



ZAMBIA

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

September 25, 2017

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Prepared by the staffs of the International
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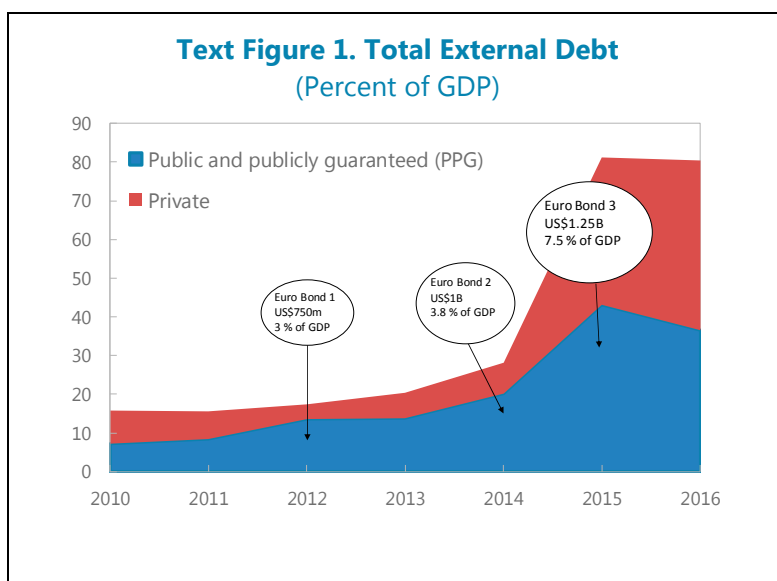
Risk of external debt distress (current policies):	High
Augmented by significant risks stemming from domestic public and/or private external debt?	Yes

This full Debt Sustainability Analysis¹ (DSA) indicates that Zambia is at high risk of debt distress, which represents a downgrade from the moderate rating of the previous DSA reported in the 2015 Article IV consultation (IMF Country Report No. 15/152). The present value (PV) of the public and publicly guaranteed external debt breaches the 40 percent of GDP threshold; it rises from 37 percent in 2016 to 42.6 percent by 2019 and to a peak of 44.3 percent in 2022. The debt-service-to-revenue ratio temporarily breaches its 20 percent threshold in 2022 and 2024 when Eurobond payments fall due. All indicators breach their respective thresholds in the case of extreme shocks. Overall public sector debt vulnerabilities are also elevated; the fixed primary balance scenario, which keeps the primary deficit-to-GDP ratio unchanged from 2016 (at 2.2 percent), shows the debt ratio rising throughout the forecast period, highlighting the urgent need for fiscal consolidation. Reducing the risk of debt distress requires strong and sustained fiscal consolidation, including measures to increase domestic revenue, strengthen public investment management, and contain fiscal risks (especially contingent liabilities of state-owned enterprises). Adoption and implementation of an appropriate debt management strategy is also critical.

¹ A Debt Sustainability Analysis Update was prepared in April 2015 in the context of the last (2015) Article IV consultation (IMF Country Report No. 15/152). Zambia's three-year average score of the Country Policy and Institutional Assessment (CPIA) for 2014–16 was 3.38, which is within the band for medium performance. Therefore, the current DSA uses the policy-dependent thresholds for medium policy performers.

BACKGROUND AND RECENT DEVELOPMENTS

1. Zambia's stock of total external debt (public and private) has risen sharply since 2011, mainly reflecting issuance of Eurobonds by the government and a rapid rise in private sector debt. At end-2016, outstanding public and publicly guaranteed (PPG) external debt stood at nearly US\$8 billion (36.5 percent of GDP) compared to US\$1.9 billion (8.4 percent of GDP) at end-2011 (Text Table 1). Publicly guaranteed debt (for ZESCO and ZAMTEL)² stood at US\$771 million (3.5 percent of GDP), almost six times the amount at end-2012.



2. The composition of public debt has shifted towards external non-concessional debt. The share of central government's debt from multilaterals has fallen sharply from about 60 percent in 2011 to 20.5 percent, while the share of private banks/investors has risen to almost 50 percent.

3. Improved data collection has shown that private sector debt is much larger than previously reported. Private sector debt, which had been relatively modest, rose from 6 percent at end-2014 to 40 percent at end-2016, which in large part reflects an increase in the coverage of firms used to estimate private sector debt; the number of firms in the survey increased from 30 in 2014 to about 350 in 2015.

4. The pace at which the authorities have contracted debt has increased considerably in recent years. The number and value of loans has increased sharply from 5 loans with a combined value of US\$0.5 billion in 2011 to 30 loans totaling US\$3.4 billion in 2016. This pace of borrowing needs to be slowed significantly to align resources with the country's absorptive capacity and to ensure the sustainability of debt. The public investment cycle, including the selection, procurement, and monitoring of infrastructure projects, needs substantial strengthening to ensure public investment projects deliver value for money.

5. Domestic public debt increased from 12.4 percent of GDP in 2011 to 24 percent of GDP in 2016. In 2011, treasury bills (T-bills) and treasury bonds (T-bonds) accounted for about 93 percent of the total domestic debt, with the remainder coming from accumulation of arrears and financing from the banking system. In 2016, the share of government securities (T-bills and T-bonds) dropped

² ZESCO Ltd. is the state-owned electricity utility company. ZAMTEL is the Zambia Telecommunications Company, a state-owned telecommunications service provider.

to 49.8 percent of total domestic debt while arrears increased to about 33 percent of the total and the remaining reflected debt to the Bank of Zambia and domestic commercial banks.

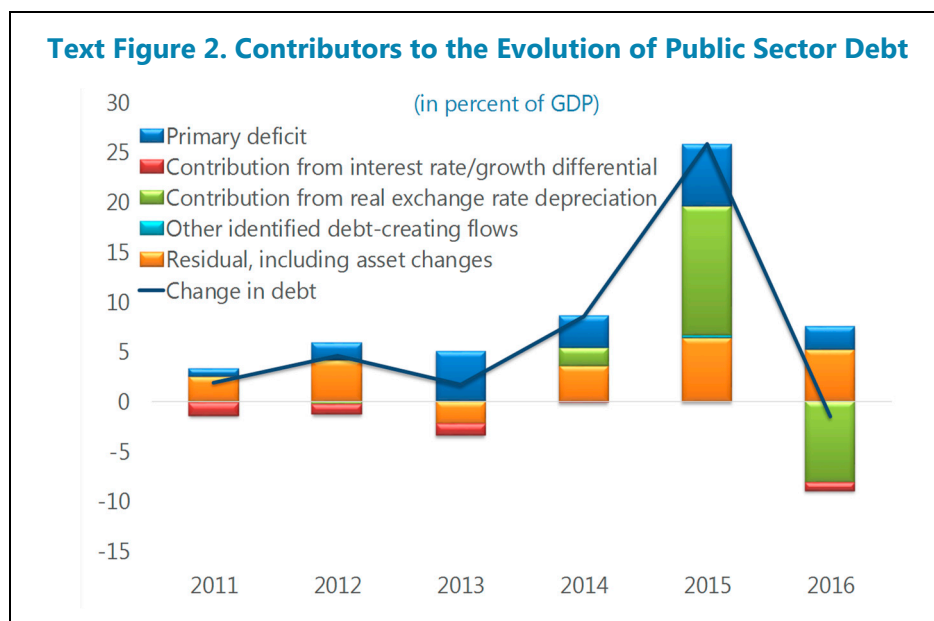
Text Table 1. Evolution of Debt Indicators

	2011	2012	2013	2014	2015	2016
Percent of GDP						
Total External debt	15.9	17.3	20.5	28.5	91.5	78.5
Public and publicly guaranteed	8.4	13.7	13.8	20.1	43.1	36.5
Central Government	6.5	11.6	11.3	16.6	37.6	32.1
BoZ	1.9	1.6	1.4	1.3	1.5	0.8
Publicly guaranteed	0.0	0.5	1.2	2.3	3.9	3.5
Private and Parastatal	7.5	3.6	6.7	8.4	48.4	42.0
Private	7.5	3.6	6.7	6.0	44.4	39.8
Parastatal	0.1	0.0	0.0	2.4	4.0	2.3
Total Public debt	20.8	25.4	27.1	35.6	61.4	60.5
Domestic debt	12.4	11.7	13.2	15.5	18.3	24.0
Securities	11.4	11.2	12.2	11.7	10.7	11.9
T-bills	6.0	5.9	6.1	5.6	5.3	6.0
T-bonds	5.4	5.3	6.0	6.1	5.4	5.9
Other 1/	1.0	0.6	1.1	3.8	7.6	12.1
External debt	8.4	13.7	13.8	20.1	43.1	36.5
Composition of Central Government's External Debt (percent)						
Multilaterals	59.7	33.6	35.5	27.1	20.2	20.5
Bilaterals	9.4	3.2	2.1	3.0	3.3	6.2
Private banks/investors	0.0	34.7	32.5	45.7	51.2	46.3
Suppliers' Credit	31.0	28.5	30.0	24.3	25.3	26.9
Composition of Domestic Debt (percent)						
Securities	92.6	93.2	79.0	74.4	57.0	49.8
T-bills	48.5	48.8	40.0	71.7	28.3	25.1
T-bonds	44.1	44.4	39.1	38.8	28.7	24.7
Other 1/	7.5	6.8	21.1	25.6	43.0	50.2

Sources : Zambia authorities and IMF staff calculations.

1/ Includes accumulation of domestic arrears and financing from BoZ and commercial banks.

6. Fiscal performance and exchange rate movements have been the main drivers of public debt dynamics (Text Figure 2). Total public sector debt at end-2016, as a ratio of GDP, is almost tripled that at end-2011. Fiscal deficits have been a significant contributor to the evolution of public debt, although in 2015 and 2016 exchange rate movements had the largest impact.



UNDERLYING ASSUMPTIONS

7. The DSA presents two scenarios that differ mainly on the assumptions about new public investment projects and associated debt. The risk rating is based on the “current policies” scenario. This scenario reflects the government’s ongoing efforts to increase tax compliance and address energy and agriculture subsidies. Based on information provided to IMF staff on loans in the pipeline, the current policies scenario also assumes that the authorities will disburse approximately US\$3.5 billion in new non-concessional loans over the next five years, on top of US\$4 billion in already contracted loans, mainly to support capital projects (executed at a pace that raises quality-of-spending concerns). Additionally, large domestic financing needs emerge, including to meet the government’s contribution to funding projects that are predominantly externally-financed. The second scenario, an “adjustment policies” scenario, assumes that capital spending will be more restrained, in line with the policies and targets outlined in the 2017 Budget Speech, including restrictions on new capital projects and major equipment purchases.

8. The current policies scenario reflects a modest fiscal adjustment over the medium term. Absent additional measures to reduce the deficit beyond the subsidy reforms undertaken thus far, the fiscal stance will remain unsustainable driven by the ambitious public investment program over the next five years, with total public debt continuing to rise. Clearance of domestic arrears is projected to slow down to accommodate the new capital spending. Key assumptions under the current policies scenario are:

- **Economic growth will remain subdued over the medium-term** mainly reflecting a crowding out of private sector investment due to the significant reliance on domestic debt to finance the budget deficit, which will affect domestic interest rates and access to credit by the private sector.
- **The external sector current account will remain in deficit up to 2022**, primarily reflecting higher imports related to government's capital outlays over the next five years. Nonetheless, a pickup in copper exports and less dependence on imported electricity will help to narrow the deficit.
- **A total of US\$7.5 billion in external debt will be disbursed over the next five years.** This assumes US\$4.2 billion in non-concessional loans and US\$3.3 billion concessional. Additionally, it is assumed that the three Eurobonds will be rolled over as they become due starting in 2022, and that there are no new Eurobond issuances prior to this.
- **The authorities implement the fiscal consolidation measures in line with the 2017 Budget Speech.** These include measures to strengthen tax enforcement and compliance, and removing obstacles to the full implementation of measures already approved by parliament, including on land titling, road-user charges, and the introduction new technology to enhance the monitoring of taxpayers' activity reporting, including in the telecommunication sector. On the expenditure side, it assumes: (i) the streamlining of the Farmer Input Support Program and full migration to the e-voucher system; (ii) keeping Food Reserve Agency (FRA) operations in line with its core mandate (in contrast to a large role in the marketing of maize in some recent years); and (iii) cost-reflective pricing of petroleum products and electricity. However, higher capital expenditure along with higher interest payments will limit the authorities' consolidation efforts.

9. Under the adjustment policies scenario, the authorities are assumed to implement more moderate public investment program aimed at restoring debt sustainability over the medium term. This scenario assumes that the authorities halt the contracting of new non-concessional external loans except for a US\$282 million communications project and debt to rollover the Eurobonds as they mature.

10. Compared to the 2015 DSA, the current policies scenario shows a much lower growth path, largely reflecting lower copper prices and production than was projected in the 2015 exercise. Larger budget deficits are projected over the medium term, given looser fiscal policy in 2015–16 and the larger investment program than assumed at the time of the 2015 DSA. The current account balance has been revised down mainly because of lower exports (particularly of copper), higher energy imports (fuel and electricity), and the larger import of capital goods associated with the government public investment plan, which were not envisaged in 2015. The adjustment scenario shows a steady pick-up in growth driven by increased confidence in government policies and lower inflation and improvements in the external sector current account due to more coherent fiscal consolidation policies.

Text Table 3. Assumptions on Disbursements

	2017		2018		2019		2020		2021		2022		2023		2,024		2025	
	Cur. Policies	Adj. poicies	Cur. Policies	Adj. poicies	Cur. Policies	Adj. poicies	Cur. Policies	Adj. poicies	Cur. Policies	Adj. poicies	Cur. Policies	Adj. poicies	Cur. Policies	Adj. poicies	Cur. Policies	Adj. poicies	Cur. Policies	Adj. poicies
Eurobond	0	0	0	0	0	0	0	0	0	0	750	750	0	0	1,000	1,000	425	425
Budget support - IDA; AfDB	0	200	0	230	0	70	0	0	0	0	0	0	0	0	0	0	0	0
Project support	864	690	1,467	964	1,617	870	1,409	728	1,199	742	937	780	858	788	965	953	1,012	1,032
Project support - concessional	489	383	751	645	563	489	451	501	478	517	519	547	532	473	544	562	556	608
Non-concessional borrowing	375	308	716	319	1,054	380	958	227	721	225	419	233	343	315	421	391	456	424
Other commercial borrowing	134	134	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOE (ZESCO, RDA, WSSDC)	272	272	208	208	115	120	86	92	41	48	42	50	46	54	49	59	53	63

Text Table 4. 2015 AIV DSA vs. Current DSA (assumptions)

	2016	2017	2018	2019	2020	2021
(Percentage Change)						
Real Growth						
2015 DSA	6.2	6.9	7.0	6.8	6.8	6.5
Current Policies DSA	3.4	4.0	4.5	4.5	4.5	4.5
Adjustments Policies DSA	3.4	4.0	4.5	5.0	5.5	5.5
Inflation (deflator, av.)						
2015 DSA	7.3	6.3	5.2	4.8	4.8	5.0
Current Policies DSA	14.3	7.9	8.1	8.1	7.8	8.0
Adjustments Policies DSA	14.3	7.9	6.8	6.3	6.0	6.0
(Percent of GDP)						
Budget Deficit						
2015 DSA	6.0	5.0	4.0	3.4	2.9	2.9
Current Policies DSA	5.7	8.0	7.8	7.2	6.5	5.3
Adjustments Policies DSA	5.7	7.3	5.9	4.0	3.2	2.4
Net FDI						
2015 DSA	6.6	6.6	6.6	6.6	6.6	6.2
Current Policies DSA	7.3	6.3	6.1	6.0	5.8	5.8
Adjustments Policies DSA	7.3	6.3	6.1	6.0	5.8	5.8
Current Account Balance						
2015 DSA	1.4	2.5	3.0	3.3	3.4	3.2
Current Policies DSA	-4.4	-3.6	-2.8	-1.5	0.0	-0.2
Adjustments Policies DSA	-4.4	-3.0	-1.5	0.1	1.2	1.4

EXTERNAL DSA

11. Under current policies, Zambia is assessed to be at high risk of debt distress. Under current policies, the present value (PV) of public and publicly guaranteed external debt as a share of GDP rises gradually from 34.5 percent in 2017 to 44.3 percent of GDP in 2020 and is sustained at that level up to 2022 before gradually falling below the 40 percent threshold in 2024 (Figure 1 and Table 1). The debt-service-to-revenue ratio in the baseline temporarily breaches the 20 percent threshold in 2022 and 2024 when Eurobond payments become due (Figure 1 and Table 1). The other debt burden indicators are below their respective thresholds.

12. All the debt indicators breach the relevant thresholds in the presence of shocks (Figure 1 and Table 2). A shock to exports would push the PV of debt-to-exports and the debt service-to-exports ratios well above their thresholds³. The shock that generates the largest impact for the PV of debt-to-GDP and PV of debt-to-revenue ratios is a combination shock where both growth and the primary balance fall below their historical average by half a standard deviation. Both indicators would rise sharply above their threshold, almost doubling by 2019, and would remain elevated well into the medium-term. This highlights the sensitivity of the debt trajectory to the fiscal and growth assumptions and further confirms the need for strong fiscal consolidation.

13. Under the adjustment policies scenario, debt dynamics improve substantially.

The present value (PV) of public external debt as a share of GDP remains below the 40 percent threshold, peaking at 37 percent of GDP in 2019 before tapering down on a sustainable trajectory (Figure 3, Table 5). The debt-service-to-revenue ratio breaches the 20 percent threshold in 2022 and 2024 when Eurobond payments become due (Figure 3, Table 5). The authorities need to monitor, and anticipate, these breaches carefully, even though they are temporary, reflecting bullet payments. The most extreme stress test indicates that those external debt burden indicators that are expressed as ratios to GDP would breach their respective thresholds in the event of a combined shock, while those measured relative to exports are sensitive to an exports shock (Figure 3 and Table 6).⁴ Zambia quickly reverts to a moderate risk rating under the adjustment policies scenario assuming the authorities halt the contracting of new non-concessional external borrowing.

PUBLIC DSA

14. Analysis of total public debt suggests a heightened level of vulnerability under current policies (Figure 2 and Table 3). The PV of total public debt to GDP reached 61 percent at end-2016, 5 percentage points above the benchmark level associated with heightened public debt

³ The export shock is where nominal export growth (in USD) is set to its historical average minus one standard deviation, and GDP deflator is where the deflator is set to its historical average minus one standard deviation.

⁴ The combination shock is where real GDP growth and the primary balance-to-GDP ratio are set to their historical average minus half a standard deviation. The export shock is where nominal export growth (in USD) is set to its historical average minus one standard deviation.

vulnerabilities for medium performers. Following a projected temporary improvement in 2017 driven by the strengthening of the exchange rate relative to 2016, this indicator will continue to rise through 2022. Similarly, under the fixed primary balance scenario, this indicator is above the threshold and is projected to continue rising, underscoring the need for an improved fiscal position (Figure 2).

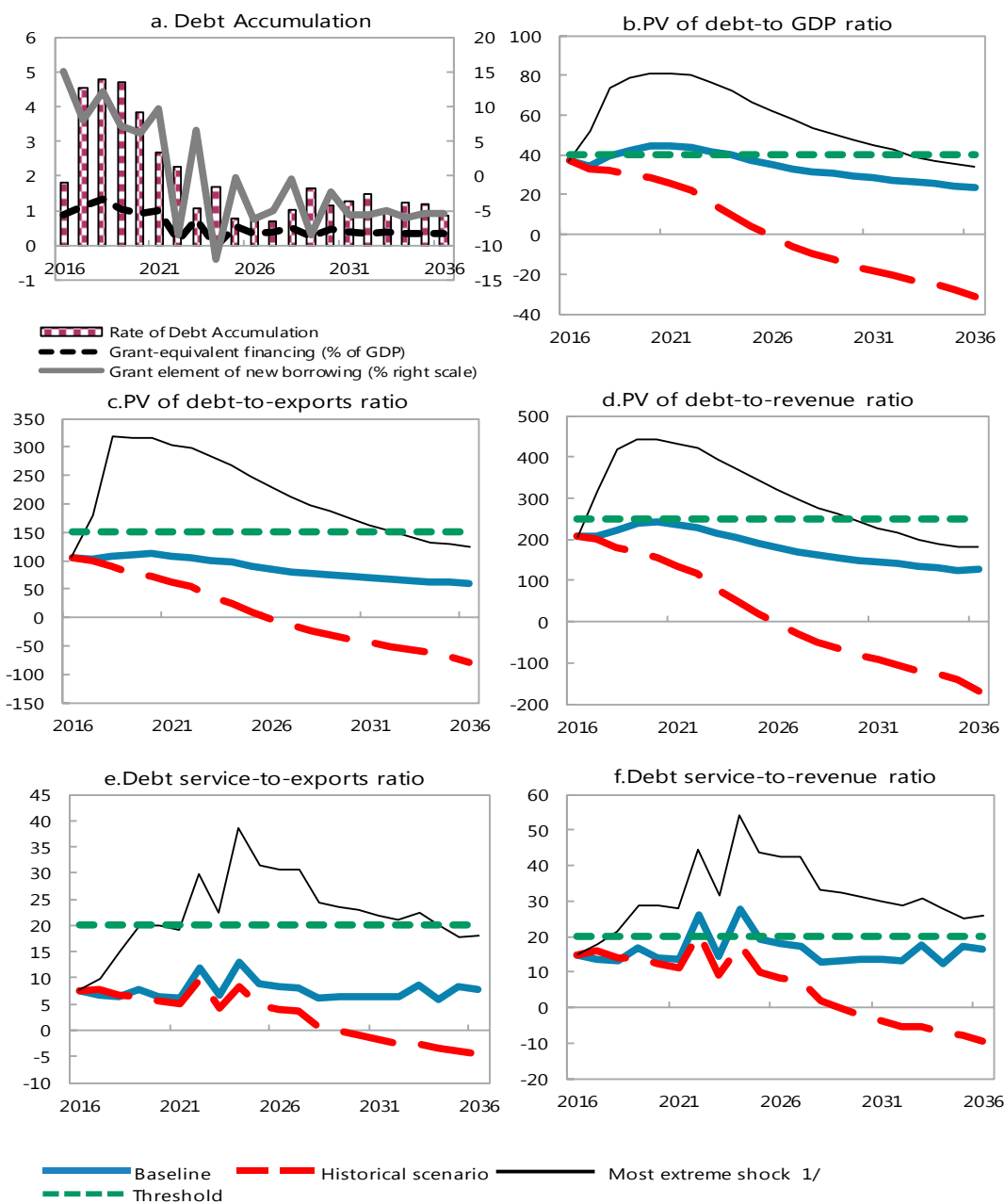
15. Debt metrics improve under the adjustment scenario. If the authorities were to take additional consolidation measures and slow down on the contracting of new non-concessional external loans, this would improve the fiscal position and the public debt dynamics (Figure 4 and Table 7).

CONCLUSION

16. Zambia faces a *high* risk of external debt distress, and heightened vulnerabilities on total public debt. Under current policies, the PV of the external debt-to-GDP ratio breaches the 40 percent threshold during 2019–23, while the debt-service-to-revenue ratio temporarily breaches its threshold in 2022 and 2024 when Eurobonds mature. All indicators breach their thresholds for extensive periods under a variety of shocks, underscoring the sensitivity of the external debt burden to fiscal performance and developments in exports, growth and the exchange rate. The ratio of total public debt to GDP breaches the benchmark level associated with heightened vulnerabilities. Debt dynamics improve substantially under the adjustment policies scenario. Fiscal consolidation, restraint on non-concessional borrowing, and strengthened debt and public investment management capacities are needed to put debt on a sustainable path.

17. The authorities broadly agreed with the DSA assessment. They indicated that they will soon be publishing the Medium-Term Debt Strategy which will guide government borrowing, with a view to ensuring that public debt remains at sustainable levels. In this context, they will seek to maximize concessional loans. They also plan to strengthen parliamentary oversight of public borrowing through an amendment to the Loans and Guarantees Act.

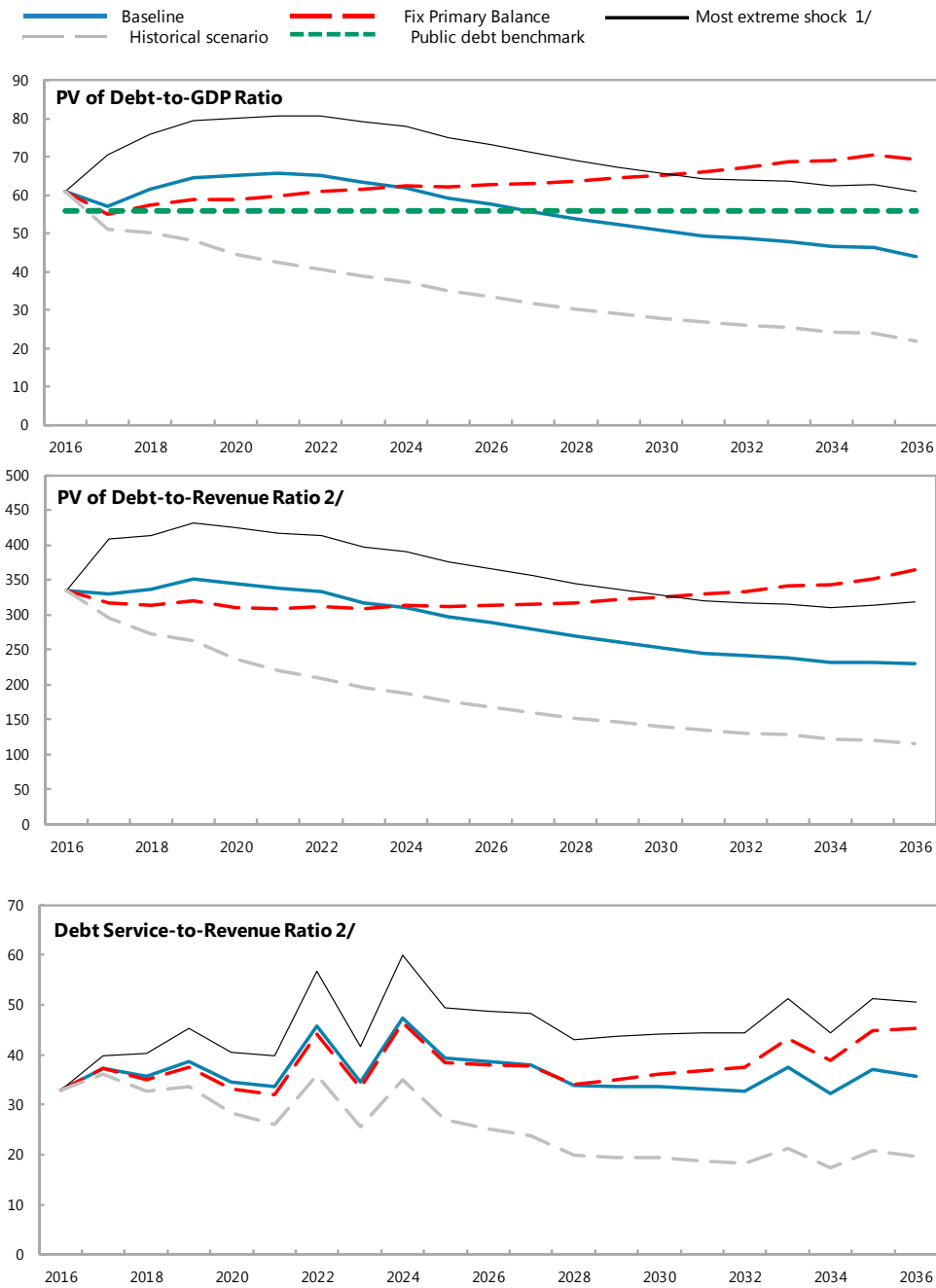
Figure 1. Zambia: Current Policies: Indicators of Public and Publicly Guaranteed External Debt under Alternatives Scenarios, 2016–36 1/



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 Exports shock; in d. to a Combination shock; in e. to a Exports shock and in figure f. to a Combination shock

Figure 2. Zambia: Current Policies: Indicators of Public Debt under Alternatives Scenarios, 2016–36 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 1. Zambia: Current Policies: External Debt Sustainability Framework, Baseline Scenario, 2013–36 1/

(Percent of GDP, unless otherwise indicated)

	Actual			Historical ^{6/} Standard ^{6/}		Projections							2016-2021			2022-2031
	2013	2014	2015	Average	Deviation	2016	2017	2018	2019	2020	2021	Average	2026	2036	Average	
External debt (nominal) 1/	20.4	28.2	91.5			78.5	68.5	73.3	75.8	76.6	75.3		58.3	38.4		
<i>of which: public and publicly guaranteed (PPG)</i>	13.8	20.1	43.1			36.5	32.9	37.3	40.4	42.4	42.6		33.8	24.1		
Change in external debt	3.1	7.8	63.3			-12.9	-10.1	4.8	2.5	0.8	-1.3		-3.1	-3.2		
Identified net debt-creating flows	-7.0	-13.2	6.3			-5.5	-5.3	-6.2	-7.6	-9.0	-8.8		-5.8	-4.0		
Non-interest current account deficit	0.2	-2.8	2.2	-2.6	4.0	2.5	1.7	1.1	-0.4	-1.7	-1.6		1.4	2.3	1.4	
Deficit in balance of goods and services	-2.1	-3.1	3.0			2.6	2.9	2.2	0.9	-0.2	0.0		2.9	3.7		
Exports	41.4	40.8	38.7			35.2	33.4	35.9	38.5	39.6	41.0		41.1	39.0		
Imports	39.3	37.7	41.7			37.7	36.3	38.1	39.4	39.4	41.0		44.1	42.7		
Net current transfers (negative = inflow)	-1.4	-1.1	-1.1	-2.2	1.0	-1.0	-1.8	-1.5	-1.6	-1.6	-1.6		-1.6	-1.5	-1.6	
<i>of which: official</i>	-0.4	-0.2	-0.1			0.0	-0.8	-0.5	-0.5	-0.5	-0.5		-0.5	-0.4		
Other current account flows (negative = net inflow)	3.7	1.4	0.3			0.9	0.6	0.4	0.3	0.1	0.1		0.1	0.1		
Net FDI (negative = inflow)	-6.0	-11.8	-5.5	-6.3	3.0	-7.3	-6.3	-6.1	-6.0	-5.8	-5.8		-5.8	-5.4	-5.8	
Endogenous debt dynamics 2/	-1.2	1.4	9.6			-0.7	-0.7	-1.1	-1.2	-1.4	-1.5		-1.4	-0.9		
Contribution from nominal interest rate	0.4	0.7	1.7			2.5	1.9	1.7	1.9	1.8	1.8		1.5	1.1		
Contribution from real GDP growth	-0.8	-1.0	-1.1			-3.2	-2.6	-2.9	-3.2	-3.2	-3.2		-2.8	-1.9		
Contribution from price and exchange rate changes	-0.8	1.7	8.9			...	...	...	...	...	...		...	...
Residual (3-4) 3/	10.1	21.0	57.0			-7.4	-4.7	11.0	10.1	9.7	7.5		2.7	0.8		
<i>of which: exceptional financing</i>	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/	...	...	94.6			79.0	70.0	75.1	78.0	78.5	76.9		59.4	37.7	
In percent of exports	...	...	244.4			224.7	209.7	209.0	202.6	198.3	187.4		144.5	96.7	
PV of PPG external debt	...	...	46.2			37.0	34.5	39.1	42.6	44.3	44.3		34.9	23.5	
In percent of exports	...	...	119.4			105.2	103.2	108.8	110.6	111.9	107.8		85.0	60.2	
In percent of government revenues	...	...	248.9			206.3	208.4	220.0	239.1	241.9	235.4		179.7	126.1	
Debt service-to-exports ratio (in percent)	2.8	6.5	8.0			9.8	9.6	8.7	9.8	8.5	8.2		10.2	9.4		
PPG debt service-to-exports ratio (in percent)	1.7	2.4	4.8			7.6	6.8	6.4	7.7	6.4	6.2		8.4	7.9		
PPG debt service-to-revenue ratio (in percent)	4.4	5.3	9.9			14.9	13.7	13.0	16.6	13.9	13.6		17.8	16.5		
Total gross financing need (Billions of U.S. dollars)	-1.2	-3.1	0.1			-0.1	-0.2	-0.4	-0.6	-1.1	-1.1		0.1	0.7		
Non-interest current account deficit that stabilizes debt ratio	-2.9	-10.6	-61.0			15.4	11.7	-3.8	-2.9	-2.5	-0.2		4.5	5.4		
Key macroeconomic assumptions																
Real GDP growth (in percent)	5.1	4.7	2.9	6.9	2.3	3.4	4.0	4.5	4.5	4.5	4.5	4.2	5.0	5.0	5.0	
GDP deflator in US dollar terms (change in percent)	4.7	-7.5	-24.0	4.4	19.7	-4.4	17.1	2.3	-1.1	0.1	1.4	2.6	3.1	3.1	3.0	
Effective interest rate (percent) 5/	2.6	3.2	4.8	2.9	1.8	2.7	2.9	2.7	2.7	2.5	2.4	2.7	2.6	2.8	2.8	
Growth of exports of G&S (US dollar terms, in percent)	10.4	-4.6	-25.7	14.3	28.8	-10.1	15.6	14.9	10.7	7.5	9.9	8.1	8.1	5.0	7.7	
Growth of imports of G&S (US dollar terms, in percent)	18.9	-7.0	-13.4	15.4	22.5	-10.6	17.0	12.2	6.9	4.4	10.4	6.7	8.2	5.0	8.4	
Grant element of new public sector borrowing (in percent)	...	...	...	...	...	15.0	8.1	12.2	7.1	6.1	9.6	9.7	-6.2	-5.5	-4.7
Government revenues (excluding grants, in percent of GDP)	16.2	18.1	18.6			17.9	16.5	17.8	17.8	18.3	18.8		19.5	18.6	19.4	
Aid flows (in Billions of US dollars) 7/	0.4	0.2	0.4			0.5	0.7	0.9	0.7	0.6	0.7		0.9	1.7		
<i>of which: Grants</i>	0.4	0.2	0.0			0.1	0.2	0.2	0.2	0.2	0.2		0.3	0.5		
<i>of which: Concessional loans</i>	0.0	0.0	0.4			0.4	0.5	0.8	0.6	0.5	0.5		0.6	1.2		
Grant-equivalent financing (in percent of GDP) 8/	...	...	...			0.9	1.1	1.3	1.0	0.9	1.0		0.3	0.3	0.4
Grant-equivalent financing (in percent of external financing) 8/	...	...	...			19.8	20.1	20.1	15.5	16.3	21.5		8.8	10.1	10.3
Memorandum items:																
Nominal GDP (Billions of US dollars)	28.0	27.2	21.2			21.0	25.6	27.3	28.2	29.5	31.3		45.5	100.4		
Nominal dollar GDP growth	10.0	-3.2	-21.8			-1.1	21.7	6.9	3.3	4.5	5.9	6.9	8.2	8.2	8.1	
PV of PPG external debt (in Billions of US dollars)	...	...	7.7			8.1	9.1	10.3	11.6	12.6	13.4		15.7	23.4	
(PVt-PVt-1)/GDpt-1 (in percent)	...	...	...			1.8	4.5	4.8	4.7	3.8	2.7	3.7	0.8	0.9	1.2
Gross workers' remittances (Billions of US dollars)	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		
PV of PPG external debt (in percent of GDP + remittances)	...	...	46.2			37.0	34.5	39.1	42.6	44.3	44.2		34.9	23.5	
PV of PPG external debt (in percent of exports + remittances)	...	...	119.3			105.1	103.1	108.7	110.6	111.8	107.7		84.9	60.2	
Debt service of PPG external debt (in percent of exports + remittance)	...	...	4.8			7.6	6.8	6.4	7.7	6.4	6.2		8.4	7.9	

Sources: Country authorities; and staff estimates and projections.

1/ Includes both public and private sector external debt.

2/ Derived as $[r - g - \rho(1+g)] / (1+g+\rho+gp)$ 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. The large residual in 2015 is mainly due to the large increase in private sector debt which reflects an increase in the survey coverage of firms (from 32 to 250) but this change in debt does not appear to be captured in the BOP flows for 2015.

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. Zambia: Current Policies: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2016–36

(Percent)

	Projections							
	2016	2017	2018	2019	2020	2021	2026	2036
PV of debt-to GDP ratio								
Baseline	37	34	39	43	44	44	35	23
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	37	33	32	30	28	25	-1	-31
A2. New public sector loans on less favorable terms in 2016-2036 2/	37	36	40	44	47	48	43	35
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	37	35	37	41	42	43	34	23
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	37	44	63	67	69	69	52	27
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	37	49	63	69	72	72	57	39
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	37	39	44	48	50	50	39	24
B5. Combination of B1-B4 using one-half standard deviation shocks	37	52	74	79	81	81	62	34
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	37	48	51	55	58	58	46	31
PV of debt-to-exports ratio								
Baseline	105	103	109	111	112	108	85	60
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	105	99	89	78	72	62	-3	-80
A2. New public sector loans on less favorable terms in 2016-2036 2/	105	109	110	115	119	117	104	91
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	105	106	105	107	108	105	84	59
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	105	180	319	315	315	304	230	125
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	105	106	105	107	108	105	84	59
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	105	117	124	124	125	121	95	62
B5. Combination of B1-B4 using one-half standard deviation shocks	105	149	210	209	210	202	154	88
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	105	106	105	107	108	105	84	59
PV of debt-to-revenue ratio								
Baseline	206	208	220	239	242	235	180	126
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	206	200	179	168	155	135	-6	-168
A2. New public sector loans on less favorable terms in 2016-2036 2/	206	220	223	248	257	255	220	190
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	206	213	211	228	232	226	175	123
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	206	268	355	375	376	365	268	144
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	206	297	355	385	391	381	295	207
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	206	236	250	268	271	264	200	129
B5. Combination of B1-B4 using one-half standard deviation shocks	206	316	416	442	444	431	319	181
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	206	288	286	310	315	307	238	167

Table 2. Zambia: Current Policies: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2016–36 (concluded)

(Percent)

	Projections							2036
	2016	2017	2018	2019	2020	2021	2026	
Debt service-to-exports ratio								
Baseline	8	7	6	8	6	6	8	8
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	8	8	7	6	6	5	4	-5
A2. New public sector loans on less favorable terms in 2016-2036 2/	8	7	7	8	8	8	13	11
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	8	7	7	8	8	7	11	8
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	8	10	15	20	20	19	31	18
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	8	7	7	8	8	7	11	8
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	8	7	8	9	9	8	12	9
B5. Combination of B1-B4 using one-half standard deviation shocks	8	8	11	14	14	13	20	13
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	8	7	7	8	8	7	11	8
Debt service-to-revenue ratio								
Baseline	15	14	13	17	14	14	18	17
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	15	16	14	14	12	11	8	-9
A2. New public sector loans on less favorable terms in 2016-2036 2/	15	15	14	16	17	17	27	23
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	15	15	14	17	17	16	23	17
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	15	15	17	24	24	23	36	21
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	15	20	24	28	28	27	39	29
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	15	15	15	19	19	18	26	18
B5. Combination of B1-B4 using one-half standard deviation shocks	15	18	21	29	29	28	42	26
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	15	20	19	22	22	22	31	23
<i>Memorandum item:</i>								
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	-3	-3	-3	-3	-3	-3	-3	-3

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 assuming an offsetting adjustment in import levels).

4/ Includes official and private transfers and FDI.

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

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

Table 3. Zambia: Current Policies: Public Sector Debt Sustainability Framework, Baseline Scenario, 2013–36
(Percent of GDP, unless otherwise indicated)

	Actual			Average ^{5/}	Standard Deviation ^{5/}	Estimate					Projections						
	2013	2014	2015			2016	2017	2018	2019	2020	2021	2016-21 Average		2022-36 Average			
Public sector debt 1/	27.1	35.6	61.4			60.5	55.6	60.0	62.4	63.3	64.0						
<i>of which: foreign-currency denominated</i>	13.8	20.1	43.1			36.5	32.9	37.3	40.4	42.4	42.6				56.6	44.7	
Change in public sector debt	1.7	8.5	25.8			-0.9	-4.9	4.4	2.5	0.9	0.7				-1.2	-3.4	
Identified debt-creating flows	4.1	9.0	22.2			-4.6	-3.1	4.2	2.8	1.1	0.2				-1.3	-0.8	
Primary deficit	4.9	3.2	6.1	-0.1	6.7	2.2	4.4	4.0	3.4	3.0	1.7	31			-0.1	0.2	-0.1
Revenue and grants	17.6	18.9	18.8			18.2	17.3	18.4	18.4	18.9	19.4				20.0	19.1	
<i>of which: grants</i>	1.5	0.8	0.2			0.2	0.7	0.6	0.6	0.6	0.6				0.6	0.5	
Primary (noninterest) expenditure	22.6	22.1	24.9			20.3	21.6	22.4	21.8	21.9	21.1				19.9	19.4	
Automatic debt dynamics	-1.1	1.7	13.0			-9.6	-5.1	1.2	0.1	-0.8	-1.3				-1.2	-1.1	
Contribution from interest rate/growth differential	-1.2	-0.1	0.1			-1.1	-0.9	-0.9	-1.0	-1.3	-1.3				-0.8	-0.8	
<i>of which: contribution from average real interest rate</i>	0.1	1.2	1.1			1.0	1.4	1.5	1.5	1.4	1.4				1.9	1.5	
<i>of which: contribution from real GDP growth</i>	-1.2	-1.2	-1.0			-2.0	-2.3	-2.4	-2.6	-2.7	-2.7				-2.7	-2.3	
Contribution from real exchange rate depreciation	0.1	1.8	12.9			-8.5	-4.2	2.0	1.1	0.5	0.1				...	...
Other identified debt-creating flows	0.2	4.1	3.1			2.9	-2.4	-1.0	-0.7	-1.0	-0.3				0.0	0.0	
Privatization receipts (negative)	0.0	0.0	0.3			0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	
Recognition of implicit or contingent liabilities	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	
Debt relief (HIPC and other)	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	
Other (includes domestic arrears flows)	0.2	4.1	2.8			2.9	-2.4	-1.0	-0.7	-1.0	-0.3				0.0	0.0	
Residual, including asset changes	-2.5	-0.5	3.6			3.7	-1.8	0.2	-0.3	-0.2	0.5				0.1	-2.6	
Other Sustainability Indicators																	
PV of public sector debt	...	...	64.5			61.0	57.1	61.7	64.6	65.2	65.7				57.7	44.1	
<i>of which: foreign-currency denominated</i>	...	...	46.2			37.0	34.5	39.1	42.6	44.3	44.3				34.9	23.5	
<i>of which: external</i>	...	...	46.2			37.0	34.5	39.1	42.6	44.3	44.3				34.9	23.5	
PV of contingent liabilities (not included in public sector debt)	...	...	...			...	...	...	...	...	...				...	...
Gross financing need 2/	11.9	12.5	16.0			13.5	18.2	17.5	17.4	16.3	14.7				14.6	14.0	
PV of public sector debt-to-revenue and grants ratio (in percent)	...	...	343.8			335.4	330.5	336.2	350.7	344.9	338.5				288.2	230.4	
PV of public sector debt-to-revenue ratio (in percent)	...	...	347.6			339.9	345.4	347.5	362.7	356.4	349.3				296.4	236.4	
<i>of which: external 3/</i>	...	...	248.9			206.3	208.4	220.0	239.1	241.9	235.4				179.7	126.1	
Debt service-to-revenue and grants ratio (in percent) 4/	15.9	19.3	26.3			32.9	37.2	35.6	38.7	34.6	33.6				38.6	35.7	
Debt service-to-revenue ratio (in percent) 4/	17.4	20.1	26.6			33.4	38.9	36.8	40.0	35.8	34.7				39.7	36.6	
Primary deficit that stabilizes the debt-to-GDP ratio	3.3	-5.3	-19.7			3.1	9.2	-0.3	0.9	2.0	1.1				1.1	3.6	
Key macroeconomic and fiscal assumptions																	
Real GDP growth (in percent)	5.1	4.7	2.9	6.9	2.3	3.4	4.0	4.5	4.5	4.5	4.5	4.2	5.0	5.0	5.0		
Average nominal interest rate on forex debt (in percent)	1.8	3.5	3.9	1.7	1.2	4.8	4.6	4.5	4.4	3.8	3.5	4.3	3.7	3.8	3.9		
Average real interest rate on domestic debt (in percent)	2.2	8.8	5.6	2.1	4.1	-2.1	2.1	3.3	3.1	3.1	3.7	2.2	6.3	5.1	5.5		
Real exchange rate depreciation (in percent, + indicates depreciation)	0.8	13.5	65.2	6.5	23.5	-19.9	...	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	9.7	5.4	6.7	9.8	3.4	14.3	7.9	8.1	8.1	7.8	8.0	9.0	5.0	5.0	5.7		
Growth of real primary spending (deflated by GDP deflator, in percent)	16.0	2.4	16.2	3.5	6.7	-15.5	10.6	8.2	1.7	4.8	1.0	1.8	5.2	1.8	4.4		
Grant element of new external borrowing (in percent)	...	...	...	...	...	15.0	8.1	12.2	7.1	6.1	9.6	9.7	-6.2	-5.5	...		

Sources: Country authorities; and staff estimates and projections.

1/ Central government and publicly guaranteed, gross basis.

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 4. Zambia: Current Policies: Sensitivity Analysis for Key Indicators of Public Debt, 2016–36

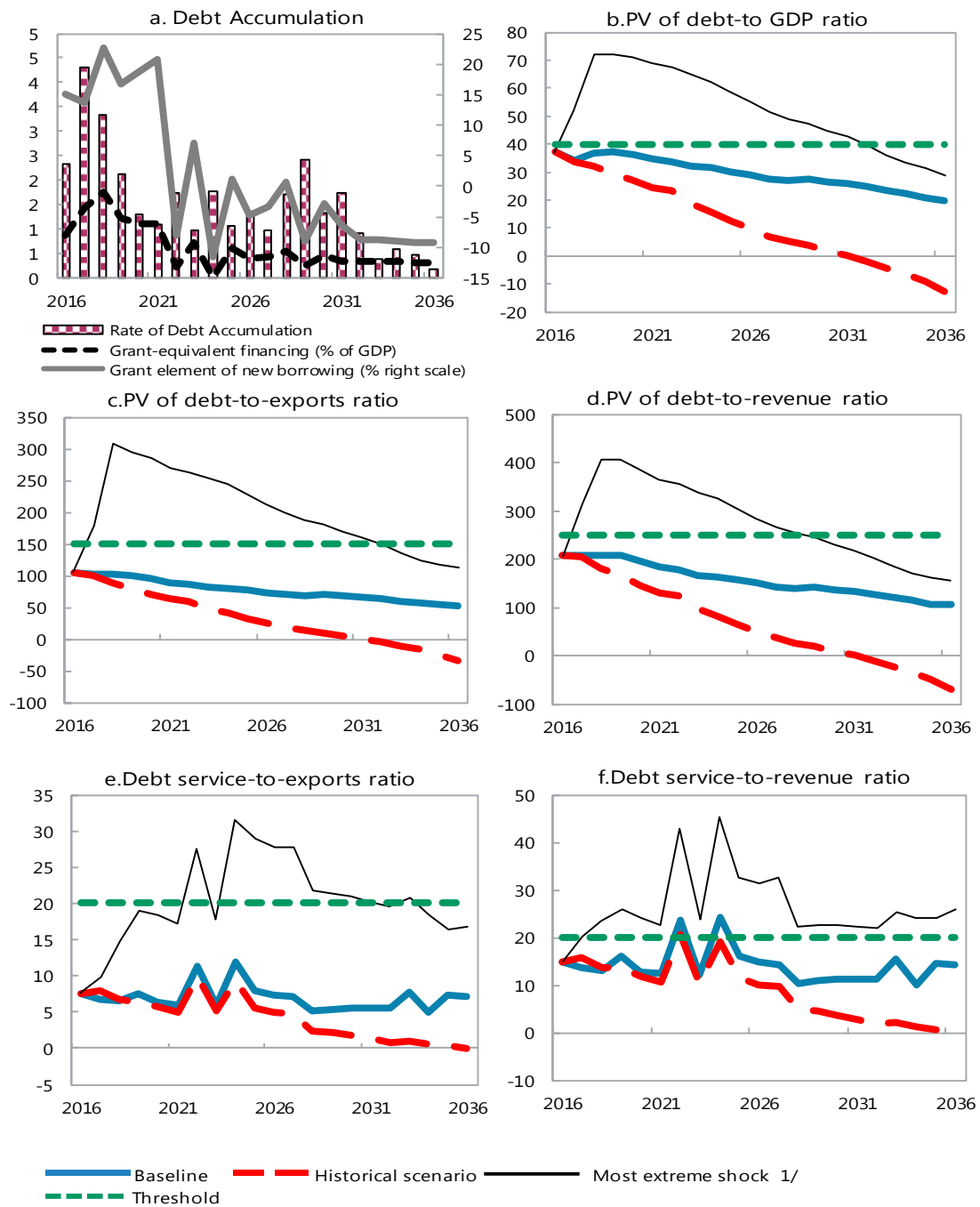
	Projections							
	2016	2017	2018	2019	2020	2021	2026	2036
PV of Debt-to-GDP Ratio								
Baseline	61	57	62	65	65	66	58	44
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	61	51	50	48	45	43	34	22
A2. Primary balance is unchanged from 2016	61	55	57	59	59	60	63	70
A3. Permanently lower GDP growth 1/	61	58	63	66	67	69	65	67
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2017-2018	61	57	61	64	64	64	56	41
B2. Primary balance is at historical average minus one standard deviations in 2017-2018	61	60	67	70	71	71	62	48
B3. Combination of B1-B2 using one half standard deviation shocks	61	55	58	60	61	60	50	33
B4. One-time 30 percent real depreciation in 2017	61	71	76	79	80	81	73	61
B5. 10 percent of GDP increase in other debt-creating flows in 2017	61	67	72	75	75	75	64	48
PV of Debt-to-Revenue Ratio 2/								
Baseline	335	331	336	351	345	338	288	230
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	335	296	273	262	237	220	169	115
A2. Primary balance is unchanged from 2016	335	318	313	320	311	308	314	364
A3. Permanently lower GDP growth 1/	335	333	341	359	356	354	327	347
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2017-2018	335	328	332	346	339	332	279	216
B2. Primary balance is at historical average minus one standard deviations in 2017-2018	335	344	365	380	373	366	311	249
B3. Combination of B1-B2 using one half standard deviation shocks	335	319	318	329	320	312	252	174
B4. One-time 30 percent real depreciation in 2017	335	408	413	431	424	417	366	318
B5. 10 percent of GDP increase in other debt-creating flows in 2017	335	390	392	405	395	385	321	251
Debt Service-to-Revenue Ratio 2/								
Baseline	33	37	36	39	35	34	39	36
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	33	36	33	34	28	26	25	20
A2. Primary balance is unchanged from 2016	33	37	35	37	33	32	38	45
A3. Permanently lower GDP growth 1/	33	37	36	39	35	35	42	46
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2017-2018	33	37	35	38	34	33	38	34
B2. Primary balance is at historical average minus one standard deviations in 2017-2018	33	37	36	40	36	35	41	37
B3. Combination of B1-B2 using one half standard deviation shocks	33	37	34	37	33	32	36	30
B4. One-time 30 percent real depreciation in 2017	33	40	40	45	41	40	49	51
B5. 10 percent of GDP increase in other debt-creating flows in 2017	33	37	38	41	36	35	41	37

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.

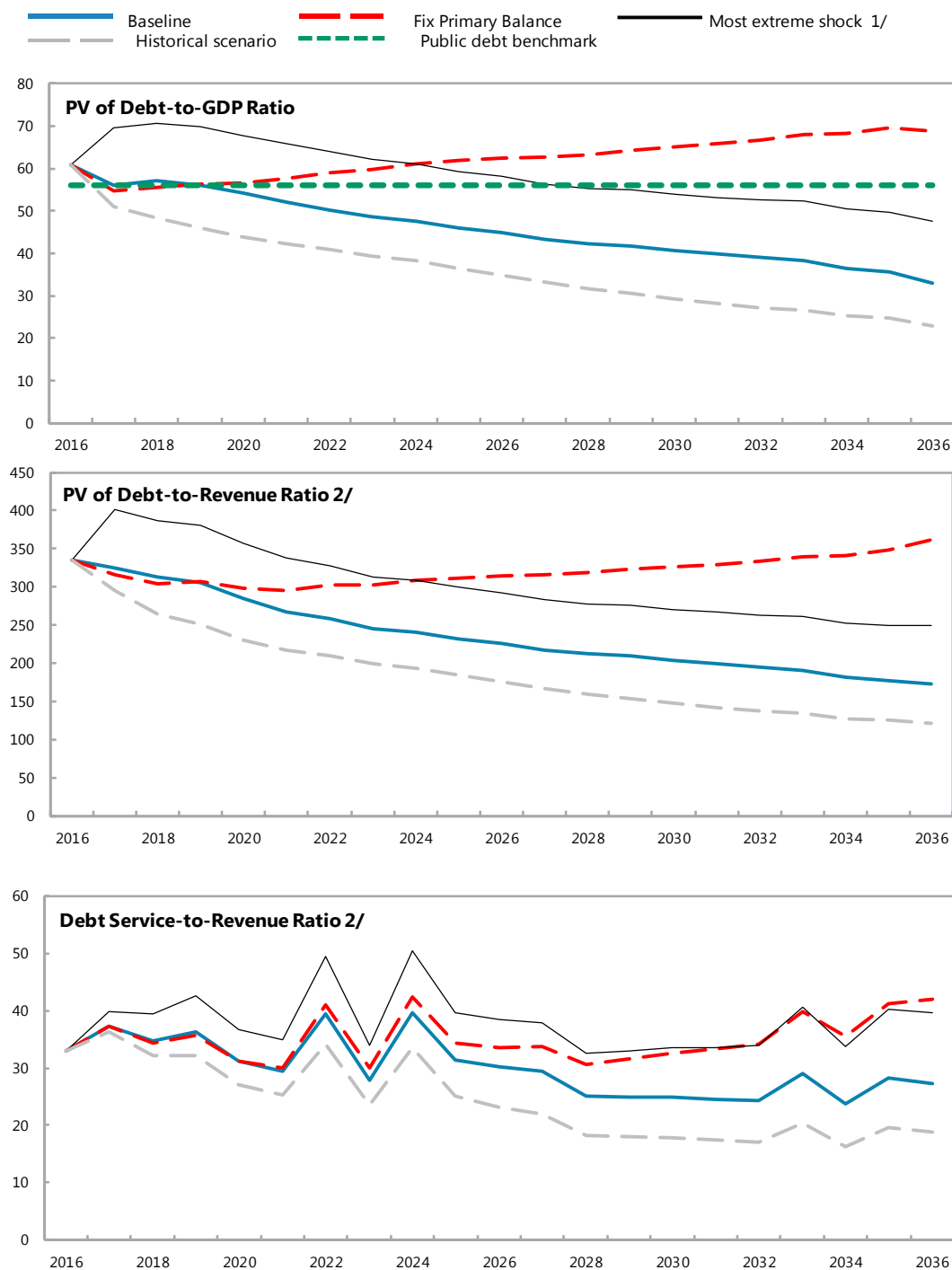
Figure 3. Zambia: Adjustment Framework: Indicators of Public and Publicly Guaranteed External Debt under Alternatives Scenarios, 2016–36 1/



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 Exports shock; in d. to a Combination shock; in e. to a Exports shock and in figure f. to a GDP deflator shock

Figure 4. Zambia: Adjustment Framework: Indicators of Public Debt under Alternatives Scenarios, 2016–36 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 5. Zambia: Adjustment Framework: External Debt Sustainability Framework, Baseline Scenario, 2013–36 1/

(Percent of GDP, unless otherwise indicated)

	Actual			Historical ^{6/} Standard ^{6/}		Projections							2016-2021		2022-2036	
	2013	2014	2015	Average	Deviation	2016	2017	2018	2019	2020	2021	Average	2026	2036	Average	
External debt (nominal) 1/	20.4	28.2	81.1			80.3	69.5	69.9	68.8	66.9	64.2		51.6	32.9		
<i>of which: public and publicly guaranteed (PPG)</i>	13.8	20.1	43.1			36.5	33.0	35.4	35.6	35.1	33.9		28.4	19.3		
Change in external debt	3.1	7.8	52.9			-0.8	-10.8	0.3	-1.1	-1.9	-2.7		-2.2	-2.7		
Identified net debt-creating flows	-7.0	-13.2	6.3			-7.2	-7.2	-7.5	-9.0	-10.4	-10.6		-7.8	-5.9		
Non-interest current account deficit	0.2	-2.8	2.2	-2.6	4.0	2.5	1.0	-0.1	-1.6	-2.4	-2.6		-0.4	0.6		-0.3
Deficit in balance of goods and services	-2.1	-3.1	3.0			2.6	2.3	1.0	-0.3	-0.9	-1.1		1.1	2.1		
Exports	41.4	40.8	38.7			35.2	33.4	35.6	37.4	38.0	39.2		39.2	37.1		
Imports	39.3	37.7	41.7			37.7	35.7	36.7	37.1	37.1	38.2		40.3	39.1		
Net current transfers (negative = inflow)	-1.4	-1.1	-1.1	-2.2	1.0	-1.0	-1.8	-1.5	-1.6	-1.6	-1.6		-1.6	-1.5		-1.6
<i>of which: official</i>	-0.4	-0.2	-0.1			0.0	-0.8	-0.5	-0.5	-0.5	-0.5		-0.5	-0.4		
Other current account flows (negative = net inflow)	3.7	1.4	0.3			0.9	0.6	0.4	0.3	0.1	0.1		0.1	0.1		
Net FDI (negative = inflow)	-6.0	-11.8	-5.5	-6.3	3.0	-7.3	-6.3	-6.3	-6.4	-6.3	-6.3		-6.3	-5.8		-6.3
Endogenous debt dynamics 2/	-1.2	1.4	9.6			-2.4	-1.9	-1.2	-1.1	-1.7	-1.7		-1.2	-0.7		
Contribution from nominal interest rate	0.4	0.7	1.7			0.4	0.7	1.7	2.2	1.9	1.7	1.7	1.3	0.9		
Contribution from real GDP growth	-0.8	-1.0	-1.1			-2.8	-2.6	-2.9	-3.3	-3.6	-3.4		-2.5	-1.6		
Contribution from price and exchange rate changes	-0.8	1.7	8.9			...	...	...	...	...	...		...	...
Residual (3-4) 3/	10.1	21.0	46.7			4.6	-4.8	7.9	8.3	8.7	8.1		5.6	3.2		
<i>of which: exceptional financing</i>	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/	...	...	83.6			80.8	70.8	71.0	70.2	67.9	65.1		52.0	33.1		
In percent of exports	...	...	216.0			229.8	212.0	199.2	187.8	178.8	165.9		132.6	89.2		
PV of PPG external debt	...	...	45.6			37.0	34.3	36.6	37.0	36.1	34.7		28.8	19.5		
In percent of exports	...	...	117.7			105.2	102.7	102.6	99.0	95.0	88.6		73.6	52.5		
In percent of government revenues	...	...	245.4			206.3	207.4	206.3	208.2	196.0	183.7		149.5	105.1		
Debt service-to-exports ratio (in percent)	2.8	6.5	8.0			9.8	9.6	8.7	9.8	8.4	8.0		9.2	8.6		
PPG debt service-to-exports ratio (in percent)	1.7	2.4	4.8			7.6	6.8	6.4	7.6	6.2	5.9		7.3	7.0		
PPG debt service-to-revenue ratio (in percent)	4.4	5.3	9.9			14.9	13.7	13.0	16.0	12.9	12.3		14.9	14.1		
Total gross financing need (Billions of U.S. dollars)	-1.2	-3.1	0.1			-0.1	-0.4	-0.7	-1.1	-1.5	-1.7		-1.3	-1.9		
Non-interest current account deficit that stabilizes debt ratio	-2.9	-10.6	-50.7			3.3	11.8	-0.4	-0.5	-0.5	0.1		1.8	3.3		
Key macroeconomic assumptions																
Real GDP growth (in percent)	5.1	4.7	2.9	6.9	2.3	3.4	4.0	4.5	5.0	5.5	5.5	4.6	5.0	5.0		5.0
GDP deflator in US dollar terms (change in percent)	4.7	-7.5	-24.0	4.4	19.7	-4.4	17.1	3.0	0.4	0.4	1.2	2.9	3.1	3.1		3.0
Effective interest rate (percent) 5/	2.6	3.2	4.8	2.9	1.8	2.7	2.9	2.7	2.7	2.6	2.5	2.7	2.7	2.9		2.9
Growth of exports of G&S (US dollar terms, in percent)	10.4	-4.6	-25.7	14.3	28.8	-10.1	15.6	14.8	10.5	7.7	10.2	8.1	8.2	5.0		7.7
Growth of imports of G&S (US dollar terms, in percent)	18.9	-7.0	-13.4	15.4	22.5	-10.6	15.1	10.6	6.5	6.0	9.8	6.2	8.2	5.0		8.3
Grant element of new public sector borrowing (in percent)	...	...	...	...	...	15.0	13.7	22.6	16.8	19.0	20.8	18.0	-4.7	-9.1		-5.5
Government revenues (excluding grants, in percent of GDP)	16.2	18.1	18.6			17.9	16.5	17.7	17.8	18.4	18.9		19.3	18.5		19.3
Aid flows (in Billions of US dollars) 7/	0.4	0.2	0.4			0.5	0.8	1.0	0.7	0.7	0.7		0.7	0.8		
<i>of which: Grants</i>	0.4	0.2	0.0			0.1	0.2	0.2	0.2	0.2	0.2		0.3	0.5		
<i>of which: Concessional loans</i>	0.0	0.0	0.4			0.4	0.6	0.9	0.6	0.5	0.5		0.4	0.3		
Grant-equivalent financing (in percent of GDP) 8/	...	...	...			0.9	1.4	1.8	1.2	1.1	1.1		0.4	0.3		0.4
Grant-equivalent financing (in percent of external financing) 8/	...	...	...			19.8	24.7	30.7	28.6	34.0	36.5		10.4	13.2		12.0
Memorandum items:																
Nominal GDP (Billions of US dollars)	28.0	27.2	21.2			21.0	25.6	27.5	29.0	30.7	32.8		48.0	106.0		
Nominal dollar GDP growth	10.0	-3.2	-21.8			10.0	-3.2	-21.8	-1.1	21.7	7.6	5.9	8.2	8.2		8.1
PV of PPG external debt (in Billions of US dollars)	...	...	7.6			8.1	9.0	9.9	10.4	10.8	11.2		13.7	20.4		
(PVt-PVt-1)/GDPT-1 (in percent)	...	...	...			2.3	4.3	3.3	2.1	1.3	1.1	2.4	1.3	0.2		1.2
Gross workers' remittances (Billions of US dollars)	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		
PV of PPG external debt (in percent of GDP + remittances)	...	...	45.6			37.0	34.3	36.6	37.0	36.1	34.7		28.8	19.4		
PV of PPG external debt (in percent of exports + remittances)	...	...	117.7			105.1	102.6	102.5	98.9	95.0	88.5		73.6	52.5		
Debt service of PPG external debt (in percent of exports + remittance)	...	...	4.8			7.6	6.8	6.4	7.6	6.2	5.9		7.3	7.0		

Sources: Country authorities; and staff estimates and projections.

1/ Includes both public and private sector external debt.

2/ Derived as $[r - g - \rho(1+g)] / (1+g+\rho+gp)$ 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. The large residual in 2015 is mainly due to the large increase in private sector debt which reflects an increase in the survey coverage of firms (from 32 to 250) but this change in debt does not appear to be captured in the BOP flows for 2015.

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 6. Zambia: Adjustment Framework: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2016–36

(Percent)

	Projections							2036
	2016	2017	2018	2019	2020	2021	2026	
PV of debt-to GDP ratio								
Baseline	37	34	37	37	36	35	29	19
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	37	34	32	29	27	25	10	-13
A2. New public sector loans on less favorable terms in 2016-2036 2/	37	36	38	39	39	38	35	29
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	37	35	36	36	35	34	28	19
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	37	44	61	61	60	58	46	23
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	37	49	60	61	59	57	48	32
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	37	39	43	43	42	41	33	20
B5. Combination of B1-B4 using one-half standard deviation shocks	37	52	72	72	71	69	55	29
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	37	47	48	49	47	46	38	26
PV of debt-to-exports ratio								
Baseline	105	103	103	99	95	89	74	52
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	105	101	89	79	71	63	25	-35
A2. New public sector loans on less favorable terms in 2016-2036 2/	105	109	107	104	102	97	90	79
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	105	106	101	97	93	87	73	52
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	105	178	309	295	285	269	214	112
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	105	106	101	97	93	87	73	52
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	105	116	120	115	110	103	85	55
B5. Combination of B1-B4 using one-half standard deviation shocks	105	147	204	195	189	178	142	79
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	105	106	101	97	93	87	73	52
PV of debt-to-revenue ratio								
Baseline	206	207	206	208	196	184	149	105
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	206	203	180	166	146	130	51	-70
A2. New public sector loans on less favorable terms in 2016-2036 2/	206	220	215	219	210	200	182	159
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	206	212	201	201	190	178	147	103
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	206	266	343	342	324	308	239	124
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	206	295	341	342	322	303	249	175
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	206	235	241	241	228	215	172	109
B5. Combination of B1-B4 using one-half standard deviation shocks	206	313	405	405	384	364	285	156
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	206	287	272	273	257	242	199	139

Table 6. Zambia: Adjustment Framework: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2016–36 (concluded)

(Percent)

	Projections							2036
	2016	2017	2018	2019	2020	2021	2026	
Debt service-to-exports ratio								
Baseline	8	7	6	8	6	6	7	7
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	8	8	7	6	6	5	5	0
A2. New public sector loans on less favorable terms in 2016-2036 2/	8	7	7	7	7	7	10	10
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	8	7	7	7	7	6	9	8
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	8	10	15	19	18	17	28	17
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	8	7	7	7	7	6	9	8
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	8	7	7	8	8	7	11	8
B5. Combination of B1-B4 using one-half standard deviation shocks	8	8	11	13	12	12	18	12
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	8	7	7	7	7	6	9	8
Debt service-to-revenue ratio								
Baseline	15	14	13	16	13	12	15	14
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	15	16	14	14	12	10	10	0
A2. New public sector loans on less favorable terms in 2016-2036 2/	15	15	13	15	15	14	21	20
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	15	14	14	15	14	13	19	15
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	15	15	16	22	21	20	31	19
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	15	20	24	26	24	23	31	26
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	15	15	15	17	16	15	22	16
B5. Combination of B1-B4 using one-half standard deviation shocks	15	18	21	27	25	24	37	23
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	15	20	19	21	19	18	25	21
<i>Memorandum item:</i>								
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	-1	-1	-1	-1	-1	-1	-1	-1

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 assuming an offsetting adjustment in import levels).

4/ Includes official and private transfers and FDI.

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

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

Table 7. Zambia: Adjustment Framework: Public Sector Debt Sustainability Framework, Baseline Scenario, 2013–36

(Percent of GDP, unless otherwise indicated)

	Actual			Average ^{5/}	Standard Deviation ^{5/}	Estimate						Projections		
	2013	2014	2015			2016	2017	2018	2019	2020	2021	2016-21 Average	2026	2036	2022-36 Average
Public sector debt 1/	27.1	35.6	61.4			60.5	54.9	56.1	54.7	53.1	51.4		44.5	32.8
<i>of which: foreign-currency denominated</i>	13.8	20.1	43.1			36.5	33.0	35.4	35.6	35.1	33.9		28.4	19.3
Change in public sector debt	1.7	8.5	25.8			-0.9	-5.6	1.2	-1.4	-1.6	-1.8		-0.8	-2.7
Identified debt-creating flows	4.1	9.0	22.2			-4.6	-3.8	1.1	-0.8	-1.9	-1.9		-0.9	-1.2
Primary deficit	4.9	3.2	6.1	-0.1	6.7	2.2	3.7	2.2	0.4	-0.2	-0.8	1.3	0.0	-0.5
Revenue and grants	17.6	18.9	18.8			18.2	17.3	18.3	18.4	19.0	19.5		19.8	19.0
<i>of which: grants</i>	1.5	0.8	0.2			0.2	0.7	0.6	0.6	0.6	0.6		0.5	0.5
Primary (noninterest) expenditure	22.6	22.1	24.9			20.3	21.0	20.6	18.7	18.9	18.7		19.8	18.5
Automatic debt dynamics	-1.1	1.7	13.0			-9.6	-5.1	0.5	-0.2	-0.8	-1.1		-0.9	-0.7
Contribution from interest rate/growth differential	-1.2	-0.1	0.1			-1.1	-0.9	-0.7	-0.9	-1.3	-1.2		-0.6	-0.5
<i>of which: contribution from average real interest rate</i>	0.1	1.2	1.1			1.0	1.4	1.7	1.7	1.6	1.5		1.6	1.2
<i>of which: contribution from real GDP growth</i>	-1.2	-1.2	-1.0			-2.0	-2.3	-2.4	-2.7	-2.8	-2.8		-2.2	-1.7
Contribution from real exchange rate depreciation	0.1	1.8	12.9			-8.5	-4.2	1.2	0.7	0.4	0.1		...	...
Other identified debt-creating flows	0.2	4.1	3.1			2.9	-2.4	-1.6	-1.0	-0.9	0.0		0.0	0.0
Privatization receipts (negative)	0.0	0.0	0.3			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Recognition of implicit or contingent liabilities	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Debt relief (HIPC and other)	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Other (includes domestic arrears flows)	0.2	4.1	2.8			2.9	-2.4	-1.6	-1.0	-0.9	0.0		0.0	0.0
Residual, including asset changes	-2.5	-0.5	3.6			3.7	-1.8	0.1	-0.6	0.3	0.2		0.1	-1.5
Other Sustainability Indicators														
PV of public sector debt	...	...	63.9			61.0	56.2	57.3	56.1	54.2	52.2		45.0	33.0
<i>of which: foreign-currency denominated</i>	...	...	45.6			37.0	34.3	36.6	37.0	36.1	34.7		28.8	19.5
<i>of which: external</i>	...	...	45.6			37.0	34.3	36.6	37.0	36.1	34.7		28.8	19.5
PV of contingent liabilities (not included in public sector debt)	...	...	...			...	...	...	...	...	...		...	...
Gross financing need 2/	11.9	12.5	16.0			13.5	17.5	15.4	13.4	11.7	10.5		11.0	9.2
PV of public sector debt-to-revenue and grants ratio (in percent)	...	...	340.4			335.4	325.0	312.6	305.5	284.5	267.8		226.5	173.5
PV of public sector debt-to-revenue ratio (in percent)	...	...	344.1			339.9	339.6	323.1	315.9	293.9	276.2		233.0	178.1
<i>of which: external 3/</i>	...	...	245.4			206.3	207.4	206.3	208.2	196.0	183.7		149.5	105.1
Debt service-to-revenue and grants ratio (in percent) 4/	15.9	19.3	26.3			32.9	37.2	34.7	36.2	31.1	29.3		30.2	27.2
Debt service-to-revenue ratio (in percent) 4/	17.4	20.1	26.6			33.4	38.9	35.9	37.4	32.1	30.3		31.0	27.9
Primary deficit that stabilizes the debt-to-GDP ratio	3.3	-5.3	-19.7			3.1	9.2	1.0	1.8	1.5	1.0		0.8	2.2
Key macroeconomic and fiscal assumptions														
Real GDP growth (in percent)	5.1	4.7	2.9	6.9	2.3	3.4	4.0	4.5	5.0	5.5	5.5	4.6	5.0	5.0
Average nominal interest rate on forex debt (in percent)	1.8	3.5	3.9	1.7	1.2	4.8	4.7	4.5	4.4	3.9	3.7	4.3	3.9	4.1
Average real interest rate on domestic debt (in percent)	2.2	8.8	5.6	2.1	4.1	-2.1	2.1	4.3	4.6	5.1	5.4	3.2	6.6	5.5
Real exchange rate depreciation (in percent, + indicates depreciation)	0.8	13.5	65.2	6.5	23.5	-19.9	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	9.7	5.4	6.7	9.8	3.4	14.3	7.9	6.8	6.3	6.0	6.0	7.9	5.0	5.0
Growth of real primary spending (deflated by GDP deflator, in percent)	16.0	2.4	16.2	3.5	6.7	-15.5	7.1	2.5	-4.3	6.3	4.6	0.1	7.2	1.6
Grant element of new external borrowing (in percent)	...	...	...	...	...	15.0	13.7	22.6	16.8	19.0	20.8	18.0	-4.7	-9.1

Sources: Country authorities; and staff estimates and projections.

1/ Central government and publicly guaranteed, gross basis.

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 8. Zambia: Adjustment Framework: Sensitivity Analysis for Key Indicators of Public Debt, 2016–36.

	Projections							
	2016	2017	2018	2019	2020	2021	2026	2036
PV of Debt-to-GDP Ratio								
Baseline	61	56	57	56	54	52	45	33
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	61	51	49	46	44	42	35	23
A2. Primary balance is unchanged from 2016	61	55	56	56	57	58	62	69
A3. Permanently lower GDP growth 1/	61	57	58	57	56	55	52	54
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2017-2018	61	56	57	55	53	51	43	30
B2. Primary balance is at historical average minus one standard deviations in 2017-2018	61	59	65	64	62	60	51	38
B3. Combination of B1-B2 using one half standard deviation shocks	61	55	56	55	52	50	40	24
B4. One-time 30 percent real depreciation in 2017	61	70	71	70	68	66	58	47
B5. 10 percent of GDP increase in other debt-creating flows in 2017	61	66	67	66	63	61	51	37
PV of Debt-to-Revenue Ratio 2/								
Baseline	335	325	313	305	284	268	227	174
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	335	295	265	252	231	217	177	122
A2. Primary balance is unchanged from 2016	335	316	304	307	298	296	315	362
A3. Permanently lower GDP growth 1/	335	327	317	313	294	281	262	282
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2017-2018	335	322	309	301	279	262	218	160
B2. Primary balance is at historical average minus one standard deviations in 2017-2018	335	343	354	347	324	306	259	199
B3. Combination of B1-B2 using one half standard deviation shocks	335	318	308	299	275	256	203	128
B4. One-time 30 percent real depreciation in 2017	335	402	386	381	357	337	293	250
B5. 10 percent of GDP increase in other debt-creating flows in 2017	335	384	367	358	332	311	257	192
Debt Service-to-Revenue Ratio 2/								
Baseline	33	37	35	36	31	29	30	27
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	33	36	32	32	27	25	23	19
A2. Primary balance is unchanged from 2016	33	37	34	36	31	30	34	42
A3. Permanently lower GDP growth 1/	33	37	35	37	32	30	33	36
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2017-2018	33	37	34	36	31	29	30	26
B2. Primary balance is at historical average minus one standard deviations in 2017-2018	33	37	36	38	33	31	34	30
B3. Combination of B1-B2 using one half standard deviation shocks	33	37	34	35	30	28	29	23
B4. One-time 30 percent real depreciation in 2017	33	40	39	43	37	35	39	40
B5. 10 percent of GDP increase in other debt-creating flows in 2017	33	37	37	38	32	30	33	28

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.