INTERNATIONAL MONETARY FUND
INTERNATIONAL DEVELOPMENT ASSOCIATION

BENIN

**Joint IMF/World Bank Debt Sustainability Analysis 2008**[1]

Prepared by the Staffs of the International Monetary Fund and
the International Development Association

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*This debt sustainability analysis (DSA) confirms that Benin's risk of debt distress remains moderate, although the debt indicators are somewhat higher than in the 2007 analysis. Under the baseline scenario, all debt ratios remain well below the indicative policy-dependent thresholds. The NPV of debt-to-export ratio projections under most alternative scenarios breach the indicative threshold. These conclusions are consistent with previous DSAs of Benin. The findings remain robust to a scaling-up scenario based on the Gleneagles commitments of doubling aid inflows to $85 per capita by 2010.*

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[1] Prepared by IMF and IDA staff in collaboration with the Beninese authorities and in consultation with the staff of the African Development Bank. The preliminary DSA results were presented by IMF staff during a seminar organized by the Beninese authorities in Cotonou on September 15, 2008. This DSA reflects comments from government officials and seminar participants, and follows the IMF and World Bank Staff Guidance Note on the Application of the Joint Fund-Bank Debt Sustainability Framework for Low-Income Countries, October 9, 2008 (available at http://www.imf.org/external/pp/longres.aspx?id=4297 and http://go.worldbank.org/JBKAT4BH40). The analysis updates the 2007 DSA (IMF Country Report for Benin 08/19, available at http://www.imf.org/external/country/BEN/index.htm). This DSA is conducted on a gross basis as no data on Benin's claim on nonresidents is available.

## I. Introduction

1. This DSA differs from earlier DSAs in the following ways:

- The DSA is consistent with the macroeconomic framework underlying the fifth review under the PRGF arrangement. As such, the 2008 debt projections incorporate the SDR 9.28 million (15 percent of quota) augmentation of access under the PRGF arrangement granted by IMF Executive Board on June 16, 2008 to help Benin adjust to the food and fuel crisis. In addition, Benin is expected to benefit from a World Bank grant under its Global Food Crisis Response Program amounting $9 million to be disbursed by end 2008. The crisis has also significantly changed Benin's macroeconomic environment, with higher inflationary pressures and further deterioration in the fiscal deficit and the current account.

- The outstanding stock of external public debt increased by 1 percent of GDP in 2007, reaching 12.5 percent of GDP in nominal terms at end-2007 (Text Table 1). This mostly reflects new borrowing (0.7 percent of GDP) and the re-assessment of debt owed to the International Fund for Agricultural Development (IFAD). IFAD notified the Beninese authorities in January 2008 that its contribution to the Enhanced HIPC debt relief would be limited to six pre-cut off date (December 1998) project loans, and would take the form of a cancellation of debt service payments during the period April 2003-May 2008. The authorities had previously reported all debt stock owed to IFAD as eligible for HIPC debt relief. Accordingly, the nominal stock of debt owed to IFAD at end-2007 has been revised upwards by 1.3 percent of GDP

- The outstanding stock of domestic public debt rose to 3 percent of GDP in 2007, from 0.9 percent in 2006, reflecting a strategic debt management decision of the Beninese authorities to issue government bonds in the West African Economic and Monetary Union (WAEMU) regional market.

2. **Although the quality of data underlying the DSA has improved, it remains uneven**. The DSA is based primarily on data provided regularly by the public debt management department of the Ministry of Finance of Benin (the *Caisse Autonome d'Amortissement, CAA).*[2] The CAA data, however, do not cover all domestic and private external debt. The staff database is completed by other sources, including BCEAO data on government bonds and private sector debt.

3. **This DSA is structured as follows**. Section II presents the baseline scenario. Section III presents key features of alternative scenarios for both external and public debt sustainability and their results; and Section IV draws policy conclusions.

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[2] The authorities have established a national debt committee (Comité National d'Endettement or CNE) to help improve and guide on debt management and quality. The CNE has benefited from the "pôle-dette," a regional debt management initiative in Central and West Africa.

**Text table 1. Benin: External Public and Publicly Guaranteed Debt Structure and Dynamics, 2006–2007 (percent of GDP)[1/]**

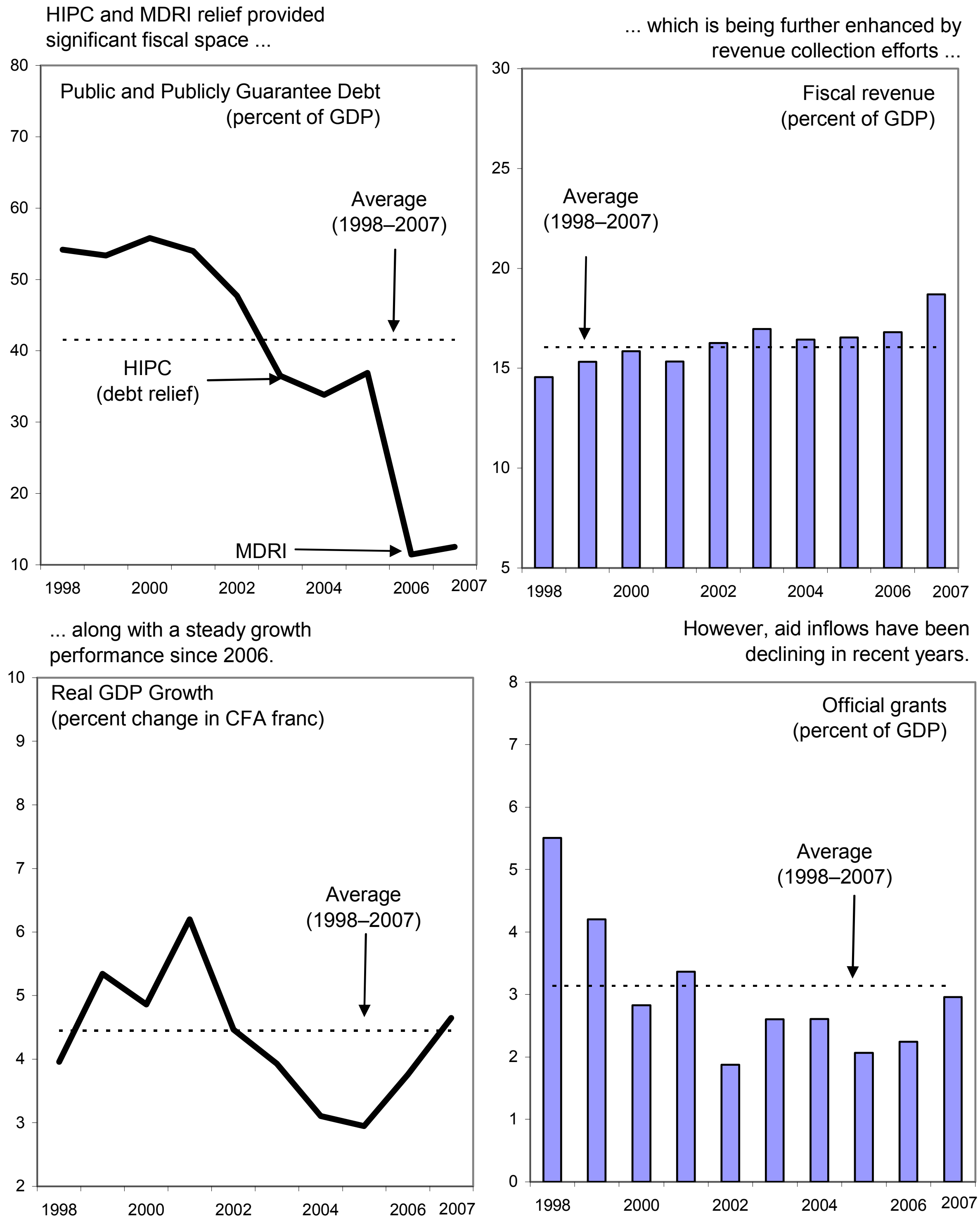
| | 2007 | | |
|---|---|---|---|
| | Before HIPC | After HIPC | Post MDRI |
| End-2007 Debt ratio (Total) | 39.4 | 32.0 | 12.5 |
| Multilateral | 33.7 | 30.1 | 10.7 |
| World Bank | 16.4 | 14.9 | 2.9 |
| African Fund for Development | 9.5 | 8.3 | 1.7 |
| IMF | 1.2 | 1.1 | 0.1 |
| Others | 6.6 | 5.9 | 5.9 |
| Bilateral | 4.7 | 0.9 | 0.9 |
| Paris Club | 3.6 | 0.2 | 0.2 |
| Non-Paris Club [2/] | 1.1 | 0.7 | 0.7 |
| Commercial | 1.0 | 1.0 | 1.0 |
| End-2006 Debt ratio | 43.1 | 32.7 | 11.5 |
| Memorandum Items: | | | |
| | *(Variation of debt to GDP ratio, 2006–07)* | | |
| IFAD debt, re-assessed | 0.0 | 1.3 | 1.3 |
| Revised GDP & exch. Rate | 0.0 | -0.3 | -0.3 |
| Amortization sch. or paid | -2.4 | -2.2 | 0.0 |
| Commercial debt adjust. | -0.2 | -0.2 | -0.2 |
| New borrowing (assumed unchanged) | 0.7 | 0.7 | 0.7 |
| Others | -1.9 | 0.0 | -0.4 |

Source: Beninese authorities.
1/ At end-2007 with HIPC relief obtained since July 2000.
2/ All non-Paris Club creditors have provided comparable treatments except Libya, Nigeria and the DRC.

## II. Baseline Scenario, 2008-2028

4. **Benin's PRGF-supported programs and recent debt relief have helped provide fiscal space and a new impetus to the economy** (see Figure 1). Benin reached the completion point under the HIPC Initiative in 2003 thanks to maintained macroeconomic stability (under the PRGF supported program), the successful implementation of a poverty reduction strategy and of a series of structural reforms in the area of governance, financial management and the cotton sector and improvement of delivery of services in health and education. After some years of volatile growth and a significant slowdown in 2005 owing to poor cotton production, growth gained momentum in 2006–07, and the fiscal position was further firmed up by strong revenue collections. Benin benefited from further debt relief under MDRI in 2006.

Figure 1. Benin: Debt Relief and Economic Performance, 1998–2007




Source: Beninese authorities and Fund staff estimates.

5. **Against this backdrop, the baseline scenario is based on assumptions drawn from both the fifth PRGF review and the World Bank's Country Economic Memorandum (CEM).**[3] These projections stand in contrast to the authorities' more optimistic scenario (Figure 2). Key assumptions underlying the baseline scenario are as follows:

- In line with the PRGF-supported program, the **medium-term baseline growth** (2008–13) is expected to reach an average of 5.8 percent. As discussed in the 2006 and 2007 DSAs and mentioned in recent staff reports, the cotton sector is unlikely to reach full capacity because of slippages in reform implementation. Two new developments explain the upward growth revision. The Beninese authorities have allowed the full pass-through of higher international food and fuel prices since July 2008, which could likely result in higher domestic food production in the medium- and long-run than that indicated in the 2006 DSA. Second, private sector activity, including FDI, has recently picked up in early 2008; However, medium-term FDI projections remains prudent.[4]

- **The global financial crisis poses a significant downside risk**. The baseline is consistent with the latest IMF World Economic Outlook assumptions and projections, including those for growth in Nigeria—an important source of trade and remittances for Benin.[5] FDI is also expected to hold up given ongoing projects and Benin's long-term growth prospects. However, if the global downturn proves protracted, Benin's growth rate would be adversely affected.

- The **long-run growth** assumptions are consistent with the World Bank's CEM "Constraints to Growth and Potential for Diversification and Innovation" dated June 2008, which implies that Benin could achieve 6 percent real GDP growth in the long-run if key structural reforms are implemented. The macroeconomic fundamentals are expected to improve further thanks to the authorities' efforts to speed up reform implementation.[6] Owing to setbacks in reform implementation in the cotton sector in 2006 and 2007, total cotton production projections are

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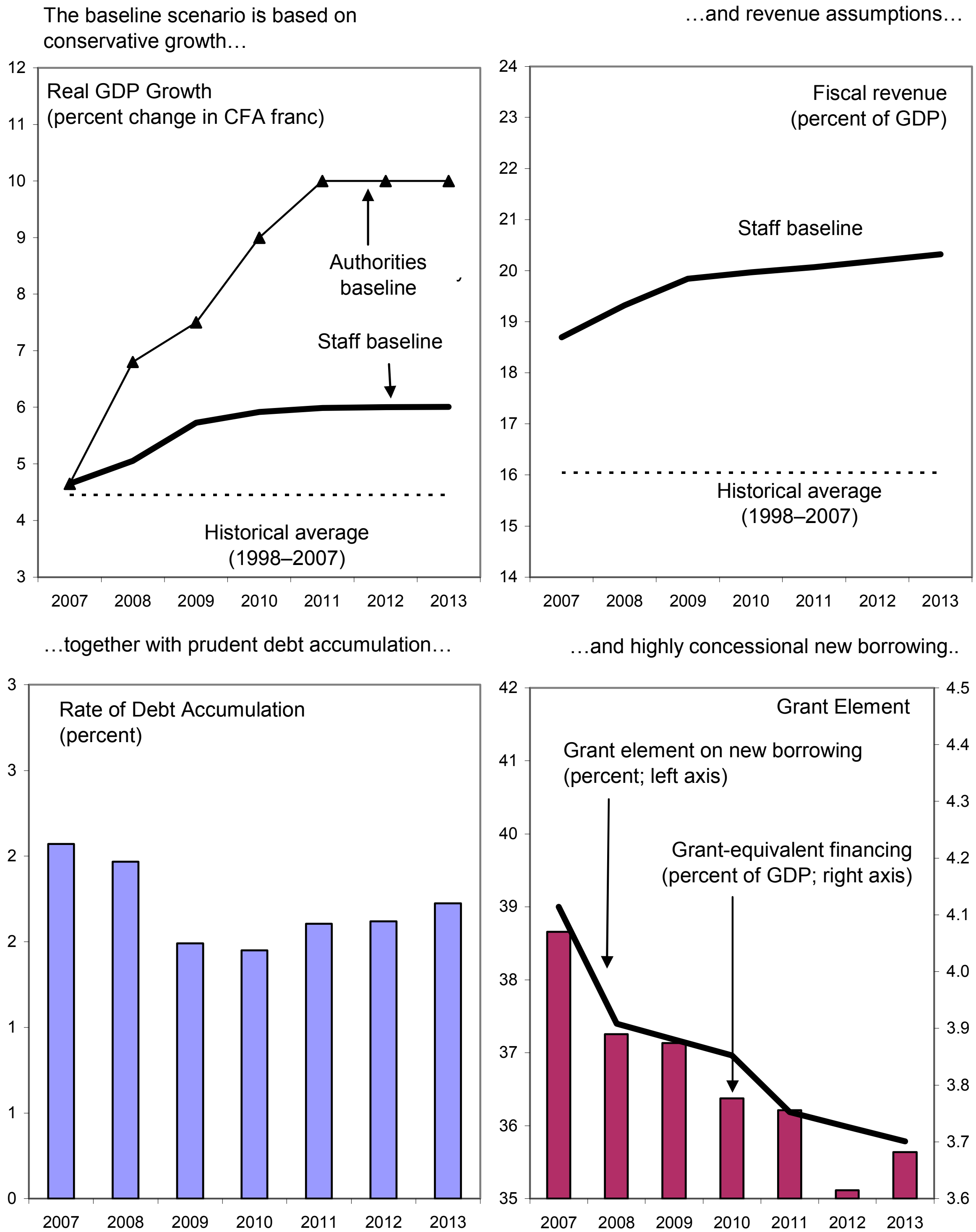
[3] Estimates and projections are in CFA francs, unless otherwise indicated.

[4] The IMF staff report for the fifth review under the PRGF arrangement discusses the impact of the international financial crisis and global slowdown as well as risks to the macroeconomic outlook. Overall, the staff medium-term outlook, which was discussed with the authorities, is subject to significant downside risks, including reduced demand for exports and a steady fall in FDI.

[5] See http://www.imf.org/external/pubs/ft/weo/2008/update/03/index.htm.

[6] The structural reform agenda has been accelerated in recent months. In October 2008, the authorities concluded the privatization of SONAPRA ginneries and Continental Bank-Benin.

Figure 2. Benin: DSA - Selected Assumptions, 2007–13




Source: Beninese authorities and Fund staff estimates.

being revised slightly down to 500,000 tons a year by 2028, 100,000 tons short of its potential. However, this relative underperformance is likely to be compensated by higher food production, given the price incentives generated by recent food crisis.

- **The public sector would play a key role in the growth process**. The authorities' objective is for Benin to become an emerging economy. In order to achieve this goal, the authorities have underscored the development and rehabilitation of economic and social infrastructure in the framework of their Special Public Works Program (*Programme de Grands Travaux-PGT*). In addition to public investment, the PGT also includes a private-public sector partnership (PPP) framework, which has led recently to a surge in private investment. To the extent that such PPP framework is enhanced through time, the projected long run growth rate of 6 percent will be achievable.[7] However, the downside risk of a protracted global slowdown could lower foreign inflows, including grants, and have a negative impact on the growth outlook.

- **Inflationary pressures** associated with the recent food and fuel crisis are projected to abate. Based on the current food and oil price shocks, CPI Inflation is projected to reach 8.8 percent in 2008 and fall gradually to 2.8 in 2010 and thereafter as medium- and long-term supply responses will take effect. This would bring inflation in Benin back in line with the WAEMU convergence criterion.

- In line with the country's development needs, the **primary fiscal deficit** is projected to further deteriorate from 3.6 percent in 2008 to 4.2 percent in 2013 and beyond, despite expected strong revenue collection and prudent expenditure management. The deterioration in the primary fiscal deficit reflects the projected scaling up of public expenditure.

- The improved **revenue collection** is expected to continue. Tax revenue is projected to rise to an average 17.7 percent of GDP annually in 2008–13, from 16.8 percent in 2007, and increase further to an average 20½ percent in 2014–28. In response to government infrastructure development needs and food and oil price shocks the overall fiscal deficit is projected to deteriorate to 5 percent of GDP in 2008 from 2.3 percent in 2007. As expenditures in public infrastructure are expected to play a key role in sustaining growth over the medium term, the fiscal deficit is projected to stay around 5 percent of GDP on average during the long run.

- **Import volume** will rise sharply (faster than GDP), growing at an average annual rate of 7.5 percent during 2008–13, and accelerating further to 10 percent on average during 2014–28. Global demand for Benin's exports is likely to remain moderate. As a result, the **current account deficit** excluding grants will average 7.7 percent of GDP during 2008–13, falling to 6.8 percent of GDP on average during 2014–28.

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[7] A recent IMF working paper finds a positive correlation between public investment and growth through private sector involvement. See Samake (2008), "Investment and Growth Dynamics: An Empirical Assessment Applied to Benin", IMF Working Paper No. WP/08/120, available at http://www.imf.org/external/pubs/ft/wp/2008/wp08120.pdf.

- On the **financing side**, the projected fiscal deficit of about 5 percent of GDP will be financed over the medium term through, on average, (i) net domestic debt of 0.3 percent of GDP; (ii) project grants of 1.7 percent of GDP, and (iii) debt-creating flows (program and project loans) of 3.0 percent of GDP.[8]

- New (gross) **public external borrowing** (for identified project and program loans and other residual debt-creating flows) is projected to remain broadly unchanged at 3.0 percent of GDP over the medium and long term. The share of multilateral debt in total public external debt is projected to decrease gradually from 85 percent at end-2007 to about 50 percent by 2028. The share of bilateral debts from both Paris and non-Paris Club creditors is expected to increase from 7 percent in 2008 to 48 percent by 2028. Finally, the share of commercial debt will decline from about 8 percent in 2008 to 2 percent in 2028. Average maturity of debt on new loans is projected to be 28.8 years with a grace period of 4.2 years, and an interest rate of 2 percent. Assuming an average discount rate of 5 percent, new loans are expected to have an average grant element of about 35 percent.

6. **The DSA projects that all external debt indicators under the baseline scenario will remain below the indicative thresholds through 2028, as indicated in previous DSAs (Figures 3-5)**.[9] In particular, the NPV of external debt to GDP ratio is expected to stabilize at around 14 percent over the long run (Text table 2). Accordingly, debt service payments would remain relatively low. However, the NPV of debt-to-exports ratio would get close to its threshold toward the end of the simulation period.

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[8] Fiscal deficits are assumed fully financed through the following three items: (i) net domestic borrowing; (ii) net external borrowing; and (iii) grants.

[9] The LIC debt sustainability framework (DSF) specified in footnote 1 is guided by indicative, country-specific debt burden thresholds based on the relative strength of a country's policies and institutions. According to the World Bank's Country Policy and Institutional Assessment (CPIA), the average CPIA rate of the last three years rating for Benin is 3.57 (corresponding to the rate of a medium performer). As a result, its thresholds are an NPV of debt-to-GDP ratio of 40 percent, NPV of debt-to-exports ratio of 150 percent, NPV of debt-to-revenue ratio of 250 percent, debt service to exports ratio of 20 percent, and debt service-to-revenue ratio of 30 percent.

**Text table 2. Benin: Selected Public Debt Indicators, 2007–28**
**(percent of GDP, unless otherwise indicated)**

| | Indicative thresholds | 2007 | Baseline Scenario 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014-28[1] |
|---|---|---|---|---|---|---|---|---|---|
| | | Act. | Projections | | | | | | |
| External | | | | | | | | | |
| Debt service to revenue | 30.0 | 2.5 | 3.1 | 2.7 | 2.9 | 3.0 | 3.1 | 2.7 | 4.5 |
| Debt service to exports | 20.0 | 4.4 | 5.1 | 4.7 | 5.0 | 5.2 | 5.4 | 4.7 | 7.3 |
| NPV of Debt to revenue | 250.0 | 37.7 | 40.4 | 42.9 | 46.5 | 49.5 | 52.2 | 55.0 | 66.5 |
| NPV of debt to exports | 150.0 | 66.0 | 65.8 | 74.3 | 79.0 | 84.4 | 90.3 | 95.5 | 108.1 |
| NPV of debt to GDP | 40.0 | 7.8 | 7.8 | 8.5 | 9.3 | 9.9 | 10.5 | 11.2 | 13.5 |
| Fiscal | | | | | | | | | |
| Debt service to revenue | | | 3.8 | 5.3 | 5.6 | 5.8 | 6.1 | 5.8 | 8.6 |
| NPV of debt to revenue | | | 57.1 | 58.2 | 62.5 | 66.4 | 70.1 | 73.4 | 91.1 |
| NPV of debt to GDP | | | 12.6 | 13.3 | 14.3 | 15.2 | 16.0 | 16.9 | 21.0 |
| Memorandum items: | | | | | | | | | |
| Public Debt to GDP[2] | | 12.5 | 12.6 | 13.6 | 14.8 | 15.7 | 16.5 | 17.3 | 17.9 |

Sources: Beninese authorities; and IMF staff estimates and projections.

[1] Simple average.

[2] External public and publicly-guaranteed debt to GDP.

7. **Standard stress tests confirm that only the NPV of debt-to-exports ratio could breach its relevant indicative threshold (Appendix table 2), which also highlights the structural weakness of the export sector.** In most stress tests, including when key variables remain at their historical averages and when new borrowing is contracted on less favorable terms, the NPV of external debt-to-exports ratio would breach the policy indicative threshold of 150 percent. The NPV of debt-to-export ratio, which has continuously been the most vulnerable debt indicator for Benin, confirms that the country's exports are structurally low compared to the size of the economy and vulnerable to both domestic (weakness in the institutional framework of the cotton sector) and external (international cotton price) conditions.

8. **The results of the public debt sustainability analysis reinforce the outcome of the external debt sustainability analysis**. Public debt would be on an upward trend over the next few years before stabilizing at around 22 percent of GDP in NPV terms. Under the baseline, the NPV of external public and publicly-guaranteed debt-to-revenue ratio remains well within the policy-dependent threshold. In addition, the public debt sustainability analysis indicates that if domestic debt accumulation is larger than 0.5 percent of GDP in 2008–28 on average, the government may face increasing difficulties in servicing its domestic debt. In line with the medium- and long-run fiscal targets, this increase will imply an average service payment of about 0.5 percent of GDP annually in 2008–13 and 1.3 percent in 2013–28, which is above the historical average of 0.2 percent of GDP, and may lead to debt service distress.

## III. Alternative Scenarios

9. **Four alternative scenarios highlight the risks Benin faces in servicing its debt.** All alternative scenarios confirm that the risk of debt distress continues to be moderate; nonetheless, debt ratios move quickly toward the indicative policy-dependent thresholds or breach it for the NPV of debt-to-export ratio. This again underlines Benin's vulnerability to its low export base to service its external debt.

- **No reform scenario (Scenario 1)**. This scenario estimates the impact of further delays in implementing structural reforms and no fiscal adjustment beyond the agreed medium-term fiscal path. In this scenario, the government is not expected to scale back on its development related expenditure and/or current expenditure. As a result, Benin is likely to stay close to its historical macroeconomic performance, including in the cotton sector, to have higher factor costs (e.g., energy bottlenecks), poor export performance, and achieve lower growth compared to the baseline. The result of this scenario suggests that if macro-critical reforms are not implemented, the risk of debt distress could substantially increase, particularly in the outer years (Figure 3). Lower growth would lead to increased financing needs, that would not be met through higher FDI inflows but would require additional borrowing, further aggravating the risk of debt distress.

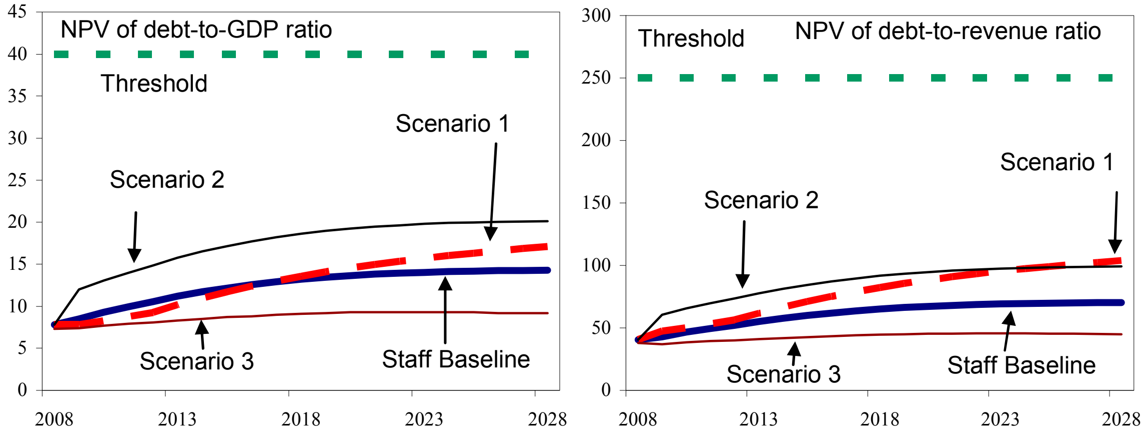
- **Real exchange rate depreciation (Scenario 2)**. This scenario, part of the standard DSA bound tests for low-income countries, highlights the implications on debt sustainability of a real exchange rate depreciation. A one-time real exchange rate depreciation would lead to an upward shift in debt ratios and a permanent increase in the debt service. The scenario demonstrates that a real exchange rate depreciation increases the risk of debt distress, as a large share of Benin's debt is denominated in foreign currencies.

- **Higher domestic financing (Scenario 3)**. This scenario envisages a 20 percent higher domestic share of total financing in the regional bond market for 2008–28. It embodies the authorities' stated policy objective of relying more heavily on the WAEMU bond market to meet their financing requirements in the future. Increasing the share of domestic borrowing worsens all public debt indicators (Figure 4), given the higher domestic interest rates. As a result, cautious domestic borrowing from the WAEMU regional bond market is needed to keep debt ratios stable.

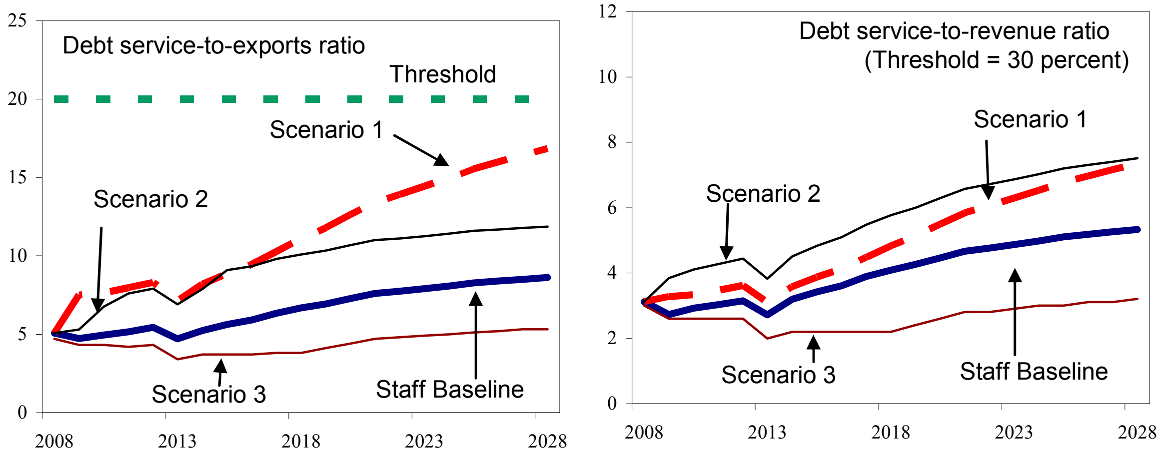
- **Scaling up scenario (Scenario 4)**. This scenario requested by the United Nations as part of the UN Africa Steering Committee simulates the impact of the doubling of aid to $85 per person by 2010 as part of the Gleneagles commitments (Box 1). In order to capture the extent of concessionality that would maintain Benin's debt sustainability, for a given amount of aid, two scenarios are simulated: (i) one scenario with 35 percent grant element (consistent with the baseline grant element); and (ii) another with 80 percent grant element. Figure 5 suggests that further aid inflows as projected in the Gleneagles scenario should be highly concessional, so as not to deteriorate debt sustainability. A grant element of about 60 percent would barely be sufficient to keep the debt ratios below the policy dependent thresholds.

Figure 3. Benin: Indicators of Public and Publicly Guarantee External Debt under Alternative Scenarios, 2008–28

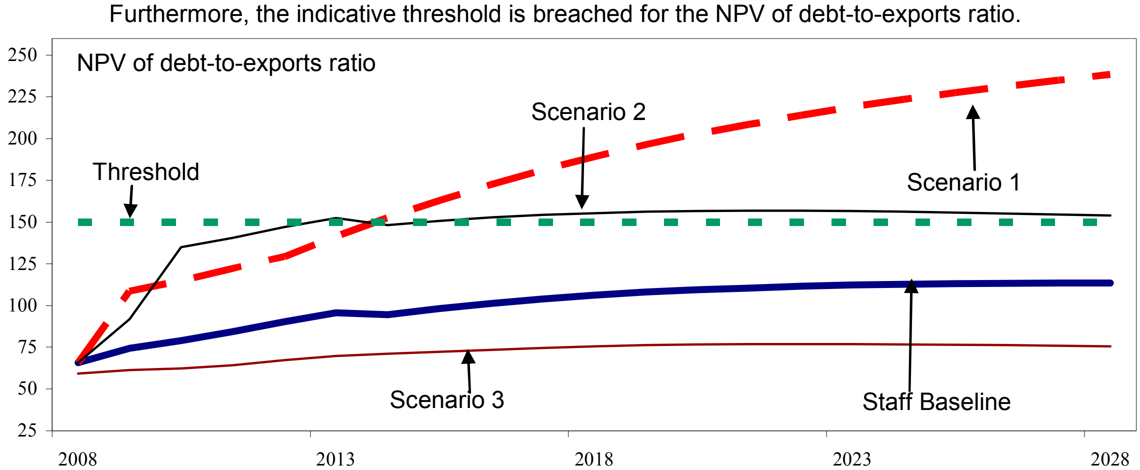
Except the scenario 3, which assumes a shift in external borrowing to domestic market, ...




all other scenario tend to increase the risk of debt distress ...

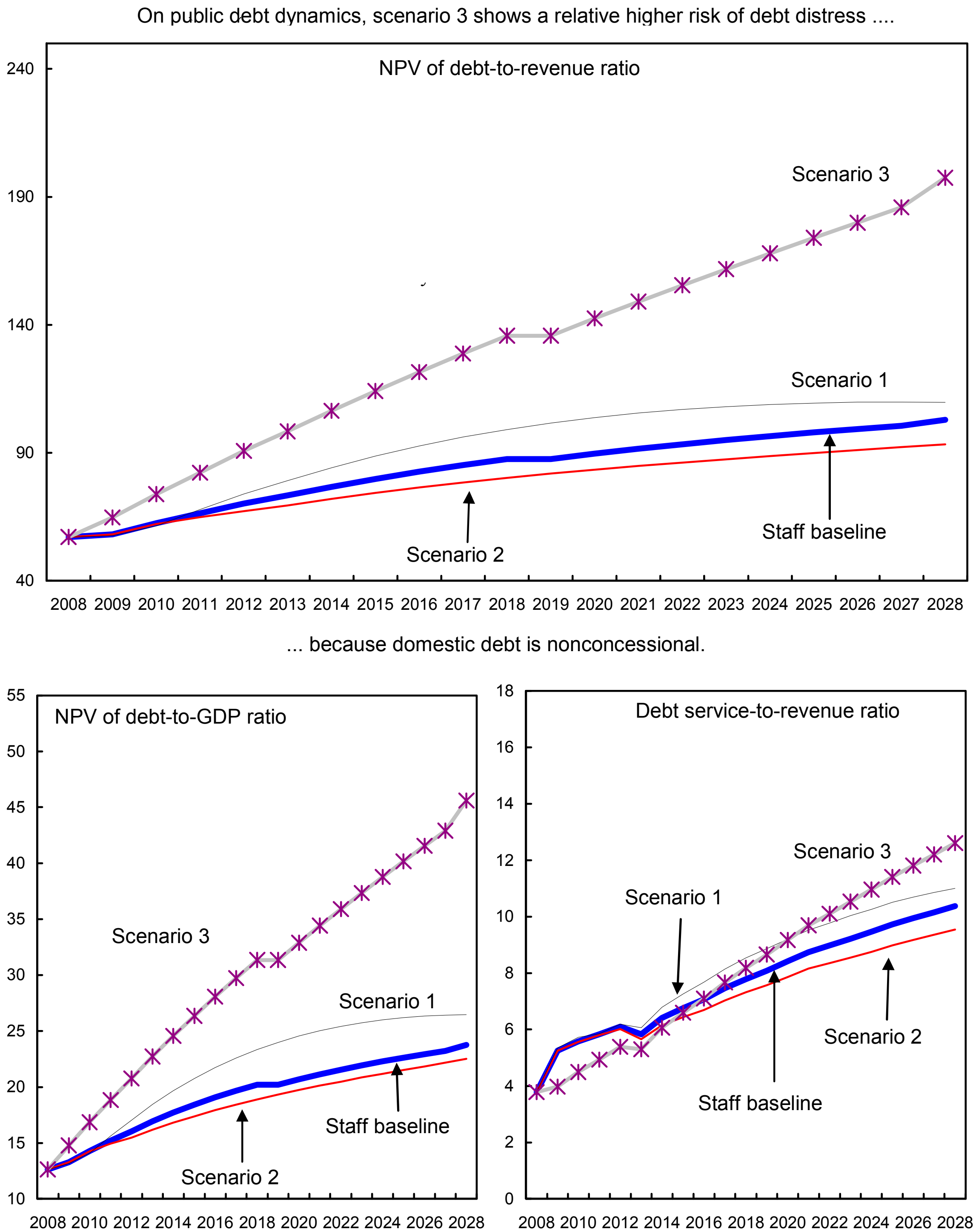



Furthermore, the indicative threshold is breached for the NPV of debt-to-exports ratio.



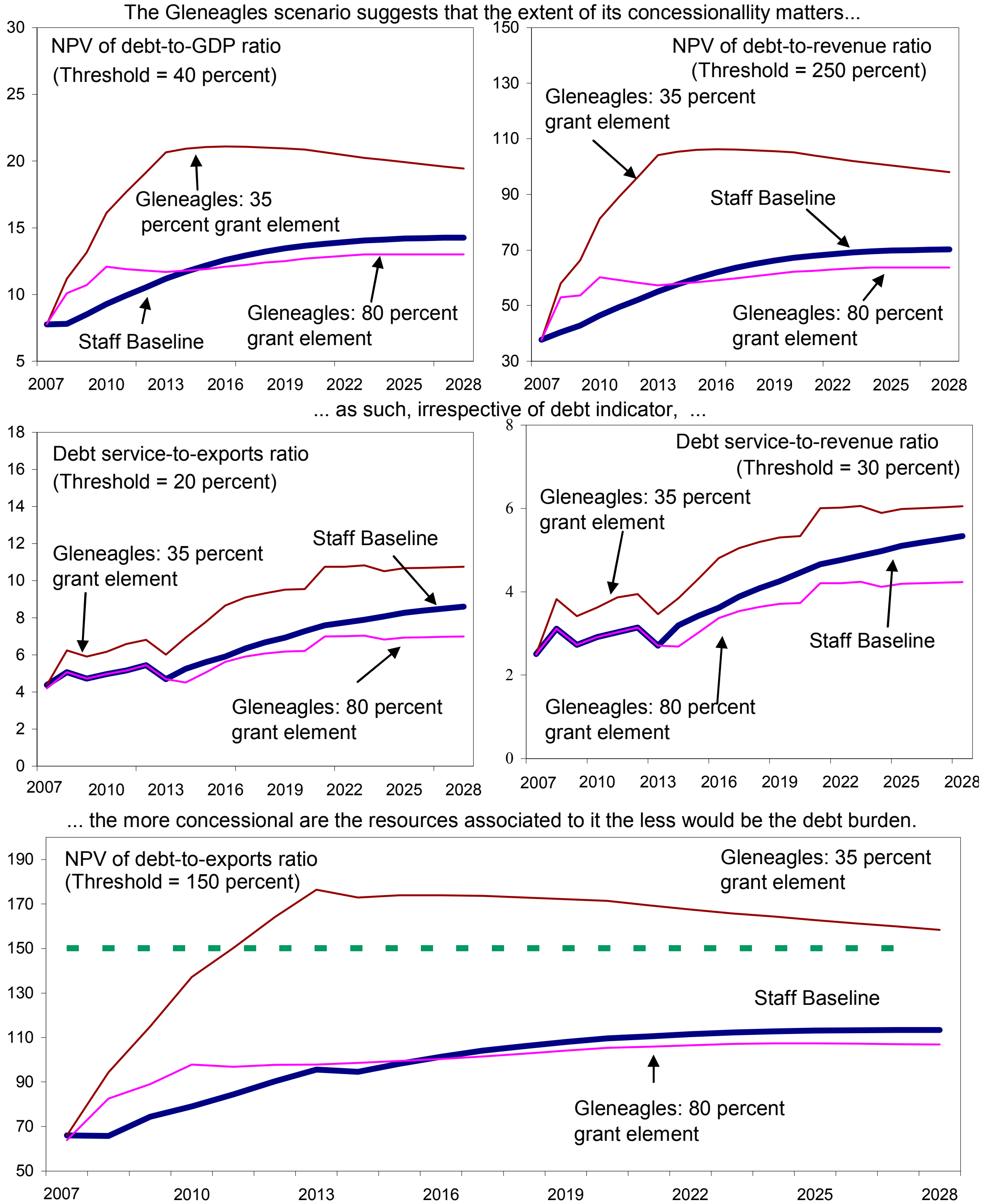

Source: Beninese authorities and Fund staff estimates.

Figure 4. Benin: Indicators of Public Debt under Alternative Scenarios, 2008–28




Source: Beninese authorities and Fund staff estimates.

Figure 5. Benin: Indicators of Public and Publicly Guarantee External Debt–
Staff Baseline vs Gleneagles Scenarios, 2007–28[1/]




Source: Beninese authorities and Fund staff estimates.

1/ The Gleneagles scenario endogenously integrates the impact of the scaling up on economic fundamentals, including growth, inflation, the exchange rate, fiscal revenue, and exports. It assumes an increase in aid from an estimated $42 per person in 2007 to $85 per person by 2010. That would imply an additional aid inflows of 2.4 percent of GDP on average in 2008–10.

**Box 1. The Scaling Up Scenario[10]**

This scaling up scenario describes the impact of doubling aid to Benin by 2010, in line with the commitments taken by the international community at the Gleneagles Summit in 2005 to double aid to Africa in order to make progress towards the achievements of the Millennium Development Goals (MDGs). The scenario employs two dynamic stochastic general equilibrium (DSGE) models to analyze the macroeconomic impact of the Gleneagles commitment for Benin. The model assumes that additional aid will be fully absorbed and spent across economic sectors.

The analysis suggests that the additional aid inflows (averaging 2.4 percent of GDP in 2008–10, and 2.0 percent of GDP in 2011–15) can be accommodated under the authorities' Fund-supported program without major disruptions to macroeconomic stability, provided the inflows are highly concessional and used effectively. The model implies, on average, 0.3 percent and 1.1 percent additional real growth in 2008–10 and 2011–15. The model also suggests higher growth beyond 2015 as higher skilled and healthier individuals enter the labor force. There are, however, significant risks associated with administrative and absorption capacity which would limit the impact on growth and poverty reduction of the additional aid inflows.

10. **The alternative scenarios also suggest risks of fiscal sustainability through higher domestic debt.** With domestic debt accumulating at a 0.5 percent of GDP annual pace, the three debt ratios (NPV of debt-to-GDP, NPV of debt-to-revenue, debt service-to-revenue) increase rapidly.[11] Furthermore, scenarios 1 and 3 suggest higher debt distress than the other scenarios. This, coupled with the potential quasi-fiscal losses from public enterprises, could further raise the risk of public debt sustainability.

## IV. Concluding Remarks

11. **In line with previous findings, this DSA confirms that Benin's risk of debt distress remains moderate.** Except in the scaling-up scenario, only the NPV of debt-to-export ratio in the alternative scenarios breaches the indicative policy-dependent thresholds, while other debt ratios remain below the indicative thresholds. The alternative scenarios though demonstrate that there is significant risk of debt distress from a no-reform scenario, a real exchange rate depreciation, a switch to domestic borrowing financing, and a scaling up of aid that is only moderately concessional. The authorities agreed with these findings.

12. **This DSA leads to the following policy implications for the Beninese authorities to consider:**

- **Structural reforms are essential to increase growth over the medium- to long-run and avoid future debt distress**. As shown in the no-reform scenario, the longer reforms take,

[10] See IMF policy paper "The Macroeconomics of Scaling-Up Aid: The Cases of Benin, Niger, and Togo" (http://www.imf.org/external/pp/longres.aspx?id=4283) and the forthcoming working paper by Mongardini and Samake "The Macroeconomic of Scaling Up Aid: The Gleneagles Initiative for Benin."

[11] The staff recommendation of limiting net domestic debt issues to 0.5 percent of GDP is driven by public debt sustainability considerations, based on the debt dynamics associated with the baseline scenario.

the higher Benin's financing needs will be, implying a higher risk of debt distress. Furthermore, Benin's debt sustainability is vulnerable to a real exchange rate depreciation. This suggests that, as indicated in the 2008 IMF Article IV Staff Report (Country Report No. 08/230), only the implementation of structural reform can safeguard Benin's external stability. In this regard, the authorities should consider reducing this vulnerability by relying more on domestic revenue to finance expenditures, and reduce their recourse to external financing. When available, external financing should be sought only on highly concessional terms.

- **A shift to a higher share of domestic financing risks undermining the debt outlook over the medium- to long-term**. A heavier reliance on domestic financing has its costs (in the form of higher interest rates) and could represent a risk to fiscal sustainability if it exceeds the limit identified in the DSA of 0.5 percent of GDP annually.

- **The envisaged scaling up of aid under the Gleneagles scenarios should be based on highly concessional financing in order to avoid increasing Benin's risk of debt distress**. A grant element of 35 percent, as under the program threshold under the PRGF arrangement, could result in a high risk of debt distress. The scaling up should therefore be mainly financed through grants and highly concessional lending.

13. **Overall, staff recommends that consideration be given to a public debt strategy that limits the risk of debt distress and thus avoids a return to an unsustainable debt burden**. In this regard, staff suggests targeting the speed and concessionality of debt accumulation, ensuring that external debt be contracted only on highly concessional terms, and choosing the appropriate composition between external and domestic financing to safeguard debt sustainability.

14. **The authorities broadly concurred with the thrust of the analysis and its findings**.[12] They expressed concern, though, about the limited concessional external financing available to scale up infrastructure spending over the coming years. They therefore indicated the need to resort to nonconcessional domestic financing as a last resort when concessional external financing falls short of Benin's development needs.

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[12] The CNE has prepared the first national DSA to be included in the 2009 budget. Preparation of individual national DSAs is a recent recommendation for CFA franc countries by the *Pôle-Dette.* Following the recommendation of *Pôle-Dette*, the WAEMU issued a regulation on external borrowing: "Règlement n° 09/2007/CM/UEMOA portant cadre de référence de la politique d'endettement public et de gestion de la dette publique dans les Etats membres de l'UEMOA."

Appendix Table 1. Benin: External Debt Sustainability Framework, Baseline Scenario, 2005-2028 1/
(In percent of GDP, unless otherwise indicated) 1/

| | Actual | | | Projections | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2018 | 2028 | 2008–13 Average | 2014–28 Average |
| **External debt (nominal) 1/** | 36.9 | 12.2 | 13.2 | 13.0 | 13.9 | 15.0 | 15.8 | 16.5 | 17.3 | 19.7 | 20.6 | | |
| o/w public and publicly guaranteed (PPG) | 36.9 | 11.5 | 12.5 | 12.6 | 13.6 | 14.8 | 15.7 | 16.5 | 17.3 | 19.7 | 20.6 | | |
| Change in external debt | 3.1 | -24.7 | 1.0 | -0.2 | 0.9 | 1.0 | 0.8 | 0.7 | 0.8 | 0.3 | 0.0 | | |
| Identified net debt-creating flows | 0.5 | 0.3 | 3.0 | 6.3 | 5.2 | 4.4 | 4.4 | 4.3 | 3.8 | 3.5 | 3.3 | | |
| Non-interest current account deficit | 5.2 | 5.3 | 6.5 | 9.6 | 7.9 | 6.6 | 6.0 | 5.8 | 5.2 | 5.2 | 5.1 | 6.9 | 5.1 |
| Deficit in balance of goods and services | 9.4 | 11.3 | 12.2 | 15.1 | 13.3 | 12.0 | 11.3 | 11.0 | 10.5 | 11.3 | 11.3 | | |
| Exports | 12.9 | 11.3 | 11.8 | 11.9 | 11.4 | 11.7 | 11.8 | 11.7 | 11.7 | 12.4 | 12.6 | | |
| Imports | 22.3 | 22.6 | 24.0 | 27.0 | 24.8 | 23.7 | 23.1 | 22.6 | 22.3 | 23.8 | 23.9 | | |
| Net current transfers (negative = inflow) | -4.8 | -6.2 | -6.0 | -5.7 | -5.6 | -5.6 | -5.6 | -5.4 | -5.6 | -6.2 | -6.2 | -5.6 | -6.2 |
| o/w official | -2.0 | -3.1 | -2.8 | -2.7 | -2.7 | -2.6 | -2.5 | -2.4 | -2.6 | -2.8 | -3.4 | | |
| Other current account flows (negative = net inflow) | 0.6 | 0.2 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.0 | 0.0 | | |
| Net FDI (negative = inflow) | -2.2 | -2.8 | -1.9 | -3.0 | -2.2 | -1.7 | -1.1 | -0.9 | -0.8 | -0.8 | -1.0 | -1.6 | -0.9 |
| Endogenous debt dynamics 2/ | -2.5 | -2.3 | -1.6 | -0.3 | -0.5 | -0.5 | -0.6 | -0.6 | -0.6 | -0.8 | -0.8 | | |
| Contribution from nominal interest rate | 0.2 | 0.4 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | | |
| Contribution from real GDP growth | -0.9 | -1.3 | -0.5 | -0.5 | -0.7 | -0.8 | -0.8 | -0.9 | -0.9 | -1.1 | -1.1 | | |
| Contribution from price and exchange rate changes | -1.8 | -1.4 | -1.3 | … | … | … | … | … | … | … | … | | |
| Residual (3-4) 3/ | 2.6 | -25.0 | -2.0 | -6.5 | -4.3 | -3.4 | -3.5 | -3.5 | -3.0 | -3.2 | -3.3 | | |
| o/w exceptional financing | -2.1 | -2.2 | -3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| PV of external debt 4/ | ... | ... | 8.4 | 8.2 | 8.8 | 9.5 | 10.1 | 10.6 | 11.2 | 13.2 | 14.3 | | |
| In percent of exports | ... | ... | 71.4 | 69.3 | 77.0 | 80.9 | 85.6 | 90.8 | 95.5 | 106.2 | 113.4 | | |
| PV of PPG external debt | ... | ... | 7.8 | 7.8 | 8.5 | 9.3 | 9.9 | 10.5 | 11.2 | 13.2 | 14.3 | | |
| In percent of exports | ... | ... | 66.0 | 65.8 | 74.3 | 79.0 | 84.4 | 90.3 | 95.5 | 106.2 | 113.4 | | |
| In percent of government revenues | ... | ... | 37.7 | 40.4 | 42.9 | 46.5 | 49.5 | 52.2 | 55.0 | 65.0 | 70.2 | | |
| Debt service-to-exports ratio (in percent) | 5.1 | 198.7 | 4.7 | 6.0 | 5.6 | 5.8 | 5.9 | 6.1 | 5.2 | 6.7 | 8.6 | | |
| PPG debt service-to-exports ratio (in percent) | 5.1 | 198.7 | 4.4 | 5.1 | 4.7 | 5.0 | 5.2 | 5.4 | 4.7 | 6.7 | 8.6 | | |
| PPG debt service-to-revenue ratio (in percent) | 4.0 | 133.9 | 2.5 | 3.1 | 2.7 | 2.9 | 3.0 | 3.1 | 2.7 | 4.1 | 5.3 | | |
| Total gross financing need (Billions of U.S. dollars) | 0.2 | 1.2 | 0.3 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.9 | 2.2 | | |
| Non-interest current account deficit that stabilizes debt ratio | 2.1 | 30.0 | 5.5 | 9.8 | 7.0 | 5.6 | 5.2 | 5.0 | 4.4 | 4.8 | 5.1 | | |
| **Key macroeconomic assumptions** | | | | | | | | | | | | | |
| Real GDP growth (in percent) | 2.9 | 3.8 | 4.6 | 5.1 | 5.7 | 5.9 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 5.8 | 6.0 |
| GDP deflator in US dollar terms (change in percent) | 5.6 | 3.9 | 12.0 | 18.7 | 3.3 | 1.3 | 3.4 | 3.4 | 3.4 | 3.5 | 3.6 | 5.6 | 3.5 |
| Effective interest rate (percent) 5/ | 0.8 | 1.2 | 2.2 | 2.3 | 1.8 | 1.8 | 1.8 | 1.7 | 1.7 | 1.7 | 1.8 | 1.8 | 1.8 |
| Growth of exports of G&S (US dollar terms, in percent) | -2.1 | -5.3 | 21.7 | 25.7 | 5.4 | 10.1 | 9.8 | 8.8 | 10.0 | 9.8 | 9.9 | 11.6 | 10.2 |
| Growth of imports of G&S (US dollar terms, in percent) | -8.8 | 9.5 | 24.0 | 40.3 | 0.3 | 2.8 | 6.8 | 7.4 | 7.7 | 9.7 | 9.8 | 10.9 | 10.3 |
| Grant element of new public sector borrowing (in percent) | ... | ... | ... | 37.4 | 37.2 | 37.0 | 36.2 | 36.0 | 35.8 | 34.8 | 32.7 | 36.6 | 34.2 |
| Government revenues (excluding grants, in percent of GDP) | 16.5 | 16.8 | 20.6 | 19.3 | 19.8 | 20.0 | 20.1 | 20.2 | 20.3 | 20.3 | 20.3 | | 20.3 |
| Aid flows (in Billions of US dollars) 7/ | 0.1 | 0.1 | 0.2 | 0.4 | 0.6 | 0.8 | 1.0 | 1.3 | 1.5 | 3.3 | 9.7 | | |
| o/w Grants | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.5 | 1.2 | | |
| o/w Concessional loans | 0.0 | 0.0 | 0.0 | 0.2 | 0.4 | 0.5 | 0.8 | 1.0 | 1.2 | 2.8 | 8.5 | | |
| Grant-equivalent financing (in percent of GDP) 8/ | ... | ... | 3.0 | 3.9 | 3.9 | 3.8 | 3.8 | 3.6 | 3.7 | 3.7 | 3.6 | 3.8 | 3.6 |
| Grant-equivalent financing (in percent of external financing) 8/ | ... | ... | 100.0 | 68.2 | 71.4 | 71.1 | 69.5 | 68.6 | 69.1 | 68.7 | 67.7 | 69.7 | 68.4 |
| **Memorandum items:** | | | | | | | | | | | | | |
| Nominal GDP (Billions of US dollars) | 4.4 | 4.7 | 5.6 | 6.9 | 7.6 | 8.1 | 8.9 | 9.8 | 10.7 | 17.0 | 43.0 | | |
| Nominal dollar GDP growth | 8.7 | 7.8 | 17.2 | 24.7 | 9.2 | 7.3 | 9.6 | 9.6 | 9.6 | 9.7 | 9.8 | **11.7** | 9.7 |
| PV of PPG external debt (in Billions of US dollars) | | | 0.4 | 0.5 | 0.6 | 0.8 | 0.9 | 1.0 | 1.2 | 2.2 | 6.1 | | |
| (PVt-PVt-1)/GDPt-1 (in percent) | | | | 2.0 | 1.5 | 1.5 | 1.6 | 1.6 | 1.7 | 1.6 | 1.4 | 1.6 | 1.5 |

Source: Staff simulations.

1/ Includes both public and private sector external debt.

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

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

4/ Assumes that 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).

Appendix Table 2.Benin: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2008-2028
(In percent)

| | Projections | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2008–13 Average | 2014–28 Average |
| PV of debt-to GDP ratio | | | | | | | | |
| **Baseline** | 7.8 | 8.5 | 9.3 | 9.9 | 10.5 | 11.2 | 9.5 | 13.5 |
| **A. Alternative Scenarios** | | | | | | | | |
| A1. Key variables at their historical averages in 2008-2028 | 7.8 | 7.8 | 8.2 | 8.8 | 9.3 | 10.1 | 8.7 | 14.6 |
| A2. New public sector loans on less favorable terms in 2008-2028 | 7.8 | 8.7 | 9.8 | 10.6 | 11.4 | 12.2 | 10.1 | 15.6 |
| **B. Bound Tests** | | | | | | | | |
| B1. Real GDP growth at historical average minus one standard deviation in 2009-2010 | 7.8 | 8.7 | 9.7 | 10.4 | 11.1 | 11.7 | 9.9 | 14.2 |
| B2. Export value growth at historical average minus one standard deviation in 2009-2010 | 7.8 | 9.3 | 12.0 | 12.5 | 13.0 | 13.5 | 11.4 | 14.6 |
| B3. US dollar GDP deflator at historical average minus one standard deviation in 2009-2010 | 7.8 | 9.1 | 10.5 | 11.2 | 11.9 | 12.6 | 10.5 | 15.2 |
| B4. Net non-debt creating flows at historical average minus one standard deviation in 2009-2010 | 7.8 | 9.8 | 11.5 | 12.0 | 12.5 | 13.1 | 11.1 | 14.4 |
| B5. Combination of B1-B4 using one-half standard deviation shocks | 7.8 | 10.3 | 13.3 | 13.8 | 14.3 | 14.8 | 12.4 | 15.8 |
| B6. One-time 30 percent nominal depreciation relative to the baseline in 2009 | 7.8 | 12.0 | 13.1 | 14.0 | 14.8 | 15.8 | 12.9 | 19.0 |
| PV of debt-to-exports ratio | | | | | | | | |
| **Baseline** | 65.8 | 74.3 | 79.0 | 84.4 | 90.3 | 95.5 | 81.6 | 108.1 |
| **A. Alternative Scenarios** | | | | | | | | |
| A1. Key variables at their historical averages in 2008-2028 | | 108.7 | 114.9 | 122.2 | 129.2 | 141.5 | 123.3 | 203.6 |
| A2. New public sector loans on less favorable terms in 2008-2028 | 65.8 | 76.4 | 83.2 | 90.5 | 97.7 | 104.2 | 86.3 | 124.9 |
| **B. Bound Tests** | | | | | | | | |
| B1. Real GDP growth at historical average minus one standard deviation in 2009-2010 | 65.8 | 74.3 | 79.0 | 84.4 | 90.3 | 95.5 | 81.6 | 108.1 |
| B2. Export value growth at historical average minus one standard deviation in 2009-2010 | 65.8 | 91.8 | 135.0 | 140.6 | 147.0 | 152.5 | 122.1 | 154.6 |
| B3. US dollar GDP deflator at historical average minus one standard deviation in 2009-2010 | 65.8 | 74.3 | 79.0 | 84.4 | 90.3 | 95.5 | 81.6 | 108.1 |
| B4. Net non-debt creating flows at historical average minus one standard deviation in 2009-2010 | 65.8 | 85.9 | 97.8 | 102.2 | 107.3 | 111.6 | 95.1 | 115.3 |
| B5. Combination of B1-B4 using one-half standard deviation shocks | 65.8 | 90.4 | 120.6 | 125.3 | 130.7 | 135.3 | 111.3 | 135.6 |
| B6. One-time 30 percent nominal depreciation relative to the baseline in 2009 | 65.8 | 74.3 | 79.0 | 84.4 | 90.3 | 95.5 | 81.6 | 108.1 |
| PV of debt-to-revenue ratio | | | | | | | | |
| **Baseline** | 40.4 | 42.9 | 46.5 | 49.5 | 52.2 | 55.0 | 47.7 | 66.5 |
| **A. Alternative Scenarios** | | | | | | | | |
| A1. Key variables at their historical averages in 2008-2028 1/ | 40.4 | 47.4 | 50.1 | 53.2 | 56.3 | 61.7 | 51.5 | 88.7 |
| A2. New public sector loans on less favorable terms in 2008-2028 2/ | 40.4 | 44.1 | 48.9 | 53.0 | 56.5 | 60.0 | 50.5 | 76.8 |
| **B. Bound Tests** | | | | | | | | |
| B1. Real GDP growth at historical average minus one standard deviation in 2009-2010 | 40.4 | 43.9 | 48.8 | 51.9 | 54.7 | 57.7 | 49.6 | 69.7 |
| B2. Export value growth at historical average minus one standard deviation in 2009-2010 3/ | 40.4 | 47.1 | 60.2 | 62.4 | 64.4 | 66.6 | 56.8 | 72.0 |
| B3. US dollar GDP deflator at historical average minus one standard deviation in 2009-2010 | 40.4 | 46.0 | 52.5 | 55.9 | 58.9 | 62.1 | 52.6 | 75.0 |
| B4. Net non-debt creating flows at historical average minus one standard deviation in 2009-2010 4/ | 40.4 | 49.5 | 57.5 | 59.9 | 62.0 | 64.3 | 55.6 | 70.9 |
| B5. Combination of B1-B4 using one-half standard deviation shocks | 40.4 | 52.0 | 66.4 | 68.7 | 70.7 | 72.9 | 61.8 | 77.9 |
| B6. One-time 30 percent nominal depreciation relative to the baseline in 2009 5/ | 40.4 | 60.4 | 65.5 | 69.8 | 73.5 | 77.6 | 64.5 | 93.7 |

Source: Staff projections and simulations.

1/ Variables include real GDP growth, growth of GDP deflator (in U.S. dollar terms), non-interest current account in percent of GDP, and 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 assu
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.

Appendix Table 3. Benin: Public Sector Debt Sustainability Framework, Baseline Scenario, 2005-2028
(In percent of GDP, unless otherwise indicated) 1/

| | Actual | | | Estimate | | | | Projections | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2008-13 Average | 2018 | 2028 | 2014-28 Average |
| **Public sector debt 1/** | 40.3 | 12.4 | 15.4 | 17.3 | 18.4 | 19.8 | 20.9 | 22.0 | 23.1 | | 26.7 | 30.1 | |
| o/w foreign-currency denominated | 36.9 | 11.5 | 12.5 | 12.6 | 13.6 | 14.8 | 15.7 | 16.5 | 17.3 | | 19.7 | 20.6 | |
| Change in public sector debt | 7.4 | -27.9 | 3.1 | 1.8 | 1.1 | 1.4 | 1.2 | 1.1 | 1.1 | | 0.6 | 0.2 | |
| Identified debt-creating flows | 4.0 | -5.8 | -3.4 | -0.8 | -0.4 | 0.1 | -0.1 | 0.0 | -0.2 | | -0.6 | -0.9 | |
| Primary deficit | 2.2 | 0.0 | -1.8 | 0.9 | 0.8 | 0.9 | 1.1 | 1.3 | 1.1 | 1.0 | 1.0 | 0.9 | 1.0 |
| Revenue and grants | 18.6 | 19.0 | 23.5 | 22.1 | 22.8 | 22.8 | 22.9 | 22.9 | 23.1 | | 23.1 | 23.1 | |
| *of which: grants* | 2.1 | 2.2 | 3.0 | 2.8 | 3.0 | 2.9 | 2.8 | 2.7 | 2.8 | | 2.8 | 2.8 | |
| Primary (noninterest) expenditure | 20.8 | 19.1 | 21.8 | 23.0 | 23.6 | 23.8 | 24.0 | 24.2 | 24.2 | | 24.1 | 24.0 | |
| Automatic debt dynamics | 1.8 | -5.8 | -1.6 | -1.6 | -1.3 | -0.8 | -1.2 | -1.3 | -1.4 | | -1.6 | -1.8 | |
| Contribution from interest rate/growth differential | -1.7 | -2.3 | -0.6 | -0.8 | -0.9 | -0.8 | -1.1 | -1.1 | -1.1 | | -1.4 | -1.5 | |
| *of which: contribution from average real interest rate* | -0.7 | -0.8 | -0.1 | 0.0 | 0.0 | 0.2 | 0.1 | 0.1 | 0.1 | | 0.1 | 0.2 | |
| *of which: contribution from real GDP growth* | -0.9 | -1.5 | -0.6 | -0.7 | -0.9 | -1.0 | -1.1 | -1.2 | -1.2 | | -1.5 | -1.7 | |
| Contribution from real exchange rate depreciation | 3.4 | -3.5 | -1.0 | -0.9 | -0.4 | 0.1 | -0.2 | -0.2 | -0.2 | | ... | ... | |
| 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 | |
| Residual, including asset changes | 3.5 | -22.1 | 6.5 | 2.6 | 1.5 | 1.2 | 1.2 | 1.1 | 1.3 | | 1.2 | 1.2 | |
| **Other Sustainability Indicators** | | | | | | | | | | | | | |
| PV of public sector debt | 3.4 | 0.9 | 10.2 | 12.6 | 13.3 | 14.3 | 15.2 | 16.0 | 16.9 | | 20.2 | 23.8 | |
| o/w foreign-currency denominated | 0.0 | 0.0 | 7.3 | 7.9 | 8.5 | 9.3 | 9.9 | 10.5 | 11.2 | | 13.2 | 14.2 | |
| o/w external | ... | ... | 7.3 | 7.9 | 8.5 | 9.3 | 9.9 | 10.5 | 11.2 | | 13.2 | 14.2 | |
| PV of contingent liabilities (not included in public sector debt) | ... | ... | ... | ... | ... | ... | ... | ... | ... | | ... | ... | |
| Gross financing need 2/ | 1.6 | 2.8 | 23.7 | -1.3 | 1.7 | 2.1 | 2.2 | 2.5 | 2.7 | | 2.8 | 3.2 | |
| PV of public sector debt-to-revenue and grants ratio (in percent) | 18.1 | 4.9 | 43.4 | 57.1 | 58.2 | 62.5 | 66.4 | 70.1 | 73.4 | | 87.5 | 102.9 | |
| PV of public sector debt-to-revenue ratio (in percent) | 20.4 | 5.5 | 49.6 | 65.4 | 66.9 | 71.6 | 75.7 | 79.4 | 83.3 | | 99.4 | 116.9 | |
| o/w external 3/ | … | … | 35.5 | 40.9 | 42.8 | 46.4 | 49.4 | 52.1 | 54.9 | | 64.9 | 70.1 | |
| Debt service-to-revenue and grants ratio (in percent) 4/ | 3.9 | 118.2 | 2.2 | 3.8 | 5.3 | 5.6 | 5.8 | 6.1 | 5.8 | | 7.8 | 10.4 | |
| Debt service-to-revenue ratio (in percent) 4/ | 1.8 | 2.4 | 0.9 | 2.1 | 2.1 | 2.2 | 2.4 | 2.5 | 2.6 | | 3.1 | 3.9 | |
| Primary deficit that stabilizes the debt-to-GDP ratio | -5.2 | 27.9 | -4.8 | -1.0 | -0.3 | -0.5 | 0.0 | 0.2 | 0.1 | | 0.5 | 0.6 | |
| **Key macroeconomic and fiscal assumptions** | | | | | | | | | | | | | |
| Real GDP growth (in percent) | 2.9 | 3.8 | 4.6 | 5.1 | 5.7 | 5.9 | 6.0 | 6.0 | 6.0 | 5.8 | 6.0 | 6.0 | 6.0 |
| Average nominal interest rate on forex debt (in percent) | 0.8 | 1.2 | 1.9 | 2.1 | 1.6 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.8 | 1.7 |
| Average nominal interest rate on domestic debt (in percent) | 0.0 | 0.0 | ... | 5.7 | 5.6 | 5.5 | 5.5 | 5.5 | 5.4 | 5.5 | 5.5 | 5.5 | 5.5 |
| Average real interest rate (in percent) | -2.3 | -2.0 | -0.7 | -0.1 | 0.1 | 1.1 | 0.3 | 0.4 | 0.5 | 0.4 | 0.4 | 0.6 | 0.5 |
| Real discount rate on foreign-currency debt (in percent) | 1.7 | 1.8 | 2.3 | 2.9 | 3.1 | 3.1 | 2.8 | 3.0 | 3.2 | 3.0 | 2.9 | 2.9 | 2.9 |
| Average real interest rate on domestic debt (in percent) | -5.3 | -3.7 | ... | -10.9 | 2.2 | 4.2 | 2.0 | 2.0 | 2.0 | 0.2 | 2.0 | 1.9 | 1.9 |
| Exchange rate (LC per US dollar) | 553.3 | 496.5 | 449.9 | 437.0 | 435.8 | 433.9 | 432.2 | 430.6 | 428.9 | 433.1 | 420.1 | 399.8 | 415.0 |
| Nominal depreciation of local currency (percentage change in LC per dollar) | 13.1 | -10.3 | -9.4 | -2.9 | -0.3 | -0.4 | -0.4 | -0.4 | -0.4 | -0.8 | -0.4 | -0.5 | -0.5 |
| Exchange rate (US dollar per LC) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Nominal appreciation (increase in US dollar value of local currency, in percent) | -11.6 | 11.4 | 10.3 | 3.0 | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 | 0.8 | 0.4 | 0.5 | 0.5 |
| Real exchange rate depreciation (in percent, + indicates depreciation) | 10.5 | -10.9 | -16.9 | -16.5 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Inflation rate (GDP deflator, in percent) | 5.6 | 3.9 | 12.0 | 18.7 | 3.3 | 1.3 | 3.4 | 3.4 | 3.4 | 5.6 | 3.5 | 3.6 | 3.5 |
| US Inflation rate (GDP deflator, in percent) | 3.2 | 3.2 | 2.7 | 2.0 | 1.8 | 1.9 | 2.1 | 1.9 | 1.7 | 1.9 | 2.0 | 2.0 | 2.0 |
| Growth of real primary spending (deflated by GDP deflator, in percent) | 0.1 | 0.0 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Grant element of new external borrowing (in percent) | ... | ... | ... | 37.4 | 37.2 | 37.0 | 36.2 | 36.0 | 35.8 | 36.6 | 34.8 | 32.7 | ... |

Sources: Country authorities; and Fund staff estimates and projections.
1/ [Indicate coverage of public sector, e.g., general government or nonfinancial public sector. Also whether net or gross debt is used.]
2/ Gross financing need is defined as the primary deficit plus debt service plus the stock of short-term debt at the end of the last period.
3/ Revenues excluding grants.
4/ Debt service is defined as the sum of interest and amortization of medium and long-term debt.
5/ Historical averages and standard deviations are generally derived over the past 10 years, subject to data availability.

Appendix Table 4. Benin: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2008-2028
(In percent)

| | Projections | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2008–13 Average | 2014–28 Average |
| **Debt service-to-exports ratio** | | | | | | | | |
| **Baseline** | 5.1 | 4.7 | 5.0 | 5.2 | 5.4 | 4.7 | 5.0 | 7.3 |
| **A. Alternative Scenarios** | | | | | | | | |
| A1. Key variables at their historical averages in 2008-2028 1/ | 5.1 | 7.5 | 7.7 | 8.0 | 8.3 | 7.1 | 7.3 | 12.9 |
| A2. New public sector loans on less favorable terms in 2008-2028 2 | 5.1 | 4.7 | 4.6 | 4.9 | 5.4 | 4.8 | 4.9 | 6.2 |
| **B. Bound Tests** | | | | | | | | |
| B1. Real GDP growth at historical average minus one standard deviation in 2009-2010 | 5.1 | 4.7 | 5.0 | 5.2 | 5.4 | 4.7 | 5.0 | 7.3 |
| B2. Export value growth at historical average minus one standard deviation in 2009-2010 3/ | 5.1 | 5.3 | 6.8 | 7.6 | 7.9 | 6.9 | 6.6 | 10.6 |
| B3. US dollar GDP deflator at historical average minus one standard deviation in 2009-2010 | 5.1 | 4.7 | 5.0 | 5.2 | 5.4 | 4.7 | 5.0 | 7.3 |
| B4. Net non-debt creating flows at historical average minus one standard deviation in 2009-2010 4/ | 5.1 | 4.7 | 5.3 | 5.7 | 5.9 | 5.1 | 5.3 | 7.9 |
| B5. Combination of B1-B4 using one-half standard deviation shocks | 5.1 | 4.9 | 6.0 | 6.7 | 7.0 | 6.1 | 6.0 | 9.3 |
| B6. One-time 30 percent nominal depreciation relative to the baseline in 2009 5/ | 5.1 | 4.7 | 5.0 | 5.2 | 5.4 | 4.7 | 5.0 | 7.3 |
| **Debt service-to-revenue ratio** | | | | | | | | |
| **Baseline** | 3.1 | 2.7 | 2.9 | 3.0 | 3.1 | 2.7 | 2.9 | 4.5 |
| **A. Alternative Scenarios** | | | | | | | | |
| A1. Key variables at their historical averages in 2008-2028 1/ | 3.1 | 3.3 | 3.3 | 3.5 | 3.6 | 3.1 | 3.3 | 5.6 |
| A2. New public sector loans on less favorable terms in 2008-2028 2 | | 2.7 | 2.7 | 2.9 | 3.1 | 2.7 | 2.8 | 3.8 |
| **B. Bound Tests** | | | | | | | | |
| B1. Real GDP growth at historical average minus one standard deviation in 2009-2010 | 3.1 | 2.8 | 3.1 | 3.2 | 3.3 | 2.8 | 3.0 | 4.7 |
| B2. Export value growth at historical average minus one standard deviation in 2009-2010 3/ | 3.1 | 2.7 | 3.0 | 3.4 | 3.5 | 3.0 | 3.1 | 4.9 |
| B3. US dollar GDP deflator at historical average minus one standard deviation in 2009-2010 | 3.1 | 2.9 | 3.3 | 3.4 | 3.5 | 3.1 | 3.2 | 5.0 |
| B4. Net non-debt creating flows at historical average minus one standard deviation in 2009-2010 4/ | 3.1 | 2.7 | 3.1 | 3.3 | 3.4 | 3.0 | 3.1 | 4.9 |
| B5. Combination of B1-B4 using one-half standard deviation shocks | 3.1 | 2.8 | 3.3 | 3.7 | 3.8 | 3.3 | 3.3 | 5.4 |
| B6. One-time 30 percent nominal depreciation relative to the baseline in 2009 5/ | 3.1 | 3.8 | 4.1 | 4.3 | 4.4 | 3.8 | 3.9 | 6.3 |
| *Memorandum item:* | | | | | | | | |
| Grant element assumed on residual financing (i.e., financing required above baseline) 6/ | 31.8 | 31.8 | 31.8 | 31.8 | 31.8 | 31.8 | 31.8 | 31.8 |

Source: Staff projections and simulations.

1/ Variables include real GDP growth, growth of GDP deflator (in U.S. dollar terms), non-interest current account in percent of GDP, and 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
1/ At end-2007 with HIPC relief obtained since July 2000.
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.