INTERNATIONAL MONETARY FUND

BENIN

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REQUEST FOR A THREE-YEAR ARRANGEMENT UNDER THE EXTENDED CREDIT FACILITY—DEBT SUSTAINABILITY ANALYSIS

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Prepared by staffs of the International Monetary Fund (IMF) and the International Development Association (IDA)[1].

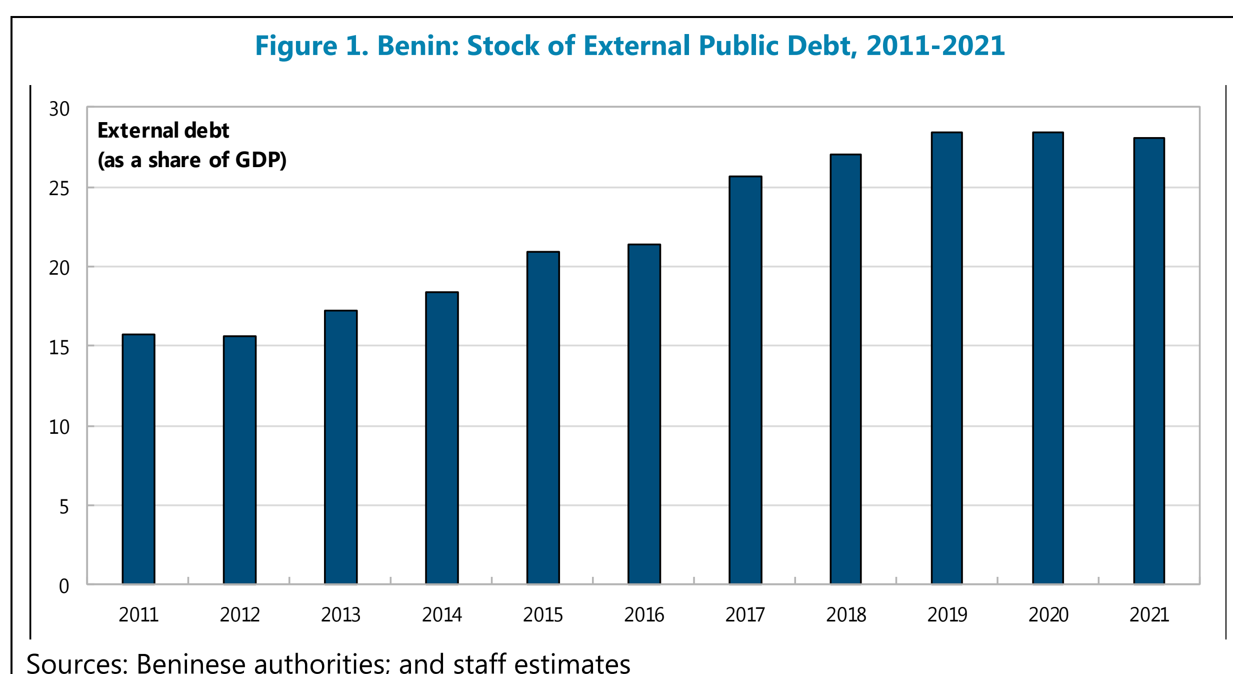
This debt sustainability analysis (DSA) for Benin finds a moderate risk of debt distress, higher than in the 2015 DSA. All projected external debt burden indicators in the baseline and most indicators under stress tests remain below the policy-dependent thresholds. One indicator, the ratio of the present value of external debt to exports, exceeds its threshold in the case of an extreme shock to exports, while the debt-to-GDP ratio and all debt service indicators remain below thresholds, largely reflecting Benin's high historical export volatility. Improving debt management is essential to contain risk at the low level. While total public and publicly-guaranteed debt confirms this conclusion, the fixed primary balance scenario underscores that medium-term fiscal consolidation is needed to strengthen long-term fiscal sustainability.

[1] Prepared in collaboration with the Beninese authorities. The fiscal year for Benin is January 1–December 31. The previous DSA update was completed on November 24, 2015 (IMF Country Report No. 16/6).

BACKGROUND AND KEY ASSUMPTIONS

1. Benin's total debt increased in 2016, reflecting the government's strategy to use domestic financing for capital investment projects. Real GDP growth averaged 4.2 percent in 2014–16 while inflation remained subdued. Meanwhile, external debt increased from 19.8 to 22.7 percent of GDP from 2014 to 2016 (Figure 1) while total public debt increased from 30.5 percent of GDP in 2014 to 50.3 percent of GDP in 2016. Still, these ratios compare favorably with other countries in the West Africa Economic and Monetary Union (WAEMU), which shows average public and external debt of about 47 and 30 percent of GDP, respectively, in 2014. Going forward, growth is projected to reach 5.4 percent in 2017 and 6.3 percent in 2019 despite the slowdown in Nigeria—Benin's neighbor and dominant trade partner. Nonetheless, poverty remains high at about 50 percent.

Figure 1. Benin: Stock of External Public Debt, 2011-2021



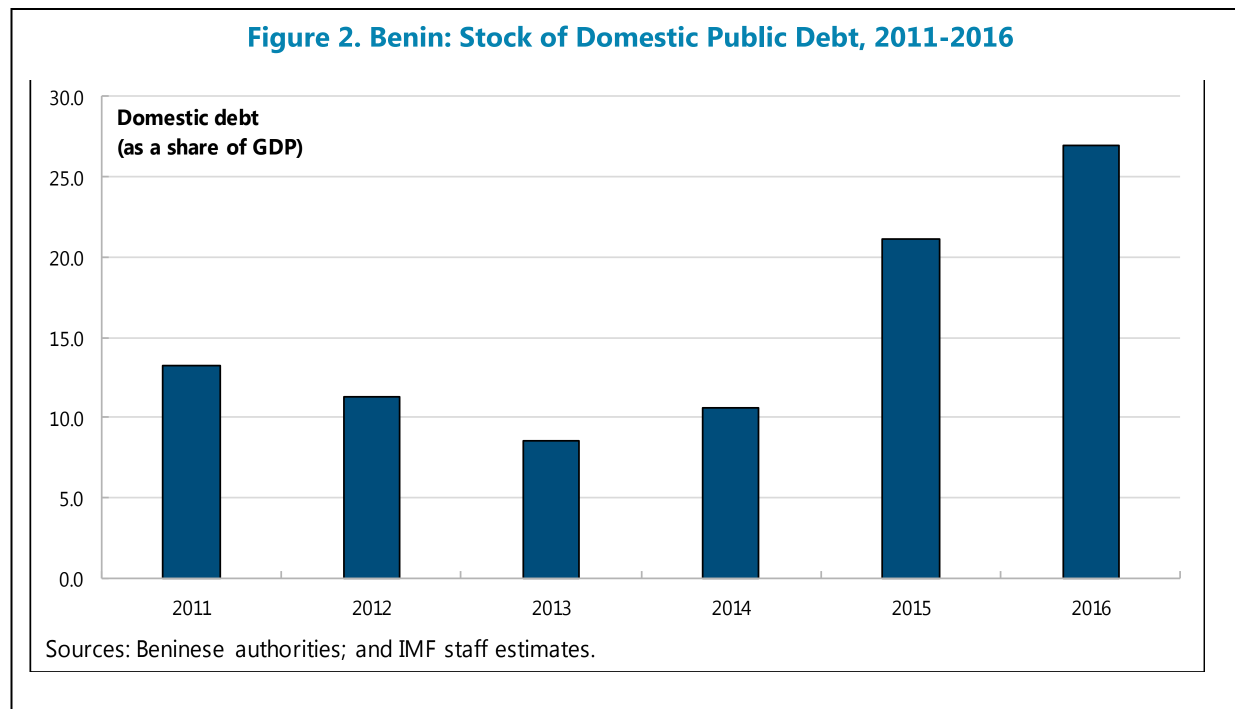
Sources: Beninese authorities; and staff estimates

2. The Beninese authorities have launched an action plan to scale up public investments to address infrastructure bottlenecks and accelerate growth. On October 26, 2016, the Council of Ministers adopted a five-year public investment program (Government's Action Program (GAP), 2016–21 worth FCFA 9,039 billion (US$15.3 billion or 170 percent of GDP) to develop the potential for higher domestic value-added in the agriculture and tourism sectors, identified as major potential sources of growth. Public and private investments will focus on infrastructure (27 percent), energy (11 percent), agriculture, and tourism (9 percent each). Some 61 percent of the funds are expected from the private sector in the form of public-private partnerships (PPPs) and 39 percent from public resources, including grants and borrowing. The PPP funding is projected to build up gradually and peak in 2019, while the public contribution would start off high in 2017 at 14 percent of GDP and decrease gradually to 7 percent by 2021. The investment plan assumes that available resources are gradually reoriented towards capital expenditures while efforts are made to improve the quality of spending and strengthen procurement

procedures. Besides enactment of a PPP Law in October 2016, the plan envisages a range of structural reforms to improve the business environment, including measures to boost financial sector development and advance reforms in health, education, and the judiciary.

3. Domestic public debt has recorded a steady increase. From about 8.6 percent of GDP in 2013, domestic debt has risen by 19 percentage points to 27.6 percent of GDP in 2016 (Figure 2). About 90 percent of government domestic liabilities consist of government securities issued to the regional bond market.

Figure 2. Benin: Stock of Domestic Public Debt, 2011-2016



Sources: Beninese authorities; and IMF staff estimates.

4. Notwithstanding weaknesses in public financial management, the scale up in investment could have a positive impact on growth (Text table 1). Benin's governance indicators suggest that it can achieve higher growth from scale up investments similar to what is discussed in the literature[2]. In particular, increasing investments by 1 percentage point is expected to increase growth by about 0.3 percentage points on average in 2017–22 compared with projections in the 2015 DSA. The World Bank's Country Policy and Institutional Assessment (CPIA) classifies Benin as having medium government capacity, and the latest CPIA component ratings related to fiscal management compare Benin favorably with averages for SSA and WAEMU (Text Figure 1). The 2014 PEFA assessment scores Benin broadly in line with the SSA average, although the slow enhancement since 2007 points to the need for accelerated reforms[3]. Medium-term

[2] For example, see Arslanalp Serkan, Fabian Bornhorst, and Sanjeev Gupta, 2011, Investing in Growth, FINANCE DEVELOPMENT, March, Vol. 48, No. 1.

[3] Recommendations for PFM reform to enhance investment efficiency were provided in IMF TAs and a World Bank TA on public investments and procurement.

growth is projected to remain at about 6 percent through 2022, higher than the average outturn in 2012–16 with gross investment picking at 29.3 percent of GDP in 2017 as a result of the scaled up investment plan.

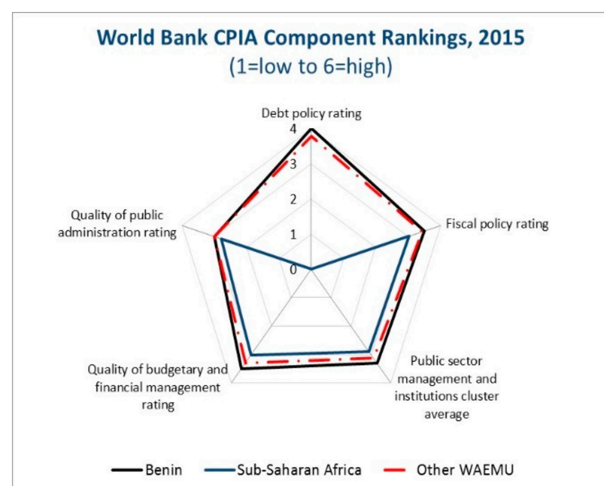
Text Table 1: Benin: Comparison of Selected Debt-related Indicators, 2015–20
(In percent of GDP, unless noted otherwise)

	2015	2016	2017	2018	2019	2020
		act.	prog.			proj.
			(Percent)			
Real GDP						
2015 DSA	5.2	5.5	5.5	5.7	5.8	6.0
Current DSA	2.2	4.0	5.4	6.0	6.3	6.7
Inflation						
2015 DSA	0.8	1.9	2.1	2.2	2.0	2.1
Current DSA	0.3	-0.8	2.0	2.1	2.0	2.0
			(Percent of GDP, unless otherwise indicated)			
Public Investment						
2015 DSA	7.8	8.9	8.0	7.7	7.6	7.3
Current DSA	7.7	5.9	10.1	7.6	6.2	5.9
Debt-service to exports ratio						
2015 DSA	6.6	5.7	5.0	5.0	4.6	4.3
Current DSA	6.0	4.9	4.8	5.1	4.8	4.9
Fiscal Deficit						
2015 DSA (excl. grants)	-6.7	-5.8	-5.3	-5.0	-4.9	-4.7
Current DSA (incl. grants)	-8.6	-6.7	-9.3	-5.9	-3.6	-2.4
Current Account						
2015 DSA	-11.0	-11.4	-11.1	-11.0	-10.7	-10.5
Current DSA	-8.4	-7.2	-9.1	-7.4	-7.2	-6.2

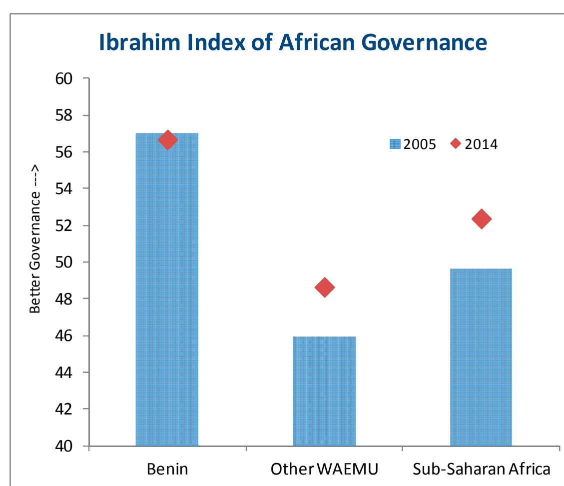
Source: IMF staff estimates and projections.
1/The debt-to-GDP ratio is consistent with a threshold of 56 percent of net present value of total public debt to GDP.

Text Figure 1. Benin: Indicators of Public Sector Capacity and Governance

Benin's capacity indicators compare favorably with the regional averages



As does this governance indicator, despite no improvement



5. **Financing needs are expected to be met by a combination of donor and Fund support.** While the authorities continue to work with potential financiers, progress has been achieved in mobilizing concessional financing. The projected financing gap for 2017 (about 1.4 percent of GDP) will be covered by budget support from multilateral institutions and by the proposed disbursements from the Fund under the three-year ECF arrangement. Prospects are good that there will be adequate financing for the remaining program period.

6. **The authorities are committed to discontinue the use of pre-financing arrangements, opting for PPP instruments.** In view of recent experiences in the sub-region and lessons learned from the pre-financing arrangements used in 2015 and early 2016, the government has canceled most of the contracts in question and has discontinued the use of this type of financing as a funding method for public investment. Furthermore, the law on PPPs should provide a frame of reference for the financing of major investment projects by the private sector. PPPs are long-term contracts under which the private sector supplies goods and infrastructure services traditionally provided by the government. PPPs can also increase efficiency and productivity through improved project design and higher quality services, and can serve as an appropriate guarantee over time. As Benin is facing both infrastructure gap and financing constraints, PPPs present prospects and could be a strong catalyst to implement their development's objectives. On the one hand, PPPs can make it possible for Benin to withdraw from day-to-day management activities in order to focus on expected outputs and results. On the other hand, it should also be recognized that PPPs pose risks and present contingent liabilities, particularly in environments of limited capacity, weak PPP framework and related PPP institutional structures, and where prior experience with PPPs is limited.

7. **The large size of the informal sector continues to complicate the DSA.** Recent estimates indicate that about 80 percent of Benin's imports are subsequently informally re-exported to Nigeria. While the Central Bank of West-African States' (BCEAO) balance of payment statistics attempt to differentiate between re-exports and export originating in Benin, this remains a possible source of statistical errors for trade statistics, and could also be a reason for the high export volatility recorded in the past.[4]

8. **This DSA is consistent with the macroeconomic framework underlying the staff report prepared for the request for a three-year ECF arrangement.** The macro framework assumes a gradual convergence towards a more sustainable growth path in the long run, an increasing contribution of aggregate demand to GDP—including higher capital expenditure and private consumption—and convergence to Benin's WAEMU membership commitments. A sustainable budget deficit level alongside the implementation of the structural reforms outlined in the GAP will allow a steady expansion of the economy throughout the baseline horizon, and the buildup of necessary buffers. In particular, the ECF supported-program envisages for 2017:

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[4] Overestimation of exports results in large residuals in the external DSA; the residual is projected to decline in the long term.

- real GDP growth of 5.4 percent from the expected improvement in the global economy, an expansion of agricultural output, and major capital spending;

- inflation turning positive and remaining below the WAEMU convergence threshold of 3 percent.

- the fiscal program targets an increase of 0.7 percentage points of GDP in government revenue to 15.4 percent of GDP, while total expenditure is expected to grow by 3.3 percentage points of GDP to 24.7 percent of GDP, driven essentially by capital spending while current primary expenditure would decline by 1.2 percentages points of GDP

- the overall deficit (including grants) would widen to 7.1 percent of GDP;[5] and

- the current account deficit is projected to reach 9.1 percent of GDP, reflecting larger investment-related imports and an increase in domestic demand.

9. Risks to the baseline are to the downside. Main risks include weak external demand and soft commodity prices in light of the fragile global recovery, particularly the recent slowdown in Nigeria driven by lower oil prices. Also, achieving the expected growth and export impact requires the authorities to rigorously implement structural reforms to improve public financial management and the business environment. Enhancing domestic revenue performance becomes essential to reduce Benin's dependence on informal re-exports to Nigeria over time. Furthermore, there is a risk that the private sector's response to government investment plans in terms of planned involvement in PPPs may not be fully realized. Given the significant risk of lower growth, a customized alternative scenario is included to compare the impact.

[5] The deficit is programmed to fall to 1.9 percent of GDP by 2019, well below the WAEMU convergence criterion of 3 percent.

Box 1. Benin: Underlying Assumptions in the DSA

- The assumptions in the baseline scenario are consistent with the medium-term macroeconomic framework underlying the program envisaged under the ECF arrangement. Key macroeconomic assumptions are as follows:
- **Global environment.** The nominal exchange rate (FCFA/USD) is assumed to appreciate slightly by about 3 percent over the baseline horizon and stabilize in the medium and long term. The external demand from Benin's trading partners is projected to be stable.
- **Growth impact.** Growth assumptions have remained roughly stable relative to the 2015 DSA. Nominal GDP is expected to grow, on average, by 6.0 percent over the horizon 2017–19, supported by a robust investment growth and increasingly by private consumption. Growth is assumed to gradually decelerate to 6.5 percent in 2020–22 as investment normalizes and net trade contribution becomes more negative. Growth is expected to stabilize at 6.6 percent in the long run. The projected growth rates reflect lower Nigeria growth as compared to projections in the 2015 DSA.
- **Inflation.** Capital goods will be partly imported, and the effect on non-tradable would be muted by high unemployment and labor mobility in WAEMU. CPI is projected to increase by up to 1 percentage point during the scaling up but remain below the WAEMU convergence threshold of 3 percent.
- **Fiscal impact.** Tax revenue is projected to increase from 14.7 percent of GDP in 2016 to 16.8 percent of GDP in 2019 as the expected reforms in tax policy and administration mature.[1] The primary deficit rises temporarily with higher capital spending and then turn into a surplus in 2021.
- **Current account impact.** As assumed in the 2015 DSA, the current account deficit is projected to increase in the short run as Benin transitions gradually to a more domestic driven growth path and later stabilize in the medium and long run.
- **Financing.** The increase of central government investments of 9 percent of GDP is predominately financed by concessional resources, with some domestic financing. Non-concessional PPG debt financing is also included. Also, the recent rise of FDI in construction, manufacturing, and services are projected to continue, in line with Benin's recent achievements in improving its *Doing Business indicators*, ranked among Top 10 most improved countries in 2013–15.

[1] Recent IMF staff analysis finds that when benchmarked by regional peers, Benin has significant scope for raising tax revenue, by about 2 percent of GDP, particularly through better domestic revenue mobilization. For example, tax expenditure is estimated to be about 1 percent of GDP per year.

EXTERNAL AND PUBLIC DEBT SUSTAINABILITY

A. External Debt Sustainability Analysis

10. The results of the external DSA show that Benin's debt dynamics are sustainable under the baseline scenario, facing a moderate risk of debt distress (Tables A1, A2 and Figure A1). In the baseline, all debt indicators remain below their relevant policy-dependent thresholds. The present value (PV) of debt-to-GDP ratio, debt-to-exports ratio, debt-to-revenue ratio and debt service-to-exports ratio

remain safely under the debt distress threshold under the baseline. The PV of total PPG external debt is expected to rise from about 17.4 percent of GDP in 2017 to 18.3 percent of GDP on average for 2019–21, surging to 22.5 percent of GDP in 2036. The ratio would remain below the corresponding threshold of 40 percent of GDP throughout the projection period. Nonetheless, one indicator—the ratio of the PV of external debt to exports—exceeds its threshold in the case of an extreme shock to exports, while the debt-to-GDP ratio and all debt service indicators remain below thresholds[6]. Benin's WAEMU membership ensures its ability to pay in case of such a temporary shock. The debt dynamic also exhibits some vulnerability to shocks in financing terms and a one-off FCFA depreciation, although all indicators remain below thresholds in the corresponding stress scenarios. Thus, overall, Benin's risk of external debt distress is assessed to be moderate, although further improving debt management is essential to contain potential risks at this level.

B. Public Debt Sustainability Analysis[7]

11. Total public (external and domestic) debt is projected to rise during the scaling up of public investment and decline afterwards (Tables A2, A3 and Figure A2). The PV of debt-to-GDP ratio is projected to rise from 42.7 percent in 2016 to 46.7 percent in 2017 with the surge in investment and then decline steadily. The ratio remains consistently below the indicative benchmark of 56 percent[8], a level that research has linked to increased probability of debt distress. The debt level also remains below the WAEMU convergence criteria of 70 percent of GDP. In the most extreme shock scenario (Figure A2), the peak PV of debt-to-GDP ratio exceeds 50 percent but remains below the 56 percent threshold. Overall, the dynamics in total public debt are consistent with a moderate risk of debt distress.

C. Debt Management Capacity

12. The authorities are strengthening reforms to boost debt management capacity to support medium-term debt sustainability. Benin's current debt monitoring capacity in recording and monitoring public debt is considered to be "adequate" since 2016, an improvement from "weak" in 2015. The reforms include streamlining of the fragmented public debt management between the treasury and the debt management agency—Caisse Autonome d'Amortissement (CAA), in line with recent IMF technical assistance recommendations. In particular, the authorities plan to enhance CAA's capacity for more comprehensive and timely debt recording, and extend the coverage of debt monitoring, including key state-owned enterprises (SOEs) that undertake significant investment projects. The capacity to fully analyze

[6] The export shock in the stress test is one standard deviation lower than the historical average export growth. For Benin, the ratio of the standard deviation to average level of the export growth over the last 10 years is about 1.7 and thus makes the shock particularly large relative to the baseline export growth. In contrast, the ratio is about 1 in the four WAEMU countries for which 2016 DSAs are available (Burkina Faso, Cote d'Ivoire, Togo, and Senegal).

[7] Public DSA ratios include expected disbursements under the new ECF arrangement in an amount of SDR 111.42 million while the fiscal tables do not.

[8] This PV ceiling would ensure that public debt remains comfortably within the estimated PV threshold of 56 percent of GDP, beyond which the risk of public debt distress is heightened for countries with moderate capacity like Benin.

the impact of non-concessional borrowing needs to be enhanced to avoid an increase in the risk of debt distress.

CONCLUSION

13. The updated DSA shows a moderate risk of debt distress for Benin. Under the baseline scenario, all debt burden indicators for external debt remain under their respective debt distress thresholds. One indicator—PV of debt-to-export ratio—exceeds its threshold in an extreme shock scenario, which is confirmed by the inclusion of domestic public debt in the analysis. Nonetheless, to maintain a sustainable position, the investment plan proposed by the authorities requires the pursuit of prudent fiscal policies and pro-growth structural reforms, including in mobilizing domestic revenue and improving PFM and the business environment. Medium-term fiscal consolidation is also needed to support long-term fiscal sustainability. Finally, risks to this baseline DSA are to the downside.

14. The authorities agree with the staff's conclusions. They concur that debt sustainability will depend crucially on the efficiency of public investments, progress in reforms to support competitiveness, and a sound fiscal policy, including enhanced mobilization of domestic source of financing and prudent borrowing mainly through concessional financing. The authorities also committed to enhancing debt management capacity to further minimize the risk of debt distress.

Table A1. Benin External Debt Sustainability Framework Program Scenario, 2013-2036 1/
(In Percent of GDP, unless otherwise indicated)

	Actual			Historical Average 6/	Standard Deviation 6/	Projections									
	2013	2014	2015			2016	2017	2018	2019	2020	2021	2016-2021 Average	2026	2036	2022-2036 Average
External debt (nominal) 1/	**16.7**	**19.8**	**21.3**			**22.7**	**26.3**	**27.1**	**27.7**	**27.8**	**27.7**		**31.4**	**32.9**	
of which: public and publicly guaranteed (PPG)	16.7	19.8	21.3			22.7	26.3	27.1	27.7	27.8	27.7		31.4	32.9	
Change in external debt	1.4	3.1	1.5			1.5	3.5	0.8	0.6	0.1	-0.1		0.6	-0.4	
Identified net debt-creating flows	2.4	3.6	10.4			5.0	6.2	4.2	3.9	2.8	2.2		0.6	-0.4	
Non-interest current account deficit	**7.2**	**8.4**	**8.1**	**7.4**	**1.2**	**7.0**	**8.8**	**7.0**	**6.8**	**5.8**	**5.3**	**6.8**	**3.7**	**2.3**	3.5
Deficit in balance of goods and services	12.8	15.2	12.9			11.8	13.8	12.4	12.1	11.4	10.5		8.6	6.2	
Exports	15.5	15.8	15.9			16.4	18.2	19.6	20.5	20.1	21.5		25.1	30.0	
Imports	28.3	31.0	28.8			28.2	32.0	31.9	32.7	31.5	32.0		33.7	36.2	
Net current transfers (negative = inflow)	-5.3	-6.4	-4.5	-4.9	0.9	-4.6	-4.9	-5.3	-5.3	-5.6	-5.2		-4.3	-3.3	-4.0
of which: official	-3.4	-4.5	-2.1			-2.0	-2.1	-2.5	-2.3	-2.1	-2.0		-1.8	-1.8	
Other current account flows (negative = net inflow)	-0.3	-0.4	-0.3			-0.2	-0.1	-0.1	0.0	0.0	0.0		-0.6	-0.6	
Net FDI (negative = inflow)	**-3.3**	**-4.0**	**-1.4**	**-2.5**	**1.2**	**-1.3**	**-1.7**	**-1.7**	**-1.8**	**-1.8**	**-1.8**		**-2.0**	**-1.8**	-1.9
Endogenous debt dynamics 2/	**-1.5**	**-0.8**	**3.8**			**-0.6**	**-0.9**	**-1.1**	**-1.2**	**-1.2**	**-1.4**		**-1.1**	**-0.9**	
Contribution from nominal interest rate	0.2	0.2	0.4			0.2	0.3	0.4	0.4	0.5	0.4		0.6	0.6	
Contribution from real GDP growth	-1.0	-1.0	-0.5			-0.8	-1.2	-1.5	-1.6	-1.7	-1.8		-1.7	-1.5	
Contribution from price and exchange rate changes	-0.7	0.0	3.9			...	...	...	...	...	...		...	...	
Residual (3-4) 3/	**-1.1**	**-0.5**	**-9.0**			**-3.6**	**-2.6**	**-3.4**	**-3.2**	**-2.7**	**-2.3**		**0.0**	**0.0**	
of which: exceptional financing	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
PV of external debt 4/	...	...	14.0			15.1	17.4	17.9	18.3	18.3	18.3		20.9	22.5	
In percent of exports	...	...	88.1			92.4	95.5	91.4	89.0	91.0	84.8		83.3	75.0	
PV of PPG external debt	**...**	**...**	**14.0**			**15.1**	**17.4**	**17.9**	**18.3**	**18.3**	**18.3**		**20.9**	**22.5**	
In percent of exports	**...**	**...**	**88.1**			**92.4**	**95.5**	**91.4**	**89.0**	**91.0**	**84.8**		**83.3**	**75.0**	
In percent of government revenues	**...**	**...**	**83.8**			**103.2**	**112.9**	**111.5**	**109.0**	**105.5**	**102.1**		**112.9**	**115.3**	
Debt service-to-exports ratio (in percent)	**5.4**	**5.1**	**6.0**			**4.9**	**4.8**	**5.1**	**4.8**	**4.9**	**4.3**		**4.9**	**5.5**	
PPG debt service-to-exports ratio (in percent)	**5.4**	**5.1**	**6.0**			**4.9**	**4.8**	**5.1**	**4.8**	**4.9**	**4.3**		**4.9**	**5.5**	
PPG debt service-to-revenue ratio (in percent)	**4.8**	**5.0**	**5.7**			**5.5**	**5.7**	**6.2**	**5.8**	**5.7**	**5.2**		**6.7**	**8.4**	
Total gross financing need (Billions of U.S. dollars)	0.4	0.5	0.6			0.6	0.7	0.6	0.6	0.6	0.5		0.5	0.7	
Non-interest current account deficit that stabilizes debt ratio	5.8	5.3	6.6			5.5	5.3	6.2	6.2	5.7	5.4		3.1	2.7	
Key macroeconomic assumptions															
Real GDP growth (in percent)	7.2	6.4	2.1	4.3	1.9	4.0	5.4	6.0	6.3	6.7	7.1	5.9	6.0	4.8	5.2
GDP deflator in US dollar terms (change in percent)	4.8	-0.2	-16.4	1.6	8.6	-0.6	-2.8	1.7	2.1	2.0	2.0	0.7	0.8	2.0	1.9
Effective interest rate (percent) 5/	1.5	1.3	1.5	2.9	4.7	1.0	1.2	1.6	1.6	1.9	1.7	1.5	2.0	2.0	2.0
Growth of exports of G&S (US dollar terms, in percent)	31.6	8.4	-14.5	11.2	21.7	6.7	14.0	15.8	13.9	6.6	16.7	12.3	7.0	8.0	9.6
Growth of imports of G&S (US dollar terms, in percent)	26.0	16.5	-20.9	10.6	21.7	1.4	16.5	7.5	11.0	4.8	11.1	8.7	7.5	7.5	8.1
Grant element of new public sector borrowing (in percent)	...	...	...	...	...	38.9	39.2	41.1	41.1	41.6	42.3	40.7	38.4	33.5	36.1
Government revenues (excluding grants, in percent of GDP)	17.6	16.3	16.7			14.7	15.4	16.0	16.8	17.4	17.9		18.5	19.5	18.8
Aid flows (in Billions of US dollars) 7/	0.1	0.1	0.0			0.2	0.4	0.4	0.4	0.4	0.4		0.4	0.5	
of which: Grants	0.1	0.1	0.0			0.0	0.1	0.2	0.2	0.2	0.1		0.1	0.1	
of which: Concessional loans	0.0	0.0	0.0			0.1	0.3	0.2	0.2	0.2	0.2		0.3	0.4	
Grant-equivalent financing (in percent of GDP) 8/	...	...	...			1.3	3.6	3.3	3.1	2.8	2.2		1.7	1.2	1.6
Grant-equivalent financing (in percent of external financing) 8/	...	...	...			51.0	51.1	62.2	61.4	62.4	58.2		46.7	40.0	43.9
Memorandum items:															
Nominal GDP (Billions of US dollars)	9.2	9.7	8.3			8.6	8.8	9.5	10.3	11.2	12.2		17.8	34.8	
Nominal dollar GDP growth	12.3	6.1	-14.7			3.4	2.5	7.9	8.5	8.8	9.2	6.7	6.9	6.9	7.2
PV of PPG external debt (in Billions of US dollars)			1.1			1.2	1.5	1.7	1.9	2.1	2.2		3.7	7.8	
(PVt-PVt-1)/GDPt-1 (in percent)						1.2	3.4	1.9	2.0	1.6	1.6	2.0	1.8	1.3	1.8
Gross workers' remittances (Billions of US dollars)	0.2	0.3	0.3			0.3	0.3	0.3	0.4	0.5	0.4		0.5	0.6	
PV of PPG external debt (in percent of GDP + remittances)	...	...	13.6			14.6	16.8	17.3	17.6	17.6	17.6		20.4	22.1	
PV of PPG external debt (in percent of exports + remittances)	...	...	73.1			76.3	80.0	77.2	75.1	74.8	73.0		75.1	71.0	
Debt service of PPG external debt (in percent of exports + rem	...	...	5.0			4.1	4.0	4.3	4.0	4.1	3.7		4.4	5.2	

Sources: Country authorities; and staff estimates and projections.

1/ Includes both public and private sector external debt.

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

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

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

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

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

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

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

Table A2. Benin Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2016-2036
(In Percent)

	Projections							
	2016	2017	2018	2019	2020	2021	**2026**	2036
PV of debt-to GDP ratio								
Baseline	15	17	18	18	18	18	**21**	23
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	15	15	16	17	18	19	**33**	53
A2. New public sector loans on less favorable terms in 2016-2036 2	15	19	20	21	22	23	**29**	37
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	15	18	19	19	20	19	**22**	24
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	15	20	26	26	25	25	**26**	24
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	15	18	20	21	21	21	**24**	26
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	15	18	20	20	20	20	**22**	23
B5. Combination of B1-B4 using one-half standard deviation shocks	15	19	26	26	26	25	**27**	26
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	15	25	26	26	27	26	**30**	33
PV of debt-to-exports ratio								
Baseline	92	95	91	89	91	85	**83**	75
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	92	85	82	81	89	89	**130**	177
A2. New public sector loans on less favorable terms in 2016-2036 2	92	103	103	104	110	105	**117**	123
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	92	95	91	89	91	85	**83**	75
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	92	140	216	207	209	192	**174**	135
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	92	95	91	89	91	85	**83**	75
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	92	100	102	99	100	93	**89**	77
B5. Combination of B1-B4 using one-half standard deviation shocks	92	119	158	152	153	142	**131**	105
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	92	95	91	89	91	85	**83**	75
PV of debt-to-revenue ratio								
Baseline	103	113	112	109	105	102	**113**	115
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	103	100	100	100	103	107	**177**	273
A2. New public sector loans on less favorable terms in 2016-2036 2	103	122	126	128	127	127	**158**	189
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	103	116	119	116	113	109	**120**	123
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	103	130	160	153	146	140	**143**	125
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	103	118	128	125	121	117	**129**	132
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	103	119	124	121	116	112	**121**	118
B5. Combination of B1-B4 using one-half standard deviation shocks	103	126	161	155	148	142	**147**	134
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	103	163	161	158	153	148	**163**	167

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.

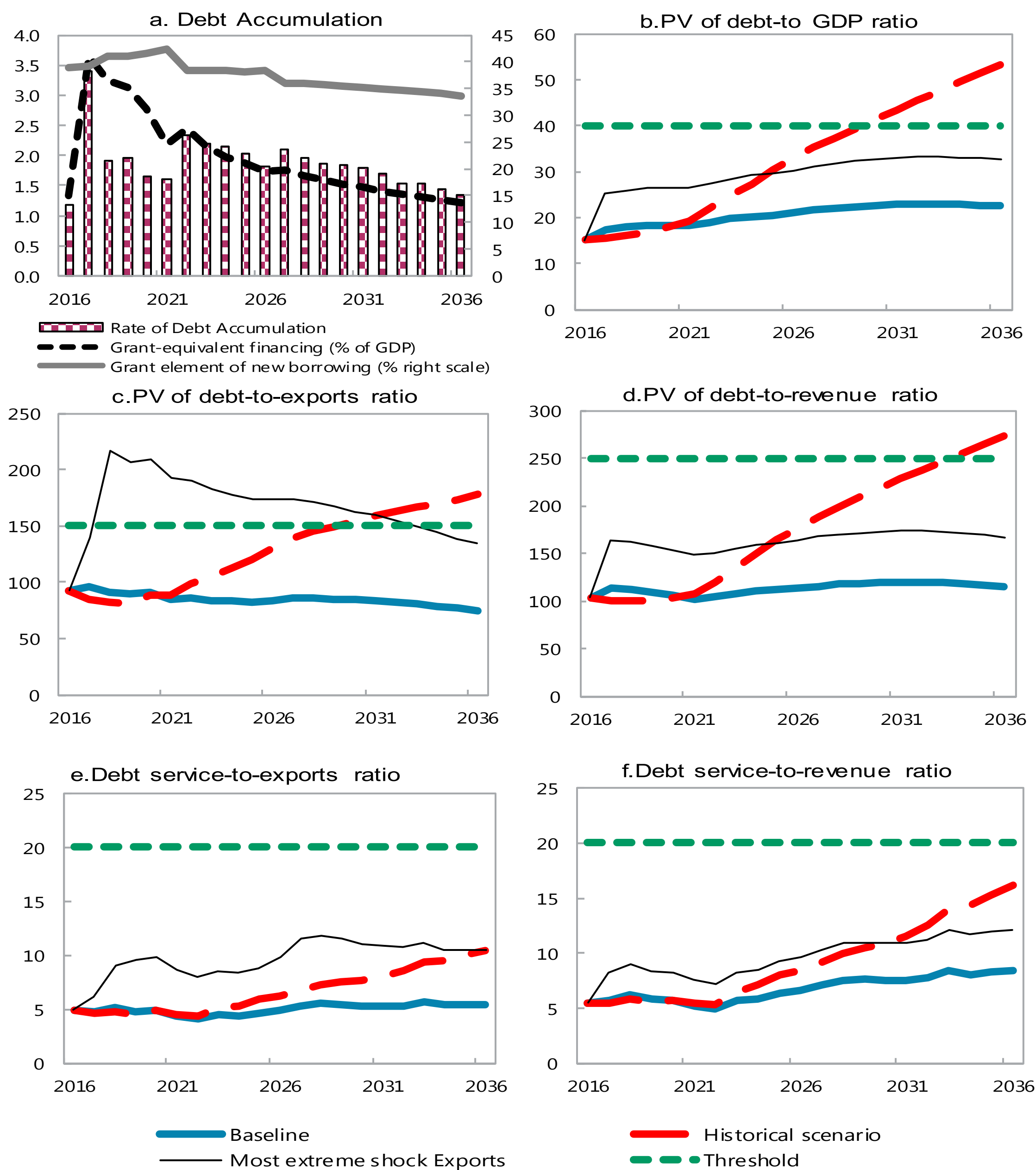
3/ Exports values are assumed to remain permanently at the lower level, but the current account as a share of GDP is assumed to return to its baseline level after the shock.

(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.

Figure A1. Benin: Indicators of Public and Publicly Guaranteed External Debt under Alternative Scenarios, 2016-2036 1/



Sources: Country authorities and staff estimates

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

Table A3. Benin: Public Debt Sustainability Framework, Baseline Scenario 2013-2036
(in percent of GDP, unless otherwise indicated)

	Actual					Estimate	Projections								
	2013	2014	2015	Average 5/	Standard Deviation 5/	2016	2017	2018	2019	2020	2021	2016-21 Average	2026	2036	2022-36 Average
Public sector debt 1/	25.3	30.5	42.4			50.3	55.6	56.1	54.3	51.1	47.2		37.9	39.4	
of which: foreign-currency denominated	16.7	19.8	21.3			22.7	26.3	27.1	27.7	27.8	27.7		31.4	32.9	
Change in public sector debt	-1.4	5.2	12.0			7.9	5.3	0.5	-1.8	-3.3	-3.9		0.2	-0.4	
Identified debt-creating flows	-0.2	2.2	10.0			5.4	4.4	-0.1	-2.5	-3.6	-4.1		-0.6	-0.3	
Primary deficit	2.1	1.5	7.3	1.6	2.4	5.0	6.2	2.3	0.1	-0.9	-1.3	1.9	0.6	1.0	0.4
Revenue and grants	18.5	17.2	17.3			15.2	16.8	17.9	18.5	19.0	18.9		19.0	19.8	
of which: grants	0.9	0.9	0.6			0.5	1.4	1.9	1.7	1.6	1.0		0.5	0.3	
Primary (noninterest) expenditure	20.6	18.7	24.6			20.2	23.0	20.2	18.6	18.1	17.6		19.6	20.8	
Automatic debt dynamics	-2.3	0.7	2.7			0.4	-1.9	-2.5	-2.6	-2.7	-2.8		-1.2	-1.3	
Contribution from interest rate/growth differential	-1.7	-1.1	0.1			-0.3	-1.9	-2.5	-2.5	-2.7	-2.8		-1.2	-1.3	
of which: contribution from average real interest rate	0.1	0.4	0.7			1.4	0.7	0.7	0.8	0.7	0.6		0.9	0.5	
of which: contribution from real GDP growth	-1.8	-1.5	-0.6			-1.6	-2.6	-3.2	-3.3	-3.4	-3.4		-2.1	-1.8	
Contribution from real exchange rate depreciation	-0.6	1.8	2.6			0.7	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Other identified debt-creating flows	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Privatization receipts (negative)	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recognition of implicit or contingent liabilities	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Debt relief (HIPC and other)	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Other (specify, e.g. bank recapitalization)	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Residual, including asset changes	-1.2	2.9	2.0			2.5	0.9	0.7	0.7	0.3	0.2		0.8	-0.1	
Other Sustainability Indicators															
PV of public sector debt	...	...	35.1			42.7	46.7	46.9	44.9	41.6	37.8		27.4	29.0	
of which: foreign-currency denominated	...	...	14.0			15.1	17.4	17.9	18.3	18.3	18.3		20.9	22.5	
of which: external	...	...	14.0			15.1	17.4	17.9	18.3	18.3	18.3		20.9	22.5	
PV of contingent liabilities (not included in public sector debt)	...	...	...			...	...	...	...	...	...		...	...	
Gross financing need 2/	12.2	8.1	14.7			12.4	14.1	15.6	11.7	9.4	7.6		4.1	4.7	
PV of public sector debt-to-revenue and grants ratio (in percent)	...	...	203.1			281.3	277.9	262.1	242.5	219.5	200.0		144.2	146.3	
PV of public sector debt-to-revenue ratio (in percent)	...	...	210.3			291.1	302.9	292.8	267.8	239.5	211.5		148.0	148.6	
of which: external 3/	...	...	83.8			103.2	112.9	111.5	109.0	105.5	102.1		112.9	115.3	
Debt service-to-revenue and grants ratio (in percent) 4/	25.3	11.7	14.4			18.7	29.6	40.8	32.3	28.2	24.6		11.0	11.5	
Debt service-to-revenue ratio (in percent) 4/	26.6	12.3	14.9			19.4	32.3	45.6	35.6	30.7	26.1		11.3	11.7	
Primary deficit that stabilizes the debt-to-GDP ratio	3.5	-3.6	-4.7			-2.9	0.9	1.8	1.9	2.4	2.6		0.4	1.4	
Key macroeconomic and fiscal assumptions															
Real GDP growth (in percent)	7.2	6.4	2.1	4.3	1.9	4.0	5.4	6.0	6.3	6.7	7.1	5.9	6.0	4.8	5.2
Average nominal interest rate on forex debt (in percent)	1.5	1.3	1.5	2.9	4.7	1.0	1.2	1.6	1.6	1.9	1.7	1.5	2.0	2.0	2.0
Average real interest rate on domestic debt (in percent)	0.7	2.3	3.9	0.3	3.1	5.3	3.3	2.8	3.3	3.0	2.9	3.5	9.0	8.3	7.5
Real exchange rate depreciation (in percent, + indicates depreciation)	-4.3	11.1	13.4	1.2	8.8	3.2	0.2	0.1	-0.2	0.0	0.0	0.5	...	...	...
Inflation rate (GDP deflator, in percent)	1.4	-0.2	0.1	2.5	2.7	-0.3	2.1	2.0	2.0	2.0	2.0	1.6	0.8	2.0	1.9
Growth of real primary spending (deflated by GDP deflator, in percent)	16.0	-3.4	34.2	4.7	11.6	-14.8	20.4	-6.8	-2.3	3.5	4.6	0.8	11.3	5.8	6.4
Grant element of new external borrowing (in percent)	...	...	...	...	...	38.9	39.2	41.1	41.1	41.6	42.3	40.7	38.4	33.5	...

Sources: Country authorities; and staff estimates and projections.

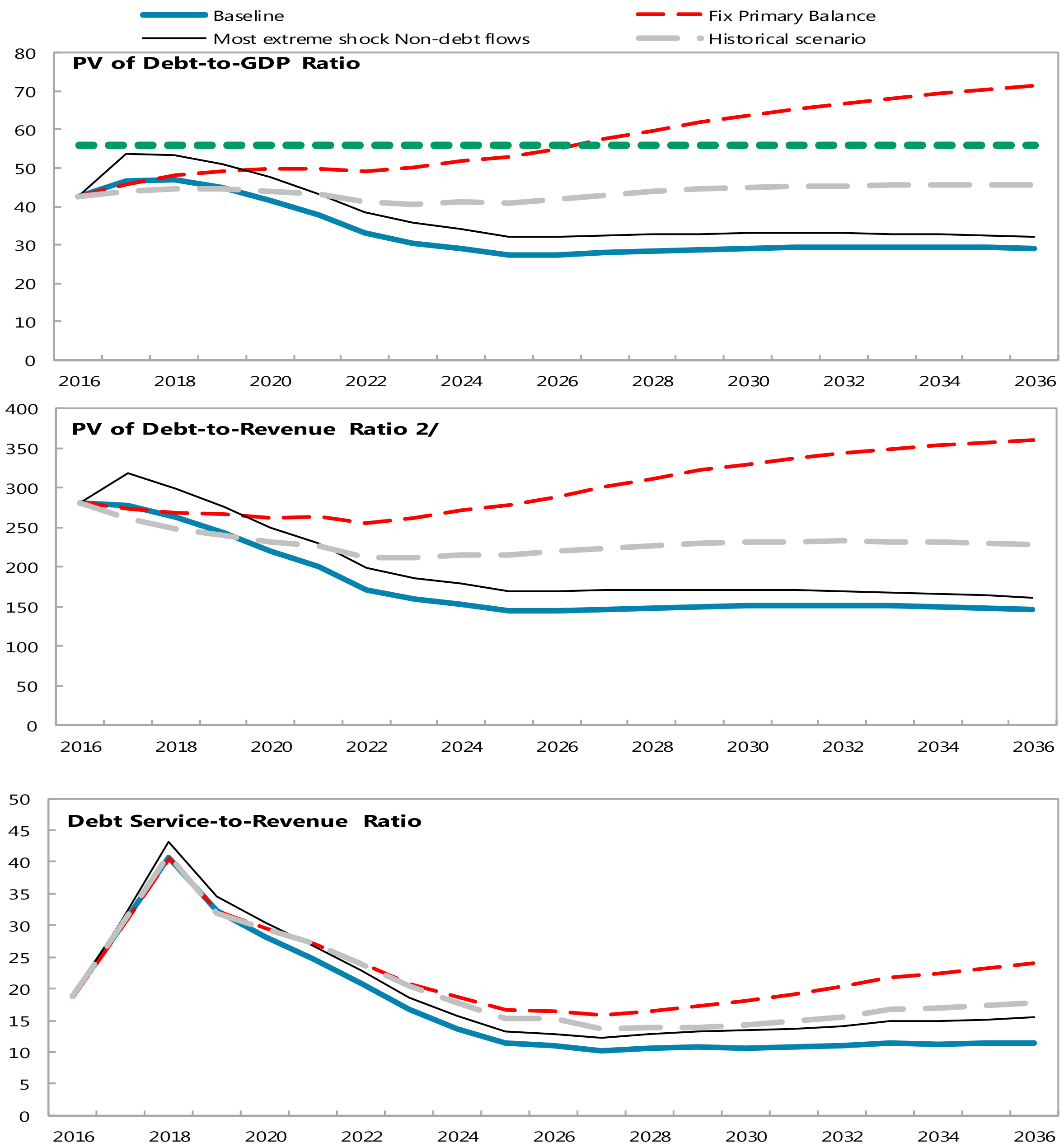
1/ Data refer to gross debt, and the coverage is central government as of 2015 and includes projected new non-financial public sector borrowing from 2016 onward.

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.



Sources: Country authorities; and staff estimates.
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.