INTERNATIONAL DEVELOPMENT ASSOCIATION

INTERNATIONAL MONETARY FUND

BHUTAN

Joint Bank-Fund Debt Sustainability Analysis- 2018 Update

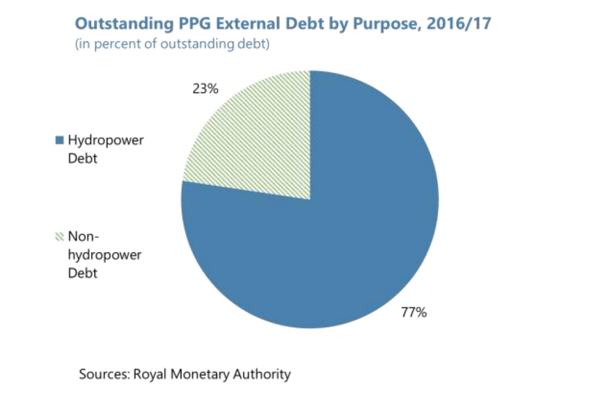
Prepared jointly by the staffs of the International Development Association (IDA) and the International Monetary Fund (IMF)

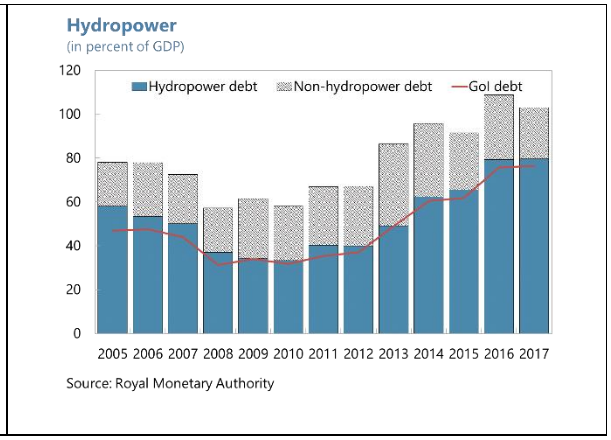
Approved by John Panzer (IDA)and Ranil Salgado and Kevin Fletcher (IMF)

The assessment of Bhutan's external risk has not changed materially from the 2016 DSA. Given the unique nature of the bulk of Bhutan's debt stock, as spelled out in the 2014 and 2016 DSAs, the risk of debt distress is assessed to remain moderate despite breaches in all five indicators under the baseline. The unique mitigating circumstances are as follows. A large share of outstanding public and publicly guaranteed debt external debt is linked to hydropower project loans from the government of India (GoI). These projects are implemented under an intergovernmental agreement in which the GoI covers both financial and construction risks of the projects and buys surplus electricity at a price reflecting cost plus a 15 percent net return. Debt dynamics are set to improve over the medium term driven by a significant increase in electricity exports and decline of imports associated with hydropower construction. While India's political commitment to increase its reliance on clean energy continues to provide reliable demand, India's recent power surplus and financing models for new projects where the construction risk is not guaranteed by India (e.g., joint ventures and public-private partnerships) are sources of risk.

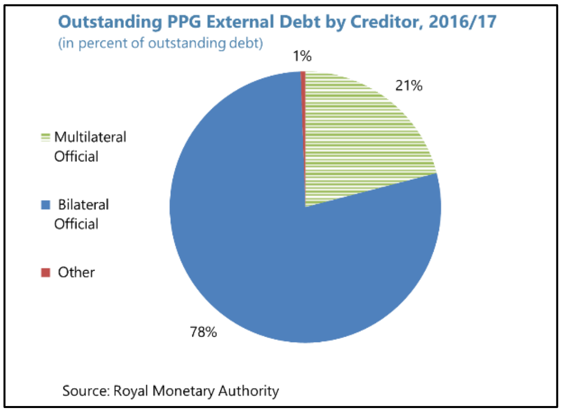
BACKGROUND

1. Public and publicly guaranteed (PPG) debt stood at 107 percent of GDP in FY2017. Bhutan borrows almost exclusively from official creditors, most of which is used to develop its hydropower sector.





Hydropower projects comprised 77 percent of the PPG external debt stock in FY2017. These projects are mostly financed by India with debt denominated in Indian rupees. More than 99 percent of public and publicly guaranteed debt was from official creditors with India lending the largest share, 74 percent, followed by the Asian Development Bank (ADB), 11 percent, and the World Bank (IDA), 9 percent.



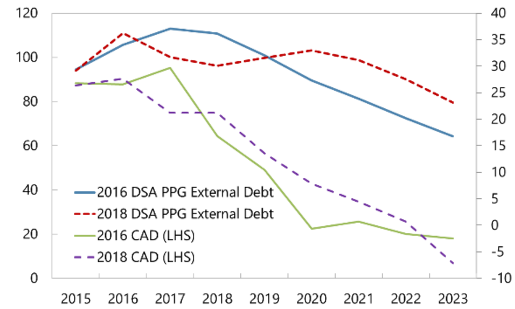
2. Debt from the Government of India (GoI) to finance hydropower projects is closer in nature to foreign direct investment (FDI) as emphasized in the last two DSAs. All existing debt from India provides financing for projects under an intergovernmental agreement in which construction and financial risks are borne by the GoI and surplus electricity is sold to India at cost plus a 15 percent net return. The price of electricity is set at the time of construction, when costs are known, and the rate is agreed to be revisited every 3 years to incorporate changes in costs.[1]

[1] See Box 1 in the 2014 DSA for more detail.

UNDERLYING ASSUMPTIONS

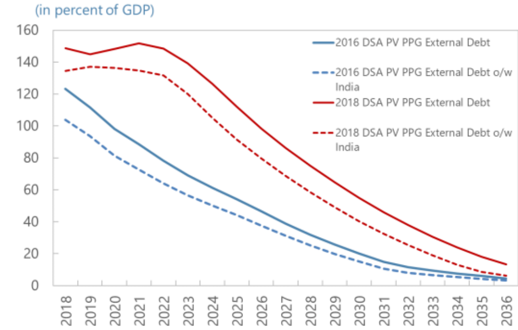
3. Delays in the completion of major hydropower plants have hampered the expected acceleration in growth and consolidation of the current account deficit (CAD). Project delays have also shifted associated disbursements causing the nominal debt path to be lower than was anticipated in the 2016 DSA. These delays come with associated costs, for example, delayed and higher debt service costs, which have led to a deterioration in the present value (PV) of debt indicators.[2] Nonetheless, at its highest level, the PV of non-Indian debt-to-GDP is 21 percent and remains well below Bhutan's threshold for a high-risk rating (40 percent of GDP). Over the medium term, the current account is still expected to improve sharply, with construction imports falling and electricity exports doubling as a percent of GDP and hovering around 60 percent of exports.

Differences in Outturns and Assumptions from 2016
(in percent of GDP)



Sources: Royal Monetary Authority and staff estimates

Present Value of PPG External Debt
(in percent of GDP)



Sources: Royal Monetary Authority and staff estimates

4. The main baseline macroeconomic assumptions are as follows:

- **Real sector.** Historical growth estimates for FY2016 and FY2017 have been revised up by around one percentage point each year. Over the medium term, with production commencing in new large hydropower projects, growth is projected to remain strong, averaging around 6 percent, close to its average during the eleventh five-year plan. Long-term growth is projected to be around 6 percent.

- **Fiscal sector.** When hydropower projects are completed, government revenues increase through both tax and non-tax revenues. As the completion of major projects has been delayed, these revenues will accrue mainly towards the end of the medium term. The fiscal deficit remains broadly balanced over the medium term, exhibiting a surplus towards the end of the five-year planning cycle as hydropower revenues from the newly commissioned projects are received.

- **External sector.** The current account deficit (CAD) is expected to narrow sharply over the medium term, reaching a surplus in FY2023. CAD dynamics are driven by an increase in electricity exports from around 7 percent of GDP to around 20 percent of GDP and a decline in imports for the hydropower sector to nearly nil over the medium term.[3] The overall balance of payments, which has been supported by grant financing, is set to remain positive over the medium term, supporting reserve accumulation. As grant financing declines over the long run, the current account surplus will support

[2] These increased costs are covered by the government of India for projects under the intergovernmental agreement.

[3] The completion of three hydropower plants is incorporated in the baseline microframework: Mangdechhu (with capacity of 720 MW in FY2019), Puna II (with capacity of 1,020 MW in FY2021), and Puna I (with capacity of 1,200 MW in FY2023).

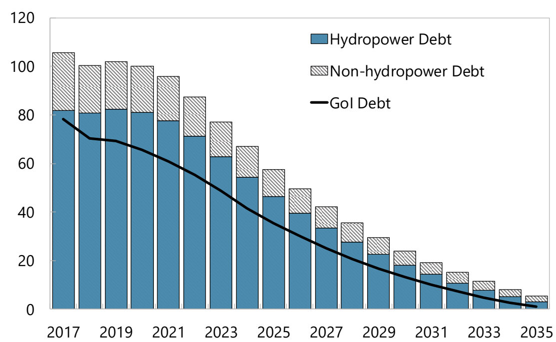
the overall balance. Bhutan's borrowing from IDA is set to remain on concessional terms, as the country is eligible for credit financing under IDA's small economy terms.

Text Table 1. Key Macroeconomic Assumptions, 2018–2036		
	2016 DSA	2018 DSA
Real GDP growth (in percent)	6.4	6.1
GDP deflator in US dollar terms (change in percent)	2.0	1.8
Growth of exports of G&S (US dollar terms, in percent)	9.7	6.7
Growth of imports of G&S (US dollar terms, in percent)	5.7	1.9
Grant element of new public sector borrowing (in percent)	27.3	30.4
Government revenues (excluding grants, in percent of GDP)	21.6	22.2
Aid flows (in Billions of US dollars)	0.1	0.1
of which: Grants	0.1	0.1
of which: Concessional loans	0.0	0.0
Grant-equivalent financing (in percent of GDP)	2.6	2.9
Non-interest current account deficit	1.1	-3.3
Net FDI (negative = inflow)	-1.5	-0.6
Public sector balance	-1.8	-1.7

EXTERNAL DSA

5. The composition of hydropower debt is projected to remain dominated by debt contracted with India under the intergovernmental agreement. Other hydropower projects will be constructed under joint venture agreements and public-private partnerships (PPPs), where guarantees from the GoI are not available. Since the stock of debt will remain dominated by projects constructed under the intergovernmental agreement, which is more like FDI, vulnerabilities are contained. The government's liabilities under projects already financed through PPPs are reflected in the DSA. Other contingent liabilities, for example from the banking sector, and external borrowing outside of hydropower are not a source of immediate risk.

Composition of External Debt Projections
(in percent of GDP)



Sources: Royal Monetary Authority and staff estimates.

6. Under the baseline scenario, each debt indicator breaches its indicative threshold. The breaches are large and will be sustained into the long run. It is important to note that the PV of debt indicators are higher than their nominal values because the loan portion of hydropower projects financed by India are not concessional. The total package—loan and grant—has a positive grant element.[4] For example, the PV of debt-to-GDP ratio falls below threshold only after 2031 whereas the nominal debt-

[4] Note that the grant element in the total package is generally below the 35 percent threshold for concessionality as defined by the IMF's debt limits policy.

(continued)

to-GDP ratio goes below the threshold in 2028. The profile of debt service indicators has worsened relative to the previous DSA, due to both higher debt service, and in the case of exports, a more moderate rate of growth.[5]

7. **Volatility in the debt service indicators is due to a lumpy amortization schedule.** Breaches in debt service indicators occur beyond the medium term and do not return to the threshold until the end of the projection horizon. This is in line with the repayment schedule for hydropower debt.

8. **All five indicators breach their indicative threshold under stress tests.** It is worth noting that although the ngultrum is pegged to the rupee, and nearly 80 percent of the debt stock is denominated in rupees, this does not preclude risks to the debt stock from an overvaluation of the ngultrum. As it stands, the ngultrum is only moderately overvalued (see External Sector Assessment in accompanying staff report), and risks remain contained given the projected improvement of the current account. Notwithstanding, efforts must remain vigilant to contain inflation near that of India.

PUBLIC DSA

9. **Domestic debt is 6 percent of the debt stock in FY2017 and does not pose an additional risk to the debt profile.** Movements in the public debt profile mirror those for external debt. As Bhutan relies less on grant financing and external concessional borrowing over the medium term, developing a deep and liquid domestic debt market will be important to meet financing needs going forward. To further this, the debt management office is preparing a Medium-Term Debt Strategy for FY2019–2023 and studying the possibility of issuance of longer term domestic instruments.

CONCLUSION

10. The current assessment remains broadly the same as the assessments made in the 2014 and 2016 Article IV DSAs, which assessed Bhutan's debt at a moderate risk of debt distress. Even though under the baseline each indicator breaches its threshold, the unique mitigating factors discussed in detail in the last two DSAs remain valid and underpin our assessment. 77 percent of Bhutan's external PPG debt is hydropower related, and most are hydropower projects constructed under the intergovernmental agreement in which the GoI covers both the financial and construction risks of these projects and buys surplus electricity at a price reflecting cost plus a 15 percent net return. Debt flows from these projects are projected to remain the bulk of the debt stock going forward. Risks stemming from non-hydropower debt are low, as the stock of non-hydropower debt-to-GDP is modest and owed mostly to the ADB and World Bank contracted on highly concessional terms.

11. **The authorities agreed with staff's assessment of a moderate risk of debt distress.** They expect the electricity exports resulting from the commissioning of Mangdechhu (in FY2019), Puna II (in FY2021), and Puna I (in FY2023) will reverse the current account deficit by the end of the medium term. The authorities acknowledged that debt levels are high but that debt vulnerabilities are contained as financing is secured through the intergovernmental agreement with the GoI.

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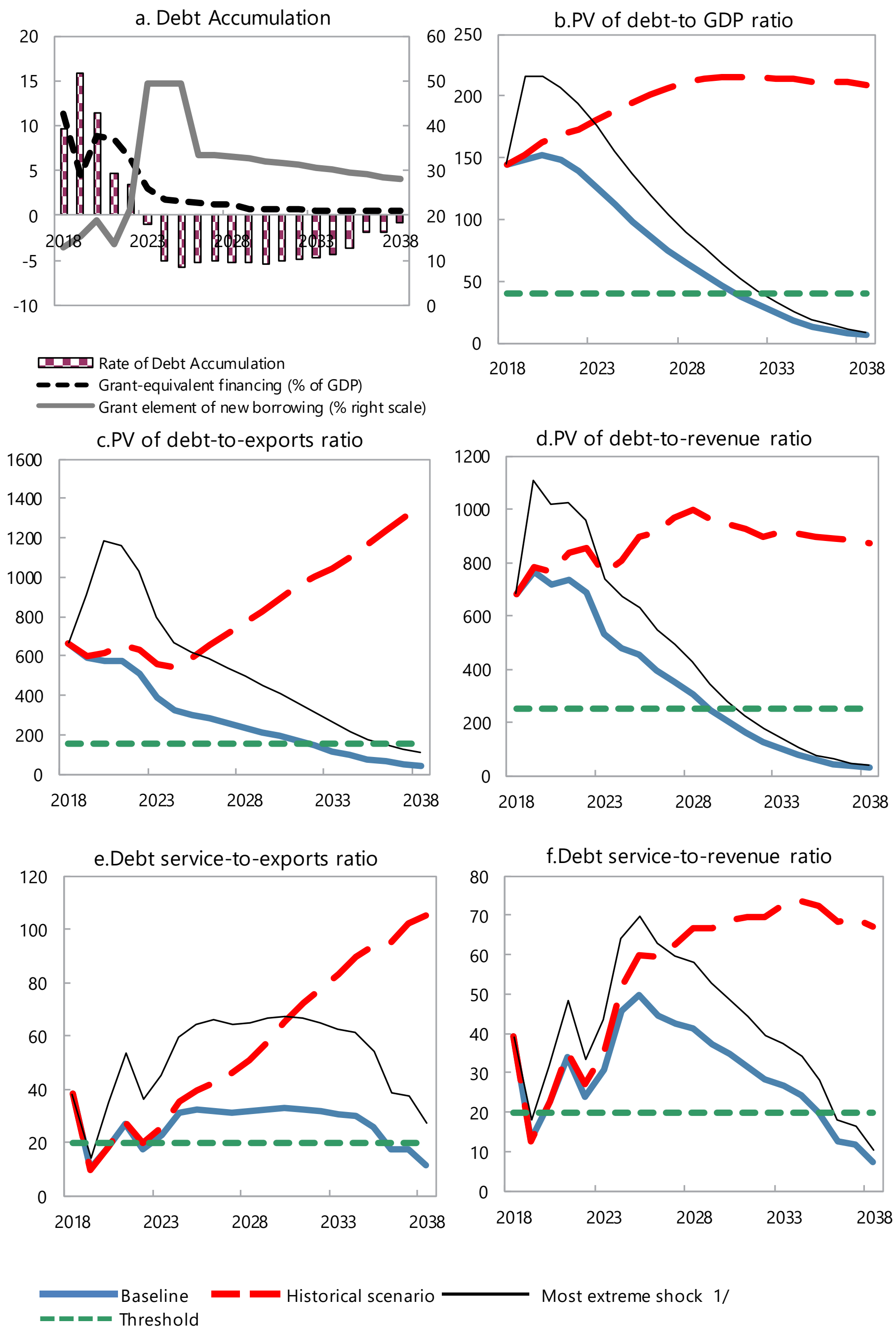
[5] Bhutan's CPIA rating, which determined the thresholds for each indicator, is assessed to remain medium as in the 2016 DSA.

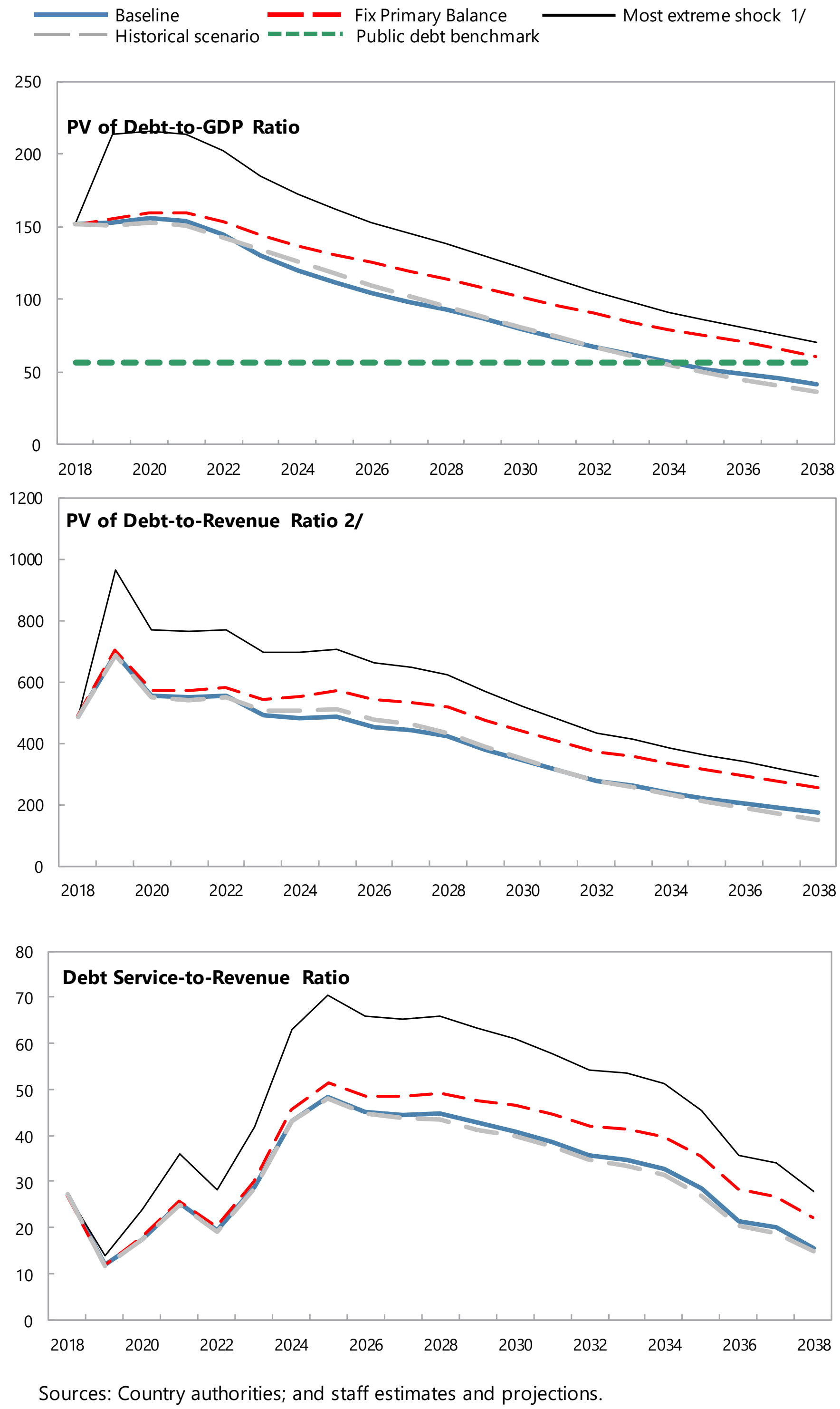
Figure 1. Bhutan: Indicators of Public and Publicly Guaranteed External Debt Under Alternative Scenarios, 2018–2038 1/



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 2028. In figure b. it corresponds to a One-time depreciation shock; in c. to a Exports shock; in d. to a One-time depreciation shock; in e. to a Exports shock and in figure f. to a One-time depreciation shock

Figure 2. Bhutan: Indicators of Public Debt Under Alternative Scenarios, 2018–2038 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 2028.
2/ Revenues are defined inclusive of grants.

Table 1. Bhutan: External Debt Sustainability Framework, Baseline Scenario, 2015–2038 1/

(In percent of GDP, unless otherwise indicated)

	Actual			Historical 6/ Average	Standard 6/ Deviation	Projections									
	2015	2016	2017			2018	2019	2020	2021	2022	2023	2018-2023 Average	2028	2038	2024-2038 Average
External debt (nominal) 1/	**94.0**	**110.9**	**100.0**			**96.2**	**99.7**	**103.2**	**98.8**	**90.1**	**79.6**		**38.4**	**3.9**	
of which: public and publicly guaranteed (PPG)	94.0	110.9	100.0			96.2	99.7	103.2	98.8	90.1	79.6		38.4	3.9	
Change in external debt	0.4	16.9	-10.9			-3.9	3.5	3.5	-4.4	-8.7	-10.5		-6.6	-0.8	
Identified net debt-creating flows	18.6	25.1	10.0			16.3	9.4	3.2	0.7	-3.5	-9.4		-7.6	-4.6	
Non-interest current account deficit	**26.3**	**27.7**	**21.2**	**19.7**	**8.6**	**21.2**	**13.6**	**7.8**	**4.5**	**0.7**	**-7.1**		**-9.5**	**-4.3**	-7.4
Deficit in balance of goods and services	21.2	25.5	19.5			17.5	8.0	5.2	3.7	0.8	-5.3		-6.0	-3.9	
Exports	28.6	23.3	23.1			21.8	25.2	26.4	25.9	27.5	32.5		27.6	15.3	
Imports	49.8	48.8	42.6			39.3	33.2	31.6	29.6	28.4	27.1		21.5	11.5	
Net current transfers (negative = inflow)	-4.0	-6.8	-7.3	-6.5	2.4	-4.6	-2.1	-2.5	-2.6	-2.3	-1.9		-1.5	-1.1	-1.4
of which: official	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Other current account flows (negative = net inflow)	9.2	8.9	9.0			8.3	7.7	5.2	3.3	2.2	0.1		-1.9	0.7	
Net FDI (negative = inflow)	**-0.5**	**-0.4**	**0.5**	**-1.3**	**1.5**	**-1.1**	**-1.2**	**-1.5**	**-1.0**	**-0.4**	**-0.4**		**-0.4**	**-0.5**	-0.4
Endogenous debt dynamics 2/	**-7.2**	**-2.2**	**-11.7**			**-3.8**	**-2.9**	**-3.1**	**-2.8**	**-3.8**	**-1.9**		**2.3**	**0.2**	
Contribution from nominal interest rate	1.9	1.7	1.6			1.5	1.4	2.8	2.9	2.8	4.3		4.8	0.5	
Contribution from real GDP growth	-5.2	-6.6	-7.2			-5.3	-4.3	-5.9	-5.8	-6.5	-6.2		-2.5	-0.3	
Contribution from price and exchange rate changes	-3.9	2.6	-6.1			...	...	...	...	...	...		...	...	
Residual (3-4) 3/	**-18.3**	**-8.2**	**-20.9**			**-20.1**	**-5.9**	**0.3**	**-5.1**	**-5.2**	**-1.1**		**1.0**	**3.8**	
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	
PV of external debt 4/	...	...	148.7			144.9	148.2	151.8	148.4	139.3	126.5		64.8	6.5	
In percent of exports	...	...	644.4			664.5	587.6	574.1	572.6	506.0	389.6		234.9	42.6	
PV of PPG external debt	**...**	**...**	**148.7**			**144.9**	**148.2**	**151.8**	**148.4**	**139.3**	**126.5**		**64.8**	**6.5**	
In percent of exports	**...**	**...**	**644.4**			**664.5**	**587.6**	**574.1**	**572.6**	**506.0**	**389.6**		**234.9**	**42.6**	
In percent of government revenues	**...**	**...**	**799.0**			**683.1**	**761.6**	**716.8**	**734.7**	**687.3**	**531.0**		**307.5**	**27.2**	
Debt service-to-exports ratio (in percent)	**22.8**	**18.7**	**33.3**			**38.0**	**9.9**	**18.0**	**26.6**	**17.5**	**22.7**		**31.4**	**11.5**	
PPG debt service-to-exports ratio (in percent)	**22.8**	**18.7**	**33.3**			**38.0**	**9.9**	**18.0**	**26.6**	**17.5**	**22.7**		**31.4**	**11.5**	
PPG debt service-to-revenue ratio (in percent)	**31.2**	**22.6**	**41.3**			**39.1**	**12.8**	**22.5**	**34.1**	**23.7**	**30.9**		**41.1**	**7.4**	
Total gross financing need (Billions of U.S. dollars)	0.7	0.7	0.8			0.7	0.4	0.3	0.3	0.2	0.0		-0.1	-0.4	
Non-interest current account deficit that stabilizes debt ratio	26.0	10.8	32.1			25.0	10.0	4.3	8.9	9.4	3.4		-2.9	-3.5	
Key macroeconomic assumptions															
Real GDP growth (in percent)	6.2	7.3	7.4	7.0	2.4	5.8	4.8	6.3	6.0	7.2	7.5	6.3	6.0	7.3	6.2
GDP deflator in US dollar terms (change in percent)	4.4	-2.7	5.8	2.1	7.8	3.1	3.2	0.7	1.6	1.8	1.8	2.0	1.8	1.8	1.8
Effective interest rate (percent) 5/	2.3	1.9	1.6	3.7	1.4	1.7	1.6	3.0	3.1	3.1	5.2	2.9	11.6	11.5	14.6
Growth of exports of G&S (US dollar terms, in percent)	8.4	-15.0	12.6	0.5	13.4	3.0	25.2	12.3	5.6	15.9	29.0	15.2	2.5	3.3	2.9
Growth of imports of G&S (US dollar terms, in percent)	8.8	2.4	-0.9	9.0	19.7	0.8	-8.7	2.0	1.1	4.4	4.6	0.7	2.7	-1.2	2.1
Grant element of new public sector borrowing (in percent)	...	...	...	...	...	13.0	15.4	18.8	13.5	21.6	49.4	22.0	33.1	28.1	33.6
Government revenues (excluding grants, in percent of GDP)	20.9	19.3	18.6			21.2	19.5	21.2	20.2	20.3	23.8	21.0	21.1	24.0	22.9
Aid flows (in Billions of US dollars) 7/	2.0	2.4	2.7			0.3	0.2	0.3	0.3	0.2	0.1	0.2	0.1	0.1	0.1
of which: Grants	0.2	0.2	0.2			0.3	0.1	0.2	0.3	0.2	0.1	0.2	0.1	0.0	0.0
of which: Concessional loans	1.9	2.2	2.5			0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Grant-equivalent financing (in percent of GDP) 8/	...	...	...			11.4	4.5	8.8	8.5	6.4	2.9	7.1	1.2	0.5	0.9
Grant-equivalent financing (in percent of external financing) 8/	...	...	...			53.5	30.3	51.6	66.9	83.2	93.8	63.2	73.9	41.9	61.9
Memorandum items:															
Nominal GDP (Billions of US dollars)	2.0	2.1	2.4			2.6	2.8	3.0	3.3	3.6	3.9		5.7	12.5	
Nominal dollar GDP growth	10.8	4.4	13.6			9.1	8.2	7.1	7.8	9.1	9.4	8.4	7.9	9.2	8.1
PV of PPG external debt (in Billions of US dollars)			3.7			3.9	4.3	4.7	4.8	4.9	4.9		3.7	0.8	
(PVt-PVt-1)/GDPt-1 (in percent)						9.7	15.9	11.4	4.8	3.5	-1.0	7.4	-5.2	-0.8	-4.3
Gross workers' remittances (Billions of US dollars)	...	...	...			...	...	...	...	...	...		...	...	
PV of PPG external debt (in percent of GDP + remittances)	...	...	148.7			144.9	148.2	151.8	148.4	139.3	126.5		64.8	6.5	
PV of PPG external debt (in percent of exports + remittances)	...	...	644.4			664.5	587.6	574.1	572.6	506.0	389.6		234.9	42.6	
Debt service of PPG external debt (in percent of exports + remittances)	...	...	33.3			38.0	9.9	18.0	26.6	17.5	22.7		31.4	11.5	

Sources: Country authorities; and staff estimates and projections.

1/ Includes both public and private sector external debt.

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

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

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

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

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

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

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

Table 2. Bhutan: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2018–2038

(In percent)

	Projections							
	2018	2019	2020	2021	2022	2023	**2028**	2038
PV of debt-to GDP ratio								
Baseline	145	148	152	148	139	126	**65**	7
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2018-2038 1/	145	152	162	169	173	180	**211**	209
A2. New public sector loans on less favorable terms in 2018-2038 2	145	156	159	153	144	131	**71**	14
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2019-2020	145	153	156	149	140	127	**65**	6
B2. Export value growth at historical average minus one standard deviation in 2019-2020 3/	145	159	169	162	152	139	**73**	9
B3. US dollar GDP deflator at historical average minus one standard deviation in 2019-2020	145	167	179	172	161	146	**75**	7
B4. Net non-debt creating flows at historical average minus one standard deviation in 2019-2020 4/	145	152	153	146	137	125	**64**	6
B5. Combination of B1-B4 using one-half standard deviation shocks	145	162	175	168	158	144	**75**	8
B6. One-time 30 percent nominal depreciation relative to the baseline in 2019 5/	145	215	216	207	194	176	**90**	9
PV of debt-to-exports ratio								
Baseline	665	588	574	573	506	390	**235**	43
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2018-2038 1/	665	601	613	651	629	555	**764**	1363
A2. New public sector loans on less favorable terms in 2018-2038 2	665	617	600	591	524	405	**256**	88
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2019-2020	665	606	580	566	500	385	**231**	41
B2. Export value growth at historical average minus one standard deviation in 2019-2020 3/	665	906	1187	1160	1026	794	**493**	106
B3. US dollar GDP deflator at historical average minus one standard deviation in 2019-2020	665	606	580	566	500	385	**231**	41
B4. Net non-debt creating flows at historical average minus one standard deviation in 2019-2020 4/	665	604	579	565	499	384	**231**	40
B5. Combination of B1-B4 using one-half standard deviation shocks	665	826	988	965	854	659	**405**	82
B6. One-time 30 percent nominal depreciation relative to the baseline in 2019 5/	665	606	580	566	500	385	**231**	41
PV of debt-to-revenue ratio								
Baseline	683	762	717	735	687	531	**307**	27
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2018-2038 1/	683	779	765	835	855	757	**1000**	871
A2. New public sector loans on less favorable terms in 2018-2038 2	683	800	749	758	712	552	**335**	56
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2019-2020	683	786	737	739	691	534	**308**	26
B2. Export value growth at historical average minus one standard deviation in 2019-2020 3/	683	817	799	803	752	584	**348**	37
B3. US dollar GDP deflator at historical average minus one standard deviation in 2019-2020	683	859	847	849	794	613	**354**	30
B4. Net non-debt creating flows at historical average minus one standard deviation in 2019-2020 4/	683	783	723	725	678	524	**302**	26
B5. Combination of B1-B4 using one-half standard deviation shocks	683	835	828	831	778	603	**356**	35
B6. One-time 30 percent nominal depreciation relative to the baseline in 2019 5/	683	1107	1021	1024	958	740	**426**	37

Table 2. Bhutan: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2018–2038 (concluded)

(In percent)

Debt service-to-exports ratio								
Baseline	38	10	18	27	17	23	**31**	12
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2018-2038 1/	38	10	18	27	20	26	**51**	105
A2. New public sector loans on less favorable terms in 2018-2038 2	38	10	17	26	18	23	**33**	11
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2019-2020	38	10	18	27	17	23	**31**	11
B2. Export value growth at historical average minus one standard deviation in 2019-2020 3/	38	14	35	53	36	45	**65**	27
B3. US dollar GDP deflator at historical average minus one standard deviation in 2019-2020	38	10	18	27	17	23	**31**	11
B4. Net non-debt creating flows at historical average minus one standard deviation in 2019-2020 4/	38	10	18	27	17	23	**31**	11
B5. Combination of B1-B4 using one-half standard deviation shocks	38	13	29	45	30	38	**54**	21
B6. One-time 30 percent nominal depreciation relative to the baseline in 2019 5/	38	10	18	27	17	23	**31**	11
Debt service-to-revenue ratio								
Baseline	39	13	22	34	24	31	**41**	7
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2018-2038 1/	39	13	23	35	27	35	**66**	67
A2. New public sector loans on less favorable terms in 2018-2038 2	39	13	21	34	24	31	**43**	7
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2019-2020	39	13	23	35	24	31	**42**	7
B2. Export value growth at historical average minus one standard deviation in 2019-2020 3/	39	13	23	37	26	33	**46**	9
B3. US dollar GDP deflator at historical average minus one standard deviation in 2019-2020	39	14	26	40	28	36	**48**	8
B4. Net non-debt creating flows at historical average minus one standard deviation in 2019-2020 4/	39	13	22	34	24	31	**41**	7
B5. Combination of B1-B4 using one-half standard deviation shocks	39	13	25	38	27	35	**47**	9
B6. One-time 30 percent nominal depreciation relative to the baseline in 2019 5/	39	18	32	48	33	44	**58**	10
Memorandum item:								
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	19	19	19	19	19	19	**19**	19

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
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 t 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 3. Bhutan: Public Sector Debt Sustainability Framework, Baseline Scenario, 2015–2038

(In percent of GDP, unless otherwise indicated)

	Actual					Estimate	Projections								
	2015	2016	2017	Average 5/	Standard Deviation 5/	2018	2019	2020	2021	2022	2023	2018-23 Average	2028	2038	2024-38 Average
Public sector debt 1/	95.7	114.2	106.3			102.7	103.9	107.4	104.6	95.8	82.8		66.3	39.5	
of which: foreign-currency denominated	94.0	110.9	100.0			96.2	99.7	103.2	98.8	90.1	79.6		38.4	3.9	
Change in public sector debt	-0.6	18.5	-7.9			-3.6	1.2	3.5	-2.8	-8.8	-13.1		-1.8	-2.4	
Identified debt-creating flows	-6.6	-3.7	-15.0			-8.0	-10.0	-4.6	-5.4	-9.9	-12.9		-1.1	-2.3	
Primary deficit	-3.5	-0.7	1.7	-2.3	2.7	-0.7	-3.8	-2.5	-2.9	-4.1	-9.1	-3.8	-1.6	-0.3	-2.2
Revenue and grants	28.8	29.9	26.7			31.1	22.1	28.1	28.0	26.3	26.6		22.1	24.2	
of which: grants	7.9	10.6	8.1			9.9	2.6	6.9	7.8	6.0	2.8		1.0	0.2	
Primary (noninterest) expenditure	25.3	29.3	28.4			30.4	18.3	25.6	25.2	22.2	17.4		20.5	23.9	
Automatic debt dynamics	-3.0	-3.0	-16.7			-7.3	-6.3	-2.1	-2.5	-5.8	-3.8		0.5	-1.9	
Contribution from interest rate/growth differential	-0.5	-4.8	-8.8			-0.6	-0.5	-1.6	-1.3	-2.7	-1.1		1.3	-1.8	
of which: contribution from average real interest rate	5.1	1.7	-0.9			5.2	4.2	4.6	4.8	4.3	5.6		5.2	1.1	
of which: contribution from real GDP growth	-5.6	-6.5	-7.9			-5.8	-4.7	-6.2	-6.1	-7.0	-6.7		-3.9	-2.9	
Contribution from real exchange rate depreciation	-2.5	1.8	-7.9			-6.7	-5.8	-0.5	-1.2	-3.1	-2.7		...	...	
Other identified debt-creating flows	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Privatization receipts (negative)	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recognition of implicit or contingent liabilities	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Debt relief (HIPC and other)	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Other (specify, e.g. bank recapitalization)	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Residual, including asset changes	6.0	22.2	7.2			4.4	11.2	8.1	2.6	1.1	-0.2		-0.7	-0.2	
Other Sustainability Indicators															
PV of public sector debt	...	...	155.0			151.4	152.4	156.0	154.2	145.0	129.6		92.8	42.0	
of which: foreign-currency denominated	...	...	148.7			144.9	148.2	151.8	148.4	139.3	126.5		64.8	6.5	
of which: external	...	...	148.7			144.9	148.2	151.8	148.4	139.3	126.5		64.8	6.5	
PV of contingent liabilities (not included in public sector debt)	...	...	...			...	...	...	...	...	...		...	...	
Gross financing need 2/	3.2	3.9	13.6			7.7	-1.1	2.5	4.2	1.0	-1.5		8.3	3.4	
PV of public sector debt-to-revenue and grants ratio (in percent)	...	...	579.7			486.9	690.6	556.1	550.1	551.9	487.9		420.2	173.8	
PV of public sector debt-to-revenue ratio (in percent)	...	...	832.8			714.1	783.3	736.8	763.6	715.5	544.3		440.2	175.4	
of which: external 3/	...	...	799.0			683.1	761.6	716.8	734.7	687.3	531.0		307.5	27.2	
Debt service-to-revenue and grants ratio (in percent) 4/	23.3	15.3	29.1			27.1	11.9	17.5	25.3	19.5	28.8		44.7	15.5	
Debt service-to-revenue ratio (in percent) 4/	32.1	23.7	41.8			39.8	13.5	23.2	35.1	25.2	32.1		46.8	15.7	
Primary deficit that stabilizes the debt-to-GDP ratio	-3.0	-19.2	9.5			2.8	-5.0	-6.0	-0.1	4.7	3.9		0.2	2.1	
Key macroeconomic and fiscal assumptions															
Real GDP growth (in percent)	6.2	7.3	7.4	7.0	2.4	5.8	4.8	6.3	6.0	7.2	7.5	6.3	6.0	7.3	6.2
Average nominal interest rate on forex debt (in percent)	2.3	1.9	1.7	3.7	1.4	1.7	1.6	3.0	3.1	3.1	5.2	2.9	11.6	11.5	14.6
Average real interest rate on domestic debt (in percent)	-3.6	1.4	-2.4	0.0	3.7	-1.7	-2.0	0.1	1.3	1.3	1.3	0.1	1.3	1.6	1.5
Real exchange rate depreciation (in percent, + indicates depreciation	-2.7	2.0	-7.7	-0.4	7.2	-6.7	...	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	5.4	4.0	6.0	6.1	1.5	4.3	4.3	4.1	3.8	4.3	4.3	4.2	4.3	4.3	4.3
Growth of real primary spending (deflated by GDP deflator, in percer	-1.4	24.4	4.2	2.7	7.7	13.0	-36.8	48.7	4.3	-5.6	-15.5	1.4	7.7	9.3	8.5
Grant element of new external borrowing (in percent)	...	...	...	...	...	13.0	15.4	18.8	13.5	21.6	49.4	22.0	33.1	28.1	...

Sources: Country authorities; and staff estimates and projections.

1/ Gross government debt including hydro-related liabilities.

2/ Gross financing need is defined as the primary deficit plus debt service plus the stock of short-term debt at the end of 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 4. Bhutan: Sensitivity Analysis for Key Indicators of Public Debt, 2018–2038

	Projections							
	2018	2019	2020	2021	2022	2023	2028	2038
PV of Debt-to-GDP Ratio								
Baseline	151	152	156	154	145	130	93	42
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	151	150	153	150	143	134	96	36
A2. Primary balance is unchanged from 2018	151	155	160	160	153	144	114	61
A3. Permanently lower GDP growth 1/	151	153	158	157	149	134	102	62
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2019-20:	151	153	159	158	148	133	97	47
B2. Primary balance is at historical average minus one standard deviations in 2019-202	151	156	162	160	150	135	97	45
B3. Combination of B1-B2 using one half standard deviation shocks	151	153	159	157	147	132	94	42
B4. One-time 30 percent real depreciation in 2019	151	213	216	214	202	184	138	70
B5. 10 percent of GDP increase in other debt-creating flows in 2019	151	160	164	162	153	137	99	46
PV of Debt-to-Revenue Ratio 2/								
Baseline	487	691	556	550	552	488	420	174
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	487	683	549	541	548	505	434	149
A2. Primary balance is unchanged from 2018	487	702	570	570	582	542	516	252
A3. Permanently lower GDP growth 1/	487	694	561	558	563	503	460	257
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2019-20:	487	692	565	559	563	500	438	195
B2. Primary balance is at historical average minus one standard deviations in 2019-202	487	706	577	570	573	508	440	185
B3. Combination of B1-B2 using one half standard deviation shocks	487	695	567	560	562	497	427	174
B4. One-time 30 percent real depreciation in 2019	487	965	769	762	769	694	624	291
B5. 10 percent of GDP increase in other debt-creating flows in 2019	487	727	585	578	581	515	447	189
Debt Service-to-Revenue Ratio 2/								
Baseline	27	12	18	25	19	29	45	16
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	27	12	17	25	19	28	44	15
A2. Primary balance is unchanged from 2018	27	12	18	26	20	30	49	22
A3. Permanently lower GDP growth 1/	27	12	18	26	20	30	47	21
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2019-20:	27	12	18	26	20	29	46	17
B2. Primary balance is at historical average minus one standard deviations in 2019-202	27	12	18	26	20	30	46	17
B3. Combination of B1-B2 using one half standard deviation shocks	27	12	18	26	20	29	45	16
B4. One-time 30 percent real depreciation in 2019	27	14	24	36	28	42	66	28
B5. 10 percent of GDP increase in other debt-creating flows in 2019	27	12	19	27	20	30	47	17

Sources: Country authorities; and staff estimates and projections.

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

2/ Revenues are defined inclusive of grants.