

INTERNATIONAL MONETARY FUND

THE MACROECONOMICS OF SCALING-UP AID: THE CASES OF BENIN, NIGER, AND TOGO

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OVERVIEW AND SUMMARY

The following three notes¹ assess the macroeconomic implications of the spending of scaled-up aid to Benin, Niger, and Togo in line with that promised by the G-8 at Gleneagles, Scotland in 2005. These assessments are prepared in response to a request from the UN.

In September 2007, the UN Secretary General launched the Millennium Development Goals (MDG) Africa Steering and Working Groups. The Steering Group brings together the leaders of multilateral institutions to identify practical steps needed for Africa to achieve the MDGs. The Managing Director of the IMF is a member of the Steering Group. The Working Group supports the Steering Group and is comprised of thematic groups in education, agriculture, health, infrastructure and trade facilitation, statistics, aid predictability, and MDG operationalization at the country level.

In addition to being co-coordinator of the thematic group on aid predictability (along with the Development Assistance Committee of the Organization for Economic Cooperation and Development) the IMF is supporting the work of the thematic group on MDG operationalization at the country level. This group is leading the preparation of “Gleneagles aid scaling-up scenarios” in 10 country cases, and the IMF has been requested to provide macroeconomic assessments of these scenarios. The scenarios are being developed for Benin, Central African Republic, Ghana, Liberia, Niger, Rwanda, Sierra Leone, Tanzania, Togo, and Zambia. The objective is to see if a dramatic boost in aid, promised at the G-8 Gleneagles Summit, can help countries meet the MDGs.

The scaling-up scenarios are based on sector-level analyses and spending plans by the country authorities. The UNDP, World Bank, and African Development Bank worked closely with country authorities in developing the spending plans. Following standard IMF practice, IMF staff are using several approaches to analyze the effects of the projected aid increase on key macroeconomic variables such as real growth, inflation, the exchange rate, and the current account balance, and to assess the implications of different policy choices. Two frameworks have been used for this exercise. The first approach is based on a traditional IMF macroeconomic model with a standard demand side, a production function—extended to include public capital with near term payoff (e.g., roads) and human capital with long-term payoff (e.g., education)—and reduced form trade equations for the external sector.² This model was applied to Niger and Benin. The second approach relies on a dynamic stochastic general equilibrium model (DSGE), with nominal rigidities, microeconomic foundations and

¹ The notes were prepared by J. Mongardini and I. Samake (Benin); E. Sacerdoti and G. Salinas (Niger); and C. Mumssen and S. Rosa (Togo) with contributions from J. Gottschalk and R. Portillo.

² Based on Farah, Sacerdoti and Salinas, (forthcoming), “The Macroeconomic Impact of Scaling Up Aid: The Case of Niger”.

multiple sectors.³ This model is suited to address both demand-led issues and medium term implications (on capital accumulation and productivity) of aid expenditures; it has been applied to Togo and Benin. Given the current state of knowledge about macroeconomic relationships in African countries, staff believe it is fruitful to use and compare different models. Results from Benin indicate that the assessment is robust to the different models.

The main conclusions of the studies are as follows:

Benin

- Meeting the Gleneagles commitment would require a moderate scaling up of aid of 2 percent of GDP (approximately) over the next few years.
- These additional aid inflows would have a positive impact on GDP growth, exert some short- to medium-term pressures on inflation and cause a moderate real exchange rate appreciation.
- There is the risk that the impact on growth and poverty reduction could be lower if Benin's absorptive and administrative capacity is not strengthened.

Niger

- The increase in aid required to meet the Gleneagles commitment would imply a scaling up of aid of 18 percent of GDP by 2010.
- The impact on GDP growth would be substantial. Greater government spending would also have a sizeable impact on domestic inflation; the real exchange rate would appreciate considerably as a result.
- In light of its magnitude, the scaling-up could increase the risk of debt distress if the grant element of new aid is relatively low.

Togo

- The increase in aid required to meet the Gleneagles target amounts to an increase in aid disbursements of 10 percent of GDP over the next few years.
- The impact on GDP growth would be considerable. The effect on inflation would be moderate and short-lived, but the impact on the real exchange rate would be persistent.
- Achieving higher GDP growth rates following the aid increase will depend on the economy's capacity constraints and the strengthening of the private sector.

³ See Berg, Andrew, Tokhir Mirzoev, Rafael Portillo and Felipe Zanna, "Large aid flows and monetary policy in a DSGE model: the case of Uganda" IMF Working Paper (forthcoming).

BENIN

This note assesses the macroeconomic implications for Benin of the Gleneagles commitment to double aid to poor countries over the next three years to reach \$85 per capita by 2010 and keep it at that level thereafter. 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 current Fund-supported program without major disruptions to macroeconomic stability provided they are highly concessional and used effectively. There are, however, risks of a relatively low impact on growth and poverty reduction of the additional aid inflows, given Benin’s limited absorptive and administrative capacity. These risks could be mitigated with strong upfront measures to strengthen absorptive capacity through structural reforms, including the divestitures of key public enterprises, and public finance measures to improve the quality and effectiveness of public investment.

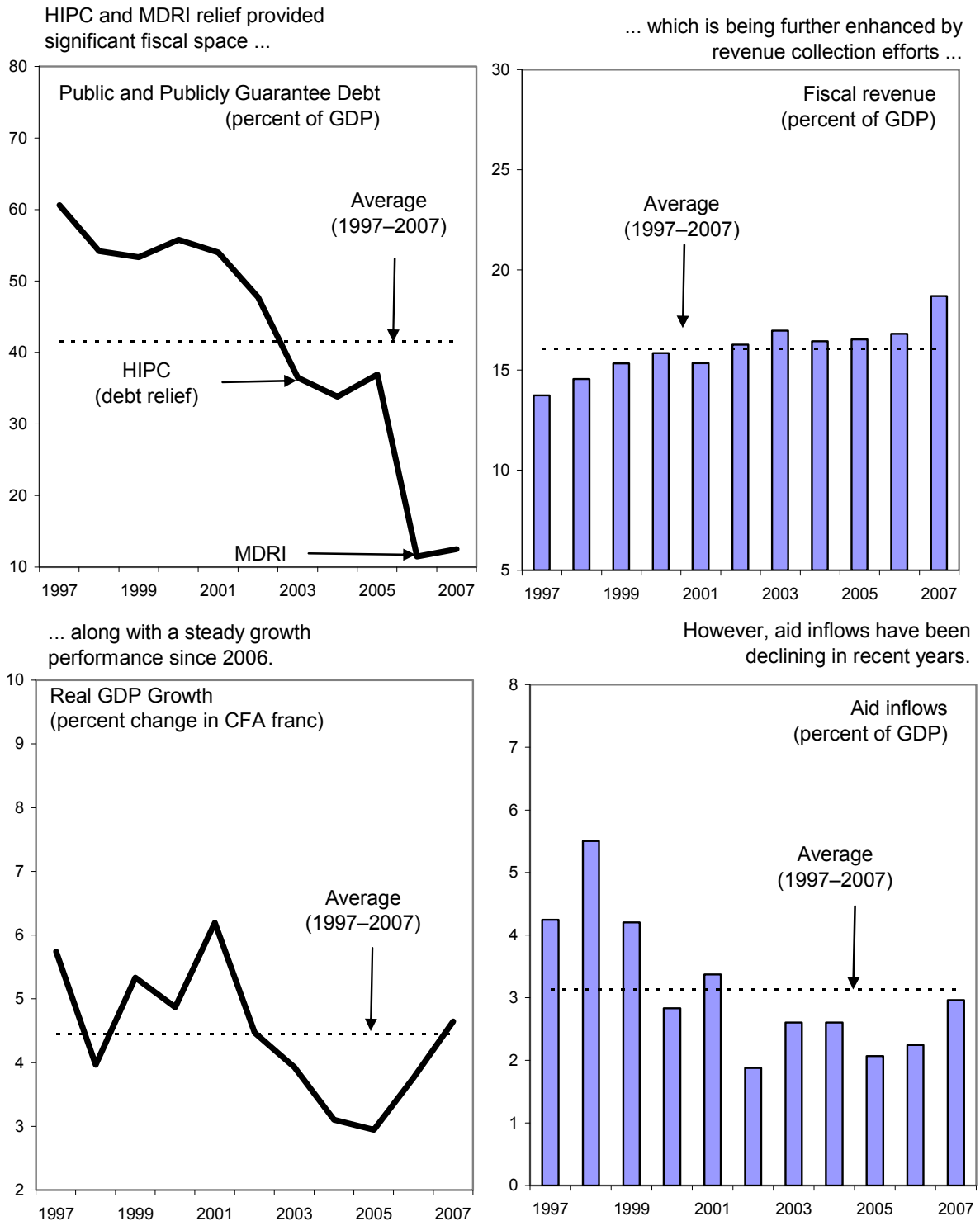
I. INTRODUCTION

1. **This note assesses the macroeconomic implications for Benin of the Gleneagles commitment to double aid to poor countries over the next three years to reach \$85 per capita by 2010 and keep it at that level thereafter.** It focuses on how additional aid can be accommodated in the Fund-supported program while safeguarding macroeconomic stability, and speeding up progress toward the MDGs. It does not, however, assess the likelihood of Benin reaching the MDGs by 2015 with the additional Gleneagles support.
2. **Recent debt relief, and continued prudent macroeconomic policies, have widened the fiscal space in Benin.** Debt relief under the Enhanced Heavily Indebted Poor Countries (HIPC) Initiative in 2003 reduced Benin’s external debt stock from 47.7 percent of GDP at end-2002 to 36.5 percent at end-2003. The Multilateral Debt Relief Initiative (MDRI) reduced Benin’s external debt further to 12.5 percent of GDP at end-2007. Accordingly, the ratio of public debt service to fiscal revenue has been reduced from 10.4 percent in 2002 to 3.5 percent in 2007. At the same time, prudent macroeconomic policies have resulted in macroeconomic stability, higher growth, and strong revenue performance (Figure 1).
3. **Economic and social conditions in Benin clearly justify a scaling up of aid to make progress towards the MDGs.** The recent IMF and World Bank Joint Staff Advisory Note (JSAN; IMF Country Report No. 08/234) indicates that, at the current pace of economic and social progress, Benin would not be able to reach all the MDG targets by 2015. At the same time, the challenge of reducing poverty in Benin is pressing, as 38 percent of the population lives below the poverty line of \$0.57 dollar a day.⁴ The Gleneagles commitments

⁴ National poverty line in 2006 US dollar.

to double aid by 2010, together with continued macroeconomic stability, a further acceleration of growth, and a strengthening of public finance management, thus represent a significant opportunity to eradicate extreme poverty and improve living standards in Benin.

Figure 1. Benin: Fiscal Space and Economic Performance, 1997–2007



Source: Beninese authorities and Fund staff estimates.

II. THE GLENEAGLES COMMITMENT VS. THE BASELINE SCENARIO

4. **The Gleneagles commitment for Benin imply a doubling of aid inflows by 2010 and keeping them at the same nominal level of \$85 per capita thereafter.** Aid inflows were 5.9 percent of GDP in 2007, which is equivalent to \$42 per person (see Text Table 1).⁵ To reach \$85 per person by 2010, aid inflows would have to increase to 7.7 percent of GDP by 2010 and average 7.5 percent of GDP annually during 2011–15. Compared to the current baseline projections, this implies additional aid inflows averaging 2.4 percent of GDP annually in 2008–10 (1.1 percent in 2008; 2.4 percent in 2009; and 3.8 percent in 2010) and 2.0 percent of GDP annually during 2011–15.⁶

Text Table 1. Benin: The Gleneagles Commitments and Additional Aid, 2007–15
(percent of GDP; unless otherwise indicated)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2008–10	2011–15	2008–15
	Act.	Projections										
	Average											
Fiscal revenue impact	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
MDG spending requirements	0.0	-1.2	-2.5	-4.0	-3.2	-2.6	-2.0	-1.5	-1.0	-2.5	-2.0	-2.2
Total additional financing needs	0.0	1.1	2.4	3.8	3.2	2.6	2.0	1.5	1.0	2.4	2.0	2.2
Additional/Gleneagles envelope	0.0	1.1	2.4	3.8	3.2	2.6	2.0	1.5	1.0	2.4	2.0	2.2
<i>Memorandum Items:</i>												
Gleneagles total commitment	5.9	6.6	7.7	8.9	8.4	7.9	7.4	7.0	6.6	7.7	7.5	7.6
or in US \$ per capita terms	42.1	56.4	70.7	85.0	85.0	85.0	85.0	85.0	85.0	70.7	85.0	79.6
of which: Baseline commitment	5.9	5.5	5.3	5.1	5.2	5.3	5.4	5.5	5.6	5.3	5.4	5.4

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

5. **Such large additional aid inflows on top of already high aid commitments are likely to have significant macroeconomic repercussions.** Two reasons motivate the need for an assessment of the macroeconomic consequences of the new aid:

- Spending of the additional aid inflows on nontradables could strain the already limited absorptive capacity, thus resulting in inflationary pressures, and a corresponding appreciation of the real exchange rate, which could further erode external competitiveness.
- To the extent that aid inflows are channeled through the government budget, they may also stretch the administrative capacity to manage additional public investment, and thus reduce the quality of public spending out of aid.

⁵ The aid inflows presented in text table 1 refer to ODA (official development assistance), following the OECD DAC definition, i.e., grants or loans with a least a 25 percent grant element. These differ from the aid inflows presented in Figure 1 which only include grants recorded in the central government budget.

⁶ It is assumed that, under the Gleneagles scenario, the additional aid would consist of both grants and loans with a combined grant element of 80 percent.

6. To simulate the macroeconomic impact of the Gleneagles commitments, the additional aid inflows are assumed to be allocated proportionately to each social sector, according to the authorities' latest PRSP. On that basis, about 70 percent of Gleneagles-related spending would go to education, health, agriculture and infrastructure (see Text Table 2).

Text Table 2. Benin: Aid-Funded Expenditures Under Gleneagles Scenario By Sector, 2007–15

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2008–10	2011–15	2008–15
	Act.	Projections										
		Average										
Total												
In percent of GDP	6.3	7.3	9.7	12.3	12.8	13.3	13.8	14.3	14.9	9.8	13.8	12.3
Of which: Gleneagles total commitments	5.9	6.6	7.7	8.9	8.4	7.9	7.4	7.0	6.6	7.7	7.5	7.6
In billions of CFA francs	157.8	214.6	314.6	423.6	480.8	545.8	619.4	703.1	798.0	317.6	629.4	512.5
		(Percent share)										
Education	30.5	30.8	30.0	31.5	31.5	31.6	31.6	31.7	31.7	30.7	31.6	31.3
Health	18.1	18.9	20.1	19.3	19.3	19.4	19.4	19.5	19.5	19.4	19.4	19.4
Agriculture	9.0	15.0	14.9	15.0	15.1	15.2	15.3	15.4	15.5	14.9	15.3	15.1
Infrastructure	10.3	9.8	13.5	15.2	15.4	15.6	15.8	16.0	16.2	12.8	15.8	14.7
Other	32.1	25.5	21.6	19.2	18.8	18.4	18.0	17.6	17.2	22.1	18.0	19.5
Gender	0.9	1.1	1.0	1.2	1.3	1.3	1.3	1.3	1.3	1.1	1.3	1.2
Environment	15.9	12.0	12.3	10.6	9.9	9.4	8.9	8.4	7.9	11.6	8.9	9.9
Governance	12.0	10.8	6.3	5.7	5.8	5.8	5.8	5.8	5.8	7.6	5.8	6.5
Population and Social Protection	3.3	1.5	1.8	1.5	1.6	1.7	1.8	1.9	2.0	1.6	1.8	1.7
Other	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

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

III. MACROECONOMIC IMPLICATIONS OF THE GLENEAGLES SCENARIO

A. The Model and Some Empirical Evidence

7. This note uses a dynamic general equilibrium (DGE) model to analyze the macroeconomic impact of the additional aid from the Gleneagles commitments.^{7 8} The model assumes that: (i) all aid is reflected in an equivalent increase in government expenditures; (ii) aid resources are allocated efficiently across socio-economic sectors; (iii) the short-run effect on growth is driven by the impact on aggregate demand, as 80 percent of the increase in government spending is concentrated on local goods and

⁷ We employ the model of by Farah, Sacerdoti and Salinas (upcoming) “The Macroeconomic Impact of Scaling Up Aid: The Case of Niger”. In order to ensure robustness of the findings, the results are compared with those derived from the model used in “Large aid flows and monetary policy in a DSGE model: the case of Uganda” by Rafael Portillo, Tokhir Mirzoev, Felipe Zanna, and Andy Berg (forthcoming). The preliminary results of the latter model are broadly consistent with the former. In addition, the results for Benin are broadly in line with the ones for Niger, although with some significant differences related to the underlying structure of the two economies.

⁸ While subject to significant uncertainty about calibration and long-term inference, DGE models provide a consistent theoretical framework to estimating the impact of additional aid inflows. The simulation results in this note should therefore be considered more qualitative than quantitative in nature, and are subject to a higher degree of uncertainty in the outer years of the simulation.

services and the remainder on imports of goods and services; (iv) any remaining foreign currency proceeds would finance additional demand for imports by the private sector; (v) the medium-run impact on growth is based on agriculture and infrastructure reforms; and (vi) the long-run incremental growth impact is based on improvements in education, health, gender representation, population and social protection.

8. Aid inflows from the Gleneagles commitments are projected to have the following macroeconomic implications (Text Table 3 and Figure 2):

Text Table 3. Benin: Selected Macroeconomic Indicators – Impacts of Additional Aid Under the Gleneagles Commitments—Deviation from the Baseline, 2008–15

	2008	2009	2010	2011	2012	2013	2014	2015	2008–10	2011–15	2008–15
	Projections								Average		
	(percent)										
Real GDP growth	0.1	0.2	0.5	0.7	0.9	1.1	1.2	1.4	0.3	1.1	0.8
GDP per capita	0.0	0.3	0.7	1.4	2.3	3.3	4.5	5.9	0.3	3.5	2.3
CPI Inflation	0.1	0.7	2.1	4.0	3.5	2.9	2.3	1.8	0.9	2.9	2.2
Real exchange rate	0.4	1.0	5.1	5.9	6.3	6.5	6.7	6.7	2.1	6.4	4.8
	(percent of GDP)										
Fiscal accounts											
Total revenue	1.2	2.5	4.0	3.2	2.6	2.0	1.5	1.0	2.5	2.0	2.2
Domestic revenue	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
ODA: Gleneagles	1.1	2.4	3.8	3.2	2.6	2.0	1.5	1.0	2.4	2.0	2.2
Total expenditure	2.0	1.2	2.0	2.4	2.5	2.6	2.6	2.7	1.7	2.6	2.3
Current expenditures	0.2	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.3	0.5	0.4
Public investment	1.8	0.8	1.7	2.0	2.1	2.1	2.1	2.0	1.4	2.0	1.8
Fiscal deficit 1/	0.8	-1.2	-2.0	-0.7	-0.1	0.6	1.1	1.7	-0.8	0.5	0.0
Current account (excl.grants)	1.2	1.1	2.8	3.1	3.0	2.8	2.3	1.6	1.7	2.6	2.2
Export of goods	0.3	0.6	0.9	1.1	1.4	1.8	2.3	2.9	0.6	1.9	1.4
Import of goods	1.5	1.7	3.7	4.2	4.5	4.7	4.7	4.5	2.3	4.5	3.7

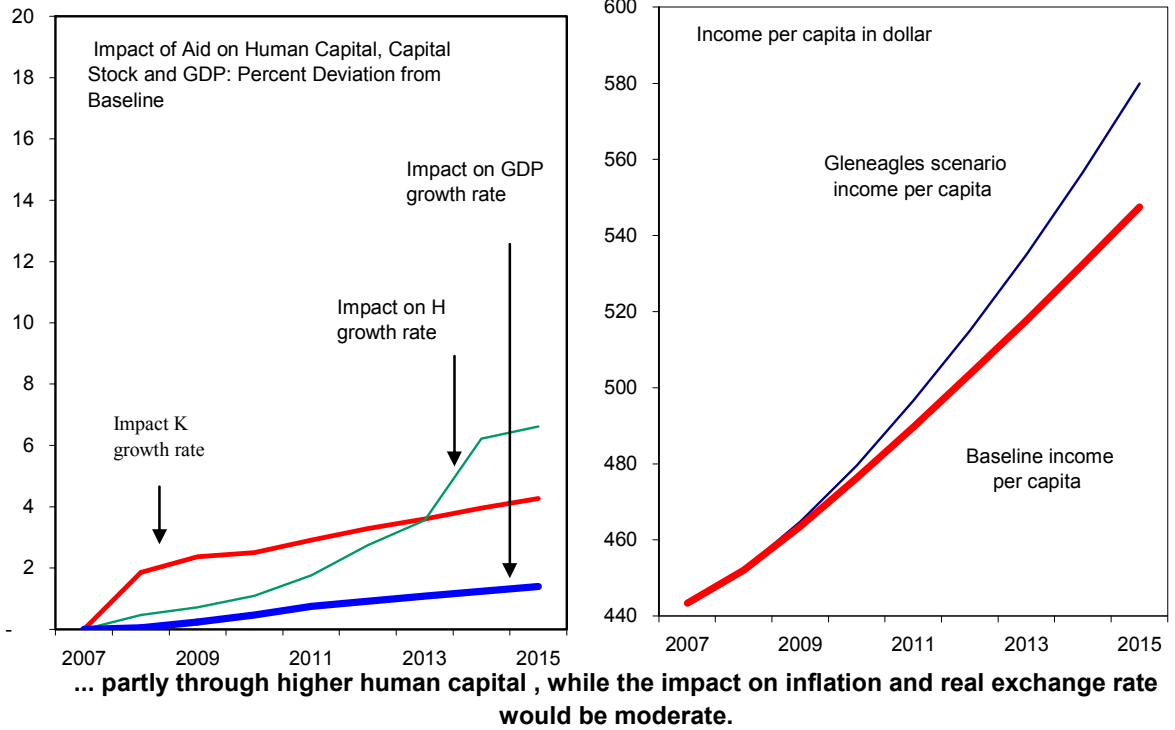
Source: UNDP and IMF staffs estimates.

1/ No additional interest payment is assumed during 2008–15

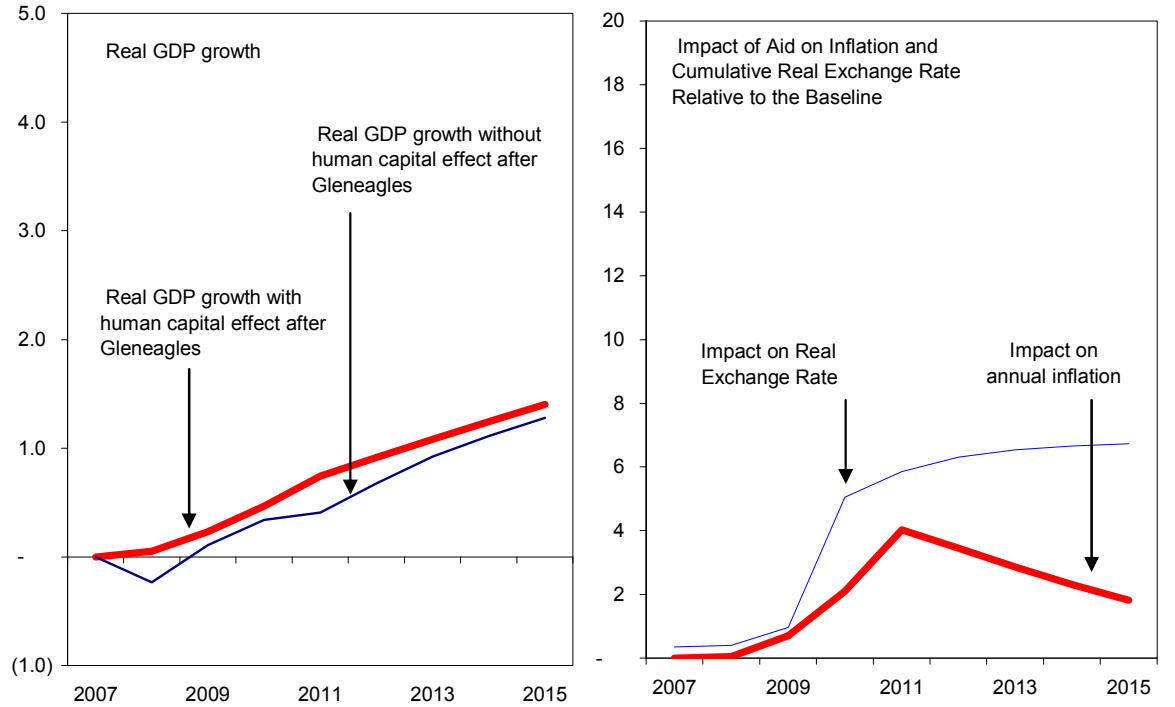
- The incremental increase in aid in 2008–15, assuming it is effectively used, will boost growth annually by 0.8 percentage points on average relative to the baseline. As a result, per capita income would be 29.4 percent higher in 2015, reaching \$574 per person at 2007 constant prices. The latter is 6 percent higher than in the baseline scenario.

Figure 2. Benin: Macroeconomic Impact of Aid Under Gleneagles Commitment, 2007–15

The additional aid from the Gleneagles commitments is expected to increase growth ... and improve living standards, ...



... partly through higher human capital, while the impact on inflation and real exchange rate would be moderate.



Source: Beninese authorities and Fund staff estimates.

- By allocating about half of the additional aid inflows to education and health, the ratio of human capital investment (to GDP) would rise to 4.7 percent of GDP in 2015 from 2.2 percent in 2008 (3.9 percent in 2008–15 on average). This suggests higher potential growth for Benin beyond 2015 as higher skilled and healthier individuals enter the labor force.
- Additional resources devoted to infrastructure would result in a physical capital stock 27.5 percent higher than under the baseline by 2015.
- The implications for inflation would depend on the composition of government spending out of aid. Under the current scenario, where 80 percent of the increase in government spending is concentrated on local goods and services, inflation would be 4 percentage points higher in 2011 relative to the baseline and would remain 1.8 percentage point higher by 2015. The impact on inflation would be lower if a higher share of the additional government spending goes to imports.
- Accordingly, the real exchange rate would appreciate relative to the baseline, given the fixed nominal exchange rate in the CFA franc zone. By 2011, the real effective exchange rate would be 5.9 percent higher than under the baseline scenario, further increasing to 6.7 percent by 2015. If it is not matched by a corresponding increase of productivity in the export sector, this could affect Benin's competitiveness,

9. **The external current account deficit (excluding grants) would widen compared to the baseline over the medium term, but exports are expected to pick up as productivity increases.** The current account deficit (excluding grants) would widen by 3.0 percent of GDP in 2012, compared to the baseline, before narrowing back to 1.6 percent in 2015 as higher export growth starts offsetting the aid-related increase in imports. This is predicated on the effective use of the additional aid leading to higher productivity in the tradable sector.

10. **Fiscal and debt sustainability will hinge on a number of factors.** First, the short- and medium-term growth impact of the additional aid should improve the sustainability of government finances by reducing the debt payment burden and increasing fiscal revenues. This is critically predicated, however, on the productive use of aid. In addition, the increase in government investment could also have a significant recurrent component beyond the scaling up horizon, with potential implications for fiscal sustainability. For the Gleneagles scenario, it is assumed that such spending would be financed in the long run through higher revenues and a rationalization of spending. Most importantly, the highly concessional nature of the additional aid (assumed to have an 80 percent grant element) would limit the risk to debt sustainability. Lower concessional nature of aid, however, would impact the debt profile over the medium- to long-run (see below).

IV. RISK TO THE GLENEAGLES SCENARIO

11. **One of the main risks to the Gleneagles scenario presented above is Benin's limited absorption capacity.** In the simulations above, the economy's ability to absorb the additional aid is based on the critical assumption that structural reforms will continue to be implemented to address any significant bottlenecks in the economy that could jeopardize the effective use of the additional aid. Two notable examples are worth mentioning here for Benin: 1) the public divestiture of the electricity sector to address the continued power shortages affecting daily economic activity in Benin; and 2) the effective management of the port of Cotonou, the main economic gateway for the country. Absent continued structural reforms to make Benin's economy more competitive and flexible, the additional aid inflows could have a significantly lower impact on growth over the medium- and long-term, while resulting instead in higher inflation that could jeopardize macroeconomic stability.

12. **The additional aid inflows could pose significant risks to fiscal and debt sustainability if aid concessionality is low.** To assess these risks, the debt profile implications of the Gleneagles commitment are simulated using an alternative scenario where the grant element of the additional aid declines (Figure 3). As the simulations indicate, a lower grant element of 35 percent—the program threshold for the PRGF arrangement—could lead to debt distress. For these reasons, staff recommends a grant element for the Gleneagles aid of at least 60 percent or more in order to keep Benin within a moderate risk of debt distress (Figure 4).

13. **Another risk to the Gleneagles arises from the authorities' limited administrative capacity to manage a large public investment program.** As shown in the execution of the government's budget in recent years, the authorities have managed to implement only an average 80 percent of their annual public investment program. This mainly reflects limited administrative capacity and antiquated procurement regulations and procedures that have materialized in significant delays in the execution of capital projects. This is further corroborated by the World Bank's 2007 Country Policy and Institutional Assessment (CPIA) of Benin, which indicates significant inefficiencies in: (i) fiscal reporting, budget preparation, and execution; (ii) procurement and purchasing, including debt management, commitment of funds and payments management; and (iii) the extent of political support for the public procurement process and the authorities' public investment program.

14. **To illustrate the impact of the limited administrative capacity, an alternative scenario was run assuming only an 80 percent effectiveness of aid stemming from weak public finance management (PFM).** The lower effectiveness of aid could result from weak governance, as described in the JSAN (IMF Country Report No. 08/234, paragraph 18–21). Under these assumptions, the average impact of aid on growth is reduced to an average 0.1 percentage points relative to the baseline (Figure 4). This is partly because public consumption increases faster than investment in this scenario and thus the contribution to

physical and human capital accumulation is lower. In addition, the lower effectiveness of aid could jeopardize the expected pickup in productivity in the export sector, thus increasing the risk to fiscal and debt sustainability. Overall, this alternative scenario vividly demonstrates the importance of PFM reforms in order to increase aid effectiveness in Benin.

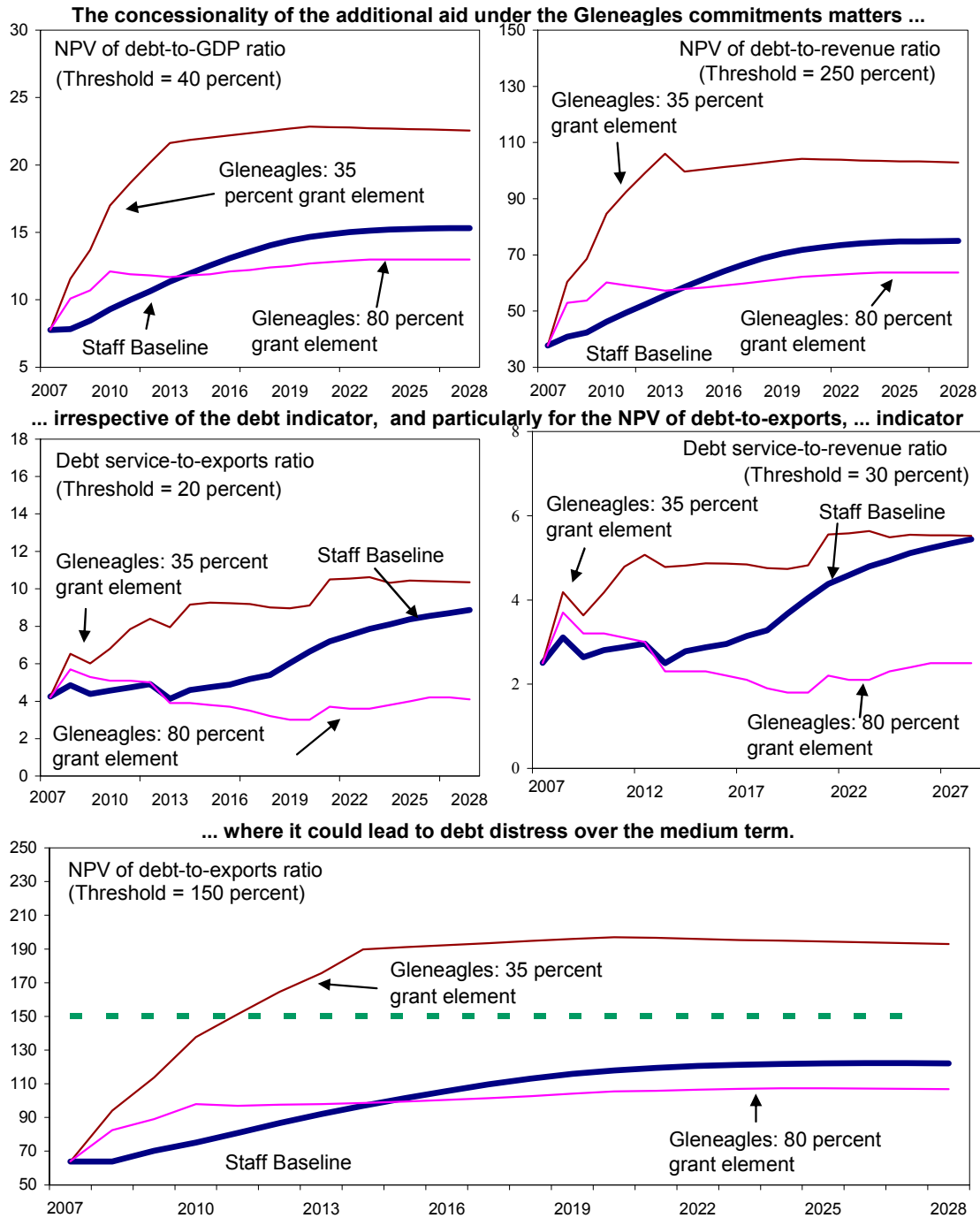
15. **The authorities' commitments to structural and PFM reforms under Fund-supported programs could help mitigate the above-mentioned risks to the Gleneagles scenario.** As in past PRGF arrangements, the Fund-supported program provides time-bound commitments to address structural and institutional impediments to the effective use of aid. Such commitments are then monitored, and adapted if necessary, during semi-annual reviews that ensure effective implementation. Such flexible monitoring could help design necessary policy adjustments to mitigate both positive and adverse shocks.

V. CONCLUSIONS AND POLICY RECOMMENDATIONS

16. **The analysis presented in this note suggests that the Gleneagles commitment could have significant macroeconomic effects for Benin, which could be accommodated under the current Fund-supported program.** As the additional aid would be fully spent, government spending would increase. The assumed effective use of aid would boost economic activity on both the demand and supply sides. This in turn would further improve fiscal revenue collections. The impact on the fiscal deficit would be mixed, but it is not expected to affect fiscal sustainability over the long run. Finally, the Fund-supported programs can accommodate the additional aid inflows of 2.4 percent of GDP, on average, during 2008–10 and 2.0 percent during 2011–15, provided that the debt inflows are highly concessional and thus do not jeopardize debt sustainability.

17. **Appropriate structural and public finance management reforms, with special focus on removing absorptive and administrative capacity constraints, would help mitigate the risks associated with the additional aid.** To the extent that additional resources are used effectively, inflation is projected to rise and the real exchange rate would appreciate accordingly, but macroeconomic stability would not be jeopardized. And the real exchange rate appreciation could be offset through higher productivity in the export sector. Slower implementation of structural reforms could reduce aid effectiveness, limit its positive impact on growth, and increase inflationary pressures. At the same time, weak PFM and institutional capacity could result in lower quality and effectiveness of aid-related spending,

Figure 3. 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 its scaling up impacts on economic fundamentals, including growth, inflation, exchange rate, fiscal revenue, and exports. It assumes an increase in aid from an estimate \$42 per person in 2007 to \$85 per person by 2015. That would imply an additional aid of 2.4 percent of GDP on average in 2008–10, and 2.0 percent in 2011–15.

further reducing the positive impact of aid on medium- long-term growth. In view of these results, staff recommends the following:

For the donor community:

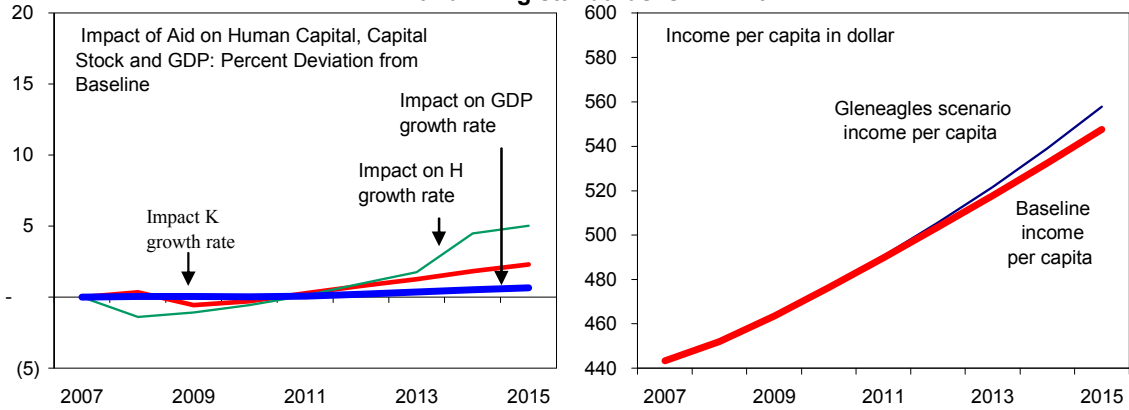
- Economic and social conditions in Benin clearly justify a scaling up of aid to make progress towards the MDGs. The Gleneagles commitments would need to be respected in order for Benin to reach at least some of the MDG targets by 2015.
- Structural and PFM reforms are essential to ensure the effectiveness of the additional aid inflows. In particular, it would be highly desirable to help the government implement those measures already identified to improve public procurement procedures and regulations, and the authorities' institutional capacity to implement their public investment program.
- The debt sustainability analysis of the Gleneagles scenario suggests a grant element of at least 60 percent for the additional aid would limit the risk of debt distress. A grant element of 80 percent would seem appropriate.

For the Beninese authorities:

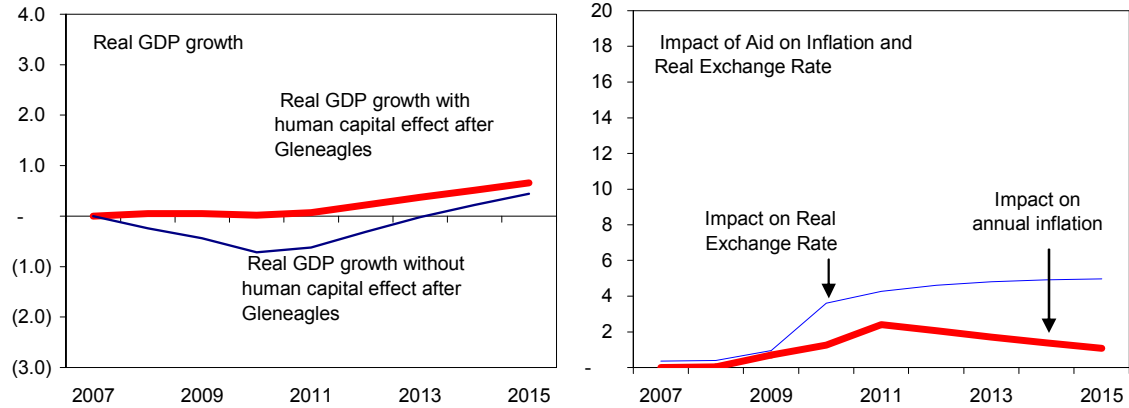
- Structural and PFM reforms are essential to ensure that the scaling up of aid be effectively used to eradicate extreme poverty and improve living standards in Benin. The sooner these reforms can be implemented the lower is the risk to the Gleneagles scenario presented in this note.
- Appropriate fiscal policy and solid administrative capacity are key to maximizing the beneficial effects of aid. In particular, it would be essential to integrate the Gleneagles commitments in the authorities' Medium-Term Expenditure Framework and in annual budgets. The execution rate of the public investment program would also need to be increased significantly.
- Aid composition and related debt implications must be taken into account. The amount of aid-related spending is less of a concern than the quality and effective use of aid. Further improvements in tax policy and tax administration, together with a rationalization of spending (e.g., civil service reform), would also ensure the sustainability of the recurrent spending arising from the Gleneagles scenario.

Figure 4. Benin: Macroeconomic Impact of Aid Under Gleneagles Commitment and With Limited Domestic Capacity, 2007–15

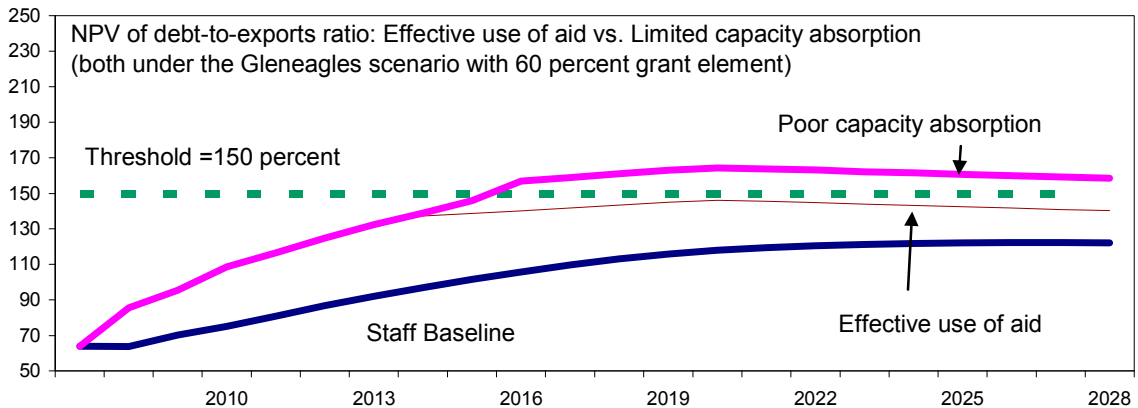
With limited institutional capacity, the impact of the additional aid on growth ... and living standards is minimal ...



... even accounting for additional human capital ... while the impact on inflation, real exchange rate, ...



... and debt sustainability could still be significant.



Source:

NIGER

The scale up in foreign aid envisioned under the Gleneagles Scenario would have a significant impact on the Nigerian economy, considerably fostering economic growth in the medium and long run, while markedly affecting main macroeconomic indicators. However, Niger could be at a higher risk of debt distress unless there is an increase in the grant component of foreign aid.

1. The Gleneagles scenario demands substantial increase in the level of foreign assistance to Niger (see Appendix

1). Additional aid under Gleneagles commitments would raise annual external assistance from CFAF 173.6 billion (8.5 % of GDP) in 2007 to CFAF 561.8 billion (23.6 % of GDP) in 2010, an increase equivalent to 18 percent of 2007 GDP. In contrast, under the program agreed between the authorities and the IMF, foreign assistance is expected to increase

by 2010 to a level equivalent to only 10.2 percent of GDP. The Gleneagles-assumed composition of aid-funded expenditures is the same as the composition of PRSP-related expenditures in 2007, with about 52 percent allocated to health and education programs, and 42 percent assigned to the productive sectors of agriculture and infrastructure. The economic consequences of such a scale up in foreign assistance are expected to be significant.

Aid-Funded Expenditures Under Gleneagles Scenario By Sector (Billion CFAF) **a**

	2007	2008	2009	2010
<i>Total</i>	173.6	288.2	421.8	561.8
<i>(in % of GDP)</i>	8.5	13.3	18.6	23.6
Education	64.9	107.7	157.7	210.0
Health	24.5	40.6	59.5	79.2
Agriculture	36.8	61.1	89.4	119.1
Infrastructure	36.8	61.1	89.5	119.2
Other	10.6	17.6	25.7	34.3
Gender	1.1	1.9	2.7	3.6
Environment	4.3	7.1	10.5	13.9
Governance	3.8	6.2	9.1	12.2
Population and Social Protection	1.0	1.6	2.3	3.1
Other	0.5	0.8	1.1	1.5
Aid Projected under IMF Program (% of GDP)	8.5	10.6	10.6	10.2

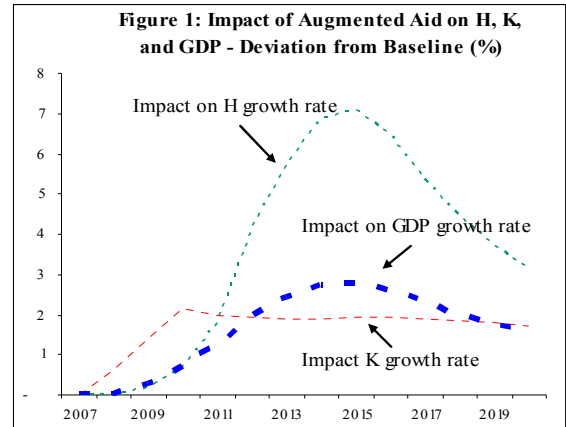
2. **A General Equilibrium Model is used to assess the impact of higher aid on growth and on main macroeconomic indicators.** The model assumes that: (i) all aid is spent and absorbed (i.e., there is no sterilization by the central bank); (ii) aid resources are used efficiently, so that the increase in human and physical capital expenditures have a positive impact on productive capacity; and (iii) aid has a different impact on GDP according to the sector to which aid is allocated (early impact for aid used for infrastructure or productive sectors and late impact for aid used for health and education). Under these assumptions, an increase in foreign aid expands aggregate demand (including imports), causing an appreciation of the real exchange rate. The supply response takes place over several years, eventually stabilizing the real exchange rate and fostering exports.⁹

⁹ The dynamic of the model is straightforward. Consider an increase in foreign aid in year t. Aggregate demand increases that same year as the increase in government consumption and investment is only partially leaked out as imports. Aggregate supply does not increase in year t and therefore the increase in demand leads to price adjustments to equilibrate demand and supply: i.e., domestic inflation increases and the real exchange rate appreciates reducing net exports and the current account balance. In year t+1, the increase in foreign aid boosts production through its effect on physical capital, and a few years later through its effect on human capital. The

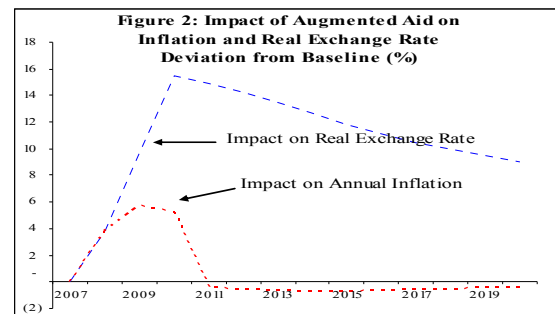
(continued)

Appendix 2 presents both the amount of foreign aid under the baseline assumption that stays at a level equivalent to 9.6 percent of GDP (the annual average level observed in 2005–07), and the amount assumed under the Gleneagles scenario¹⁰. A table of key parameters is presented in Appendix 3.

3. **The impact of scaled up aid on aggregate supply would be substantial.** Over the next ten years the augmentation of aid allocated to agriculture and infrastructure raises the growth rate of physical capital (K) by an average of 2 percentage points and boosts the investment rate to 30 percent of GDP since 2010 (see Appendix 4). The increase in late impact aid implied by Gleneagles increases the rate of human capital (H) formation by an annual average of 4 percent over the long run¹¹ (see Figure 1). Higher growth in the factors of production in turn raise average GDP growth by 1.9 percentage points per year during the following ten years, allowing Niger to increase real income per capita by 60 percent from 2008 to 2020 (as opposed to an increase of about 30 percent under the baseline). Income per capita could be further enhanced if population control programs supported by the PRSP are successful in reducing the current population growth rate of 3 percent per year.



4. **This scenario would be altered if a bigger percentage of aid was to be affected to social expenditures and a smaller one to infrastructure.** With a higher share of foreign assistance being directed to social expenditures the impact of aid on growth in the short term would be smaller, as the impact of these type of



increase of production since year $t+1$ raises income and this in turn expands the main aggregate demand components, including investment. This implies that the increase in foreign aid crowds-in private investment. The expansion of supply since year $t+1$ also eases the pressure on domestic inflation and the real exchange rate.

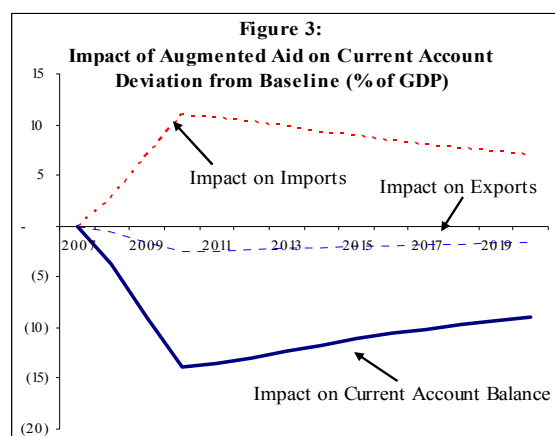
¹⁰ It should be noted that the results of these models applied to LICs are subject to significant uncertainties since: (i) the quality of the data is weak; (ii) parameters are highly unstable through time; and (iii) elasticities are roughly approximated from cross-country calculations.

¹¹ The higher impact of scaled up aid on the accumulation of human capital relative to its impact on physical capital reflects the fact that the increase in government expenditures in health and education implied by Gleneagles more than doubles these expenditures between 2007 and 2010, whereas the funds devoted to physical capital increases this type of investment by less than 50 percent in the same period.

aid on output takes place over a longer time span.

5. **The massive inflow of foreign funds foreseen under Gleneagles assumptions will affect most of the major macroeconomic aggregates (see Appendix 4 and 5).** The increase in demand fostered by higher aid would increase annual inflation to around 7.5 percent in 2009–10 (up from baseline inflation of 2 percent), which would lead to an appreciation of the real exchange rate of 16 percent between 2007 and 2010. However, an interesting outcome of the simulation is that the impact of aid on inflation is short-lived, despite the fact that foreign aid remains at very high levels from 2010. The pressure on domestic prices and the real exchange rate would ease up in the medium run as aggregate supply responds to increased foreign aid.

6. **The scale up in foreign assistance would also cause a substantial widening of the current account deficit, as all aid is absorbed.** The appreciation of the real exchange rate and increased imports generated by higher government expenditures would increase the current account deficit as a share of GDP from 15 percent in 2007 to 30 percent in 2010. This increase corresponds to the inflow of real resources transferred to Niger as a result of aid and does not call for corrective measures.

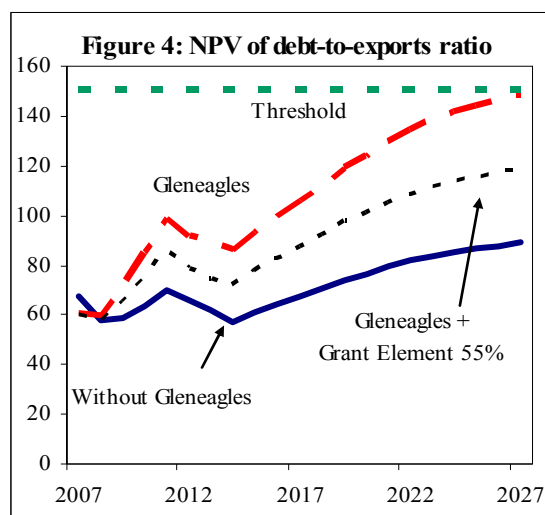


7. **The appreciation of the real exchange rate would reduce moderately the share of exports in GDP.** Nevertheless, the value of exports would still grow by 1 percentage points higher than under the counterfactual of no additional aid, benefiting from the overall supply response to scaled up aid. Exports and output could increase further if foreign aid boosts total factor productivity, which the model assumes exogenous. Given the ample room for increased productivity of exports crops (e.g., tomatoes, onions, livestock, etc), it is not expected that the appreciation of the real exchange rate would have negative long-term effects on agricultural and livestock export sector.

8. **Simulation results would change considerably if aid is not fully absorbed, i.e., if the current account deficit does not expand in line with higher aid.** For instance, if the central bank does not sell the foreign exchange resulting from foreign aid or sterilizes the monetary expansion by selling bonds, aggregate demand would be constrained and the private sector would be crowded out. In this case, inflation and the real exchange rate would not rise as much as shown in Figure 2, and therefore, the current account deficit would not rise by the same magnitude of the additional aid. The lower inflow of foreign goods would result in output growing by less than under the case of full absorption, unless idle domestic resources can fully substitute foreign goods.

9. **Higher aid inflows would have a considerable impact on Niger’s main external debt ratios, unless they have a much higher grant component.** Under the latest 2007 Debt Sustainability Analysis (DSA), Niger is considered to be under a moderate risk of debt distress because in the baseline scenario all debt ratios remain below the thresholds established for a medium policy performer¹², while only a few sensitivity tests lead to violations of these thresholds (see Appendix 6). The baseline scenario in the DSA assumes that grants constitute about two thirds of new aid, and the remaining one third includes loans with an average grant element of 47 percent. This takes into account the recently approved lowering of the minimum grant element for loans to Niger from 50 to 35 percent.

10. **If the Gleneagles-envisioned expansion in foreign aid would preserve the grant component assumed in the latest DSA, several debt ratios come much closer to the thresholds, though without violating them by 2027** (see Appendix 5¹³). Most notable would be the deterioration in the ratio of NPV of debt-to-exports, which would reach 148 percent in 2007, and stabilize around the threshold since then. The increase of this and other ratios under the Gleneagles scenario implies that some stress tests would lead to a violation of thresholds.



11. **Debt sustainability could be safeguarded if the expansion of foreign aid is undertaken either under more favorable terms (e.g., fully in grants) or if reforms are successful in improving Niger’s policy performance, as thresholds are higher for stronger performers¹⁴.** An increase of the average grant element of loans to Niger to 55 percent would significantly reduce debt ratios, many of them returning to their level projected in the latest DSA. An upgrade of Niger’s policy performance would have a stronger effect. The IMF and the World Bank have established debt thresholds that are higher

¹² Niger is considered a Medium policy performer under the template of the IMF/WB Debt Sustainability Analysis since the country’s latest CPIA rating was 3.32, below the minimum 3.75 rating established for strong policy performance.

¹³ These projections incorporate macroeconomic projections using the General Equilibrium model in (Farah et al, forthcoming), adding also the impact to exports and fiscal revenues from the planned Imourarem project, which will almost triple the current volume of Uranium exports by 2014.

¹⁴ The thresholds for Strong policy performers are: 50% for NPV of debt-to-GDP, 200% for NPV of debt-to-exports, 300% for NPV of debt-to-revenue, 25% for debt service-to-exports, and 35% for debt service-to-revenue.

for those countries with better policies and institutions, as rated in the World Bank's Country Policy and Institutional Assessment (CPIA). This is grounded on empirical analysis that finds that countries operating in a stronger institutional and policy environment are likely to experience debt distress only at significantly higher debt ratios (Kraay and Nehru, 2004). Thus, if Niger would upgrade its policy performance from medium to strong, debt sustainability thresholds would increase substantially, so that most debt indicators would remain further below their threshold than was the case in the 2007 DSA.

12. **It is important that the execution capacity of the public administration is improved to better manage the increased expenditures funded by scaled up aid.** The results presented in this assessment hinge on a supply response that has been calculated on the basis of a production function, which neglects any major bottleneck in the accumulation of factors of production. If, for instance, these additional expenditures are only 80 percent as efficient as current projects in accumulating factors of production,¹⁵ GDP would grow by 1.4 above the baseline over the next ten years (0.5 percent less than previously estimated). The weaker supply response implies a lower income per capita by 2020, a larger real exchange rate appreciation by 2010, and an NPV of debt-to exports that surpasses the DSA threshold (see Appendix 7). Hence, the macroeconomic and debt assessment of aid augmentation largely depends on the public administration being capable of executing efficiently the projects that would be funded by additional foreign assistance.

¹⁵ We simulate this scenario by assuming that while 100 percent of aid augmentation has an impact on aggregated demand, only 80 percent of it leads to the accumulation of K or H.

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Appendix 1

*Aid-Funded Expenditures Under Gleneagles Scenario By Sector (Billion CFAF)**

	2007			2008			2009			2010		
	Current	Capital	Total	Current	Capital	Total	Current	Capital	Total	Current	Capital	Total
<i>Total</i>	87.7	85.9	173.6	145.6	142.6	288.2	213.1	208.8	421.8	283.8	278.0	561.8
<i>% of GDP</i>	4.3	4.2	8.5	6.7	6.6	13.3	9.4	9.2	18.6	11.9	11.7	23.6
Education(AID _{LI})	35.2	29.7	64.9	58.5	49.2	107.7	85.6	72.1	157.7	114.0	96.0	210.0
Health(AID _{LI})	20.1	4.4	24.5	33.3	7.3	40.6	48.8	10.7	59.5	65.0	14.3	79.2
Agriculture(AID _{EI})	15.6	21.3	36.8	25.8	35.3	61.1	37.8	51.7	89.4	50.3	68.8	119.1
Infrastructure(AID _{EI})	13.3	23.5	36.8	22.1	39.1	61.1	32.3	57.2	89.5	43.0	76.2	119.2
Other	3.6	7.0	10.6	5.9	11.7	17.6	8.6	17.1	25.7	11.5	22.8	34.3
Gender(AID _{LI})	0.2	0.9	1.1	0.4	1.5	1.9	0.6	2.1	2.7	0.8	2.8	3.6
Environment(AID _{NI})	1.4	2.9	4.3	2.4	4.8	7.1	3.5	7.0	10.5	4.7	9.3	13.9
Governance(AID _{NI})	1.5	2.2	3.8	2.5	3.7	6.2	3.7	5.4	9.1	5.0	7.2	12.2
Population and Social Protection(AID _{LI})	0.2	0.8	1.0	0.3	1.3	1.6	0.4	1.9	2.3	0.6	2.5	3.1
Other(AID _{NI})	0.2	0.3	0.5	0.3	0.5	0.8	0.4	0.7	1.1	0.5	0.9	1.5

* AID_{EI}: Early Impact aid. AID_{LI}: Late Impact aid. AID_{NI}: No Impact aid

Appendix 2

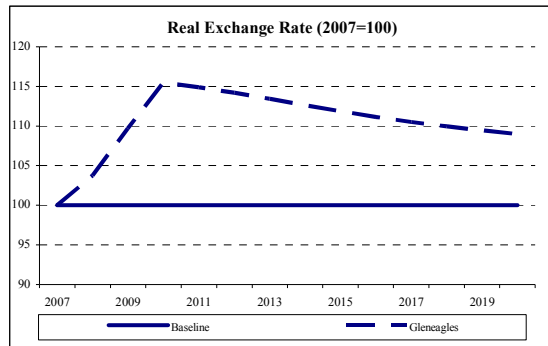
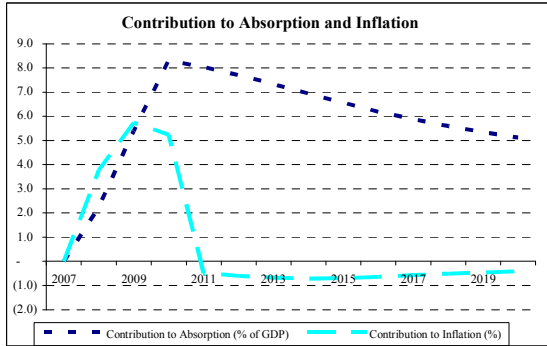
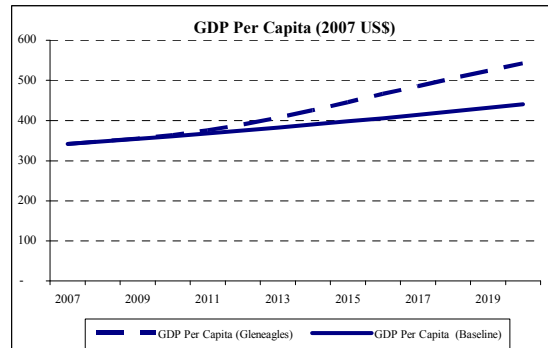
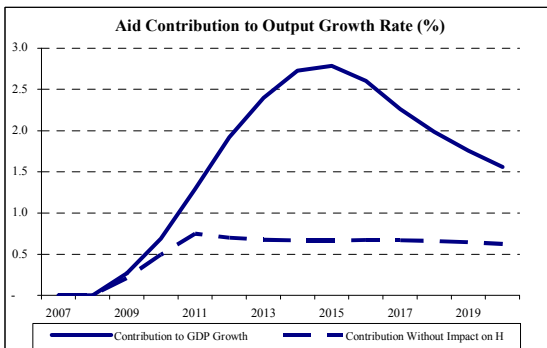
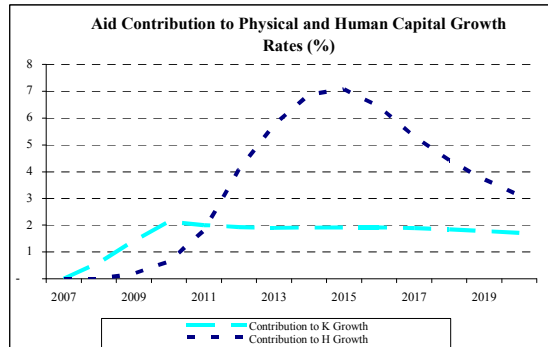
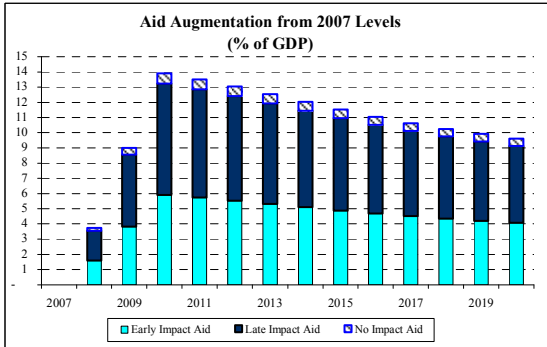
Scenarios of Foreign Aid from 2007 to 2010 (CFAF billion)	2005-07	2008	2009	2010
<i>I. Gleneagles Scenario</i>	197.0	288.2	421.8	561.8
Physical Capital (Early Impact Aid)	83.6	122.2	178.9	238.3
Physical Capital for Education and Health (Laid Impact Aid)	40.6	59.3	86.8	115.7
Consumption in Education and Health (Late Impact Aid)	63.2	92.5	135.4	180.3
Other Consumption (No-Impact Aid)	9.7	14.1	20.7	27.6
<i>II. Baseline Scenario: Keeping Aid Constant as % of GDP since 2005-07</i>	197.0	207.2	217.4	228.2
Physical Capital (Early Impact Aid)	83.6	87.9	92.2	96.8
Physical Capital for Education and Health (Laid Impact Aid)	40.6	42.7	44.7	47.0
Consumption in Education and Health (Late Impact Aid)	63.2	66.5	69.7	73.2
Other Consumption (No-Impact Aid)	9.7	10.2	10.7	11.2
<i>III. Scaling up of Aid (I-II)</i>		80.9	204.5	333.7
Physical Capital (Early Impact Aid)		34.3	86.7	141.5
Physical Capital for Education and Health (Laid Impact Aid)		16.7	42.1	68.7
Consumption in Education and Health (Late Impact Aid)		26.0	65.6	107.1
Other Consumption (No-Impact Aid)		4.0	10.0	16.4
<i>Memo Items</i>				
Baseline GDP	2052.6	2158.8	2264.1	2376.8

Source: Staff Projections based on Gleneagles template provided by the United Nations

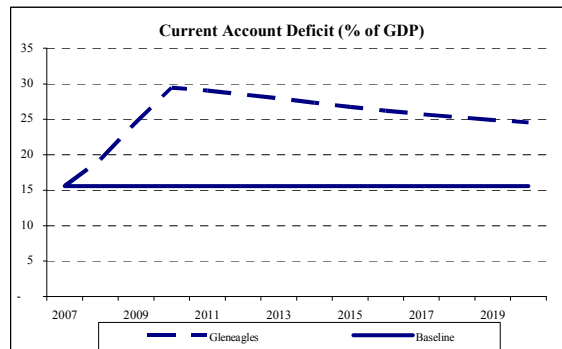
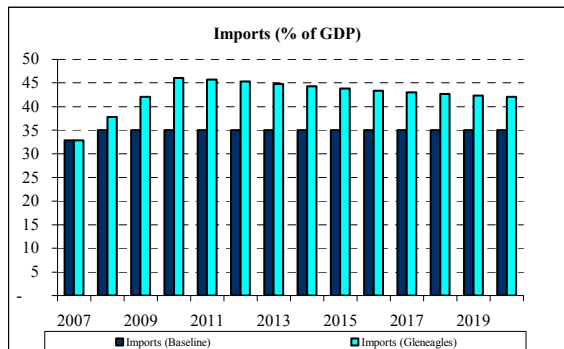
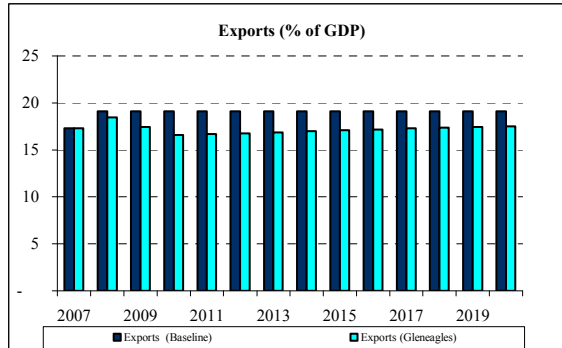
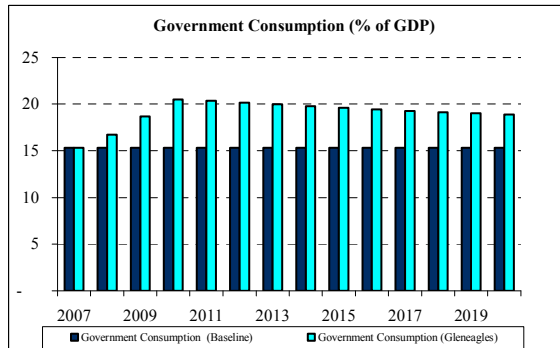
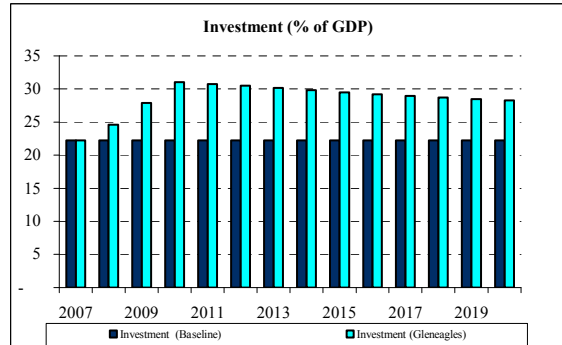
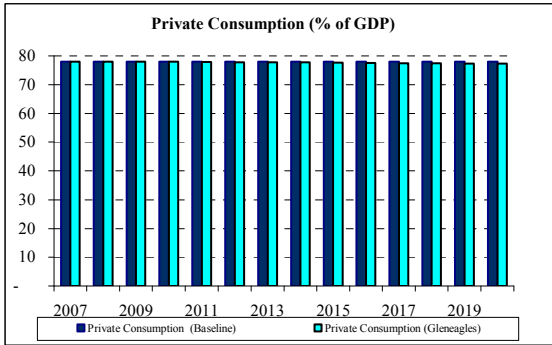
Appendix 3**Assumed Values of Key Parameters for General Equilibrium Simulation**

Parameters	Values
Share of Physical Capital in Production	0.35
Share of Human Capital In Production	0.30
Ratio of Public Investment to Tax Revenue	0.71
Ratio of Private Investment to Disposable Income	0.16
Marginal Propensity to Consume	0.84
Income Elasticity of Exports	1.00
Price Elasticity of Exports	1.00
Income Elasticity of Imports	1.00
Price Elasticity of Imports	1.08
Ratio of Tax Revenue to Disposable Income	0.11
Share Total Aid Spent in Imports	0.40
Ratio of Government Consumption to Tax Revenue	1.40

Appendix 4 Main Macroeconomic Indicators With or Without Gleneagles



Appendix 4 (continued)



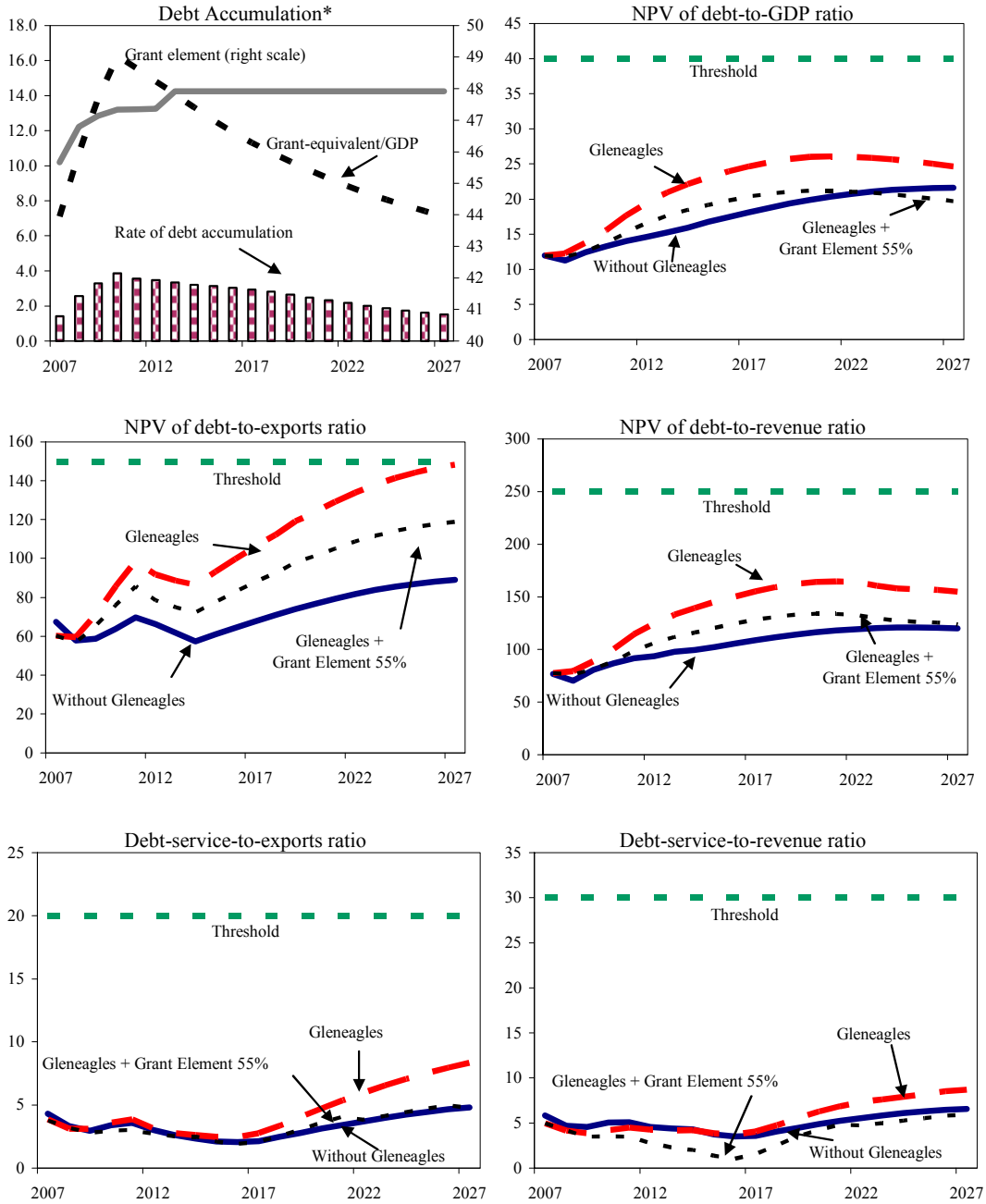
Appendix 5

Selected Macroeconomic Indicators in Niger Under Gleneagles Scenario

	Baseline	Gleneagles Scenario				
	2008-2020	2008	2009	2010	2015	2020
Annual GDP Growth (%)	5.0	5.2	5.1	5.7	7.9	6.8
Annual Inflation (%)	2.0	5.8	7.7	7.2	1.3	1.6
Gross Investment (% of GDP)	22.3	24.6	27.9	31.0	29.5	28.3
Government Expenditure (% of GDP)	23.1	26.9	32.1	37.0	34.7	32.7
Tax Revenue (% of GDP)	10.9	10.9	10.9	10.9	10.9	10.9
Exports of Goods and Services (% of GDP)	19.1	18.5	17.5	16.6	17.1	17.5
Imports of Goods and Services (% of GDP)	35.0	37.8	42.0	46.1	43.8	42.1
Current Account Deficit (% of GDP)	15.6	19.3	24.6	29.5	26.7	24.6
Real Exchange Rate (2007=100)	100.0	103.8	109.7	115.5	111.9	109.0
<i>Memo Items</i>						
Per Capita Income (2007 US\$)						
Baseline		349	355	361	398	440
Gleneagles		349	355	364	446	542
Per Capita Consumption (2007 US\$)						
Baseline		182	191	201	258	332
Gleneagles		182	192	202	288	406

Source: Staff Estimates

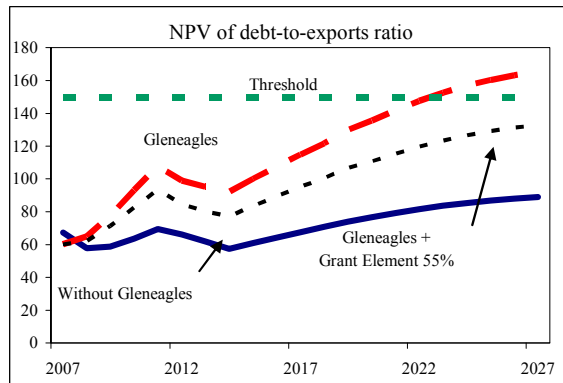
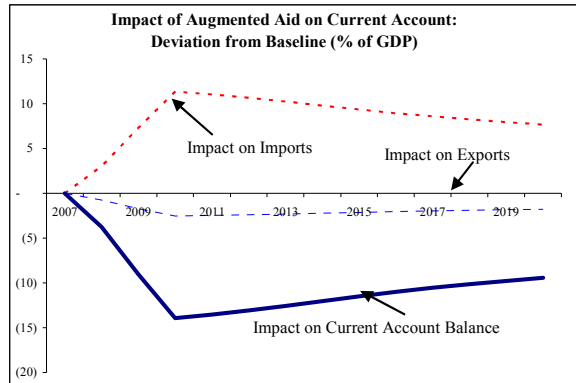
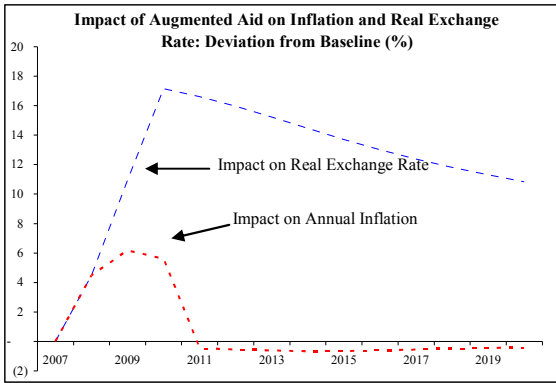
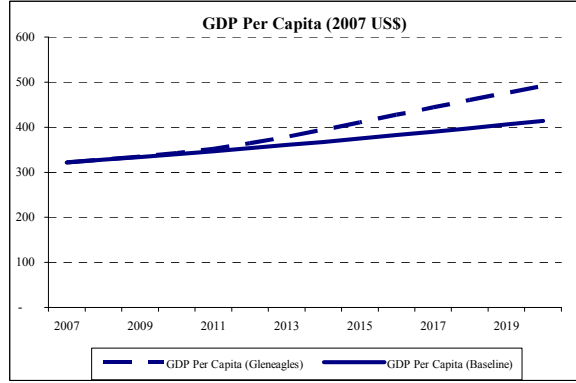
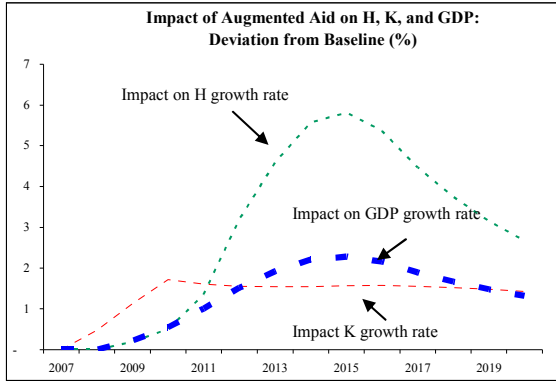
Appendix 6 DSA Based on Gleneagles Assumptions and Composition of Aid of One Third Loans – Two Thirds Grants



Source: Staff projections and simulations.

* Grant-equivalent includes grants provided directly to the government and through new borrowing (difference between the face value and the NPV of new debt). Rate of Debt Accumulation is the annual change in NPV of debt divided by GDP

Appendix 7 Macroeconomic and Debt Assessment Assuming 80 Percent Efficiency of Additional Expenditures¹⁶



¹⁶ This scenario assumes that due to implementation constraints, additional expenditures envisioned under Gleneagles are only 80 percent as efficient as current expenditures in accumulating factors of production.

TOGO

This note summarizes a simulation of a rise in foreign aid to Togo envisaged under the Gleneagles commitments, based on a dynamic stochastic general equilibrium (DSGE) model. The model predicts that such an increase in aid would have a significant effect on Togo's economy, considerably boosting economic growth and GDP per capita. While inflation and the real exchange rate would rise in the short run, the adverse impact on the tradable sector would be relatively limited. The very positive growth response is explained by the significant impact of higher aid on the accumulation of public and private capital, which is starting at a low level after more than a decade of interruption of donor support and depleted public infrastructure. The numerical simulations must be interpreted with some caution, as there is considerable uncertainty regarding key macroeconomic relationships in Togo. A potential caveat is that the economy may not be able to absorb fully the additional aid, given Togo's capacity constraints and a still weak private sector.

1. **The Gleneagles scenario would imply a significant boost in foreign assistance to Togo, far beyond the increase in aid envisaged in the I-PRSP.** After more than a decade of sociopolitical crisis and donor disengagement, Togo has recently embarked on important political and economic reforms, and normalized relations with major creditors and donors. In light of the progress on economic reforms since 2006, on April 21, 2008 the IMF Executive Board approved a three-year PRGF arrangement, paving the way for large arrears clearance operations with major creditors. Foreign assistance is currently still very low by regional standards, at CFAF 22 billion (1.9 percent of GDP) in 2007; Togo's I-PRSP assumes a quadrupling of foreign assistance, to 7.5 percent of GDP by 2010, close to regional averages. While this would be an important success, this would not be sufficient for Togo to achieve the MDGs. The Gleneagles commitments, assumed here, would raise Togo's annual external assistance by much more, to about 17 percent of GDP in 2010.

2. **The macroeconomic consequences of the Gleneagles scenario are analyzed in a DSGE model (see Appendix 1).** The model assumes certain economic parameters and steady-state values for key macroeconomic variables (Table 1), broadly in line with Togo's I-PRSP framework after prospective HIPC-MDRI debt relief. The model simulates the impact of a quasi-permanent increase in foreign aid (grants) in line with Gleneagles commitments, specifically:

- a. annual aid inflows increase to 17 percent (compared to a steady-state of 7.5 percent of GDP after HIPC/MDRI debt relief), and decline to 14 percent of GDP after 20 years;
- b. government spending increases by the same amount, though with a small lag of six months or so (due to minor capacity constraints in implementing higher spending). The Gleneagles spending plans jointly developed by the UNDP and

authorities envision that about half of the additional spending would go to the health and education sectors and another quarter towards infrastructure spending.

3. The Model predicts a significant reallocation of resources in response to the aid increase. Specifically:

- a. The increase in aid-financed government spending (about two-thirds of which is allocated to non-traded goods) leads to an increase in demand for domestic and imported goods and services.
- b. Aid is almost fully absorbed (that is, spent on higher imports), with a minor time lag between the inflow of aid and the actual imports. This reflects the assumption that additional income earned in the non-traded private sector is ultimately spent on imports, rather than saved.
- c. Higher demand for non-traded goods leads to an increase in prices in this sector, which—through higher wages and profitability—helps to attract factors from the tradable sector (Figure 2). The increase in wages and prices in the non-traded sector is large (they increase by double-digit rates initially), but overall inflation rises more moderately on account of relative price stability in the tradable sector: inflation peaks at about 5 percent in the first year before reverting to the steady-state of 2 percent. The real exchange rate, measured as the relative price of tradable and non-tradable goods, appreciates noticeably, which is a key element in the transmission mechanism of shifting resources from the tradable to the non-tradable sector.¹⁷ Non-traded production is projected to increase by about 9 percent in the first year, whereas output in the tradable sector contracts. In the longer term, tradable output recovers and eventually surpasses its previous steady state level on account of strong investment.

4. The model predicts that a permanent large increase in aid would have a substantial and permanent positive impact on growth and per capita GDP. In particular, GDP growth is 1 percent higher on average over the first ten years. The positive impact of higher aid on the accumulation of public and private capital is relatively large, given Togo's low starting point after more than a decade without donor support and deteriorating capital stock. Specifically, government investment could rise from 8 percent of GDP to about 16 percent in two years (private investment stays relatively constant because disinvestment in

¹⁷ The price elasticities of imports and exports to the real exchange rate help determine the required real appreciation in the model in response to the increase in aid. The price elasticity of import is set to 1.5. While there is no parameter in the model that directly captures the price elasticity of exports, the reduced form elasticity is close to 1.2.

the tradable sector offsets initially strong investment in the non-tradable sector).¹⁸ The actual growth response may be even higher if the model were to allow a stronger labor market response, which may be possible in Togo, given large currently low participation in the formal labor market.

5. **A caveat of the simulation is that it does not explicitly model Togo's limited absorptive capacity, given weak public institutions and a poor business environment.**

Possible pitfalls include:

- a. **Diversion of aid to government consumption:** If the government uses aid primarily for additional consumption, the rate of capital accumulation may be less than predicted in the model.
- b. **Delays in project execution:** Limited government capacity may delay or even the use of aid for spending and absorption, leading to an accumulation of international reserves and reducing the positive impact of aid on per capita GDP.
- c. **Capital outflows:** Higher aid may lead to significant capital outflows, especially given Togo's relatively poor business environment. If returns to private capital are very low or risky, the private sector could end up using the foreign currency proceeds from aid to accumulate foreign assets, rather than import much needed capital goods. This could reduce the positive impact of aid on private investment and growth.
- d. **Skills shortages and supply rigidities:** Given skill shortages, depleted infrastructure, and a poor business environment infrastructure, the supply response to the aid-financed increase in demand for non-traded goods and services may be much weaker than the model assumes. In this case, wages would be pushed up, while the impact on investment growth may be limited.
- e. **Model uncertainty:** The quantitative projections are highly uncertain. In particular, they reflect a number of difficult-to-verify assumptions. In general, these come from data on the Togo economy and from the broader literature. But substantial uncertainties remain. Perhaps most notable in the context of these scaling up scenarios are the assumptions regarding the productivity of public investment.
- f. **Effects of other reforms:** The simulated growth rates do not take into account the effect the productivity increases that could arise from improvements in PFM and implementation of structural reforms.

¹⁸ It is assumed that 70 percent of all public investment projects are efficient, while the remaining 30 percent would not lead to an increase in public capital.

6. **The model is also simulated under alternative assumptions to assess two distinct downside risks.** Under the first alternative calibration, it is assumed that public spending has a limited impact on public capital (equal to half of the previous effect). This can be the case if a large fraction of aid ends up being consumed rather than invested or if public investment projects are inefficient. Under the second scenario, it is assumed that the temporary contraction in exports, that follows from the real appreciation, leads to a persistent decline in productivity in that sector (what is referred to as Dutch Disease). Figure 3 displays the implications for growth under these alternative scenarios. On average, annual GDP growth is 0.5 percent lower if public spending is 50 percent less productive, and 0.3 percent lower if there is Dutch Disease.

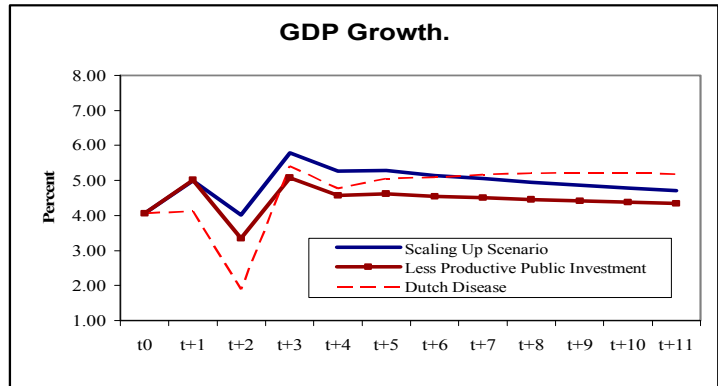


Table 1. Togo: Steady State Values**National Income accounts (as a share of GDP)**

Private spending	100.7
Private consumption	87.6
Traded sector	60.0
Non-Traded sector	27.6
Private investment	13.1
Traded sector	8.4
Non-traded sector	4.7
Government Spending	24.7
Government consumption	16.3
Government investment	8.4
Government spending on traded goods	5.3
Government spending on non-traded goods	19.4
Trade Balance	-25.4
Exports	44.6
Imports	70.0
Value added in the non-traded sector	45.0
Value added in the domestic traded sector	55.0

Government accounts (as a share of GDP)

Spending	24.7
Taxes	18.0
Aid	7.5
Seigniorage	0.0
Interest payments	0.8
Government debt	25.0
Of which: held by the central bank	0.0
Government deposits at the central bank	1.0

Central Bank Accounts

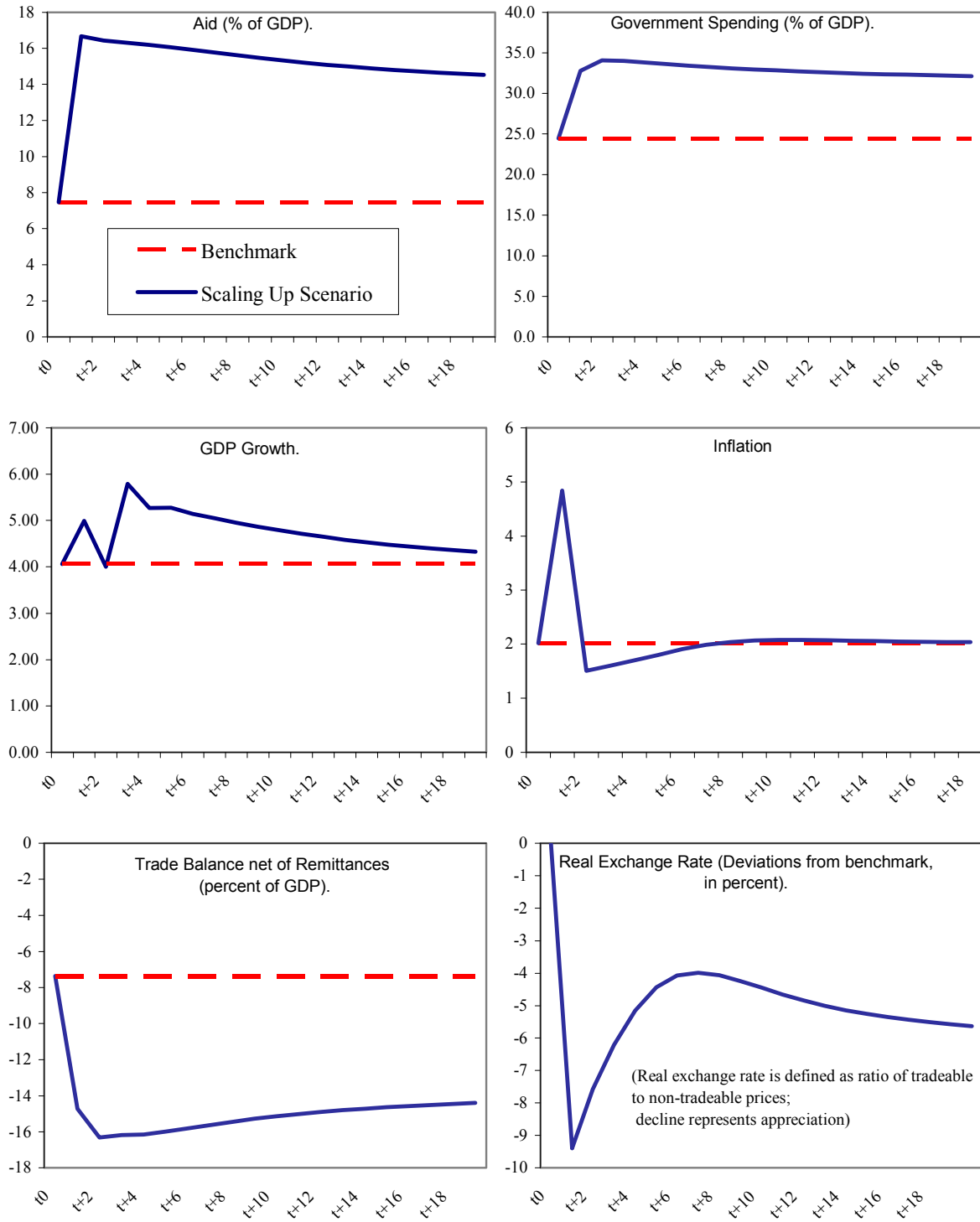
Government debt held by the Central Bank	0.0
Government deposits at the Central Bank	1.0
Net Foreign Assets (Reserves)	14.0

Assets (as a share of GDP)

Real money Balances (Base money/Broad money)	13.0
Foreign assets held by the private sector	2.0
Government bonds held by the private sector	25.0
Annualized Inflation, nominal depreciation	0.0
Annualized Nominal interest rates	4.8
Annualized Real interest rates	3.0

Source: Fund staff estimates.

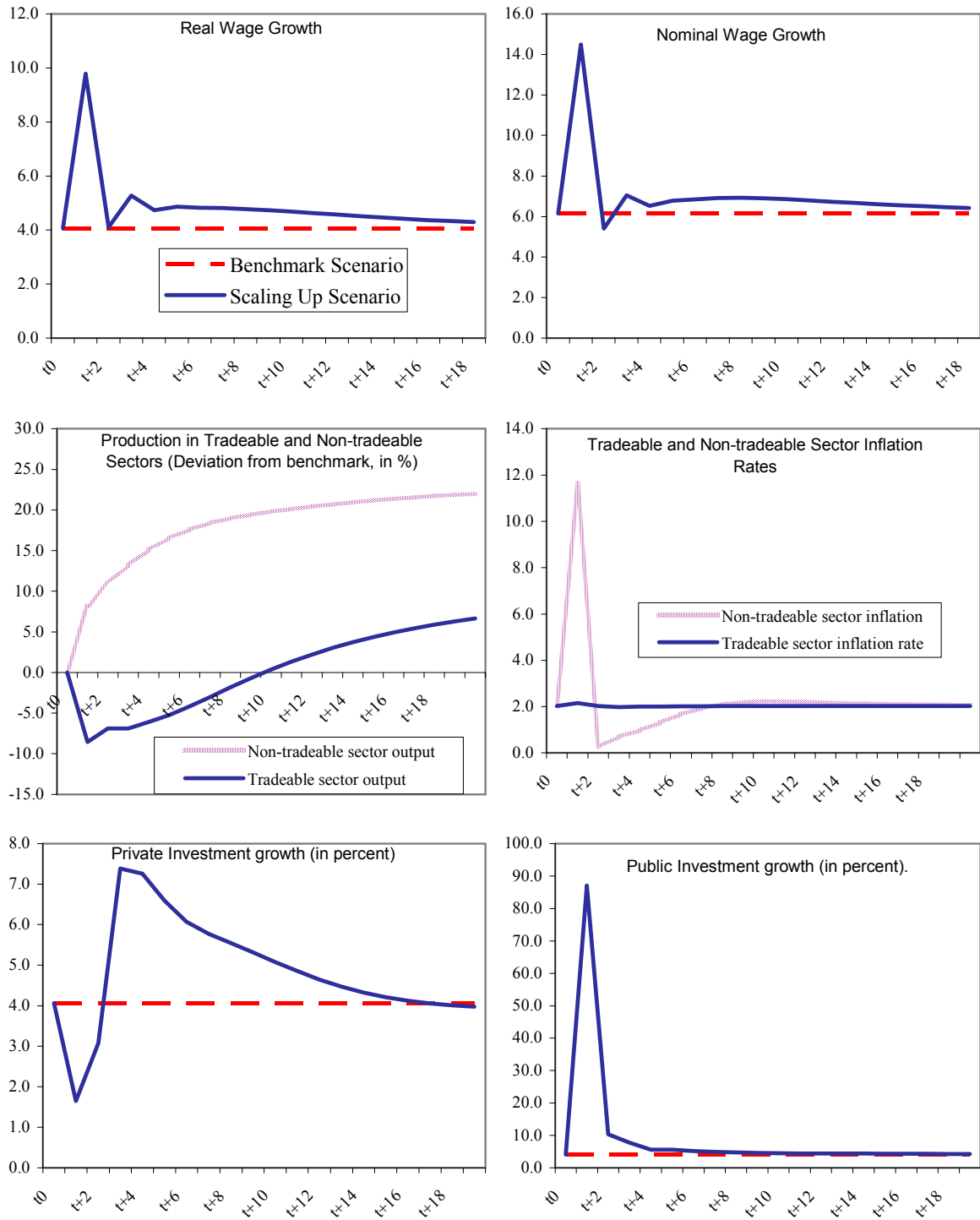
Figure 1. Togo: Scaling Up Scenario 1/



Source: Fund staff estimates.

1/ Results are in percent unless otherwise indicated, and the time period is annual.

Figure 2. Togo: Scaling Up Scenario



Source: Fund staff estimates

Appendix 1

The DSGE model

The model represents a small open economy model, with multiple sectors (exportables, non-traded and imports) and economic agents (firms, households, a government and a central bank). It can be summarized as follows:

- Consumers/Workers decide how much labor to supply, make savings decision, invest in different types of financial assets (domestic government debt, foreign assets and money) and allocate consumption between different goods (non-traded, exportables and imports).
- Firms in different sectors must decide the optimal amount of labor to hire, how much real investment to undertake, and how to set prices. Firms in the non-traded sector are subject to price adjustment costs, which leads to a new-Keynesian Phillips curve for non-traded goods inflation. Firms in the exporting sector are exposed to potential learning by doing effects, which imply that a temporary contraction in exports—resulting from a real exchange rate depreciation— can have near-permanent effects (what is often referred as “Dutch Disease”).
- There is a single labor market, where firms from both traded and non-traded sectors interact with workers to determine wages and employment. Wage setting is also subject to adjustment costs.
- The government must choose how to allocate the aid transfer between public savings, consumption or investment and whether to spend on local goods and services or imports. The government also taxes labor income and receives seigniorage revenue from the Central Bank.
- The Central Bank intervenes in both FX and domestic debt markets to accumulate reserves, sterilize foreign inflows and/or ensure the stability of the fixed exchange rate regime.
- Additional features include limited international capital mobility and steady state growth.

The output of the model is a sequence of all macroeconomic variables (prices and quantities, real and nominal variables) which clears all markets for goods, factors and financial assets over time. For more details, see Berg, Andrew, Tokhir Mirzoev, Rafael Portillo and Felipe Zanna, “Large aid flows and monetary policy in a DSGE model: the case of Uganda” IMF Working Paper (forthcoming).