INTERNATIONAL MONETARY FUND
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MONGOLIA

Joint IMF/World Bank Debt Sustainability Analysis

Prepared by the staffs of the International Monetary Fund and
The International Development Association

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After four years of strong economic performance, Mongolia is now at a low risk of debt distress and, with its vast mineral wealth, the public debt burden is projected to continue to decline. Debt burden indicators under the baseline and the standard stress tests are generally well below their indicative thresholds, even in the event of a decline in the terms of trade or further delays in developing a large new copper and gold mine. However, a large issuance of nonconcessional external sovereign debt, which is being considered, could raise concerns over Mongolia's debt sustainability. In addition, the historical scenario leads to a prolonged and sustained breach of the threshold for the NPV of debt-to-GDP. The Staff considers, however, that this result should be interpreted cautiously given the extensive structural changes that have taken place in the economy, which implies that a scenario based on historical averages does not appropriately capture the risks to the economy.

I. Background

1. **This debt sustainability analysis (DSA) assesses Mongolia's fiscal and external debt outlook using the joint IMF/World Bank forward-looking debt sustainability framework for low-income countries (LICs).**[1] Compared with the previous exercise, the baseline scenario of the current analysis assumes that the development of Oyu Tolgoi (OT) mine will go forward, which leads to substantial increases in GDP, exports, and government

[1] The DSAs presented in this document are based on the common standard LIC DSA framework. Under this framework, Mongolia is rated as a medium performer with regard to its policies and institutions, and the debt sustainability is analyzed in relation to the indicative threshold indicators for countries in this category. See "Debt Sustainability in Low-Income Countries: Proposal for an Operational Framework and Policy Implications" (http://www.imf.org/external/np/pdr/sustain/2004/020304.htm and IDA/SECM2004/0035, 2/3/04) and "Debt Sustainability in Low-Income Countries: Further Considerations on an Operational Framework, Policy Implications" (http://www.imf.org/external/np/pdr/sustain/2004/091004.htm and IDA/SECM2004/0629, 9/10/04) and "Applying the Debt Sustainability Framework for Low-Income Countries Post Debt Relief", (http://www.imf.org/external/np/pp/eng/2006/110606.pdf and IDA/SecM2006-0564, 8/11/06).

revenues starting from 2011.[2] The current analysis also recognizes that private external debt and portfolio capital flows, in addition to foreign direct investment, are likely to be of increasing importance in the economy in the future.

2. **Mongolia's public debt at the end of 2007 was estimated to amount to 40 percent of GDP.** Most of Mongolia's public debt is external with about 60 percent of external debt contracted with multilateral creditors on concessional terms and the remaining amount contracted with official bilateral creditors. At the end of 2007, Mongolia did not have any outstanding public debt to external commercial creditors.

II. Medium-Term Macroeconomic and DSA Assumptions

3. **The baseline macroeconomic framework is built on the assumption that the medium-term economic outlook is favorable.** Real GDP is assumed to grow by 7−10 percent during 2007−10, underpinned by the development of the OT mine, and increase to 12−14 percent during 2011−12 when the production of the OT mine comes on stream. In the long run, real GDP is expected to grow by 5 percent. Inflation is projected to slow to about 5−6 percent in the medium term, while GDP deflator is expected to decline following the projected declines in commodity prices.

4. **The baseline scenario assumes that the overall budget would fluctuate from a surplus in 2008 to deficits in the medium term and back to a surplus in 2014, when the budget begins accruing significant revenues from the OT mine**. Similarly, the external current account balance will deteriorate in the next few years due to large mining-related imports of investment goods, but will improve from 2011 when the OT mine begins production and export growth picks up substantially.[3]

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[2] IMF Country Report No. 07/30.

[3] The current account is expected to record surplus from 2012 (a residual item in LIC DSA framework).

Mongolia: Medium-Term Macroeconomic Framework, 2004–13										
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
				Est.	Proj. 1/					
	(In percent of GDP; unless otherwise indicated)									
Real sector										
Nominal GDP (in billions of togrogs)	2,152	2,780	3,715	4,558	5,456	6,123	6,766	7,886	9,328	10,261
Nominal GDP (in millions of U.S. dollars) 2/	1,814	2,307	3,156	3,894	4,759	5,344	5,690	6,405	7,316	7,787
Per capita GDP (in U.S. dollars) 2/	720	905	1,224	1,489	1,793	1,984	2,081	2,308	2,597	2,723
Real GDP (percent change)	10.6	7.3	8.6	9.9	8.6	8.0	7.2	12.2	13.7	5.3
Mineral real GDP	34.3	10.9	6.3	1.7	1.4	1.2	1.1	37.5	42.2	3.2
Nonmineral real GDP	5.6	6.3	9.2	12.2	10.3	9.6	8.5	7.2	6.6	6.0
GDP deflator (percent change)	17.2	20.4	23.1	11.6	10.3	3.9	3.1	3.9	4.0	4.5
Consumer prices (period average; percent change)	7.9	12.5	5.1	9.0	12.0	7.4	5.8	5.5	5.5	5.3
Consumer prices (end-period; percent change)	10.6	9.2	6.0	15.1	8.8	6.0	5.5	5.5	5.5	5.0
General government accounts										
Total revenue and grants	33.1	30.1	36.6	40.6	42.6	40.8	39.0	35.8	36.5	36.5
Total expenditure and net lending	35.0	27.5	28.5	38.4	41.1	40.2	40.1	38.8	38.8	38.7
Current balance	7.8	8.4	14.8	14.1	12.2	11.2	9.5	6.7	7.4	7.5
Overall balance (including grants)	-1.8	2.6	8.1	2.2	1.5	0.6	-1.1	-3.0	-2.3	-2.2
Nonmineral overall balance	-5.5	-1.4	-2.4	-12.5	-12.0	-9.9	-8.0	-8.0	-8.0	-8.0
Foreign financing (including gap financing)	3.6	3.2	2.3	1.8	1.7	1.5	1.5	1.3	1.2	1.1
Balance of payments										
Exports (percent change)	39.0	22.5	44.6	26.3	10.8	3.4	7.4	17.5	56.7	-11.5
Imports (percent change)	23.5	19.8	23.9	43.2	38.4	12.0	8.5	-9.6	10.6	4.8
Current account balance (including official transfers)	1.5	1.3	7.0	2.6	-8.5	-12.1	-12.8	-0.9	5.5	0.8
Gross official reserves										
(In millions of U.S. dollars)	208	333	718	1001	1253	1,382	1,460	1,530	1,709	1,786
(In months of next year's imports of goods and services)	1.6	2.1	3.3	3.6	4.0	4.1	4.7	4.4	4.7	4.6
Memorandum items										
Copper prices (US$ per ton)	2,863	3,676	6,731	7,132	7,000	6,000	4,500	3,500	3,300	3,300
Gold prices (US$ per ounce)	409	445	604	697	960	985	1,015	1,050	1,080	1,095
Broad money growth (percent change)	20.3	37.3	30.8	57.3	22.9	23.3	22.1	21.4	19.5	17.0

Sources: Data provided by the Mongolian authorities; and Fund staff estimates and projections.

1/ Fund staff projections based on policy recommendations.
2/ Based on period average exchange rate.

5. **The baseline scenario assumes that the NPV of public external debt in terms of GDP would be kept at comfortable levels in the long run**. As Mongolia's per capita income rises, the share of external financing provided on concessional terms is expected to decline. The baseline scenario also assumes that Mongolia will no longer receive any grants in the long run. Along with greater participation of the private sector in the economy, the external borrowing of the private sector, which (apart from foreign direct investment) has been negligible so far, is assumed to increase in the medium and long term.

6. **In addition to the standard alternative scenarios and bound tests used in the DSA exercise, this analysis presents additional country-specific scenarios and shocks**. The first country-specific scenario assumes that the government will borrow a total of US$1.2 billion in 2008−09 (half in each year) on commercial terms.[4] The projects financed by the bonds are assumed to be economically viable and have a high import content (90 percent). The second country-specific scenario assumes a 3−year delay in the timetable for bringing the OT mine on stream and a higher government equity participation (51 percent) in the project.[5] The government's equity participation is assumed to be financed through nonrecourse borrowing. Repayment of this loan will be made out of dividends and the government would not have to make payments exceeding its cash flow from the project. The third country-specific scenario assumes an adverse terms-of-trade shock in which copper

[4] US$1.2 billion is the maximum amount approved by the Parliament.

[5] The government equity participation in the baseline scenario is 34 percent. The discussions and negotiations to raise the government equity participation, to at least 51 percent, are now in progress.

and gold prices decline sharply in 2011 (i.e., by 35 percent and 25 percent, respectively, on top of the WEO projection) and catch up with the prices used in the baseline scenario within 5 years.

III. Public Debt Sustainability Assessment

A. Baseline Scenarios

7. **Under the baseline scenario, public sector debt remains on a downward trend over the projection period** (Figure 1 and Table 1). Public debt falls from about 46½ percent of GDP at end-2006 to 26½ percent at end-2012 and continues to decline thereafter.[6] Strong growth, together with buoyant revenues from new mining projects in outer years, bolsters the downward trend of public debt. In NPV terms, the amount of public debt as a share of GDP declines to 18 percent by 2012, with further modest declines thereafter. The NPV of debt-to-revenue and debt service-to-revenue ratios are also projected to follow a similar pattern.

B. Alternative Scenarios

8. **The alternative scenarios under the standard DSA template suggests that public debt sustainability would be put at risk if GDP growth and the primary budget balance reverted to historical averages** (Figure 1 and Table 2). However, this result should be interpreted cautiously. Given the extensive structural changes that have taken place in the economy, it is not clear that a scenario based on historical averages appropriately captures the risks to the economy. For this reason, country-specific scenarios have been included in the LIC DSA analysis.

9. **The analysis based on the country-specific scenarios indicates that large sovereign borrowing would increase the public debt burden in the medium term** (Table 2). Delays in developing the OT mine and greater government equity participation would also increase public debt burden slightly over the medium term. However, once the mine is developed, the debt burden would come down to that of the baseline scenario by 2027.

C. Bound Tests

10. **The bound tests indicate that Mongolia's public debt sustainability would be most vulnerable to a sharp decline in economic activity**. Given the high importance of the mining sector in the Mongolian economy, the authorities should ensure that the tax and investment regimes for the mining sector are transparent, stable, and internationally competitive.

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[6] Fiscal surpluses during 2014-22 would lead to a large build up of government assets (a residual item in LIC DSA framework).

IV. External Debt Sustainability Assessment

A. Baseline Scenarios

11. **The results of the external debt sustainability analysis indicate that Mongolia is now at a low risk of external debt distress** (Figure 2 and Table 3). Under the baseline scenario, the NPV of the external debt-to-GDP ratio, which was 24½ percent (below the 40 percent threshold) at end-2007, is projected to decline to 17½ percent in 2012, dropping further in the long run. The NPV of debt-to-exports ratio would stay well below the corresponding threshold (150 percent) during the entire projection period. Since most of the external debt is on concessional terms, the debt service ratio would stay at 1−3 percent of exports, against the 20 percent threshold. The NPVs of debt-to-revenue and debt service-to-revenue ratios would also stay well below the 250 percent and 30 percent thresholds, respectively, as a result of buoyant mineral revenues and robust growth.

B. Alternative Scenarios

12. **The debt burden is expected to increase under the alternative scenarios, but most debt burden indicators would remain below their indicative thresholds** (Figure 2 and Table 4). The standard alternative scenario using key variables at historical averages indicates that the NPV of debt-to-GDP ratio would breach the threshold in the medium and long terms, but for the reasons mentioned earlier, the Staff does not consider that this scenario appropriately captures the risks to the baselines scenario. The issuance of sovereign bonds worth US$1.2 billion (about a quarter of the projected nominal GDP in 2009), would make the NPV of debt-to-GDP ratio breach the 40 percent threshold in 2009, although the other indicators would remain below their indicative thresholds. A delay of the OT mine would raise the debt burden modestly in the medium term, especially in terms of exports and revenue. However, the external debt burden indicator would improve substantially in the long run.

C. Bound Tests

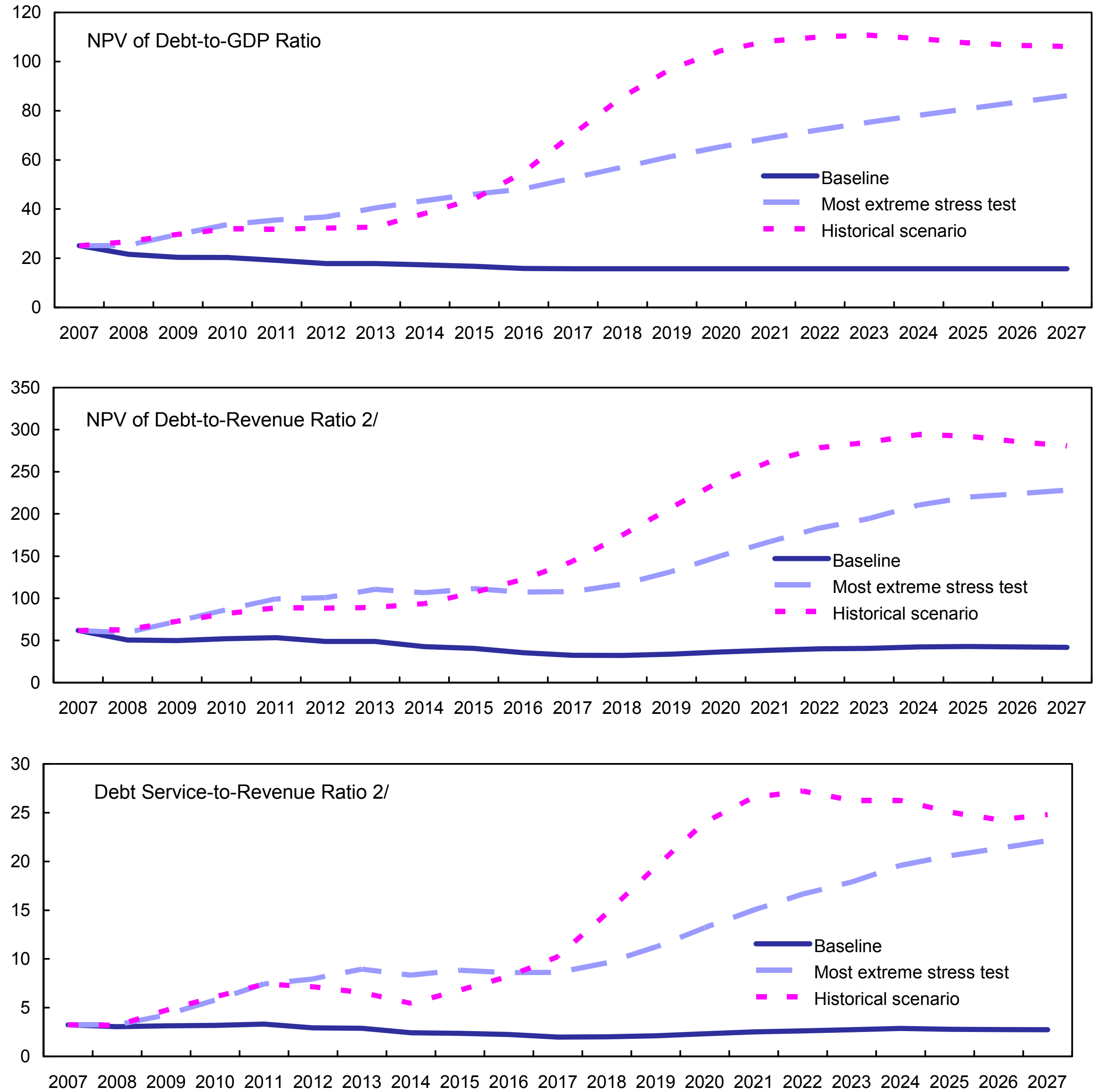
13. **The stress test would result in a mild deterioration of the debt burden indicators, but all these indicators would remain well below their indicative thresholds** (Figure 2 and Table 4**).** Of all the stress tests, the adverse terms-of-trade shock, discussed earlier, generally results in the most important deterioration of the debt burden indicators. However, even under the terms-of-trade shock, debt burden indicators are not expected to breach their indicative threshold because the additional production and exports from the OT mine would offset the effect of price shocks.

V. Conclusion

14. **Mongolia is now at a low risk of debt distress, assuming the authorities continue to borrow mainly on concessional terms and the external economic environment evolves**

broadly as envisaged in the baseline scenario. The strong economic performance over the past years has been crucial for lowering the debt burden, reducing vulnerability to external shocks, and making room for high priority public investment in the future. However, Mongolia should move gradually and cautiously in tapping nonconcessional sources of finance, which should be used only for projects with clear economic viability that cannot be financed from concessional sources. Establishing transparent, stable, and internationally competitive mining regime is also important to sustain rapid growth and preserve Mongolia's debt sustainability.

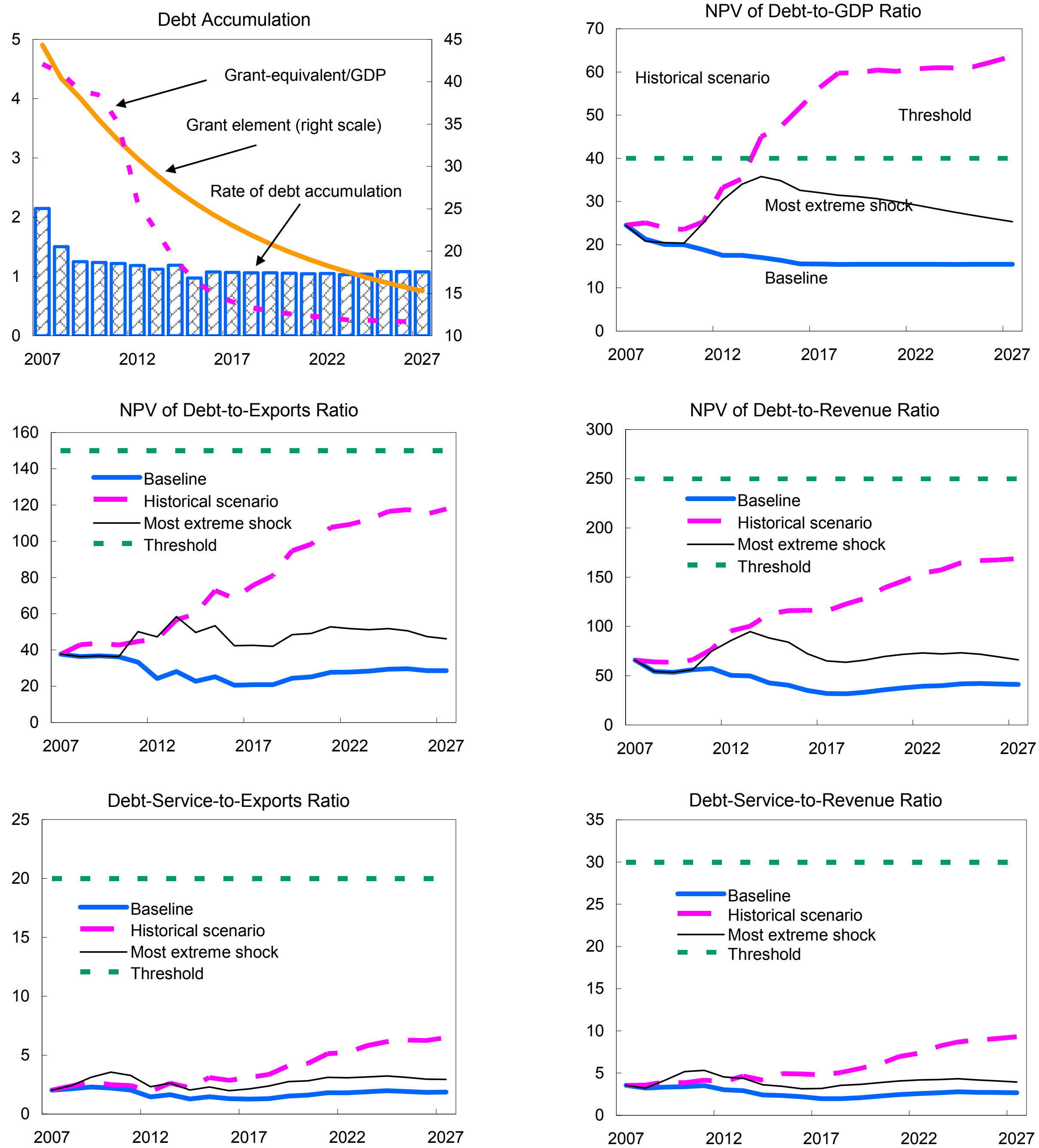
Figure 1. Mongolia: Indicators of Public Debt Under Alternative Scenarios, 2007–27 1/



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. Mongolia: Indicators of Public and Publicly Guaranteed External Debt Under Alternative Scenarios, 2007–27



Source: Staff projections and simulations.

Table 1. Mongolia: Public Sector Debt Sustainability Framework, Baseline Scenario, 2004–27

(In percent of GDP, unless otherwise indicated)

	Actual			Historical	Standard	Est.	Projections								
	2004	2005	2006	Average 5/	Deviation 5/	2007	2008	2009	2010	2011	2012	2007–12 average	2017	2027	2018–23 average
Public sector debt 1/	81.4	60.3	46.7			40.0	34.1	31.8	31.3	29.1	26.6		21.6	19.0	
Of which : foreign-currency denominated	74.9	56.9	45.0			39.4	33.8	31.5	31.0	28.8	26.3		21.4	18.7	
Change in public sector debt	-18.8	-21.0	-13.6			-6.7	-5.9	-2.3	-0.5	-2.2	-2.4		-0.5	-0.2	
Identified debt-creating flows	-19.4	-20.6	-25.7			-11.0	-9.6	-3.3	-1.0	-0.6	-1.4		-11.7	-0.2	
Primary deficit	0.8	-3.4	-8.6	2.9	5.7	-2.6	-1.9	-1.0	0.7	2.6	1.9	0.0	-10.5	0.6	-3.0
Revenue and grants	33.1	30.1	36.6			40.6	42.6	40.8	39.0	35.8	36.5		48.8	37.7	
Of which: grants	0.3	0.2	0.1			0.1	0.3	0.3	0.3	0.3	0.3		0.3	0.3	
Primary (noninterest) expenditure	33.9	26.8	28.0			38.0	40.7	39.8	39.7	38.5	38.5		38.3	38.3	
Automatic debt dynamics	-19.4	-17.0	-16.7			-8.1	-7.5	-2.1	-1.6	-3.1	-3.2		-1.1	-0.7	
Contribution from interest rate/growth differential	-11.1	-6.3	-10.0			-5.0	-3.5	-2.8	-2.3	-3.5	-3.6		-1.1	-0.7	
Of which: contribution from average real interest rate	-1.5	-0.8	-5.2			-0.8	-0.3	-0.2	-0.2	-0.2	-0.1		0.0	0.2	
Of which: contribution from real GDP growth	-9.6	-5.5	-4.8			-4.2	-3.1	-2.5	-2.1	-3.4	-3.5		-1.1	-0.9	
Contribution from real exchange rate depreciation	-8.4	-10.7	-6.7			-3.0	-4.0	0.7	0.7	0.4	0.4		...	...	
Other identified debt-creating flows	-0.8	-0.2	-0.4			-0.4	-0.2	-0.2	-0.1	-0.1	-0.1		-0.1	0.0	
Privatization receipts (negative)	-0.8	-0.2	-0.4			-0.4	-0.2	-0.2	-0.1	-0.1	-0.1		-0.1	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	0.7	-0.4	12.0			4.3	3.7	1.0	0.5	-1.6	-1.0		11.2	0.0	
NPV of public sector debt	57.9	44.5	29.8			25.1	21.6	20.3	20.3	19.1	17.8		15.8	15.7	
Of which : foreign-currency denominated	51.5	41.1	28.1			24.5	21.3	20.1	20.0	18.9	17.5		15.5	15.5	
Of which : external	...	...	28.1			24.5	21.3	20.1	20.0	18.9	17.5		15.5	15.5	
NPV of contingent liabilities (not included in public sector debt)	...	...	...			...	...	...	...	...	...		...	...	
Gross financing need 2/	5.6	-1.7	-6.8			-1.3	-0.6	0.3	2.0	3.8	3.0		-9.5	1.6	
NPV of public sector debt-to-revenue and grants ratio (in percent)	174.8	147.6	81.3			61.8	50.6	49.8	52.0	53.4	48.8		32.3	41.7	
NPV of public sector debt-to-revenue ratio (in percent)	176.3	148.4	81.6			61.9	50.9	50.2	52.4	53.9	49.2		32.5	42.1	
Of which : external 3/	...	...	77.0			60.5	50.3	49.5	51.7	53.1	48.4		32.0	41.4	
Debt service-to-revenue and grants ratio (in percent) 4/	14.6	5.6	5.0			3.2	3.0	3.1	3.2	3.3	2.9		2.0	2.7	
Debt service-to-revenue ratio (in percent) 4/	14.7	5.6	5.0			3.3	3.1	3.1	3.2	3.3	3.0		2.0	2.8	
Primary deficit that stabilizes the debt-to-GDP ratio	19.5	17.7	5.1			4.1	4.0	1.3	1.3	4.8	4.4		-10.0	0.7	
Key macroeconomic and fiscal assumptions															
Real GDP growth (in percent)	10.6	7.3	8.6	5.3	2.9	9.9	8.6	8.0	7.2	12.2	13.7	9.9	5.4	4.8	5.8
Average nominal interest rate on forex debt (in percent)	1.1	1.1	1.1	1.3	0.3	1.1	1.1	1.2	1.3	1.4	1.5	1.3	2.0	3.1	2.3
Average real interest rate on domestic currency debt (in percent)	-12.0	-15.6	-18.0	-85.7	223.1	-10.7	-1.6	5.9	6.7	5.8	5.8	2.0	4.6	4.5	4.8
Real exchange rate depreciation (in percent, + indicates depreciation)	-10.8	-15.3	-14.0	-3.3	10.3	-7.5	...	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	17.2	20.4	23.1	11.9	9.2	11.6	10.3	3.9	3.1	3.9	4.0	6.1	5.1	5.3	5.0
Growth of real primary spending (deflated by GDP deflator, in percent)	4.1	-15.3	13.7	5.9	11.9	49.1	16.1	5.7	7.1	8.5	13.8	16.7	5.3	4.8	5.8
Grant element of new external borrowing (in percent)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

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

1/ Gross debt of the general government sector.
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. Mongolia: 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	25	22	20	20	19	18	16	16
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	25	27	30	32	32	32	70	106
A2. Primary balance is unchanged from 2007	25	21	18	15	10	5	13	11
A3. Permanently lower GDP growth 1/	25	22	21	22	22	21	28	62
A4. Sovereign bond issue for 2008–09 2/	25	35	45	43	38	34	15	15
A5. Delay of a big mining project and higher government equity participation 3/	25	21	20	22	23	25	29	16
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2008–2009	25	25	30	34	36	37	53	86
B2. Primary balance is at historical average minus one standard deviations in 2008–2009	25	31	39	38	36	33	28	25
B3. Combination of B1-B2 using one half standard deviation shocks	25	30	36	35	33	30	27	26
B4. One-time 30 percent real depreciation in 2008	25	29	28	27	26	24	20	21
B5. 10 percent of GDP increase in other debt-creating flows in 2008	25	31	29	29	27	25	22	20
NPV of Debt-to-Revenue Ratio 4/								
Baseline	62	51	50	52	53	49	32	42
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	62	63	73	82	89	88	144	281
A2. Primary balance is unchanged from 2007	62	49	45	39	27	13	27	28
A3. Permanently lower GDP growth 1/	62	51	52	56	60	58	58	165
A4. Sovereign bond issue for 2008–09 2/	62	79	110	109	108	94	32	41
A5. Delay of a big mining project and higher government equity participation 3/	62	52	53	60	63	68	72	41
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2008–2009	62	59	73	86	99	101	108	228
B2. Primary balance is at historical average minus one standard deviations in 2008–2009	62	74	95	98	100	90	57	67
B3. Combination of B1-B2 using one half standard deviation shocks	62	70	88	90	91	82	56	70
B4. One-time 30 percent real depreciation in 2008	62	69	68	70	72	65	42	55
B5. 10 percent of GDP increase in other debt-creating flows in 2008	62	72	72	74	76	69	44	54
Debt Service-to-Revenue Ratio 4/								
Baseline	3	3	3	3	3	3	2	3
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	3	3	5	6	7	7	10	25
A2. Primary balance is unchanged from 2007	3	3	3	3	2	0	1	-1
A3. Permanently lower GDP growth 1/	3	3	3	3	4	4	4	15
A4. Sovereign bond issue for 2008–09 2/	3	3	5	7	7	6	2	3
A5. Delay of a big mining project and higher government equity participation 3/	3	3	3	3	4	4	6	3
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2008–2009	3	3	4	6	7	8	9	22
B2. Primary balance is at historical average minus one standard deviations in 2008–2009	3	3	6	9	9	8	4	6
B3. Combination of B1-B2 using one half standard deviation shocks	3	3	6	8	8	7	3	6
B4. One-time 30 percent real depreciation in 2008	3	3	4	4	4	3	3	4
B5. 10 percent of GDP increase in other debt-creating flows in 2008	3	3	6	6	6	6	3	5

Sources: Mongolia 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/ Assumes that the government issues sovereign bonds of $1.2 billion in 2008–09 ($600 million each year).
3/ Assumes that the Oyu Tolgoi mining project will be delayed by 3 years and government equity participation in the project will be 51 percent.
4/ Revenues are defined inclusive of grants, however not all grants reported in the balance of payment are included in the budget.

Table 3. Mongolia: External Debt Sustainability Framework, Baseline Scenario, 2007–27 1/

(In percent of GDP, unless otherwise indicated)

	Actual			Historical Average 6/	Standard Deviation 6/	Projections									
	2004	2005	2006			2007	2008	2009	2010	2011	2012	2007–12 Average	2017	2027	2013–27 Average
External debt (nominal) 1/	76.9	58.1	45.8			42.5	41.0	42.1	44.0	40.7	37.4		33.3	30.5	
Of which: public and publicly guaranteed (PPG)	74.6	56.6	45.0			39.4	33.8	31.5	31.0	28.8	26.3		21.4	18.7	
Change in external debt	-13.9	-18.8	-12.3			-3.2	-1.6	1.1	1.9	-3.3	-3.3		-0.5	-0.2	
Identified net debt-creating flows	-26.9	-28.9	-31.8			-14.7	-8.9	-6.3	-6.6	-10.7	-19.4		-13.4	-10.6	
Non-interest current account deficit	-2.3	-1.9	-7.5	2.5	5.2	-3.0	8.0	11.2	11.5	-0.5	-6.8		-6.1	-3.7	-3.3
Deficit in balance of goods and services	10.7	3.9	-4.8			1.5	12.4	15.6	16.1	2.0	-15.4		-18.4	-7.0	
Exports	66.7	64.3	64.4			64.9	58.5	54.5	55.1	56.5	72.3		74.2	54.1	
Imports	77.5	68.2	59.6			66.3	70.9	70.1	71.2	58.5	56.8		55.8	47.1	
Net current transfers (negative = inflow)	-12.9	-9.6	-6.0	-8.7	2.7	-5.6	-5.3	-5.1	-5.1	-4.7	-3.3		-1.7	-1.3	-1.7
Of which: official	-4.8	-3.8	-3.5			-3.4	-3.4	-3.3	-3.3	-2.9	-1.7		-0.2	0.0	
Other current account flows (negative = net inflow)	-0.2	3.8	3.3			1.1	1.0	0.7	0.5	2.2	12.0		14.0	4.6	
Net FDI (negative = inflow)	-7.1	-11.2	-9.2	-5.7	3.4	-8.4	-14.5	-15.4	-16.5	-6.9	-9.1		-7.0	-7.0	-7.0
Endogenous debt dynamics 2/	-17.4	-15.8	-15.2			-3.3	-2.4	-2.0	-1.6	-3.3	-3.6		-0.3	0.1	
Contribution from nominal interest rate	0.9	0.7	0.5			0.4	0.5	0.9	1.3	1.4	1.3		1.4	1.5	
Contribution from real GDP growth	-7.7	-4.4	-3.6			-3.7	-3.0	-2.9	-2.9	-4.8	-4.9		-1.7	-1.4	
Contribution from price and exchange rate changes	-10.6	-12.1	-12.0			…	…	…	…	…	…		…	…	
Residual (3–4) 3/	13.0	10.1	19.5			11.4	7.4	7.4	8.6	7.4	16.1		12.9	10.4	
Of which: exceptional financing	-0.3	-0.2	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
NPV of external debt 4/	...	...	28.8			27.6	28.4	30.6	33.0	30.8	28.6		27.4	27.2	
In percent of exports	...	...	44.8			42.6	48.6	56.2	59.9	54.5	39.6		37.0	50.4	
NPV of PPG external debt	...	...	28.1			24.5	21.3	20.1	20.0	18.9	17.5		15.5	15.5	
In percent of exports	...	...	43.6			37.8	36.4	36.8	36.3	33.4	24.3		20.9	28.6	
In percent of government revenues	...	...	84.9			65.9	54.3	53.4	56.0	57.3	50.3		31.9	41.1	
Debt service-to-exports ratio (in percent)	12.8	3.5	3.3			4.3	3.3	4.1	6.2	10.6	7.4		7.1	9.9	
PPG debt service-to-exports ratio (in percent)	7.5	2.9	2.8			2.0	2.1	2.3	2.2	2.1	1.5		1.3	1.9	
PPG debt service-to-revenue ratio (in percent)	17.6	7.1	5.4			3.6	3.2	3.3	3.4	3.5	3.0		1.9	2.7	
Total gross financing need (billions of U.S. dollars)	0.0	-0.3	-0.5			-0.3	-0.2	-0.1	-0.1	-0.1	-0.8		-0.9	-1.2	
Non-interest current account deficit that stabilizes debt ratio	11.6	16.9	4.9			0.2	9.5	10.0	9.6	2.8	-3.5		-5.6	-3.5	
Key macroeconomic assumptions															
Real GDP growth (in percent)	10.6	7.3	8.6	5.3	2.9	9.9	8.6	8.0	7.2	12.2	13.7	9.9	5.4	4.8	5.8
GDP deflator in U.S. dollar terms (change in percent)	13.2	18.6	26.0	4.1	13.0	12.3	12.6	3.9	-0.7	0.4	0.4	4.8	1.9	2.1	1.8
Effective interest rate (percent) 5/	1.2	1.1	1.1	1.1	0.1	1.1	1.5	2.5	3.2	3.6	3.6	2.6	4.4	5.3	4.6
Growth of exports of G&S (U.S. dollar terms, in percent)	44.9	22.6	37.0	17.0	18.9	24.4	10.3	4.5	7.7	15.4	46.1	18.1	5.3	6.7	6.1
Growth of imports of G&S (U.S. dollar terms, in percent)	29.6	12.0	19.5	12.9	8.2	37.4	30.6	11.0	8.2	-7.5	11.0	15.1	5.1	5.9	6.3
Grant element of new public sector borrowing (in percent)	...	...	...	...	...	44.4	40.4	38.0	35.4	33.1	30.9	37.0	23.0	15.3	20.8
Aid flows (in billions of U.S. dollars) 7/	0.2	0.2	0.2			0.2	0.3	0.3	0.3	0.3	0.3		0.2	0.1	
Of which: grants	0.1	0.1	0.1			0.1	0.2	0.2	0.2	0.2	0.1		0.0	0.0	
Of which: concessional loans	0.1	0.1	0.1			0.1	0.1	0.1	0.1	0.1	0.1		0.1	0.1	
Grant-equivalent financing (in percent of GDP) 8/	...	...	...			4.6	4.4	4.1	4.1	3.6	2.3		0.6	0.2	0.6
Grant-equivalent financing (in percent of external financing) 8/	...	...	...			75.9	74.7	74.2	73.7	72.3	63.9		31.9	15.3	27.9
Memorandum items:															
Nominal GDP (billions of U.S. dollars)	1.8	2.3	3.2			3.9	4.8	5.3	5.7	6.4	7.3		11.3	22.0	
(NPVt-NPVt-1)/GDPt-1 (in percent)						2.1	1.5	1.3	1.2	1.2	1.2	1.4	1.1	1.1	1.1

Source: Staff simulations.

1/ Includes both public and private 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 4. Mongolia: Sensitivity Analyses for Key Indicators of Public and Publicly Guaranteed External Debt, 2007–27

(In percent)

	Projections							
	2007	2008	2009	2010	2011	2012	2017	2027
NPV of debt-to-GDP ratio								
Baseline	24	21	20	20	19	18	16	15
A. Alternative scenarios								
A1. Key variables at their historical averages in 2008–27 1/	24	25	24	24	25	33	56	64
A2. New public sector loans on less favorable terms in 2008–27 2/	24	22	21	22	21	20	19	23
A3. Sovereign bond issue for 2008–09 3/	24	34	45	43	38	34	15	15
A4. Delay of a big mining project and higher government equity participation 4/	24	21	20	20	20	20	17	16
B. Bound tests								
B1. Real GDP growth at historical average minus one standard deviation in 2008–09	24	23	22	22	21	20	17	17
B2. Export value growth at historical average minus one standard deviation in 2008–09 5/	24	26	31	31	29	27	23	19
B3. US dollar GDP deflator at historical average minus one standard deviation in 2008–09	24	26	28	28	27	25	22	22
B4. Net nondebt creating flows at historical average minus one standard deviation in 2008–09 6/	24	30	37	37	34	32	26	21
B5. Combination of B1-B4 using one-half standard deviation shocks	24	26	27	27	25	23	21	21
B6. One-time 30 percent nominal depreciation relative to the baseline in 2008 7/	24	29	27	27	26	24	21	21
B7. Terms-of-trade shocks on copper and gold exports in 2011 8/	24	21	20	20	25	30	32	25
NPV of debt-to-exports ratio								
Baseline	38	36	37	36	33	24	21	29
A. Alternative scenarios								
A1. Key variables at their historical averages in 2007–26 1/	38	43	44	43	45	46	76	118
A2. New public sector loans on less favorable terms in 2007–26 2/	38	37	39	40	37	28	26	42
A3. Sovereign bond issue for 2008–09 3/	38	61	83	78	66	46	21	29
A4. Delay of a big mining project and higher government equity participation 4/	38	36	37	36	40	40	24	30
B. Bound tests								
B1. Real GDP growth at historical average minus one standard deviation in 2008–09	38	36	37	36	33	24	21	29
B2. Export value growth at historical average minus one standard deviation in 2008–09 5/	38	50	69	68	62	45	37	42
B3. U.S. dollar GDP deflator at historical average minus one standard deviation in 2008–09	38	36	37	36	33	24	21	29
B4. Net nondebt creating flows at historical average minus one standard deviation in 2008–09 6/	38	51	68	67	61	44	36	39
B5. Combination of B1-B4 using one-half standard deviation shocks	38	38	37	36	33	24	21	29
B6. One-time 30 percent nominal depreciation relative to the baseline in 2008 7/	38	36	37	36	33	24	21	29
B7. Terms-of-trade shocks on copper and gold exports in 2011 8/	38	36	37	36	50	47	43	46
NPV of debt-to-revenue ratio								
Baseline	66	54	53	56	57	50	32	41
A. Alternative scenarios								
A1. Key variables at their historical averages in 2007–26 1/	66	64	63	66	77	95	116	169
A2. New public sector loans on less favorable terms in 2007–26 2/	66	56	57	61	64	57	40	60
A3. Sovereign bond issue for 2008–09 3/	66	86	116	116	114	96	31	40
A4. Delay of a big mining project and higher government equity participation 4/	66	57	57	60	58	56	41	39
B. Bound tests								
B1. Real GDP growth at historical average minus one standard deviation in 2008–09	66	58	60	63	64	56	36	46
B2. Export value growth at historical average minus one standard deviation in 2008–09 5/	66	67	84	87	88	77	47	51
B3. U.S. dollar GDP deflator at historical average minus one standard deviation in 2008–09	66	67	75	79	81	71	45	58
B4. Net nondebt creating flows at historical average minus one standard deviation in 2008–09 6/	66	76	99	103	104	91	54	55
B5. Combination of B1-B4 using one-half standard deviation shocks	66	67	71	75	77	67	43	55
B6. One-time 30 percent nominal depreciation relative to the baseline in 2008 7/	66	74	73	76	78	69	43	56
B7. Terms-of-trade shocks on copper and gold exports in 2011 8/	66	54	53	56	75	86	65	66
Debt service-to-exports ratio								
Baseline	2.0	2.1	2.3	2.2	2.1	1.5	1.3	1.9
A. Alternative scenarios								
A1. Key variables at their historical averages in 2008–27 1/	2.0	2.4	2.7	2.5	2.4	1.9	3.1	6.5
A2. New public sector loans on less favorable terms in 2008–27 2/	2.0	2.1	2.3	2.3	2.2	1.6	1.6	2.8
A3. Sovereign bond issue for 2008–09 3/	2.2	2.1	3.9	5.3	4.5	3.2	1.3	1.9
A4. Delay of a big mining project and higher government equity participation 4/	2.2	2.1	2.3	2.2	2.4	2.4	1.4	2.0
B. Bound tests								
B1. Real GDP growth at historical average minus one standard deviation in 2008–09	2.0	2.1	2.3	2.2	2.1	1.5	1.3	1.9
B2. Export value growth at historical average minus one standard deviation in 2008–09 5/	2.0	2.4	3.1	3.6	3.3	2.3	2.1	2.9
B3. U.S. dollar GDP deflator at historical average minus one standard deviation in 2008–09	2.0	2.1	2.3	2.2	2.1	1.5	1.3	1.9
B4. Net nondebt creating flows at historical average minus one standard deviation in 2008–09 6/	2.0	2.1	2.9	3.4	3.1	2.2	2.1	2.8
B5. Combination of B1-B4 using one-half standard deviation shocks	2.0	2.2	2.3	2.2	2.1	1.5	1.3	1.9
B6. One-time 30 percent nominal depreciation relative to the baseline in 2008 7/	2.0	2.1	2.3	2.2	2.1	1.5	1.3	1.9
B7. Terms-of-trade shocks on copper and gold exports in 2011 8/	2.2	2.1	2.3	2.2	2.4	2.0	2.1	3.3
Debt service-to-revenue ratio								
Baseline	3.6	3.2	3.3	3.4	3.5	3.0	1.9	2.7
A. Alternative scenarios								
A1. Key variables at their historical averages in 2008–27 1/	3.6	3.6	3.9	3.8	4.2	4.0	4.8	9.3
A2. New public sector loans on less favorable terms in 2008–27 2/	3.6	3.2	3.4	3.5	3.8	3.4	2.4	3.9
A3. Sovereign bond issue for 2008–09 3/	3.8	3.1	5.5	7.8	7.8	6.5	1.9	2.6
A4. Delay of a big mining project and higher government equity participation 4/	3.8	3.4	3.5	3.6	3.6	3.3	2.5	2.5
B. Bound tests								
B1. Real GDP growth at historical average minus one standard deviation in 2008–09	3.6	3.4	3.7	3.8	3.9	3.4	2.2	3.0
B2. Export value growth at historical average minus one standard deviation in 2008–09 5/	3.6	3.2	3.8	4.6	4.7	4.0	2.7	3.5
B3. U.S. dollar GDP deflator at historical average minus one standard deviation in 2008–09	3.6	4.0	4.7	4.8	5.0	4.3	2.7	3.8
B4. Net non-debt creating flows at historical average minus one standard deviation in 2008–09 6/	3.6	3.2	4.1	5.2	5.3	4.5	3.2	3.9
B5. Combination of B1-B4 using one-half standard deviation shocks	3.6	3.9	4.5	4.5	4.7	4.0	2.6	3.6
B6. One-time 30 percent nominal depreciation relative to the baseline in 2008 7/	3.6	4.4	4.5	4.6	4.8	4.1	2.7	3.6
B7. Terms-of-trade shocks on copper and gold exports in 2011 8/	3.8	3.2	3.3	3.4	3.5	3.6	3.2	4.7
Memorandum item:								
Grant element assumed on residual financing (i.e., financing required above baseline) 9/	25	25	25	25	25	25	25	25

Source: Staff projections and simulations.

1/ Variables include real GDP growth, growth of GDP deflator (in U.S. dollar terms), non-interest current account in percent of GDP, and nondebt creating flows.
2/ Assumes that the interest rate on new borrowing is by 2 percentage points higher than in the baseline., while grace and maturity periods are the same as in the baseline.
3/ Assumes that the government issues sovereign bonds of $1.2 billion in 2008–09 ($600 million each year)
4/ Assumes that the Oyu Tolgoi mining project will be delayed by 3 years and government equity participation in the project will be 51 percent.
5/ Exports values are assumed to remain permanently at the lower level, but the current account as a share of GDP is assumed to return to its baseline level after the shock (implicitly assuming an offsetting adjustment in import levels).
6/ Includes official and private transfers and FDI.
7/ Depreciation is defined as percentage decline in dollar/local currency rate, such that it never exceeds 100 percent.
8/ Assumes that copper and gold prices decline by 35 percent and 25 percent, respectively, in 2011 on top of the WEO assumptions, and catch up with prices in the baseline scenario in 5 years.
9/ 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.