NEPAL

STAFF REPORT FOR THE 2017 ARTICLE IV CONSULTATION—DEBT SUSTAINABILITY ANALYSIS

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Prepared by the staffs of the International Monetary Fund and the World Bank.

Nepal's risk of debt distress[1] remains low, taking into account the important role of remittances. Strong revenue growth and subdued capital spending have kept the budget in surplus for the past four years. As a result, public debt has been on a declining path. The indicators of the public external debt stock and public debt service ratios continue to stay comfortably within the policy-dependent indicative thresholds, even when applying standard stress tests, due to the projected continued high level of concessionality of official borrowing.[2]

BACKGROUND

1. **The 2015 earthquakes and the disruption to trade at Nepal's southern border in FY2015/16 resulted in a sharp slowdown of the Nepali economy but the risk of debt distress is expected to remain low.** The growth of real GDP at market prices is estimated to have slowed to 0.6 percent in FY2015/16, as key sectors of the economy were affected by the trade disruption. Under the baseline macroeconomic scenario which underlies this debt sustainability analysis (DSA), higher financing requirements driven by post-earthquake reconstruction and higher public investment expenditures are assumed to be met primarily by external loans and grants. Nonetheless, the risk of debt distress remains low, thanks to the low starting level of external debt and the high concessionality of new debt.

2. **The present value of external debt in 2016 exceeded the projection in the previous DSA, but a decline is projected over the medium term.** The previous DSA (see IMF Country Report No. 15/317) projected the present value (PV) of public and publicly-guaranteed (PPG)

[1] The risk rating is determined using the low-income debt sustainability analysis (LIC DSA) framework. Nepal's fiscal year starts in mid-July. For example, fiscal year 2016 extends from mid-July 2015 until mid-July 2016.

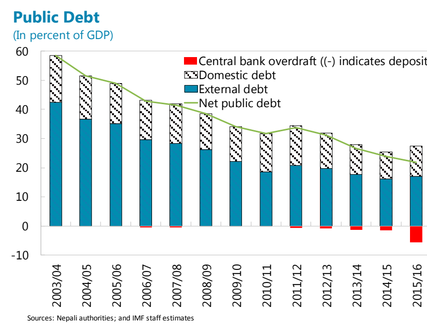
[2] The thresholds are determined based on Nepal's policy performance rating, which is "medium" according to the CPIA score which averaged 3.39 in 2013–15. Nepal continues to receive large amounts of remittances, averaging 27.5 percent of GDP and 242.9 percent of exports of goods and services per annum during 2013–15. As remittances exceed relevant thresholds (10 percent of GDP and 20 percent of exports of goods and services), they are incorporated into the analysis.

external debt to reach 11½ percent of GDP in 2016 and to gradually rise to 12 percent of GDP over the next five projection years. This DSA compares as follows:

- Despite continued low execution of foreign-financed capital spending, the PV of PPG external debt rose to 12.6 percent of GDP in 2016, 1 percent of GDP higher than projected in the previous DSA. The rising debt ratio reflected lower-than-expected economic growth and depreciation of the Nepali rupee. This provides the new base to project the path of external public debt in the current DSA.

- The PV of PPG external debt is projected to decline slightly over the medium term to about 10¾ percent of GDP by 2022. This takes into account the expected drawdown of government deposits accumulated in recent years (NRs 127 billion by mid-2016 (equivalent to 5.7 percent of GDP), see text table below). The drawdown of deposits will reduce the borrowing requirement and slow the pace of debt accumulation (Box 1 and Table 1a).

3. Nepal's public debt has been on a declining path but it increased to 27.3 percent of GDP in FY2015/16, from 25.2 percent of GDP in FY2014/15, despite a fiscal surplus.



- Strong revenue growth and subdued capital spending have kept the budget in surplus for the past four years. As a result, public debt declined steadily and the government accumulated large cash balances at the central bank.

- External debt stood at US$3.6 billion or 16.9 percent of GDP at the end of FY2015/16, of which 87 percent was concessional borrowing mainly from the World Bank and the Asian Development Bank (ADB). Japan was the largest bilateral creditor, followed by South Korea, India and China.

- Domestic debt rose from 9.3 percent of GDP at the end of FY2014/15 to 10.4 percent of GDP at the end of FY2015/16, as government bonds were issued as planned even though the under-execution of the budget resulted in the further accumulation of government cash deposits, to NRs 127 billion.

Nepal: Structure of External Public Debt, at end FY2015/2016

	Nominal Value (in million USD)	In percent of GDP	NPV (in million USD)
Public debt	3,566	17.0	2,661
Multilateral	3,225	15.4	2,399
Asian Development Bank	1,417	6.8	1,115
World Bank	1,679	8.0	1,096
IMF	91	0.4	154
Other	37	0.2	34
Official Bilateral	346	1.6	263
Paris Club	193	0.9	157
Non-Paris Club	152	0.7	106
Commerical	-	-	-

Source: Nepali authorities; Fund staff estimates.

Nepal: Domestic Public Debt 1/
(In billions of Nepalese rupees unless otherwise stated)

	2012	2013	2014	2015	2016
Government bonds	209	207	202	197	234
(In percent of GDP)	13.7	12.2	10.3	9.3	10.4
Of which:					
Treasury Bills	132	136	136	120	116
Development Bonds	58	52	47	57	109
National Savings Bonds	16	16	17	17	1
Citizen Savings Bonds	4	3	2	3	8
Memorandum items:					
NRB overdrafts (+) / deposits (-)	-2	-14	-25	-34	-127
Net domestic debt outstanding	207	193	177	163	107
(In percent of GDP)	13.5	11.4	9.0	7.7	4.7

Source: Nepali authorities; Fund staff estimates
[1] Fiscal years ending in mid-July

4. Debt management capacity could be further enhanced. The World Bank's 2014 Debt Management Performance Assessment (DeMPA) found that several areas of debt management have been gradually improved, including cash flow forecasting and cash balance management, the better alignment of public debt management with macro policy, as well as the creation of separate open market committees for public debt management and monetary management at the NRB. Nevertheless, the managerial oversight on the debt management functions could be more effective. One entity should be made responsible for the preparation of a comprehensive debt management strategy, analyze the cost and risks of the debt portfolio—including analysis of sensitivity to variability in the exchange rate, and make debt service forecasts more robust. Over the course of 2016, the World Bank has been engaged with the Nepali authorities to undertake training programs geared toward building capacity to formulate and update a consistent debt management strategy.

MACROECONOMIC ASSUMPTIONS

5. Macroeconomic assumptions for this DSA are consistent with the baseline macroeconomic projections underlying the 2017 Article IV consultation. The differences from the assumptions underlying the previous DSA include (Box 1): (i) a deterioration in medium-term growth prospects owing to political uncertainty and frequent changes of government; (ii) somewhat lower grants due to delays in project implementation; (iii) somewhat higher government capital spending ("net acquisition of non-financial assets") reflecting sustained efforts on the part of the government; and (iv) slower growth of remittances, in line with the reduced outflows of migrant workers observed .

- Real GDP growth is expected to recover from the earthquakes and the 4½ month trade disruption to reach 5½ percent in FY2016/17 and 4½ percent in FY2017/18, both above the 4 percent historical average (Table 1a). Nevertheless, growth is forecast to moderate to 3.8 percent per annum in the medium term, slightly below that of the previous DSA. This takes into account past patterns in the under-execution of capital budgets, more moderate growth of remittances than in recent years, as well as the experience in other fragile countries where events such as the earthquakes and trade disruption have had permanent effects on potential growth.

- Fiscal policy is expected to remain prudent. Expenditure is projected to rise over the medium term, largely driven by the delivery of household reconstruction grants and to some extent higher capital expenditure. Revenue and grants are projected to stabilize at about 24 percent of GDP. As a result, primary fiscal deficits in the medium term are almost 1 percent of GDP smaller than in the previous DSA. And the net incurrence of liabilities in the medium term is projected to be smaller by 1¾ percent of GDP per annum than in the previous DSA reflecting the drawdown of government cash balances (5.7 percent of GDP in mid-2016). This path is consistent with public debt stabilizing at about 22 percent of GDP in the medium term.

- The large current account surpluses of the last few years are expected to unwind and turn to modest deficits over the medium term. In fact, the current account was broadly in balance during the first 5 months of the current fiscal year, compared to a surplus of more than US$1.4 billion in the same period last year. The exchange rate peg to the Indian rupee is assumed to remain at the current level over the projection period. Import growth is expected to moderate in line with a slowdown in remittances. The growth of the US$-value of exports of goods and services is projected at around 7 percent per annum in the medium term, but export as a share of GDP would decline to below 3 percent in the medium term, reflecting continued weak competitiveness due to the persistent inflation wedge with India and significant infrastructure bottlenecks.

Box 1. Macroeconomic Assumptions Table

	Previous				Current				Current vs. Previous	
	2013/14	**2014/15**	**MT**	**LT**	**2015/16**	**2016/17**	**MT**	**LT**	**MT**	**LT**
Real growth (%)	5.4	3.4	4.2	4.0	5.5	4.5	3.8	3.8	-0.3	-0.2
Inflation (GDP deflator, %)	8.7	5.9	7.2	5.0	6.7	7.6	6.6	5.9	-0.6	0.9
Revenues and grants (% GDP)	20.8	20.3	22.1	22.8	24.2	24.2	24.1	24.4	1.9	1.6
Grants (% GDP)	2.4	1.9	2.6	2.3	1.9	1.9	1.8	1.5	-0.8	-0.7
Primary expenditure (% GDP)	18.9	20.9	24.5	24.2	25.8	25.8	25.5	25.4	1.0	1.2
Net acquisition of non-financial assets (% GDP)	3.3	3.9	5.7	5.0	5.5	6.0	5.7	5.5	0.0	0.5
Primary deficit (% GDP)	-1.9	-0.6	2.3	1.4	1.6	1.6	1.4	1.0	-0.9	-0.4
Net incurrence of liabilities	-1.3	0.6	3.0	1.0	2.8	-0.3	1.3	1.7	-1.7	0.7
Net domestic financing (% GDP)	0.9	1.0	1.7	1.7	5.2	-1.3	0.7	1.2	-1.0	-0.5
Exports of G&S (y/y growth)	12.0	-11.9	7.2	6.5	-19.3	14.8	7.5	6.0	0.3	-0.5
Imports of G&S (y/y growth)	13.2	7.0	10.1	7.6	-6.5	22.3	7.5	6.1	-2.6	-1.5
Remittances (y/y growth)	12.4	11.2	8.5	8.5	1.0	3.4	5.6	6.0	-2.9	-2.5
Current account balance (% GDP)	4.6	2.8	-2.0	1.3	6.3	-0.3	-1.8	-1.4	0.2	-2.7

Note: MT (medium term) is the average over the next 5 years, and LT (long term) is the average over the following 7-20 years.

- In the context of the International Conference on Nepal's Reconstruction (ICNR) held in Kathmandu in June 2015, Nepal’s development partners announced new pledges of financial assistance. About forty percent of this additional financing would come in the form of grants and the remainder in the form of loans. However, reflecting the weak budget implementation capacity which underlies the fiscal surpluses of the last four years and persistent downward trend in Nepal’s public debt to GDP ratio, the baseline assumes only part of the additional external financing—approximately US$2.7 billion for the next 5-year period in order to meet post-earthquake reconstruction-related financing needs—would be drawn.[3]

[3] The ADB has recently noted that its operations in Nepal are challenged by weak capacity of public institutions in project planning and implementation (see page 70 in https://www.adb.org/sites/default/files/publication/211636/mapping-fcas-asia-pacific.pdf). Notwithstanding large development needs, ADB and World Bank disbursement rates to Nepal remain low. In 2015, before the new aid commitments triggered by the earthquakes, US$2.3 billion (11 percent of GDP) remained to be disbursed on the ADB and World Bank’s combined US$3.7 billion portfolio of active projects and programs.

EXTERNAL DEBT SUSTAINABILITY

A. Baseline

6. **Under the baseline scenario, Nepal's external debt indicators continue to stay well below indicative sustainability thresholds** (Figure 1 and Table 1b). As in the previous DSA, remittances are formally included in the analysis as the inflows reached close to 30 percent of GDP in FY2015/16. Nonetheless, debt dynamics may be susceptible to volatility in remittance flows, as captured under standard shocks, discussed below. Over the medium term, the present value (PV) of external debt stabilizes at a level equal to: 8 percent of GDP and remittances, 32 percent of exports and remittances, and 45 percent of revenues. The ratio of debt service to export and remittances stabilizes at 2 percent, while the ratio of debt service to revenues stabilizes at 3 percent over the medium term.

B. Stress Tests and Alternative Scenarios

7. **Debt dynamics remain resilient to standard shocks.** These stress tests include shocks to real GDP growth, exports, non-debt creating flows, and a combination of these shocks, as well as a one-time 30 percent nominal depreciation shock. Under the most severe shock (to non-debt creating flows, capturing a shock to remittances), the PV of debt to exports and remittances rises sharply over the next three years but stays well below the threshold, and declines thereafter, while all other indicators remain well below the thresholds. The relative sensitivity to a shock to remittances illustrates Nepal's exposure to potential adverse developments in the external environment.

PUBLIC DEBT SUSTAINABILITY

8. **Under the baseline, the ratio of public debt to GDP gradually declines from 27.3 percent in 2015/16 to 22 percent of GDP in the medium term and 20½ percent of GDP in the long term** (Table 2a). In PV terms, public debt to GDP also decreases over time, from 23 percent in 2015/16 to 15.7 percent of GDP in 2036/37. As a ratio of revenues and grants, the PV of public debt declines from 98.5 percent in 2015/16 to 62 percent in 2036/37. Unlike in the 2015 DSA, the composition of public debt is projected to tilt toward a higher share of external debt, from 62 percent in 2015/16 to 73 percent in the medium term, before reverting back to 62 percent of total public debt in the long term.

9. **Debt dynamics remain resilient under standard stress tests.** In the context of the PV of public debt to GDP ratio, as in the 2015 DSA, the most extreme shocks are the real GDP growth at historical average minus one standard deviation and the 10 percent of GDP increase in other debt-creating flows in 2017/18. Overall, the PV of public debt to GDP ratio remains well below the 56 percent threshold, for all the standard stress tests.

10. Contingent liabilities arise mainly from the operations of state owned enterprises (SOEs), and civil service pension liabilities:

- The Nepal Oil Corporation (NOC) and the Nepal Electricity Authority (NEA) have been the two largest loss-making SOEs. However, the NOC was able to repay 1½ percent of GDP in loans over the past 2 fiscal years by delaying the pass through of declining oil import prices. The NEA made a loss of ½ percent of GDP in 2015/16 and has long-term debts of close to 5 percent of GDP. But the NEA's cash flow has improved in recent months thanks to a July 2016 hike in electricity tariffs and improvements in demand side management.

- Civil service pension liabilities remain modest. Moreover, according to a 2014 IMF TA mission on pension reforms, these liabilities can be addressed through adequate parametric reforms in the medium term.

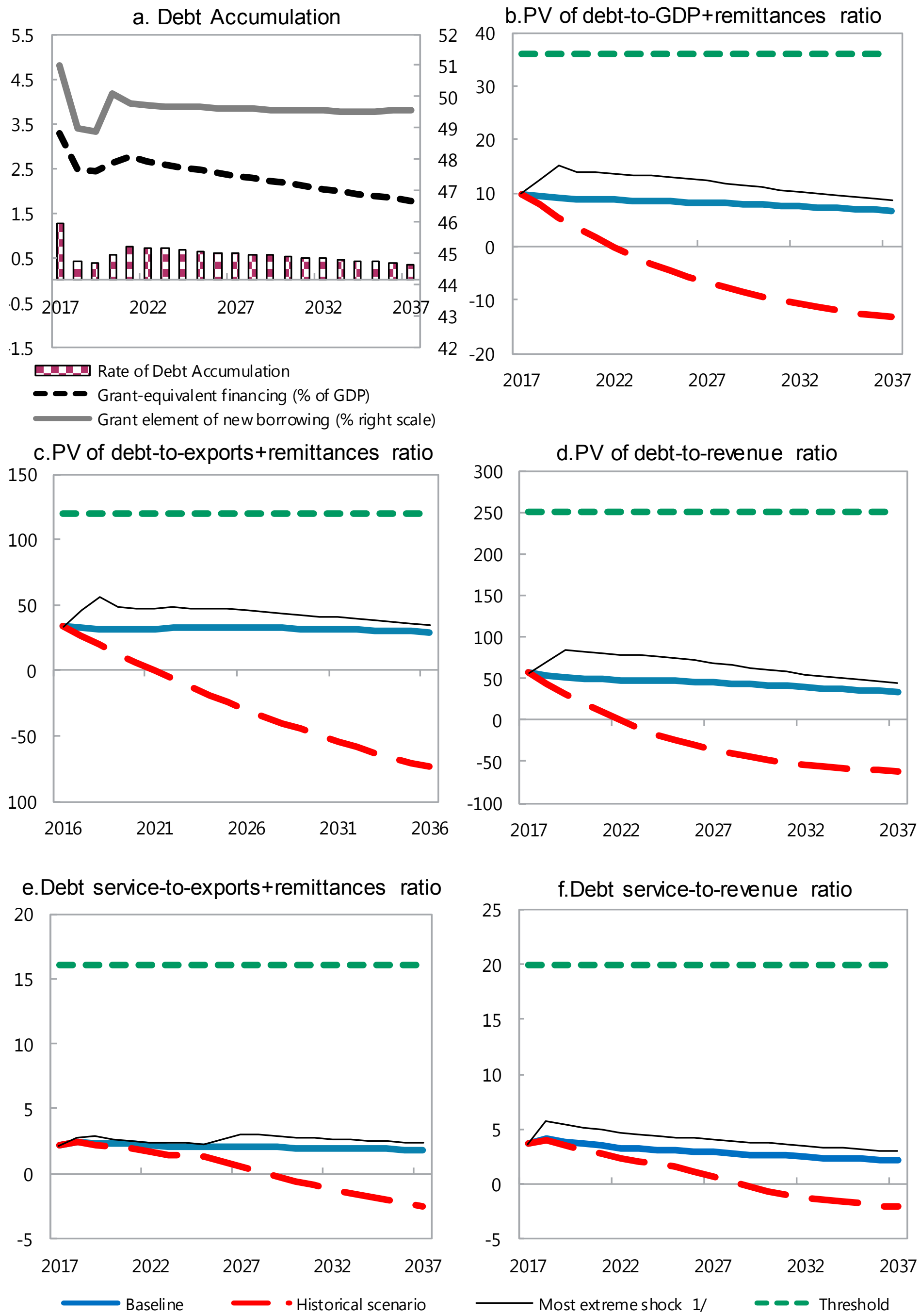
AUTHORITIES' VIEWS

11. The authorities broadly agreed with the findings of the DSA. They noted that their efforts were geared toward strengthening capital budget implementation and mobilizing additional foreign financing with a view to speed up the recovery from the earthquakes and trade disruption and raise medium-term growth. The authorities expressed confidence that the risk of debt distress would remain low even with scaled up public investment.

CONCLUSION

12. The DSA suggests Nepal's risk of debt distress is low. Weak budget execution has contributed to fiscal surpluses in each of the past four years. In recent months there has been a pickup in government spending and a large number of households affected by the 2015 earthquakes have received the first installment of housing grants provided to assist in rebuilding structures that were destroyed by the earthquakes. The government also intends to raise capital spending to address infrastructure bottlenecks and boost growth. On this basis, the baseline macroeconomic projections underlying this DSA assume a pickup in government spending and the fiscal balance turning to a small deficit. However, Nepal's risk of debt distress is expected to remain low in view of the assumed continued high level of concessionality of official borrowing and limited scaling up of capital spending due to weak implementation capacity over the medium term. Under the baseline macroeconomic scenario, the indicators of the public external debt stock and public debt service ratios remain well below the policy-dependent indicative thresholds, even under stress tests, due to the assumed continued high level of concessionality of official borrowing.

Figure 1. Nepal: Indicators of Public and Publicly Guaranteed External Debt under Alternative Scenarios, 2016/17-2036/37 1/



Sources: Country authorities; and staff estimates and projections.

1/ The most extreme stress test is the test that yields the highest ratio on or before 2026. In figure b. it corresponds to a Combination shock; in c. to a Combination shock; in d. to a Combination shock; in e. to a Combination shock and in figure f. to a One-time depreciation shock

Table 1a. Nepal: External Debt Sustainability Framework, Baseline Scenario, 2013/14-2036/37 1/

(In percent of GDP, unless otherwise indicated)

	Actual			Historical 6/	Standard 6/	Projections									
	2013/14	2014/15	2015/16	Average	Deviation	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2016/17-2021/22 Average	2026/27	2036/37	2022/23-2036/37 Average
External debt (nominal) 1/	**18.2**	**15.9**	**16.9**			**17.5**	**16.7**	**16.0**	**15.8**	**16.0**	**16.0**		**15.7**	**12.9**	
of which: public and publicly guaranteed (PPG)	18.0	15.9	16.9			17.5	16.7	16.0	15.8	16.0	16.0		15.7	12.9	
Change in external debt	-1.1	-2.3	1.0			0.6	-0.8	-0.7	-0.2	0.2	0.1		-0.2	-0.3	
Identified net debt-creating flows	-5.8	-6.3	-6.5			-0.8	0.3	0.7	0.9	1.1	1.1		0.2	-0.2	
Non-interest current account deficit	**-4.7**	**-5.2**	**-6.5**	**-3.0**	**3.0**	**0.1**	**1.1**	**1.4**	**1.6**	**1.8**	**1.9**		**1.3**	**0.8**	1.2
Deficit in balance of goods and services	29.3	30.0	29.8			33.7	33.6	33.1	32.7	32.4	32.1		29.7	26.6	
Exports	11.5	11.7	9.5			9.9	9.9	9.7	9.6	9.5	9.4		8.4	7.7	
Imports	40.9	41.7	39.2			43.5	43.4	42.8	42.3	41.9	41.4		38.1	34.3	
Net current transfers (negative = inflow)	-32.2	-33.4	-34.6	-28.7	4.0	-31.8	-30.7	-29.9	-29.4	-28.9	-28.4		-26.8	-24.1	-25.9
of which: official	-1.8	-1.4	-1.9			-1.2	-1.2	-1.2	-1.2	-1.2	-1.2		-1.3	-1.3	
Other current account flows (negative = net inflow)	-1.8	-1.7	-1.7			-1.7	-1.7	-1.7	-1.7	-1.7	-1.7		-1.7	-1.6	
Net FDI (negative = inflow)	**-0.2**	**-0.2**	**-0.3**	**-0.3**	**0.2**	**-0.3**	**-0.3**	**-0.3**	**-0.3**	**-0.4**	**-0.4**		**-0.7**	**-0.7**	-0.7
Endogenous debt dynamics 2/	**-0.9**	**-1.0**	**0.3**			**-0.7**	**-0.5**	**-0.4**	**-0.4**	**-0.4**	**-0.4**		**-0.4**	**-0.3**	
Contribution from nominal interest rate	0.2	0.1	0.1			0.2	0.2	0.2	0.2	0.2	0.2		0.2	0.1	
Contribution from real GDP growth	-1.1	-0.5	-0.1			-0.8	-0.7	-0.6	-0.6	-0.6	-0.6		-0.6	-0.5	
Contribution from price and exchange rate changes	0.0	-0.7	0.2			...	...	...	...	...	...		...	...	
Residual (3-4) 3/	**4.7**	**4.1**	**7.5**			**1.5**	**-1.1**	**-1.4**	**-1.1**	**-0.9**	**-1.1**		**-0.4**	**-0.1**	
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	
PV of external debt 4/	...	...	12.6			12.6	11.9	11.3	11.0	10.8	10.7		10.0	8.1	
In percent of exports	...	...	132.7			127.3	120.2	116.1	114.2	114.2	114.1		119.2	105.3	
PV of PPG external debt	**...**	**...**	**12.6**			**12.6**	**11.9**	**11.3**	**11.0**	**10.8**	**10.7**		**10.0**	**8.1**	
In percent of exports	**...**	**...**	**132.7**			**127.3**	**120.2**	**116.1**	**114.2**	**114.2**	**114.1**		**119.2**	**105.3**	
In percent of government revenues	**...**	**...**	**58.7**			**56.3**	**53.2**	**50.8**	**49.2**	**48.7**	**48.1**		**44.7**	**33.7**	
Debt service-to-exports ratio (in percent)	**8.9**	**8.1**	**10.3**			**8.2**	**9.2**	**8.7**	**8.4**	**8.2**	**7.8**		**7.7**	**19.3**	
PPG debt service-to-exports ratio (in percent)	**8.9**	**8.1**	**10.3**			**8.2**	**9.2**	**8.7**	**8.4**	**8.2**	**7.8**		**7.7**	**6.6**	
PPG debt service-to-revenue ratio (in percent)	**5.6**	**4.9**	**4.5**			**3.6**	**4.1**	**3.8**	**3.6**	**3.5**	**3.3**		**2.9**	**2.1**	
Total gross financing need (Billions of U.S. dollars)	-0.7	-0.9	-1.2			0.1	0.4	0.5	0.6	0.7	0.8		0.6	1.6	
Non-interest current account deficit that stabilizes debt ratio	-3.6	-2.9	-7.5			-0.5	1.9	2.1	1.8	1.6	1.9		1.5	1.2	
Key macroeconomic assumptions															
Real GDP growth (in percent)	6.0	2.7	0.6	4.0	1.6	5.5	4.5	3.8	3.8	3.8	3.8	4.2	3.8	3.8	3.8
GDP deflator in US dollar terms (change in percent)	0.1	3.8	-1.3	6.0	8.5	4.4	4.6	4.5	4.4	4.1	4.1	4.4	3.6	3.1	3.5
Effective interest rate (percent) 5/	1.0	0.8	0.9	0.9	0.1	1.1	1.3	1.4	1.4	1.4	1.3	1.3	1.1	1.0	1.1
Growth of exports of G&S (US dollar terms, in percent)	12.0	7.8	-19.3	5.9	10.8	14.8	9.4	7.0	6.9	6.8	6.8	8.6	6.4	6.3	6.0
Growth of imports of G&S (US dollar terms, in percent)	13.2	8.6	-6.5	12.1	11.3	22.3	9.1	7.0	7.0	7.0	6.9	9.9	6.6	5.9	6.1
Grant element of new public sector borrowing (in percent)	...	...	...	...	...	51.0	49.0	48.9	50.1	49.8	49.7	49.7	49.6	49.5	49.6
Government revenues (excluding grants, in percent of GDP)	18.2	19.1	21.4			22.3	22.3	22.3	22.3	22.2	22.3		22.4	24.0	22.9
Aid flows (in Billions of US dollars) 7/	0.6	0.5	0.5			0.6	0.6	0.7	0.7	0.8	0.8		1.2	1.9	
of which: Grants	0.4	0.4	0.4			0.4	0.5	0.5	0.5	0.6	0.6		0.8	1.4	
of which: Concessional loans	0.1	0.1	0.1			0.2	0.2	0.2	0.2	0.2	0.2		0.4	0.6	
Grant-equivalent financing (in percent of GDP) 8/	...	...	...			3.3	2.5	2.4	2.6	2.8	2.7		2.3	1.8	2.2
Grant-equivalent financing (in percent of external financing) 8/	...	...	...			70.4	77.7	78.6	76.2	74.1	74.8		76.3	79.4	77.2
Memorandum items:															
Nominal GDP (Billions of US dollars)	20.0	21.3	21.2			23.3	25.5	27.7	30.0	32.4	35.0		50.4	102.4	
Nominal dollar GDP growth	6.1	6.6	-0.7			10.2	9.4	8.5	8.3	8.1	8.1	8.8	7.6	7.0	7.4
PV of PPG external debt (in Billions of US dollars)			2.7			2.9	3.0	3.1	3.3	3.5	3.7		5.1	8.3	
(PVt-PVt-1)/GDPt-1 (in percent)						1.3	0.4	0.4	0.6	0.7	0.7	0.7	0.6	0.4	0.5
Gross workers' remittances (Billions of US dollars)	5.5	6.2	6.3			6.5	6.8	7.2	7.6	8.0	8.5		11.4	20.4	
PV of PPG external debt (in percent of GDP + remittances)	...	...	9.7			9.8	9.4	9.0	8.8	8.7	8.6		8.2	6.8	
PV of PPG external debt (in percent of exports + remittances)	...	...	32.2			33.4	32.5	31.8	31.5	31.7	31.8		32.4	29.4	
Debt service of PPG external debt (in percent of exports + remittanc	...	...	2.5			2.2	2.5	2.4	2.3	2.3	2.2		2.1	1.8	

Sources: Country authorities; and staff estimates and projections.

1/ Includes both public and private sector external debt.

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

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

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

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

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

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

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

Table 1b. Nepal: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2016/17-2036/37

	Projections							
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	**2026/27**	2036/37
PV of debt-to-GDP+remittances ratio								
Baseline	10	9	9	9	9	9	**8**	7
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	10	8	5	3	2	0	**-7**	-13
A2. New public sector loans on less favorable terms in 2016-2036 2	10	10	10	10	10	10	**11**	11
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	10	10	9	9	9	9	**8**	7
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	10	10	10	10	10	10	**9**	7
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	10	10	10	10	10	10	**9**	8
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	10	12	14	13	13	13	**11**	8
B5. Combination of B1-B4 using one-half standard deviation shocks	10	12	15	14	14	14	**12**	9
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	10	12	12	11	11	11	**11**	9
PV of debt-to-exports+remittances ratio								
Baseline	33	33	32	31	32	32	**32**	29
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	33	27	20	13	6	-1	**-30**	-74
A2. New public sector loans on less favorable terms in 2016-2036 2	33	34	34	35	36	38	**44**	47
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	33	33	32	31	32	32	**32**	29
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	33	36	39	39	39	39	**39**	33
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	33	33	32	31	32	32	**32**	29
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	33	48	55	47	47	47	**45**	35
B5. Combination of B1-B4 using one-half standard deviation shocks	33	46	55	48	48	47	**46**	35
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	33	33	32	31	32	32	**32**	29
PV of debt-to-revenue ratio								
Baseline	56	53	51	49	49	48	**45**	34
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	56	44	31	19	9	-1	**-36**	-62
A2. New public sector loans on less favorable terms in 2016-2036 2	56	55	54	54	56	57	**60**	54
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	56	54	53	51	50	50	**46**	35
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	56	56	59	57	56	55	**50**	36
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	56	57	58	56	56	55	**51**	38
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	56	67	77	74	73	71	**63**	40
B5. Combination of B1-B4 using one-half standard deviation shocks	56	69	84	81	80	78	**68**	44
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	56	75	71	69	69	68	**63**	47

Table 1b. Nepal: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2016/17-2036/37 (continued)

	Projections							
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	**2026/27**	2036/37
Debt service-to-exports+remittances ratio								
Baseline	2	2	2	2	2	2	**2**	2
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	2	2	2	2	2	2	**1**	-3
A2. New public sector loans on less favorable terms in 2016-2036 2	2	2	2	2	2	2	**3**	3
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	2	2	2	2	2	2	**2**	2
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	2	3	3	3	3	2	**3**	2
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	2	2	2	2	2	2	**2**	2
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	2	3	3	3	3	2	**3**	2
B5. Combination of B1-B4 using one-half standard deviation shocks	2	3	3	3	3	2	**3**	2
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	2	2	2	2	2	2	**2**	2
Debt service-to-revenue ratio								
Baseline	4	4	4	4	4	3	**3**	2
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	4	4	4	3	3	2	**1**	-2
A2. New public sector loans on less favorable terms in 2016-2036 2	4	4	4	4	4	4	**4**	3
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	4	4	4	4	4	3	**3**	2
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	4	4	4	4	4	3	**3**	2
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	4	4	4	4	4	4	**3**	2
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	4	4	4	4	4	4	**4**	3
B5. Combination of B1-B4 using one-half standard deviation shocks	4	4	4	4	4	4	**5**	3
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	4	6	5	5	5	5	**4**	3
Memorandum item:								
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	49	49	49	49	49	49	**49**	49

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.

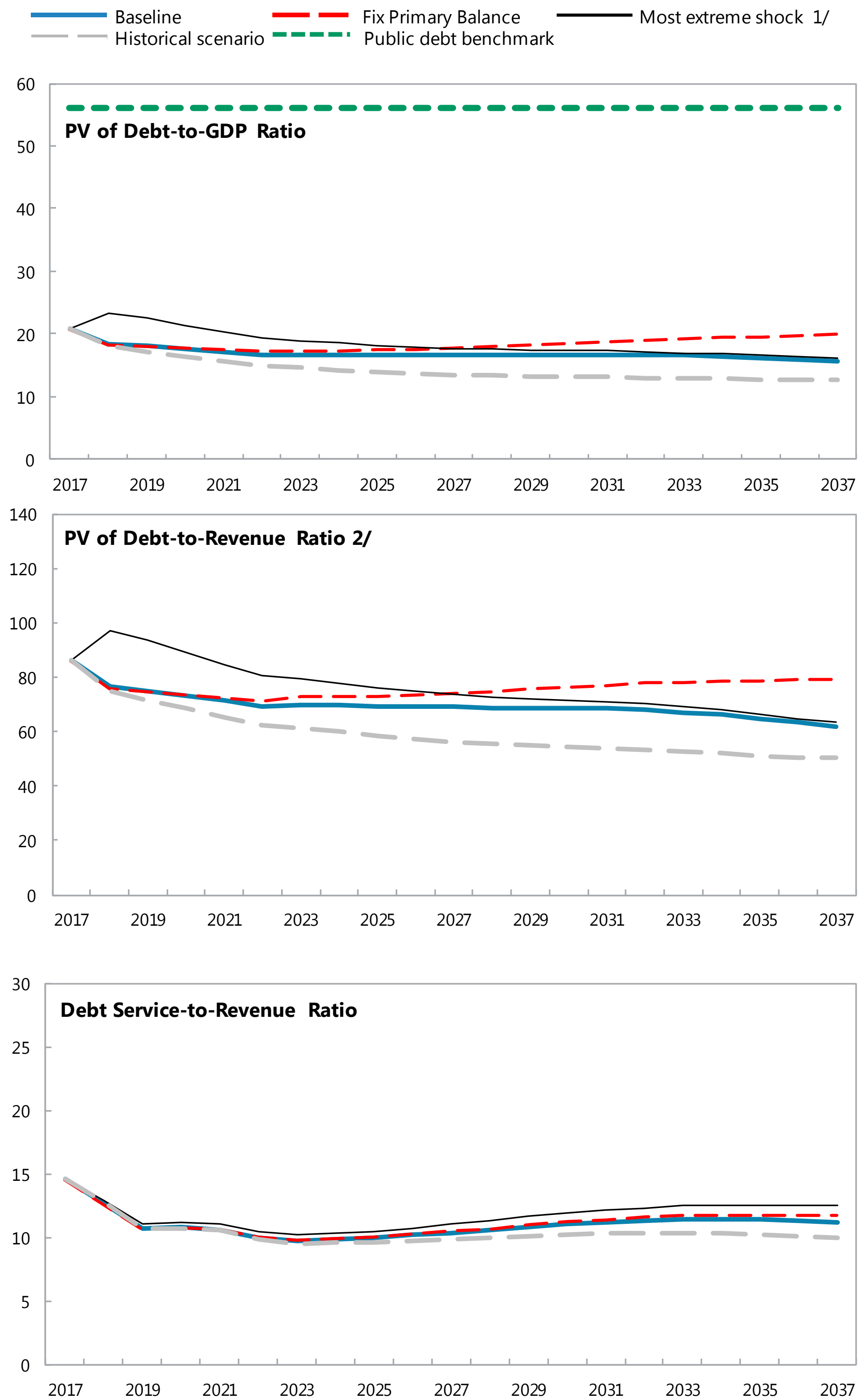
3/ Exports values are assumed to remain permanently at the lower level, but the current account as a share of GDP is assumed to return to its baseline level after the shock (implicitly assum
an offsetting adjustment in import levels).

4/ Includes official and private transfers and FDI.

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

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

Figure 2. Nepal: Indicators of Public Debt Under Alternative Scenarios, 2016/17-2036/37 1/



Sources: Country authorities; and staff estimates and projections.
1/ The most extreme stress test is the test that yields the highest ratio on or before 2026.
2/ Revenues are defined inclusive of grants.

Table 2a. Nepal: Public Sector Debt Sustainability Framework, Baseline Scenario, 2013/14-2036/37

(In percent of GDP, unless otherwise indicated)

	Actual					Estimate	Projections								
	2013/14	2014/15	2015/16	Average 5/	Standard Deviation 5/	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2016/17-2021/22 Average	2026/27	2036/37	2022/23-2036/37 Average
Public sector debt 1/	28.3	25.2	27.3			25.7	23.2	22.8	22.5	22.3	22.0		22.3	20.5	
of which: foreign-currency denominated	18.0	15.9	16.9			17.5	16.7	16.0	15.8	16.0	16.0		15.7	12.9	
Change in public sector debt	-3.3	-3.1	2.1			-1.6	-2.5	-0.4	-0.3	-0.3	-0.3		0.0	-0.4	
Identified debt-creating flows	-3.7	-0.8	-0.7			-0.6	-0.1	0.1	-0.2	-0.2	-0.3		0.0	-0.6	
Primary deficit	-1.0	0.7	-0.7	0.7	1.3	1.6	1.8	1.7	1.2	1.2	1.1	1.4	1.2	0.3	1.0
Revenue and grants	20.4	20.9	23.3			24.2	24.1	24.1	24.1	24.0	24.0		24.1	25.3	
of which: grants	2.2	1.7	1.9			1.9	1.8	1.8	1.8	1.8	1.8		1.6	1.3	
Primary (noninterest) expenditure	19.4	21.5	22.7			25.8	26.0	25.7	25.3	25.2	25.1		25.2	25.7	
Automatic debt dynamics	-2.6	-1.4	0.0			-2.2	-1.9	-1.5	-1.5	-1.4	-1.4		-1.2	-0.9	
Contribution from interest rate/growth differential	-2.7	-1.1	-0.6			-1.9	-1.5	-0.8	-1.1	-1.1	-1.1		-0.9	-0.8	
of which: contribution from average real interest rate	-0.9	-0.4	-0.4			-0.4	-0.4	0.0	-0.3	-0.3	-0.3		-0.1	0.0	
of which: contribution from real GDP growth	-1.8	-0.8	-0.1			-1.4	-1.1	-0.9	-0.8	-0.8	-0.8		-0.8	-0.8	
Contribution from real exchange rate depreciation	0.1	-0.3	0.5			-0.4	-0.4	-0.7	-0.3	-0.3	-0.3		...	...	
Other identified debt-creating flows	-0.1	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)	-0.1	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	0.4	-2.3	2.8			-1.0	-2.4	-0.6	0.0	0.0	0.0		0.0	0.2	
Other Sustainability Indicators															
PV of public sector debt	...	...	23.0			20.8	18.4	18.1	17.7	17.1	16.6		16.6	15.7	
of which: foreign-currency denominated	...	...	12.6			12.6	11.9	11.3	11.0	10.8	10.7		10.0	8.1	
of which: external	...	...	12.6			12.6	11.9	11.3	11.0	10.8	10.7		10.0	8.1	
PV of contingent liabilities (not included in public sector debt)	...	...	...			...	...	...	...	...	...		...	...	
Gross financing need 2/	2.8	5.1	3.6			6.1	5.6	4.8	4.4	4.3	4.1		4.3	3.9	
PV of public sector debt-to-revenue and grants ratio (in percent)	...	...	98.5			86.0	76.3	75.1	73.4	71.2	69.1		68.9	62.0	
PV of public sector debt-to-revenue ratio (in percent)	...	...	107.3			93.1	82.5	81.1	79.3	76.9	74.6		73.9	65.4	
of which: external 3/	...	...	58.7			56.3	53.2	50.8	49.2	48.7	48.1		44.7	33.7	
Debt service-to-revenue and grants ratio (in percent) 4/	13.5	16.7	14.8			14.6	12.6	10.7	10.8	10.6	9.9		10.4	11.2	
Debt service-to-revenue ratio (in percent) 4/	15.1	18.2	16.1			15.8	13.7	11.5	11.6	11.5	10.7		11.1	11.8	
Primary deficit that stabilizes the debt-to-GDP ratio	2.3	3.8	-2.8			3.2	4.3	2.1	1.5	1.4	1.4		1.2	0.7	
Key macroeconomic and fiscal assumptions															
Real GDP growth (in percent)	6.0	2.7	0.6	4.0	1.6	5.5	4.5	3.8	3.8	3.8	3.8	4.2	3.8	3.8	3.8
Average nominal interest rate on forex debt (in percent)	1.0	0.8	0.9	1.0	0.1	1.1	1.3	1.4	1.4	1.4	1.3	1.3	1.1	1.0	1.1
Average real interest rate on domestic debt (in percent)	-6.8	-1.9	-2.6	-3.6	10.2	-2.8	-3.6	-3.3	-2.8	-2.6	-2.6	-3.0	0.2	1.8	0.6
Real exchange rate depreciation (in percent, + indicates depreciation	0.5	-1.7	3.4	-2.3	16.3	-2.3	...	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	11.8	5.1	5.5	10.5	13.2	6.7	7.6	7.3	6.7	6.5	6.5	6.9	6.0	5.5	5.9
Growth of real primary spending (deflated by GDP deflator, in percer	10.3	13.8	6.0	3.1	5.1	20.1	5.2	2.9	2.0	3.5	3.6	6.2	3.9	4.1	4.0
Grant element of new external borrowing (in percent)	...	...	...	...	...	51.0	49.0	48.9	50.1	49.8	49.7	49.7	49.6	49.5	...

Sources: Country authorities; and 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.