

**FOR
AGENDA**

SM/07/347
Supplement 2

November 5, 2007

To: Members of the Executive Board

From: The Secretary

Subject: **Myanmar—Staff Report for the 2007 Article IV Consultation—Debt Sustainability Analysis**

The attached debt sustainability analysis is being issued as a supplement to the staff report for the 2007 Article IV consultation with Myanmar (SM/07/347, 11/5/07), which is tentatively scheduled for discussion on **Wednesday, November 28, 2007**. At the time of circulation of this paper to the Board, the Secretary's Department has not received a communication from the authorities of Myanmar indicating whether or not they consent to the Fund's publication of this paper; such communication may be received after the authorities have had an opportunity to read the paper.

Questions may be referred to Mr. Teo (ext. 34283) and Mr. Hori (ext. 39513) in APD.

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MYANMAR

Debt Sustainability Analysis 2007

Prepared by Staff Representatives for the 2007 Consultation with Myanmar

Approved by Kalpana Kochhar and Matthew Fisher

November 2, 2007

Based on the debt sustainability analysis (DSA) under the debt sustainability framework (DSF) for low-income countries, Myanmar is likely to remain in debt distress over the projection period.¹ Myanmar has accumulated substantial external arrears, especially to official creditors, and is likely to continue to accumulate more arrears despite improvements in servicing capacity. Data on external debt are incomplete and therefore the results of this analysis should be construed only as orders of magnitude.

I. BACKGROUND

1. **The most conservative policy-dependent thresholds are applied in this analysis.** The low income country DSF provides indicative levels (thresholds) of debt burdens beyond which a country's risk of debt distress rises significantly. These threshold levels are influenced by the quality of their policies and institutions, and are normally assigned according to the World Bank's Country Policy and Institutional Assessment (CPIA) rating. Since Myanmar does not currently have a CPIA rating, the most conservative thresholds are applied for the purposes of this DSA.²

A. Public Debt Sustainability

2. **Although public debt and debt service ratios improve over the projection period, they are expected to remain very high.** Nominal public debt stood at 69 percent at end-2006/07, while the NPV of debt was estimated at 70 percent of GDP, or 902 percent of government revenue. These ratios are expected to decline in the next two decades, but this is largely driven by the assumed maintenance of negative real interest rates on domestic debt (see Box 1). Public debt would remain very high should the authorities decide to switch from financing the large fiscal deficits through money creation to public debt issuance.

¹ This analysis was conducted by Fund staff only because IDA has no financial relationship with Myanmar.

² These thresholds, which apply to external public and publicly guaranteed debt, are: NPV of debt-to-GDP of 30 percent, NPV of debt-to-exports of 100 percent, NPV of debt-to-revenue of 200 percent, debt service-to-exports of 15 percent, and debt service-to-revenue of 25 percent.

Box 1. Macroeconomic Assumptions Underlying the DSA

The macroeconomic assumptions are as follows:

- **Real GDP growth** is around 4 percent, which is slightly more conservative than staff's estimate of historical growth.
- **Inflation** increases and is volatile but stabilizes at around 22.5 percent after 2013.
- The **fiscal deficit** is assumed to remain largely unchanged from current level (at about 3.3 percent of GDP). A modest decline is assumed in the **revenue-to-GDP ratio** to 7.4 percent in the initial year, assuming that high value in 2006/07, that is, 7.7 percent, resulted from extraordinary efforts in that year.
- **The growth of exports and imports** average around 3 percent over the medium term, with a slightly higher growth rate for imports. This is also conservative since in recent years, export growth has outpaced import growth
- **Current account deficit (including grants):** The current account deficit averages around 0.7 percent of GDP, reflecting the restrictions to trade related to the self-sufficiency objective of the government. **Net aid inflows** remain limited.
- **Real interest rates** on domestic currency debt are somewhat higher than the historical average.
- **Important caveats:** (i) **Data** are not available or are incomplete; (ii) access to **external financing** remains limited; and (iii) **arrears** are significant (close to 50 percent of the current stock of foreign debt).

3. **Sensitivity analysis confirms this result.** Not surprisingly, stress tests lead to debt service ratios that are in general higher than the very high levels in the baseline scenario. Only under the most optimistic scenario, the NPV of debt-to-GDP fall below 30 percent at the end of the projection period. A one-time 30 percent real depreciation in 2008 has the most negative impact, raising NPV of debt-to-GDP to 85 percent, or 1,172 percent of government revenue in the year it occurs.

B. External Debt Sustainability

4. **Myanmar's nominal public external debt (including arrears) was estimated at US\$7.4 billion (50.4 percent of GDP) at the end of fiscal year 2006, of which close to half of this outstanding amount is in arrears.** Close to 50 percent of Myanmar's debt (excluding arrears) is owed to bilateral creditors, mainly Japan. Loans from multilateral creditors, such as IDA and AsDB amounted to slightly above US\$1 billion, while the

remaining stock of debt consists of trade-related supplier's credits of state economic enterprises and loans from financial institutions. For debt in arrears, 74 percent is owed to bilateral creditors. There are no plans in place to settle external arrears.

5. Current external debt indicators are in breach of their respective thresholds.

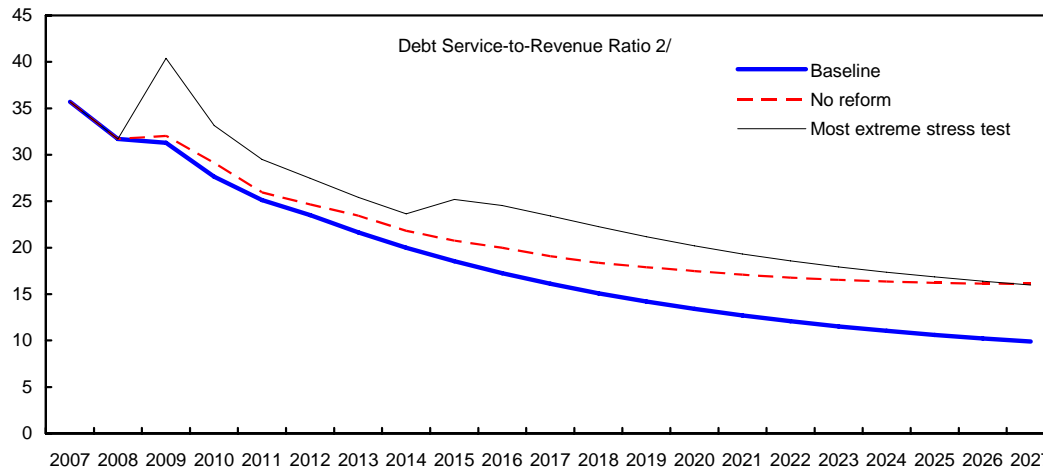
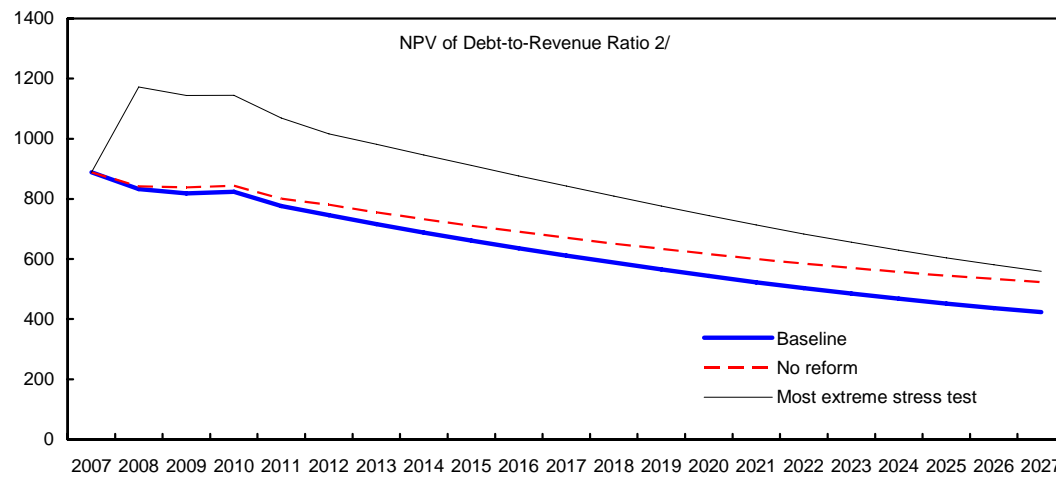
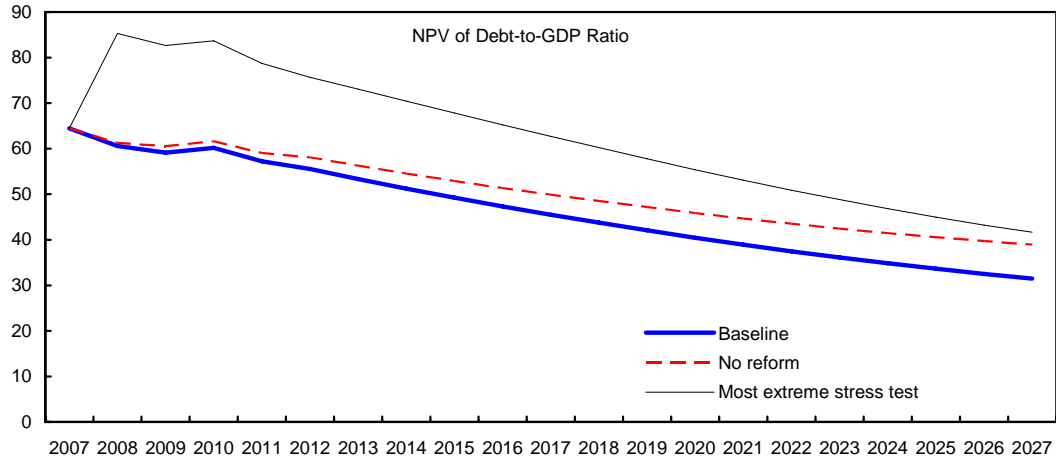
NPV of debt-to-GDP and to-exports, albeit falling in recent years, remain above indicative thresholds for distress at end-2006/07. By contrast, the debt service-to-exports ratio is 9.1 percent, below its threshold. Low debt service contrasts with the high stock of debt because only a small proportion is current and serviceable.

6. External debt and debt service ratios would fall below their respective thresholds over the projection period, assuming low demand for and supply of external financing.

This assumption is sensitive to changes in the policy regime, such as decisions to repay or resolve external arrears, which could significantly increase investment and external financing.

7. Sensitivity analysis point to continued risks over the projection period. Stress tests reveal significant vulnerabilities to changes in the macroeconomic environment. A reduction in the dollar value of the GDP deflator, by one standard deviation below historical average, has a substantial impact on the NPV of debt-to-GDP ratio. The latter peaks at 70 percent following the described shock, 50 percentage points above the indicative threshold. A one-time 30 percent nominal depreciation relative to the baseline in 2008 would increase the NPV of debt-to-GDP ratio from 47 percent in 2007 to about 62 percent in 2008–10.

Figure 1. Myanmar: Indicators of Public Debt Under Alternative Scenarios, 2007-27 1/

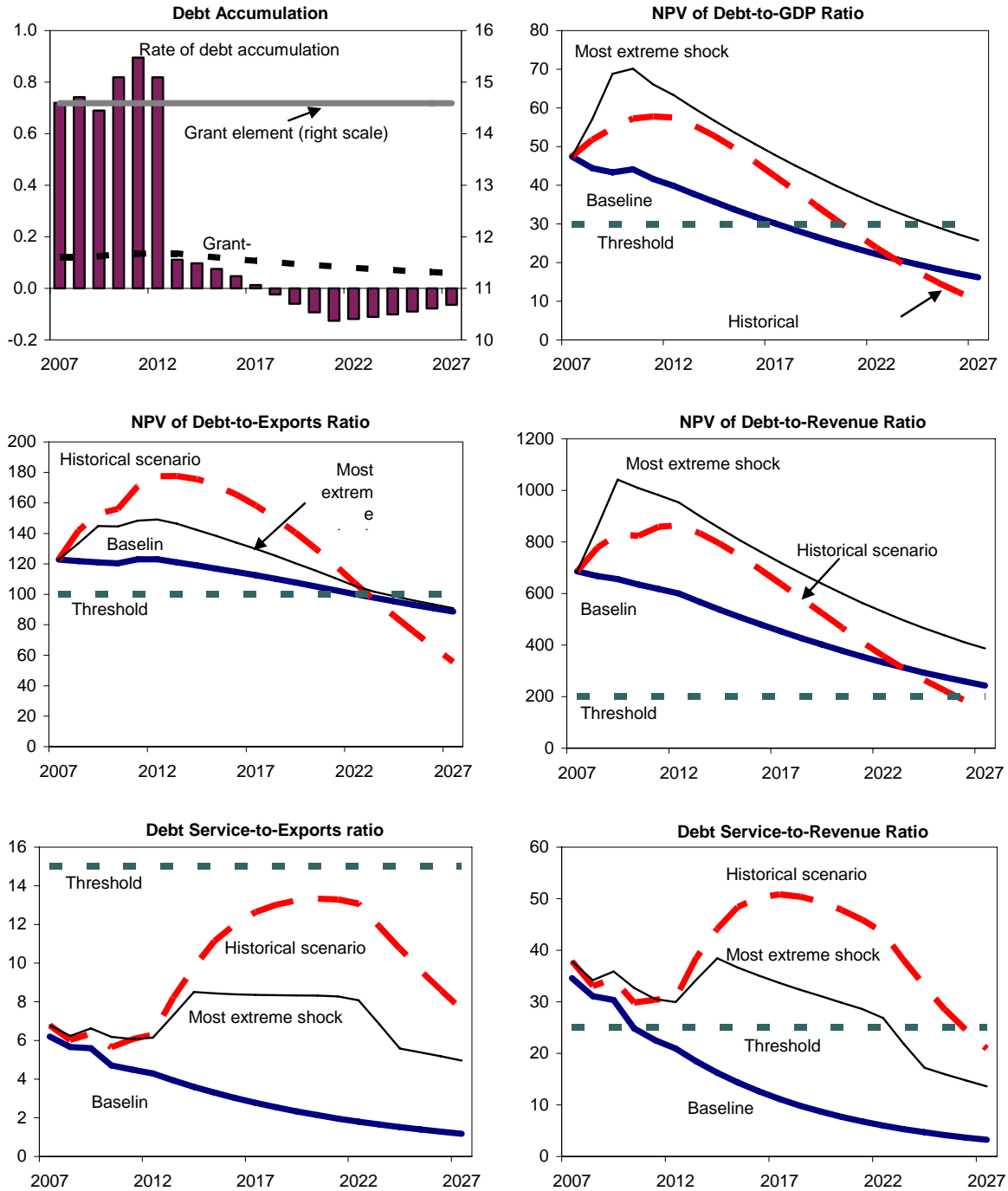


Source: Fund staff projections and simulations.

1/ Most extreme stress test is test that yields highest ratio in 2017.

2/ Revenue including grants.

Figure 2. Myanmar: Indicators of Public and Publicly Guaranteed External Debt Under Alternative Scenarios, 2007-27



Source: Fund staff projections and simulations.

Table 1. Myanmar: Public Sector Debt Sustainability Framework, Baseline Scenario, 2004–27
(In percent of GDP, unless otherwise indicated)

| | Actual | | | | | Estimate | | | | | Projections | | | | | 2013-27 Average |
|--|--------|-------|-------|--------------------------|--------------------------|----------|-------|-------|-------|-------|-------------|--------------------|-------|-------|--|--------------------|
| | 2004 | 2005 | 2006 | Historical Average %/ | Standard Deviation %/ | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2007-12 Average | 2017 | 2027 | | |
| Public sector debt 1/ | | | | | | | | | | | | | | | | |
| Of which foreign-currency denominated | 84.9 | 81.2 | 69.2 | | | 64.5 | 61.2 | 60.5 | 62.6 | 60.3 | 59.5 | | 47.5 | 32.6 | | |
| Change in public sector debt | 63.6 | 61.6 | 50.4 | | | 47.4 | 45.0 | 44.8 | 46.5 | 44.7 | 43.8 | | 32.1 | 17.3 | | |
| Identified debt-creating flows | -3.8 | -3.7 | -12.0 | | | -4.7 | -3.3 | -0.7 | 2.0 | -2.2 | -0.8 | | -2.1 | -1.1 | | |
| Primary deficit | -2.7 | -6.2 | -14.7 | | | -5.7 | -4.5 | -2.1 | 0.4 | -3.9 | -2.6 | | -1.9 | -1.0 | | |
| Revenue and grants | 3.9 | 2.6 | 3.5 | 4.3 | 1.4 | 3.3 | 2.5 | 2.2 | 3.4 | 2.7 | 2.3 | 2.7 | 2.8 | 2.8 | | |
| Of which grants | 6.5 | 6.7 | 7.7 | | | 7.3 | 7.3 | 7.2 | 7.3 | 7.4 | 7.4 | | 7.4 | 7.4 | | |
| Primary (noninterest) expenditure | 0.0 | 0.0 | 0.0 | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | |
| Automatic debt dynamics | 10.4 | 9.3 | 11.3 | | | 10.5 | 9.7 | 9.5 | 10.7 | 10.1 | 9.8 | | 10.2 | 10.2 | | |
| Contribution from interest rate/growth differential | -6.7 | -8.8 | -18.3 | | | -8.9 | -7.0 | -4.3 | -3.0 | -6.7 | -4.9 | | -4.7 | -3.8 | | |
| Of which contribution from average real interest rate | -11.7 | -13.7 | -12.0 | | | -8.1 | -5.7 | -5.1 | -5.6 | -5.8 | -4.9 | | -4.7 | -3.8 | | |
| Of which contribution from real GDP growth | -10.6 | -10.1 | -9.2 | | | -4.5 | -3.2 | -2.7 | -3.3 | -3.4 | -2.5 | | -2.8 | -2.5 | | |
| Contribution from real exchange rate depreciation | 5.0 | 4.8 | -6.3 | | | -3.6 | -2.5 | -2.4 | -2.3 | -2.4 | -2.3 | | -1.9 | -1.3 | | |
| Other identified debt-creating flows | 0.0 | 0.0 | 0.0 | | | -0.9 | -1.3 | 0.7 | 2.6 | -0.9 | 0.0 | | ... | ... | | |
| Privatization receipts (negative) | 0.0 | 0.0 | 0.0 | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | |
| Recognition of implicit or contingent liabilities | 0.0 | 0.0 | 0.0 | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | |
| Debt relief (HIPC and other) | 0.0 | 0.0 | 0.0 | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | |
| Other (specify, e.g. bank recapitalization) | 0.0 | 0.0 | 0.0 | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | |
| Residual, including asset changes | -1.0 | 2.5 | 2.7 | | | 1.0 | 1.2 | 1.4 | 1.7 | 1.7 | 1.8 | | -0.1 | -0.1 | | |
| NPV of public sector debt | | | | | | | | | | | | | | | | |
| Of which foreign-currency denominated | 21.3 | 19.6 | 69.7 | | | 64.5 | 60.6 | 59.1 | 60.2 | 57.2 | 55.6 | | 45.5 | 31.5 | | |
| Of which external | 0.0 | 0.0 | 50.9 | | | 47.4 | 44.4 | 43.3 | 44.2 | 41.6 | 39.9 | | 30.1 | 16.2 | | |
| NPV of contingent liabilities (not included in public sector debt) | ... | ... | ... | | | 47.4 | 44.4 | 43.3 | 44.2 | 41.6 | 39.9 | | 30.1 | 16.2 | | |
| Gross financing need 2/ | 23.0 | 21.7 | 21.1 | | | 18.8 | 17.7 | 17.2 | 17.3 | 16.7 | 16.6 | | ... | ... | | |
| NPV of public sector debt-to-revenue and grants ratio (in percent) | 329.8 | 292.2 | 901.7 | | | 888.7 | 833.0 | 817.8 | 823.8 | 776.5 | 746.3 | | 611.3 | 423.0 | | |
| NPV of public sector debt-to-revenue ratio (in percent) | 329.9 | 292.3 | 901.8 | | | 888.9 | 833.1 | 817.9 | 823.9 | 776.6 | 746.3 | | 611.3 | 423.0 | | |
| Of which external 3/ | ... | ... | 659.2 | | | 653.0 | 610.5 | 599.6 | 604.1 | 564.3 | 536.8 | | 404.3 | 217.4 | | |
| Debt service-to-revenue and grants ratio (in percent) 4/ | 48.5 | 54.8 | 44.1 | | | 35.7 | 31.7 | 31.3 | 27.6 | 25.1 | 23.5 | | 16.1 | 9.9 | | |
| Debt service-to-revenue ratio (in percent) 4/ | 48.6 | 54.8 | 44.1 | | | 35.7 | 31.7 | 31.3 | 27.6 | 25.1 | 23.5 | | 16.1 | 9.9 | | |
| Primary deficit that stabilizes the debt-to-GDP ratio | 7.7 | 6.3 | 15.6 | | | 7.9 | 5.7 | 2.9 | 1.3 | 5.0 | 3.1 | | 4.8 | 3.9 | | |
| Key macroeconomic and fiscal assumptions | | | | | | | | | | | | | | | | |
| Real GDP growth (in percent) | 13.6 | 13.6 | 12.7 | 11.3 | 3.1 | 5.5 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.3 | 4.0 | 4.0 | | |
| Average nominal interest rate on forex debt (in percent) | 1.5 | 1.3 | 1.6 | 1.0 | 0.6 | 1.2 | 1.0 | 0.9 | 0.8 | 0.7 | 0.6 | 0.9 | 0.4 | 0.1 | | |
| Average real interest rate on domestic currency debt (in percent) | -4.2 | -15.5 | -17.4 | -16.5 | 8.5 | -24.6 | -18.7 | -15.2 | -18.2 | -18.0 | -12.7 | -17.9 | -15.4 | -14.8 | | |
| Real exchange rate depreciation (in percent, + indicates depreciation) | 8.2 | 8.7 | -11.5 | 6.3 | 22.8 | -1.8 | ... | ... | ... | ... | ... | ... | ... | ... | | |
| Inflation rate (GDP deflator, in percent) | 3.6 | 19.2 | 20.7 | 22.5 | 12.7 | 34.4 | 25.0 | 20.0 | 25.0 | 25.0 | 17.5 | 24.5 | 22.5 | 22.5 | | |
| Growth of real primary spending (deflated by GDP deflator, in percent) | 21.7 | 1.8 | 36.4 | 12.7 | 26.0 | -1.5 | -3.9 | 1.4 | 17.1 | -1.4 | 0.5 | 2.0 | 4.0 | 4.3 | | |
| Grant element of new external borrowing (in percent) | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | | |

Sources: Myanmar authorities; and Fund staff estimates and projections.

1/ Indicate coverage of public sector, e.g., general government or nonfinancial public sector. Also whether net or gross debt is used.

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

3/ Revenues excluding grants.

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

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

Table 2. Myanmar: Sensitivity Analysis for Key Indicators of Public Debt 2007-27

| | Projections | | | | | | | |
|---|-------------|------|------|------|------|------|------|------|
| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2017 | 2027 |
| NPV of Debt-to-GDP Ratio | | | | | | | | |
| Baseline | 64 | 61 | 59 | 60 | 57 | 56 | 46 | 31 |
| A. Alternative scenarios | | | | | | | | |
| A1. Real GDP growth and primary balance are at historical averages | 64 | 58 | 55 | 54 | 49 | 47 | 37 | 33 |
| A2. Primary balance is unchanged from 2007 | 64 | 61 | 61 | 62 | 59 | 58 | 50 | 39 |
| A3. Permanently lower GDP growth 1/ | 64 | 61 | 60 | 62 | 59 | 58 | 51 | 44 |
| B. Bound tests | | | | | | | | |
| B1. Real GDP growth is at historical average minus one standard deviations in 2008-09 | 64 | 58 | 54 | 55 | 51 | 49 | 38 | 22 |
| B2. Primary balance is at historical average minus one standard deviations in 2008-09 | 64 | 63 | 64 | 66 | 62 | 61 | 50 | 35 |
| B3. Combination of B1-B2 using one half standard deviation shocks | 64 | 60 | 57 | 59 | 56 | 55 | 47 | 35 |
| B4. One-time 30 percent real depreciation in 2008 | 64 | 85 | 83 | 84 | 79 | 76 | 63 | 42 |
| B5. 10 percent of GDP increase in other debt-creating flows in 2008 | 64 | 69 | 67 | 68 | 65 | 64 | 53 | 37 |
| NPV of Debt-to-Revenue Ratio 2/ | | | | | | | | |
| Baseline | 889 | 833 | 818 | 824 | 777 | 746 | 611 | 423 |
| A. Alternative scenarios | | | | | | | | |
| A1. Real GDP growth and primary balance are at historical averages | 889 | 801 | 761 | 733 | 671 | 632 | 501 | 447 |
| A2. Primary balance is unchanged from 2007 | 889 | 842 | 838 | 843 | 801 | 781 | 670 | 523 |
| A3. Permanently lower GDP growth 1/ | 889 | 839 | 830 | 844 | 803 | 780 | 683 | 595 |
| B. Bound tests | | | | | | | | |
| B1. Real GDP growth is at historical average minus one standard deviations in 2008-09 | 889 | 797 | 747 | 746 | 697 | 663 | 511 | 289 |
| B2. Primary balance is at historical average minus one standard deviations in 2008-09 | 889 | 869 | 891 | 898 | 848 | 816 | 677 | 474 |
| B3. Combination of B1-B2 using one half standard deviation shocks | 889 | 819 | 795 | 805 | 763 | 737 | 627 | 470 |
| B4. One-time 30 percent real depreciation in 2008 | 889 | 1172 | 1143 | 1145 | 1069 | 1016 | 843 | 559 |
| B5. 10 percent of GDP increase in other debt-creating flows in 2008 | 889 | 945 | 926 | 936 | 885 | 853 | 711 | 500 |
| Debt Service-to-Revenue Ratio 2/ | | | | | | | | |
| Baseline | 36 | 32 | 31 | 28 | 25 | 24 | 16 | 10 |
| A. Alternative scenarios | | | | | | | | |
| A1. Real GDP growth and primary balance are at historical averages | 36 | 30 | 29 | 26 | 22 | 21 | 17 | 21 |
| A2. Primary balance is unchanged from 2007 | 36 | 32 | 32 | 29 | 26 | 25 | 19 | 16 |
| A3. Permanently lower GDP growth 1/ | 36 | 32 | 32 | 28 | 26 | 25 | 19 | 17 |
| B. Bound tests | | | | | | | | |
| B1. Real GDP growth is at historical average minus one standard deviations in 2008-09 | 36 | 30 | 29 | 25 | 22 | 21 | 12 | 3 |
| B2. Primary balance is at historical average minus one standard deviations in 2008-09 | 36 | 32 | 34 | 33 | 28 | 26 | 21 | 14 |
| B3. Combination of B1-B2 using one half standard deviation shocks | 36 | 30 | 30 | 29 | 26 | 24 | 19 | 15 |
| B4. One-time 30 percent real depreciation in 2008 | 36 | 33 | 34 | 30 | 27 | 25 | 17 | 11 |
| B5. 10 percent of GDP increase in other debt-creating flows in 2008 | 36 | 32 | 40 | 33 | 30 | 27 | 23 | 16 |

Sources: Myanmar authorities; and Fund staff estimates and projections.

1/ Assumes that real GDP growth is at baseline minus one standard deviation divided by the square root of 20 (i.e., the length of the projection period).

2/ Revenues are defined inclusive of grants.

Table 3a. Myanmar: External Debt Sustainability Framework, Baseline Scenario, 2007-27 1/
(In percent of GDP, unless otherwise indicated)

| | Actual | | | | | | | | | | Projections | | | | | | | | | |
|--|--------|-------|-------|-------|------|------|-------|-----------------------|------|-----------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-----------------|
| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | Historical Average 6/ | | Standard Deviation 6/ | | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2017 | 2027 | 2013-27 Average |
| | | | | | | | | | | | | | | | | | | | | |
| External debt (nominal) 1/ | 84.3 | 118.4 | 87.8 | 69.6 | 63.6 | 61.6 | 50.4 | | | | | 47.4 | 45.0 | 44.8 | 46.5 | 44.7 | 43.8 | 32.1 | 17.3 | |
| Of which public and publicly guaranteed (PPG) | 84.3 | 118.4 | 87.8 | 69.6 | 63.6 | 61.6 | 50.4 | | | | | 47.4 | 45.0 | 44.8 | 46.5 | 44.7 | 43.8 | 32.1 | 17.3 | |
| Change in external debt | 13.1 | 34.2 | -30.7 | -18.2 | -6.0 | -2.0 | -11.2 | | | | | -3.0 | -2.4 | -0.3 | 1.7 | -1.8 | -0.8 | -2.1 | -1.1 | |
| Identified net debt-creating flows | 11.3 | 29.7 | -31.8 | -22.8 | -9.3 | -9.8 | -22.7 | | | | | -10.2 | -7.2 | -5.8 | -5.0 | -2.7 | -1.7 | 0.9 | 4.1 | |
| Noninterest current account deficit | -0.1 | 1.5 | -1.2 | 0.3 | -3.2 | -4.5 | -7.8 | 0.3 | 5.9 | | | -7.3 | -4.9 | -3.6 | -2.6 | -0.7 | 0.4 | 2.6 | 5.0 | 3.3 |
| Deficit in balance of goods and services | 3.7 | 5.4 | 1.0 | 1.9 | -1.1 | -2.9 | -6.3 | | | | | -6.1 | -3.9 | -2.6 | -1.7 | 0.1 | 1.2 | 3.1 | 5.3 | |
| Exports | 32.0 | 53.4 | 41.8 | 30.6 | 29.9 | 33.7 | 37.8 | | | | | 38.6 | 36.5 | 35.8 | 36.7 | 33.8 | 32.4 | 26.8 | 18.2 | |
| Imports | 35.8 | 58.9 | 42.8 | 32.5 | 28.8 | 30.8 | 31.5 | | | | | 32.4 | 32.5 | 33.2 | 35.0 | 33.9 | 33.6 | 29.8 | 23.5 | |
| Net current transfers (negative = inflow) | -3.3 | -3.4 | -1.9 | -1.2 | -1.5 | -1.4 | -1.1 | -3.9 | 3.6 | | | -1.0 | -0.9 | -0.9 | -0.9 | -0.8 | -0.8 | -0.6 | -0.3 | -0.5 |
| Of which official | -0.5 | -0.8 | -0.7 | -0.2 | -0.3 | -0.5 | -0.4 | | | | | -0.3 | -0.3 | -0.3 | -0.3 | -0.2 | -0.2 | -0.2 | -0.1 | |
| Other current account flows (negative = net inflow) | -0.6 | -0.6 | -0.3 | -0.5 | -0.6 | -0.1 | -0.3 | | | | | -0.1 | -0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | |
| Net FDI (negative = inflow) | -0.9 | -0.7 | -1.1 | -1.6 | -2.2 | -1.8 | -1.8 | -3.5 | 3.9 | | | -0.8 | -0.8 | -0.8 | -0.9 | -0.6 | -0.6 | -0.5 | -0.3 | -0.4 |
| Endogenous debt dynamics 2/ | 12.3 | 28.9 | -29.5 | -21.5 | -3.8 | -3.5 | -13.1 | | | | | -2.1 | -1.4 | -1.4 | -1.5 | -1.5 | -1.5 | -1.2 | -0.7 | |
| Contribution from nominal interest rate | 1.1 | 1.3 | 1.0 | 0.7 | 0.9 | 0.6 | 0.7 | | | | | 0.4 | 0.3 | 0.3 | 0.3 | 0.2 | 0.2 | 0.1 | 0.0 | |
| Contribution from real GDP growth | -11.3 | -12.7 | -10.6 | -9.1 | -8.8 | -8.1 | -6.1 | | | | | -2.5 | -1.8 | -1.8 | -1.8 | -1.7 | -1.7 | -1.3 | -0.7 | |
| Contribution from price and exchange rate changes | 22.6 | 40.2 | -20.0 | -13.2 | 4.1 | 3.9 | -7.7 | | | | | 7.1 | 4.8 | 5.5 | 6.7 | 0.9 | 0.9 | -2.9 | -5.2 | |
| Residual (3-4) 3/ | 1.8 | 4.5 | 1.1 | 4.6 | 3.3 | 7.8 | 11.5 | | | | | -1.2 | -1.0 | -1.0 | -0.9 | -0.8 | -0.7 | -0.5 | -0.3 | |
| Of which exceptional financing | -2.4 | -0.7 | -2.0 | -1.8 | -1.0 | -1.8 | -2.0 | | | | | 47.4 | 44.4 | 43.3 | 44.2 | 41.6 | 39.9 | 30.1 | 16.2 | |
| NPV of external debt 4/ | ... | ... | ... | ... | ... | ... | 50.9 | | | | | 122.8 | 121.8 | 121.0 | 120.3 | 123.0 | 123.0 | 112.5 | 88.7 | |
| In percent of exports | ... | ... | ... | ... | ... | ... | 134.7 | | | | | 47.4 | 44.4 | 43.3 | 44.2 | 41.6 | 39.9 | 30.1 | 16.2 | |
| NPV of PPG external debt | ... | ... | ... | ... | ... | ... | 50.9 | | | | | 122.8 | 121.8 | 121.0 | 120.3 | 123.0 | 123.0 | 112.5 | 88.7 | |
| In percent of exports | ... | ... | ... | ... | ... | ... | 134.7 | | | | | 686 | 667.9 | 656.0 | 635.5 | 618.3 | 599.9 | 452.7 | 243.4 | |
| In percent of government revenues | ... | ... | ... | ... | ... | ... | 670 | | | | | 6.2 | 5.7 | 5.6 | 4.7 | 4.5 | 4.3 | 2.8 | 1.2 | |
| Debt service-to-exports ratio (in percent) | 17.0 | 10.3 | 10.5 | 12.0 | 9.1 | 9.7 | 9.1 | | | | | 6.2 | 5.7 | 5.6 | 4.7 | 4.5 | 4.3 | 2.8 | 1.2 | |
| PPG debt service-to-exports ratio (in percent) | 17.0 | 10.3 | 10.5 | 12.0 | 9.1 | 9.7 | 9.1 | | | | | 34.6 | 31.1 | 30.4 | 24.8 | 22.6 | 20.9 | 11.2 | 3.2 | |
| PPG debt service-to-revenue ratio (in percent) | 85.0 | 99.8 | 96.6 | 70.6 | 42.4 | 46.4 | 45.3 | | | | | -0.6 | -0.3 | -0.1 | 0.0 | 0.4 | 0.6 | 1.1 | 2.8 | |
| Total gross financing need (billions of U.S. dollars) | 0.4 | 0.5 | 0.5 | 0.5 | 0.0 | 0.0 | -0.6 | | | | | -4.2 | -2.6 | -3.3 | -4.3 | 1.2 | 1.3 | 4.6 | 6.1 | |
| Noninterest current account deficit that stabilizes debt ratio | -13.2 | -32.7 | 29.5 | 18.5 | 2.7 | -2.5 | 3.4 | | | | | 5.5 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | |
| Key macroeconomic assumptions | | | | | | | | | | | | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | |
| Real GDP growth (in percent) | 13.7 | 11.3 | 12.0 | 13.8 | 13.6 | 13.6 | 12.7 | 12.0 | 19.2 | | | 5.5 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | |
| GDP deflator in U.S. dollar terms (change in percent) | -24.1 | -32.3 | 20.3 | 17.7 | -5.6 | -5.8 | 14.2 | 0.2 | 0.2 | | | 3.4 | 4.2 | 0.0 | -3.8 | 4.2 | 2.2 | 1.7 | 1.9 | |
| Effective interest rate (percent) 5/ | 1.3 | 1.2 | 1.1 | 1.1 | 1.4 | 1.0 | 1.5 | 1.4 | 0.3 | | | 0.9 | 0.8 | 0.7 | 0.6 | 0.5 | 0.5 | 0.7 | 0.3 | |
| Growth of exports of G&S (U.S. dollar terms, in percent) | 17.2 | 25.7 | 5.4 | -1.9 | 4.7 | 20.5 | 44.5 | 17.1 | 13.8 | | | 11.2 | 2.4 | 2.2 | 2.5 | -0.2 | 2.0 | 3.4 | 2.0 | |
| Growth of imports of G&S (U.S. dollar terms, in percent) | -7.0 | 23.9 | -1.9 | 1.7 | -5.2 | 14.3 | 31.7 | 6.9 | 14.3 | | | 12.4 | 8.7 | 6.2 | 5.6 | 5.0 | 5.2 | 7.2 | 3.5 | |
| Grant element of new public sector borrowing (in percent) | ... | ... | ... | ... | ... | ... | ... | ... | ... | | | 14.6 | 14.6 | 14.6 | 14.6 | 14.6 | 14.6 | 14.6 | 14.6 | |
| Aid flows (in billions of U.S. dollars) 7/ | 4.4 | 4.1 | 4.0 | 4.0 | 4.0 | 4.0 | 4.1 | ... | ... | | | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | |
| Of which Grants | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | ... | ... | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Of which Concessional loans | 4.4 | 4.1 | 4.0 | 4.0 | 4.0 | 4.0 | 4.1 | ... | ... | | | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | |
| Grant-equivalent financing (in percent of GDP) 8/ | ... | ... | ... | ... | ... | ... | ... | ... | ... | | | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | |
| Grant-equivalent financing (in percent of external financing) 8/ | ... | ... | ... | ... | ... | ... | ... | ... | ... | | | 14.7 | 14.7 | 14.7 | 14.6 | 14.6 | 14.6 | 14.6 | 14.6 | |
| Memorandum items: | | | | | | | | | | | | 16.0 | 17.4 | 18.1 | 18.1 | 19.6 | 20.8 | 27.9 | 49.9 | |
| Nominal GDP (billions of US dollars) | 7.3 | 5.5 | 7.4 | 10.0 | 10.7 | 11.4 | 14.7 | | | | | 0.7 | 0.7 | 0.7 | 0.8 | 0.9 | 0.8 | 0.0 | -0.1 | |
| (NPV)(NPV-t)/GDP-t (in percent) | | | | | | | | | | | | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.0 | -0.1 | |

Source: Fund staff simulations.

1/ Includes only public sector external debt.

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

3/ Includes exceptional financing (i.e., changes in arrears and debt relief); changes in gross foreign assets; and valuation adjustments. For projections also includes contribution from price and exchange rate changes.

4/ Assumes that NPV of private sector debt is equivalent to its face value.

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

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

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

8/ Grant-equivalent financing includes grants provided directly to the government and through new borrowing (difference between the face value and the NPV of new debt).

Table 3b. Myanmar: Sensitivity Analyses for Key Indicators of Public and Publicly Guaranteed External Debt, 2007-27
(In percent)

| | Projections | | | | | | | 2027 |
|--|-------------|------|------|------|------|------|------------|------|
| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2017 | |
| NPV of Debt-to-GDP Ratio | | | | | | | | |
| Baseline | 47 | 44 | 43 | 44 | 42 | 40 | 30 | 16 |
| A. Alternative scenarios | | | | | | | | |
| A1. Key variables at their historical averages in 2008-27 1/ | 47 | 52 | 55 | 57 | 58 | 58 | 42 | 10 |
| A2. New public sector loans on less favorable terms in 2008-27 2/ | 47 | 45 | 44 | 45 | 42 | 41 | 31 | 18 |
| B. Bound tests | | | | | | | | |
| B1. Real GDP growth at historical average minus one standard deviation in 2008-09 | 47 | 42 | 39 | 40 | 38 | 36 | 27 | 15 |
| B2. Export value growth at historical average minus one standard deviation in 2008-09 3/ | 47 | 44 | 42 | 43 | 41 | 39 | 30 | 16 |
| B3. U.S. dollar GDP deflator at historical average minus one standard deviation in 2008-09 | 47 | 57 | 69 | 70 | 66 | 63 | 48 | 26 |
| B4. Net nondebt creating flows at historical average minus one standard deviation in 2008-09 4/ | 47 | 49 | 52 | 53 | 50 | 48 | 35 | 17 |
| B5. Combination of B1-B4 using one-half standard deviation shocks | 47 | 45 | 39 | 39 | 37 | 35 | 28 | 18 |
| B6. One-time 30 percent nominal depreciation relative to the baseline in 2008 5/ | 47 | 62 | 61 | 62 | 58 | 56 | 42 | 23 |
| NPV of Debt-to-Exports Ratio | | | | | | | | |
| Baseline | 123 | 122 | 121 | 120 | 123 | 123 | 112 | 89 |
| A. Alternative scenarios | | | | | | | | |
| A1. Key variables at their historical averages in 2007-26 1/ | 123 | 142 | 153 | 156 | 171 | 177 | 158 | 56 |
| A2. New public sector loans on less favorable terms in 2007-26 2/ | 123 | 122 | 122 | 121 | 125 | 125 | 117 | 99 |
| B. Bound tests | | | | | | | | |
| B1. Real GDP growth at historical average minus one standard deviation in 2008-09 | 123 | 122 | 121 | 120 | 123 | 123 | 112 | 89 |
| B2. Export value growth at historical average minus one standard deviation in 2008-09 3/ | 123 | 120 | 116 | 116 | 118 | 118 | 108 | 87 |
| B3. U.S. dollar GDP deflator at historical average minus one standard deviation in 2008-09 | 123 | 122 | 121 | 120 | 123 | 123 | 112 | 89 |
| B4. Net nondebt creating flows at historical average minus one standard deviation in 2008-09 4/ | 123 | 133 | 145 | 145 | 148 | 149 | 130 | 91 |
| B5. Combination of B1-B4 using one-half standard deviation shocks | 123 | 105 | 83 | 82 | 83 | 83 | 81 | 74 |
| B6. One-time 30 percent nominal depreciation relative to the baseline in 2008 5/ | 123 | 122 | 121 | 120 | 123 | 123 | 112 | 89 |
| NPV of Debt-to-Revenue Ratio | | | | | | | | |
| Baseline | 686 | 668 | 656 | 635 | 618 | 600 | 453 | 243 |
| A. Alternative scenarios | | | | | | | | |
| A1. Key variables at their historical averages in 2007-26 1/ | 686 | 778 | 829 | 824 | 859 | 865 | 637 | 152 |
| A2. New public sector loans on less favorable terms in 2007-26 2/ | 686 | 670 | 660 | 641 | 626 | 610 | 471 | 271 |
| B. Bound tests | | | | | | | | |
| B1. Real GDP growth at historical average minus one standard deviation in 2008-09 | 686 | 635 | 593 | 575 | 559 | 543 | 409 | 220 |
| B2. Export value growth at historical average minus one standard deviation in 2008-09 3/ | 686 | 664 | 643 | 622 | 605 | 587 | 445 | 243 |
| B3. US dollar GDP deflator at historical average minus one standard deviation in 2008-09 | 686 | 859 | 1042 | 1009 | 982 | 953 | 719 | 387 |
| B4. Net non-debt creating flows at historical average minus one standard deviation in 2008-09 4/ | 686 | 732 | 785 | 763 | 746 | 727 | 522 | 249 |
| B5. Combination of B1-B4 using one-half standard deviation shocks | 686 | 670 | 584 | 562 | 544 | 524 | 424 | 266 |
| B6. One-time 30 percent nominal depreciation relative to the baseline in 2008 5/ | 686 | 938 | 921 | 892 | 868 | 843 | 636 | 342 |