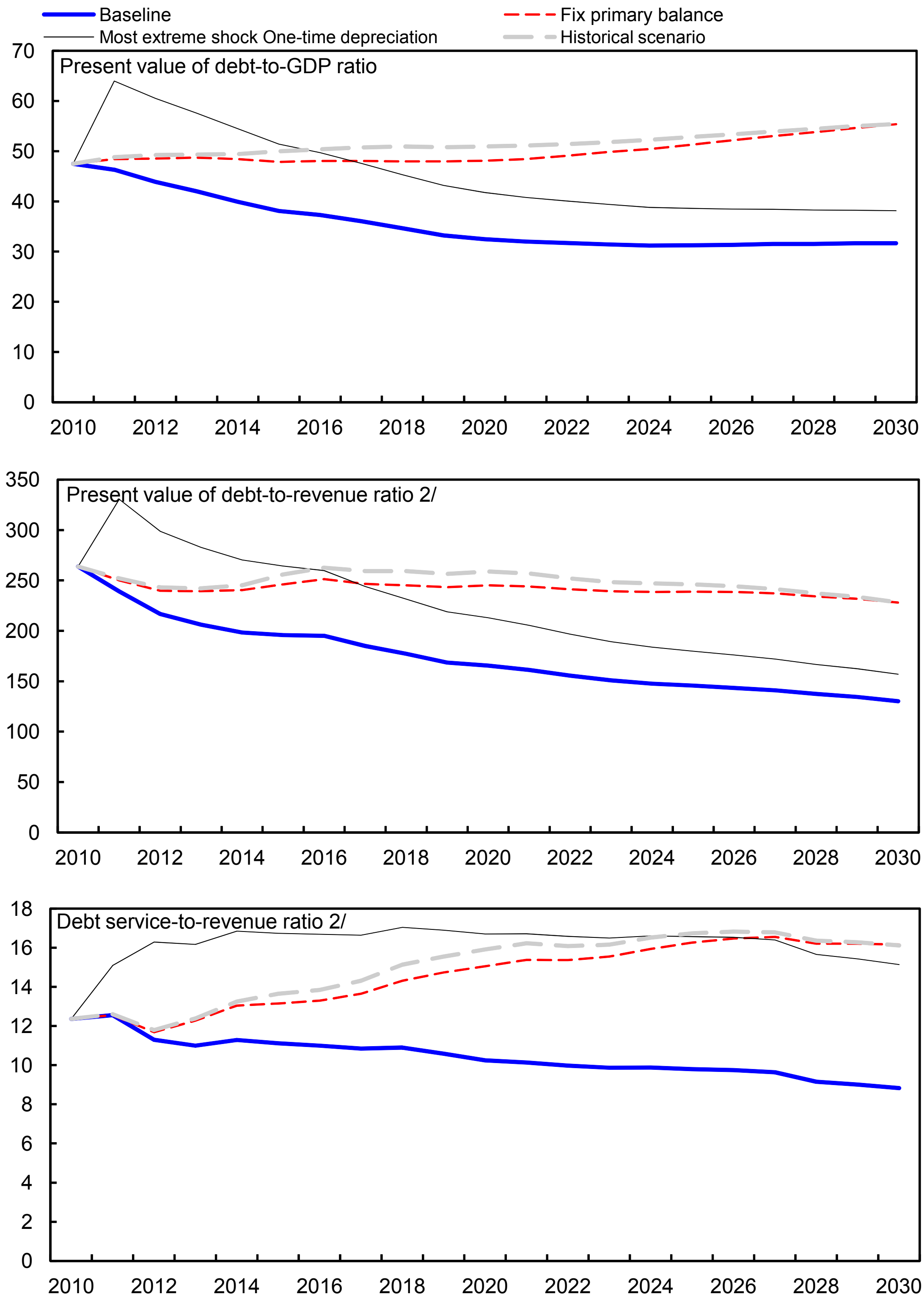
**Figure 1. Lao P.D.R.: Indicators of Public and Publicly-Guaranteed External Debt Under Alternative Scenarios, 2010–30** 1/




Sources: Lao P.D.R. 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 One-time depreciation shock; in c. to an Exports shock; in d. to a One-time depreciation shock; in e. to an Exports shock; and in figure f. to a One-time depreciation shock.

**Figure 2. Lao P.D.R.: Indicators of Public Debt Under Alternative Scenarios, 2010–30** 1/




Sources: Lao P.D.R. 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. Lao P.D.R.: External Debt Sustainability Framework, Baseline Scenario, 2007–30 1/

(In percent of GDP, unless otherwise indicated)

| | Actual | | | Historical | Standard | Projections | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2007 | 2008 | 2009 | Average 1/ | Deviation 1/ | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2010–15 Average | 2020 | 2030 | 2016–30 Average |
| **External debt (nominal)** 2/ | **100.6** | **96.4** | **101.5** | | | **91.5** | **92.1** | **94.6** | **99.1** | **102.3** | **98.8** | | **79.7** | **49.2** | |
| *Of which:* Public and publicly-guaranteed (PPG) | 58.2 | 54.0 | 55.4 | | | 51.5 | 51.0 | 49.9 | 48.7 | 47.3 | 45.6 | | 39.0 | 27.9 | |
| Change in external debt | 7.4 | -4.3 | 5.1 | | | -10.0 | 0.6 | 2.5 | 4.5 | 3.2 | -3.5 | | -3.6 | -2.7 | |
| Identified net debt-creating flows | -0.4 | -11.0 | 4.8 | | | -3.5 | 1.1 | 0.9 | 4.5 | 3.1 | -3.5 | | 0.5 | -1.9 | |
| **Noninterest current account deficit** | **14.6** | **17.4** | **16.4** | **11.4** | **6.4** | **8.1** | **11.6** | **13.5** | **18.2** | **24.1** | **18.4** | | **12.2** | **6.2** | 9.9 |
| Noninterest current account deficit | 15.0 | 16.8 | 16.2 | | | 8.7 | 11.9 | 13.8 | 18.5 | 24.8 | 19.4 | | 10.5 | 1.9 | |
| Exports | 37.8 | 38.0 | 33.6 | | | 40.3 | 42.1 | 43.6 | 42.1 | 41.3 | 39.1 | | 36.8 | 35.4 | |
| Imports | 52.9 | 54.8 | 49.8 | | | 49.0 | 54.0 | 57.4 | 60.6 | 66.1 | 58.5 | | 47.3 | 37.3 | |
| Net current transfers (negative = inflow) | -2.5 | -2.7 | -2.3 | -3.6 | 1.9 | -2.7 | -2.8 | -2.8 | -2.8 | -2.8 | -2.8 | | -2.4 | -1.9 | -2.3 |
| *Of which:* Official | -1.3 | -1.5 | -1.7 | | | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | | -1.6 | -0.6 | |
| Other current account flows (negative = net inflow) | 2.0 | 3.2 | 2.5 | | | 2.0 | 2.4 | 2.5 | 2.4 | 2.1 | 1.8 | | 4.2 | 6.2 | |
| **Net FDI (negative = inflow)** | **-1.7** | **-8.9** | **-7.8** | **-3.3** | **3.0** | **-6.9** | **-6.2** | **-8.2** | **-9.8** | **-15.8** | **-14.8** | | **-8.0** | **-6.2** | -7.7 |
| **Endogenous debt dynamics** 3/ | **-13.3** | **-19.5** | **-3.7** | | | **-4.7** | **-4.3** | **-4.4** | **-3.9** | **-5.2** | **-7.1** | | **-3.7** | **-1.9** | |
| Contribution from nominal interest rate | 1.3 | 1.1 | 1.2 | | | 2.1 | 2.0 | 1.9 | 1.7 | 1.7 | 1.5 | | 1.5 | 1.0 | |
| Contribution from real GDP growth | -6.2 | -6.2 | -6.9 | | | -6.9 | -6.3 | -6.3 | -5.6 | -6.9 | -8.6 | | -5.3 | -2.8 | |
| Contribution from price and exchange rate changes | -8.4 | -14.4 | 2.0 | | | … | … | … | … | … | … | | … | … | |
| **Residual (3–4)** 4/ | **7.8** | **6.7** | **0.3** | | | **-6.5** | **-0.5** | **1.6** | **0.0** | **0.1** | **0.0** | | **-4.1** | **-0.8** | |
| Of which: exceptional financing | 0.0 | 0.0 | 0.0 | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Present value (PV) of external debt 5/ | ... | ... | 89.5 | | | 80.7 | 81.7 | 84.5 | 89.3 | 92.7 | 89.4 | | 71.5 | 43.5 | |
| PV of external debt 5/ | ... | ... | 266.0 | | | 200.3 | 194.3 | 193.9 | 212.1 | 224.2 | 228.9 | | 194.1 | 122.9 | |
| **PV of PPG external debt** | **...** | **...** | **43.4** | | | **40.8** | **40.6** | **39.8** | **39.0** | **37.7** | **36.3** | | **30.8** | **22.2** | |
| **In percent of exports** | **...** | **...** | **129.0** | | | **101.2** | **96.6** | **91.4** | **92.5** | **91.2** | **92.8** | | **83.5** | **62.6** | |
| **In percent of government revenues** | **...** | **...** | **282.6** | | | **255.7** | **233.9** | **218.1** | **212.1** | **207.7** | **207.7** | | **170.5** | **93.4** | |
| **Debt service-to-exports ratio (in percent)** | **12.5** | **10.4** | **15.6** | | | **16.2** | **14.0** | **12.6** | **14.7** | **14.8** | **13.8** | | **18.1** | **12.8** | |
| **PPG debt service-to-exports ratio (in percent)** | **4.0** | **4.3** | **5.0** | | | **5.0** | **5.0** | **5.0** | **5.1** | **5.3** | **5.3** | | **5.3** | **4.7** | |
| **PPG debt service-to-revenue ratio (in percent)** | **10.8** | **11.4** | **11.0** | | | **12.6** | **12.2** | **11.9** | **11.7** | **12.1** | **11.9** | | **10.7** | **7.0** | |
| Total gross financing need (in billions of U.S. dollars) | 0.7 | 0.7 | 0.8 | | | 0.5 | 0.8 | 0.8 | 1.2 | 1.3 | 0.9 | | 1.7 | 1.7 | |
| Noninterest current account deficit that stabilizes debt ratio | 7.1 | 21.6 | 11.2 | | | 18.1 | 11.0 | 11.0 | 13.7 | 20.9 | 21.9 | | 15.8 | 8.9 | |
| **Key macroeconomic assumptions** | | | | | | | | | | | | | | | |
| Real GDP growth (in percent) | 7.8 | 7.8 | 7.6 | 7.0 | 1.2 | 7.7 | 7.5 | 7.3 | 6.4 | 7.6 | 9.3 | 7.6 | 7.0 | 6.0 | 6.6 |
| GDP deflator in U.S. dollar terms (change in percent) | 9.9 | 16.6 | -2.1 | 7.4 | 8.2 | 5.2 | 2.0 | 0.0 | 0.9 | 1.2 | 1.4 | 1.8 | 3.0 | 3.0 | 2.8 |
| Effective interest rate (percent) 6/ | 1.6 | 1.4 | 1.3 | 1.7 | 0.3 | 2.4 | 2.4 | 2.2 | 2.0 | 1.9 | 1.6 | 2.1 | 2.0 | 2.1 | 1.9 |
| Growth of exports of G&S (U.S. dollar terms, in percent) | 18.7 | 26.3 | -6.8 | 16.2 | 21.1 | 35.8 | 14.5 | 11.2 | 3.7 | 6.9 | 4.8 | 12.8 | 6.8 | 10.3 | 8.8 |
| Growth of imports of G&S (U.S. dollar terms, in percent) | 34.2 | 30.4 | -4.3 | 17.4 | 14.0 | 11.6 | 20.7 | 14.1 | 13.4 | 18.7 | -2.0 | 12.8 | 5.6 | 7.6 | 6.3 |
| Grant element of new public sector borrowing (in percent) | ... | ... | ... | ... | ... | 25.2 | 24.8 | 27.5 | 29.0 | 30.0 | 28.4 | 27.5 | 27.0 | 21.7 | 25.2 |
| Government revenues (excluding grants, in percent of GDP) | 14.1 | 14.3 | 15.3 | | | 15.9 | 17.4 | 18.3 | 18.4 | 18.1 | 17.5 | | 18.0 | 23.8 | 19.8 |
| Aid flows (in billions of U.S. dollars) 7/ | 0.1 | 0.1 | 0.1 | | | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | | 0.4 | 0.4 | |
| *Of which:* Grants | 0.1 | 0.1 | 0.1 | | | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | | 0.2 | 0.2 | |
| *Of which:* Concessional loans | 0.0 | 0.0 | 0.0 | | | 0.1 | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 | | 0.2 | 0.2 | |
| Grant-equivalent financing (in percent of GDP) 8/ | ... | ... | ... | | | 3.0 | 3.1 | 3.0 | 3.1 | 3.2 | 3.2 | | 2.5 | 1.1 | 2.1 |
| Grant-equivalent financing (in percent of external financing) 8/ | ... | ... | ... | | | 51.6 | 48.6 | 52.3 | 53.2 | 53.6 | 51.4 | | 49.6 | 35.4 | 45.2 |
| Memorandum items: | | | | | | | | | | | | | | | |
| Nominal GDP (in billions of U.S. dollars) | 4.2 | 5.3 | 5.6 | | | 6.3 | 7.0 | 7.5 | 8.0 | 8.7 | 9.7 | | 15.4 | 37.8 | |
| Nominal dollar GDP growth | 18.6 | 25.7 | 5.4 | | | 13.3 | 9.7 | 7.3 | 7.3 | 8.9 | 10.8 | 9.6 | 10.2 | 9.1 | 9.5 |
| PV of PPG external debt (in billions of U.S. dollars) | | | 2.4 | | | 2.6 | 2.8 | 2.9 | 3.1 | 3.3 | 3.5 | | 4.7 | 8.4 | |
| (PVt-PVt-1)/GDPt-1 (in percent) | | | | | | 2.7 | 2.9 | 2.2 | 2.2 | 2.2 | 2.5 | 2.5 | 2.0 | 1.3 | 1.8 |
| Gross remittances (in billions of U.S. dollars) | 0.1 | 0.1 | 0.0 | | | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | | 0.1 | 0.5 | |
| PV of PPG external debt (in percent of GDP + remittances) | ... | ... | 43.1 | | | 40.5 | 40.3 | 39.5 | 38.7 | 37.4 | 36.0 | | 30.5 | 21.9 | |
| PV of PPG external debt (in percent of exports + remittances) | ... | ... | 126.6 | | | 99.5 | 94.9 | 89.8 | 90.8 | 89.4 | 91.0 | | 81.7 | 60.4 | |
| Debt service of PPG external debt (in percent of exports + remittances) | ... | ... | 4.9 | | | 4.9 | 4.9 | 4.9 | 5.0 | 5.2 | 5.2 | | 5.1 | 4.5 | |

Sources: Lao P.D.R. authorities; and staff estimates and projections.

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

2/ Includes both public and private sector external debt. The years in the table refer to calendar years.

3/ 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.

4/ 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.

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

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

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. Lao P.D.R.: Public Sector Debt Sustainability Framework, Baseline Scenario, 2007–30

(In percent of GDP, unless otherwise indicated)

| | Actual | | | | | Projections | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Standard | | | | | | | 2010–15 | | | 2016–30 |
| | 2007 | 2008 | 2009 | Average 1/ | Deviation 1/ | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | Average | 2020 | 2030 | Average |
| **Public sector debt** 2/ | 59.8 | 57.0 | 61.5 | | | 58.3 | 56.7 | 53.9 | 51.8 | 49.5 | 47.4 | | 40.7 | 37.3 | |
| *Of which:* Foreign-currency denominated | 58.2 | 54.0 | 55.4 | | | 51.5 | 51.0 | 49.9 | 48.7 | 47.3 | 45.6 | | 39.0 | 27.9 | |
| Change in public sector debt | -4.8 | -2.9 | 4.5 | | | -3.2 | -1.6 | -2.8 | -2.2 | -2.2 | -2.1 | | -1.1 | -0.2 | |
| Identified debt-creating flows | -6.3 | -8.5 | 4.9 | | | -2.9 | -2.2 | -2.8 | -2.3 | -2.4 | -2.7 | | -1.7 | -0.9 | |
| Primary deficit | 2.2 | 3.2 | 6.1 | 3.4 | 1.3 | 3.2 | 1.0 | 0.5 | 0.8 | 1.0 | 1.3 | 1.3 | 1.4 | 1.2 | 1.3 |
| Revenue and grants | 15.8 | 16.0 | 17.6 | | | 18.0 | 19.4 | 20.3 | 20.4 | 20.1 | 19.5 | | 19.6 | 24.3 | |
| *Of which:* Grants | 1.7 | 1.7 | 2.3 | | | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 1.6 | 0.5 | |
| Primary (noninterest) expenditure | 17.9 | 19.2 | 23.7 | | | 21.2 | 20.3 | 20.7 | 21.2 | 21.2 | 20.7 | | 21.0 | 25.5 | |
| Automatic debt dynamics | -8.4 | -11.6 | -0.9 | | | -6.1 | -3.2 | -3.3 | -3.2 | -3.5 | -4.0 | | -3.1 | -2.1 | |
| Contribution from interest rate/growth differential | -5.8 | -4.9 | -3.9 | | | -4.0 | -3.9 | -4.0 | -3.4 | -3.6 | -4.1 | | -2.6 | -1.7 | |
| *Of which:* Contribution from average real interest rate | -1.1 | -0.5 | 0.1 | | | 0.3 | 0.1 | -0.2 | -0.1 | 0.0 | 0.1 | | 0.2 | 0.4 | |
| *Of which:* Contribution from real GDP growth | -4.7 | -4.3 | -4.0 | | | -4.4 | -4.1 | -3.9 | -3.2 | -3.7 | -4.2 | | -2.7 | -2.1 | |
| Contribution from real exchange rate depreciation | -2.6 | -6.7 | 3.0 | | | -2.1 | 0.8 | 0.7 | 0.2 | 0.2 | 0.1 | | ... | ... | |
| Other identified debt-creating flows | 0.0 | -0.1 | -0.3 | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Privatization receipts (negative) | 0.0 | -0.1 | -0.3 | | | 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 | 5.7 | -0.4 | | | -0.3 | 0.6 | 0.1 | 0.2 | 0.2 | 0.6 | | 0.7 | 0.7 | |
| **Other sustainability indicators** | … | … | 49.4 | | | 47.5 | 46.3 | 43.9 | 42.0 | 39.9 | 38.1 | | 32.5 | 31.7 | |
| *Of which:* Foreign-currency denominated | … | … | 43.4 | | | 40.8 | 40.6 | 39.8 | 39.0 | 37.7 | 36.3 | | 30.8 | 22.2 | |
| Of which: External | ... | ... | 43.4 | | | 40.8 | 40.6 | 39.8 | 39.0 | 37.7 | 36.3 | | 30.8 | 22.2 | |
| *Of which:* External | ... | ... | ... | | | ... | ... | ... | ... | ... | ... | | ... | ... | |
| Gross financing need 3/ | 4.5 | 5.6 | 8.9 | | | 6.0 | 3.6 | 3.2 | 3.4 | 3.7 | 3.9 | | 3.9 | 7.3 | |
| PV of public sector debt-to-revenue and grants ratio (in percent) | … | … | 280.9 | | | 263.9 | 239.2 | 216.7 | 206.2 | 198.4 | 195.7 | | 165.4 | 130.3 | |
| PV of public sector debt-to-revenue ratio (in percent) | … | … | 322.1 | | | 297.8 | 266.6 | 240.3 | 228.6 | 220.2 | 218.0 | | 179.9 | 133.3 | |
| *Of which:* External 4/ | … | … | 282.6 | | | 255.7 | 233.9 | 218.1 | 212.1 | 207.7 | 207.7 | | 170.5 | 93.4 | |
| Debt service-to-revenue and grants ratio (in percent) 5/ | 10.3 | 11.1 | 10.3 | | | 12.4 | 12.6 | 11.3 | 11.0 | 11.3 | 11.1 | | 10.2 | 8.8 | |
| Debt service-to-revenue ratio (in percent) 5/ | 11.6 | 12.5 | 11.9 | | | 14.0 | 14.0 | 12.5 | 12.2 | 12.5 | 12.4 | | 11.1 | 9.0 | |
| Primary deficit that stabilizes the debt-to-GDP ratio | 7.0 | 6.1 | 1.6 | | | 6.4 | 2.6 | 3.2 | 3.0 | 3.3 | 3.4 | | 2.4 | 1.4 | |
| **Key macroeconomic and fiscal assumptions** | | | | | | | | | | | | | | | |
| Real GDP growth (in percent) | 7.8 | 7.8 | 7.6 | 7.0 | 1.2 | 7.7 | 7.5 | 7.3 | 6.4 | 7.6 | 9.3 | 7.6 | 7.0 | 6.0 | 6.6 |
| Average nominal interest rate on forex debt (in percent) | 0.8 | 1.0 | 0.9 | 0.8 | 0.2 | 1.6 | 1.6 | 1.8 | 1.8 | 2.0 | 1.9 | 1.8 | 1.9 | 2.1 | 2.0 |
| Average real interest rate on domestic debt (in percent) | 3.0 | 3.9 | 9.5 | 13.2 | 13.1 | -0.8 | 1.1 | -1.5 | -1.4 | 0.1 | 1.5 | -0.2 | 3.1 | 2.9 | 3.1 |
| Real exchange rate depreciation (in percent, + indicates depreciation) | -4.6 | -12.6 | 5.9 | -4.4 | 9.0 | -4.0 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Inflation rate (GDP deflator, in percent) | 4.3 | 6.0 | -4.3 | 8.1 | 5.7 | 4.9 | 4.1 | 3.8 | 3.7 | 3.1 | 2.9 | 3.7 | 3.0 | 3.0 | 3.0 |
| Growth of real primary spending (deflated by GDP deflator, in percent) | 0.2 | 0.2 | 0.3 | 0.1 | 0.1 | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Grant element of new external borrowing (in percent) | ... | ... | ... | … | … | 25.2 | 24.8 | 27.5 | 29.0 | 30.0 | 28.4 | 27.5 | 27.0 | 21.7 | ... |

Sources: Lao P.D.R. authorities; and staff estimates and projections.

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

2/ The public sector debt represents general government gross debt. The fiscal year for Lao P.D.R. is October–September, but the DSA is done based on calendar year data.

3/ 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.

4/ Revenues excluding grants.

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

## Table 3. Lao P.D.R.: Sensitivity Analysis for Key Indicators of Public and Publicly-Guaranteed External Debt, 2010–30

(In percent)

| | Projections | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | **2020** | 2030 |
| **Present value of debt-to-GDP ratio** | | | | | | | | |
| **Baseline** | 41 | 41 | 40 | 39 | 38 | 36 | **31** | 22 |
| **A. Alternative scenarios** | | | | | | | | |
| A1. Key variables at their historical averages in 2010–30 1/ | 41 | 40 | 40 | 37 | 36 | 37 | **43** | 48 |
| A2. New public sector loans on less favorable terms in 2010–30 2/ | 41 | 41 | 41 | 41 | 41 | 41 | **38** | 33 |
| **B. Bound tests** | | | | | | | | |
| B1. Real GDP growth at historical average minus one standard deviation in 2011–12 | 41 | 40 | 40 | 40 | 38 | 37 | **32** | 23 |
| B2. Export value growth at historical average minus one standard deviation in 2011–12 3/ | 41 | 45 | 54 | 53 | 51 | 49 | **39** | 24 |
| B3. U.S. dollar GDP deflator at historical average minus one standard deviation in 2011–12 | 41 | 41 | 41 | 40 | 39 | 37 | **32** | 23 |
| B4. Net nondebt creating flows at historical average minus one standard deviation in 2011–12 4/ | 41 | 45 | 51 | 50 | 48 | 46 | **37** | 24 |
| B5. Combination of B1–B4 using one-half standard deviation shocks | 41 | 45 | 52 | 51 | 49 | 47 | **38** | 24 |
| B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/ | 41 | 56 | 55 | 55 | 53 | 51 | **44** | 31 |
| **Present value of debt-to-exports ratio** | | | | | | | | |
| **Baseline** | 101 | 97 | 91 | 93 | 91 | 93 | **84** | 63 |
| **A. Alternative scenarios** | | | | | | | | |
| A1. Key variables at their historical averages in 2010–30 1/ | 101 | 96 | 91 | 88 | 86 | 95 | **118** | 135 |
| A2. New public sector loans on less favorable terms in 2010–30 2/ | 101 | 97 | 94 | 98 | 100 | 104 | **104** | 92 |
| **B. Bound tests** | | | | | | | | |
| B1. Real GDP growth at historical average minus one standard deviation in 2011–12 | 101 | 95 | 90 | 91 | 90 | 92 | **83** | 63 |
| B2. Export value growth at historical average minus one standard deviation in 2011–12 3/ | 101 | 129 | 174 | 176 | 173 | 175 | **148** | 96 |
| B3. U.S. dollar GDP deflator at historical average minus one standard deviation in 2011–12 | 101 | 95 | 90 | 91 | 90 | 92 | **83** | 63 |
| B4. Net nondebt creating flows at historical average minus one standard deviation in 2011–12 4/ | 101 | 107 | 117 | 118 | 116 | 118 | **101** | 67 |
| B5. Combination of B1–B4 using one-half standard deviation shocks | 101 | 117 | 140 | 142 | 139 | 141 | **120** | 78 |
| B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/ | 101 | 95 | 90 | 91 | 90 | 92 | **83** | 63 |
| **Present value of debt-to-revenue ratio** | | | | | | | | |
| **Baseline** | 256 | 234 | 218 | 212 | 208 | 208 | **171** | 93 |
| **A. Alternative scenarios** | | | | | | | | |
| A1. Key variables at their historical averages in 2010–30 1/ | 256 | 232 | 217 | 203 | 196 | 213 | **240** | 202 |
| A2. New public sector loans on less favorable terms in 2010–30 2/ | 256 | 235 | 225 | 226 | 227 | 232 | **213** | 137 |
| **B. Bound tests** | | | | | | | | |
| B1. Real GDP growth at historical average minus one standard deviation in 2011–12 | 256 | 233 | 221 | 216 | 212 | 212 | **175** | 96 |
| B2. Export value growth at historical average minus one standard deviation in 2011–12 3/ | 256 | 260 | 295 | 287 | 280 | 278 | **216** | 102 |
| B3. U.S. dollar GDP deflator at historical average minus one standard deviation in 2011–12 | 256 | 236 | 222 | 217 | 214 | 214 | **177** | 97 |
| B4. Net nondebt creating flows at historical average minus one standard deviation in 2011–12 4/ | 256 | 259 | 279 | 271 | 265 | 264 | **206** | 100 |
| B5. Combination of B1–B4 using one-half standard deviation shocks | 256 | 262 | 286 | 278 | 272 | 269 | **209** | 99 |
| B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/ | 256 | 325 | 304 | 297 | 292 | 292 | **241** | 132 |

## Table 3. Lao P.D.R.: Sensitivity Analysis for Key Indicators of Public and Publicly-Guaranteed External Debt, 2010–30 (concluded)

(In percent)

| | Projections | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2020 | 2030 |
| **Debt service-to-exports ratio** | | | | | | | | |
| **Baseline** | 5 | 5 | 5 | 5 | 5 | 5 | **5** | 5 |
| **A. Alternative scenarios** | | | | | | | | |
| A1. Key variables at their historical averages in 2010–30 1/ | 5 | 5 | 5 | 4 | 4 | 4 | **5** | 6 |
| A2. New public sector loans on less favorable terms in 2010–30 2/ | 5 | 5 | 5 | 5 | 6 | 6 | **7** | 7 |
| **B. Bound tests** | | | | | | | | |
| B1. Real GDP growth at historical average minus one standard deviation in 2011–12 | 5 | 5 | 5 | 5 | 5 | 5 | **5** | 5 |
| B2. Export value growth at historical average minus one standard deviation in 2011–12 3/ | 5 | 6 | 7 | 8 | 9 | 9 | **10** | 8 |
| B3. U.S. dollar GDP deflator at historical average minus one standard deviation in 2011–12 | 5 | 5 | 5 | 5 | 5 | 5 | **5** | 5 |
| B4. Net nondebt creating flows at historical average minus one standard deviation in 2011–12 4/ | 5 | 5 | 5 | 6 | 6 | 6 | **7** | 5 |
| B5. Combination of B1–B4 using one-half standard deviation shocks | 5 | 5 | 6 | 7 | 7 | 7 | **8** | 6 |
| B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/ | 5 | 5 | 5 | 5 | 5 | 5 | **5** | 5 |
| **Debt service-to-revenue ratio** | | | | | | | | |
| **Baseline** | 13 | 12 | 12 | 12 | 12 | 12 | **11** | 7 |
| **A. Alternative scenarios** | | | | | | | | |
| A1. Key variables at their historical averages in 2010–30 1/ | 13 | 12 | 11 | 10 | 10 | 10 | **10** | 9 |
| A2. New public sector loans on less favorable terms in 2010–30 2/ | 13 | 12 | 12 | 12 | 13 | 13 | **14** | 10 |
| **B. Bound tests** | | | | | | | | |
| B1. Real GDP growth at historical average minus one standard deviation in 2011–12 | 13 | 12 | 12 | 12 | 12 | 12 | **11** | 7 |
| B2. Export value growth at historical average minus one standard deviation in 2011–12 3/ | 13 | 12 | 13 | 14 | 14 | 14 | **15** | 8 |
| B3. U.S. dollar GDP deflator at historical average minus one standard deviation in 2011–12 | 13 | 13 | 12 | 12 | 12 | 12 | **11** | 7 |
| B4. Net nondebt creating flows at historical average minus one standard deviation in 2011–12 4/ | 13 | 12 | 13 | 13 | 13 | 13 | **14** | 8 |
| B5. Combination of B1–B4 using one-half standard deviation shocks | 13 | 12 | 12 | 13 | 13 | 13 | **14** | 8 |
| B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/ | 13 | 17 | 17 | 17 | 17 | 17 | **15** | 10 |
| Memorandum item: | | | | | | | | |
| Grant element assumed on residual financing (i.e., financing required above baseline) 6/ | 24 | 24 | 24 | 24 | 24 | 24 | **24** | 24 |

Sources: Lao P.D.R. authorities; and staff estimates and projections.

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

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

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

4/ Includes official and private transfers and FDI.

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

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

## Table 4. Lao P.D.R.: Sensitivity Analysis for Key Indicators of Public Debt 2010–30

| | Projections | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2020 | 2030 |
| **Present value of debt-to-GDP ratio** | | | | | | | | |
| **Baseline** | 47 | 46 | 44 | 42 | 40 | 38 | 32 | 32 |
| **A. Alternative scenarios** | | | | | | | | |
| A1. Real GDP growth and primary balance are at historical averages | 47 | 49 | 49 | 49 | 49 | 50 | 51 | 55 |
| A2. Primary balance is unchanged from 2010 | 47 | 48 | 49 | 49 | 48 | 48 | 48 | 55 |
| A3. Permanently lower GDP growth 1/ | 47 | 46 | 44 | 43 | 41 | 39 | 35 | 41 |
| **B. Bound tests** | | | | | | | | |
| B1. Real GDP growth is at historical average minus one standard deviations in 2011–12 | 47 | 47 | 46 | 44 | 43 | 41 | 37 | 40 |
| B2. Primary balance is at historical average minus one standard deviations in 2011–12 | 47 | 50 | 51 | 49 | 47 | 44 | 37 | 34 |
| B3. Combination of B1–B2 using one half standard deviation shocks | 47 | 50 | 51 | 49 | 47 | 45 | 39 | 39 |
| B4. One-time 30 percent real depreciation in 2011 | 47 | 64 | 61 | 58 | 54 | 51 | 42 | 38 |
| B5. 10 percent of GDP increase in other debt-creating flows in 2011 | 47 | 56 | 53 | 51 | 48 | 46 | 38 | 35 |
| **Present value of debt-to-revenue ratio** 2/ | | | | | | | | |
| **Baseline** | 264 | 239 | 217 | 206 | 198 | 196 | 165 | 130 |
| **A. Alternative scenarios** | | | | | | | | |
| A1. Real GDP growth and primary balance are at historical averages | 264 | 252 | 243 | 242 | 245 | 256 | 259 | 228 |
| A2. Primary balance is unchanged from 2010 | 264 | 250 | 240 | 239 | 241 | 246 | 245 | 228 |
| A3. Permanently lower GDP growth 1/ | 264 | 240 | 218 | 209 | 202 | 201 | 179 | 167 |
| **B. Bound tests** | | | | | | | | |
| B1. Real GDP growth is at historical average minus one standard deviations in 2011–12 | 264 | 244 | 226 | 218 | 212 | 212 | 189 | 163 |
| B2. Primary balance is at historical average minus one standard deviations in 2011–12 | 264 | 257 | 253 | 241 | 232 | 229 | 190 | 142 |
| B3. Combination of B1–B2 using one half standard deviation shocks | 264 | 256 | 251 | 241 | 233 | 231 | 199 | 159 |
| B4. One-time 30 percent real depreciation in 2011 | 264 | 330 | 299 | 283 | 270 | 264 | 213 | 157 |
| B5. 10 percent of GDP increase in other debt-creating flows in 2011 | 264 | 288 | 262 | 250 | 240 | 236 | 195 | 144 |
| **Debt service-to-revenue ratio** 2/ | | | | | | | | |
| **Baseline** | 12 | 13 | 11 | 11 | 11 | 11 | 10 | 9 |
| **A. Alternative scenarios** | | | | | | | | |
| A1. Real GDP growth and primary balance are at historical averages | 12 | 13 | 12 | 12 | 13 | 14 | 16 | 16 |
| A2. Primary balance is unchanged from 2010 | 12 | 13 | 12 | 12 | 13 | 13 | 15 | 16 |
| A3. Permanently lower GDP growth 1/ | 12 | 13 | 11 | 11 | 11 | 11 | 11 | 11 |
| **B. Bound tests** | | | | | | | | |
| B1. Real GDP growth is at historical average minus one standard deviations in 2011–12 | 12 | 13 | 12 | 11 | 12 | 12 | 12 | 11 |
| B2. Primary balance is at historical average minus one standard deviations in 2011–12 | 12 | 13 | 12 | 13 | 13 | 12 | 13 | 10 |
| B3. Combination of B1–B2 using one half standard deviation shocks | 12 | 13 | 12 | 13 | 13 | 13 | 13 | 11 |
| B4. One-time 30 percent real depreciation in 2011 | 12 | 15 | 16 | 16 | 17 | 17 | 17 | 15 |
| B5. 10 percent of GDP increase in other debt-creating flows in 2011 | 12 | 13 | 13 | 15 | 13 | 13 | 13 | 10 |

Sources: Lao P.D.R. 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.