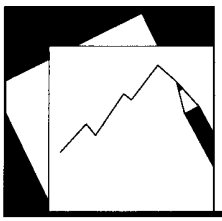
WP/08/117



IMF Working Paper

Calculating Sustainable Non-mineral Balances as Benchmarks for Fiscal Policy: The Case of Botswana

Jens R. Clausen

INTERNATIONAL MONETARY FUND

 WP/08/117

IMF Working Paper

African Department

Calculating Sustainable Non-mineral Balances as Benchmarks for Fiscal Policy: The Case of Botswana

Prepared by Jens R. Clausen[1]

Authorized for distribution by Francesco Caramazza

May 2008

Abstract

Assuming a social welfare function that smoothes expenditure, this paper calculates a sustainability benchmark for the non-mineral balance in Botswana that is based on a notion of a "permanent income" from non-renewable resources. It is derived by constructing a hypothetical annuity from revenues from these resources, which is held constant in terms of GDP. Botswana is an interesting case because current projections suggest that diamond resources could be largely exhausted within a generation.

JEL Classification Numbers: E21, E24, H62, Q32, Q38

Keywords: Non-mineral balance, non-renewable resources, sustainability, fiscal policy

Author's E-Mail Address: jclausen@imf.org

[1] I am very thankful to Janet Stotsky for giving me the opportunity to join the 2007 Article IV mission team to Botswana and for providing continuous guidance and feedback to this project. I am also grateful to Olivier Basdevant and Helmut Franken for discussing with me their work on Botswana and Equatorial Guinea, and to Norbert Funke for valuable feedback. Earlier versions of this research also benefited from useful comments from Daniel Leigh, Jan-Peter Olters, Martin Petri, Mauricio Villafuerte, and Mark Horton as well as from participants at AFR's Fiscal Network brown bag lunch. The usual disclaimer applies.

Contents Page

I. INTRODUCTION

Resource-rich countries must decide how much to spend now and how much to save of the revenues from non-renewable resources. Many countries with non-renewable resources have been accumulating large pools of savings in recent years, with oil and commodity prices at all-time highs. Some are funneling these savings into Sovereign Wealth Funds (SWFs), which are making headlines because the sheer size of the assets they manage has raised questions about the investment motives of the governments that control them and whether SWFs need to adhere to greater standards of transparency (see, e.g., *Economist*, 2008). Other countries are accumulating reserves in central banks or elsewhere, without creating explicit SWFs, but the discussion about the management of these funds has similar elements. An important aspect of the issue is how countries with non-renewable resources make decisions about whether to save rather than spend revenues from these resources.

The issue of how to use revenues derived from non-renewable resources has a long history. Hotelling (1931) found that the rate of exploitation of a non-renewable resource is efficient if the rate of increase in its price equals the discount rate. Barnett and Ossowksi (2003) focus on the sustainability and intergenerational equity of fiscal policies in oil-rich countries. They show that in order to preserve government wealth, which is defined as the present value of future revenue streams, the optimal path of the non-oil deficit depends on the return on government wealth. This requires the government to ensure that its expenditure does not exceed its permanent income and to accumulate financial assets during years of oil production. The return on these assets can then finance the non-oil deficit once oil revenue dries up. Recent studies that analyze fiscal sustainability in resource-rich countries build on this approach (e.g., Olters, 2007; Carcillo, Leigh, and Villafuerte, 2007; Jafarov and Leigh, 2007). Basdevant (2007) provides an earlier application of the permanent income hypothesis to fiscal spending in Botswana. This paper, however, differs from the earlier work in that it assumes a different profile of future revenue and in that it focuses on calculating a sustainable non-mineral balance as a benchmark for fiscal policy.

Drawing on Barnett and Ossowski (2003), this paper discusses a simple practical approach to calculating sustainable non-mineral balances as a benchmark for fiscal policy. It suggests comparing the actual fiscal stance against a benchmarked stance that could be used to augment an existing fiscal policy framework. Assuming a simplified social welfare function that smoothes expenditure—a reasonable assumption for a middle-income country—this paper calculates a sustainability benchmark for the non-mineral balance in Botswana based on a notion of a "permanent income" from non-renewable resources. Such a benchmarked balance can then guide spending decisions and revenue goals. The practical aspect of this paper is that it assumes that the contribution to spending from mineral revenues is phrased in terms of GDP and kept flat. This is convenient because fiscal goals are also often stated in terms of GDP and since it ensures a simple distribution of mineral wealth over time. Botswana is an interesting case in that current projections suggest that diamond resources could be largely exhausted within a generation, and easily mined resources within the next 15 years.

It is important to look at the non-mineral primary balance since the overall fiscal balance often does not tell the whole story (see Barnett and Ossowski, 2003). Overall balances can improve due to higher revenues from resources and can be misinterpreted as "fiscal consolidation" or "fiscal adjustment.". When revenues from non-renewable resources rise, a fiscal expansion can be temporarily masked by an improving overall balance.

The non-mineral (or non-oil) primary balance is an important fiscal indicator for a resource-rich economy. By excluding mineral-related revenues and expenditures and net interest from the overall fiscal balance, it provides a picture of the fiscal situation abstracting from the mineral sector. The non-mineral primary balance can provide an analytically important tool in that it is a useful measure of the fiscal effort and underlying fiscal policy stance. It can therefore be a key input for a fiscal sustainability and intertemporal analysis.

The following first describes the international experience on fiscal frameworks in selected resource-rich countries (section II.A), then discusses the permanent income hypothesis (II.B), and a mathematical representation of how to calculate sustainability benchmarks (II.C), before tailoring the process to Botswana (section III). A sensitivity analysis looks at the impact of varying assumptions and the robustness of the results before concluding.

II. Fiscal Policy in Resource-Rich Countries:

A. International Experience

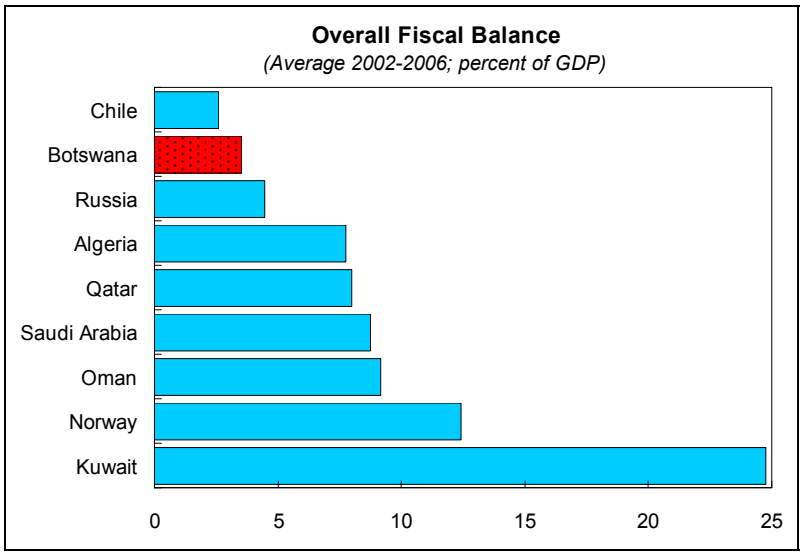
This section is intended to provide an international context by describing how some selective resource-rich countries conduct fiscal policy. Norway's and Chile's fiscal frameworks are often cited as benchmarks for conducting fiscal policy in resource-rich countries.

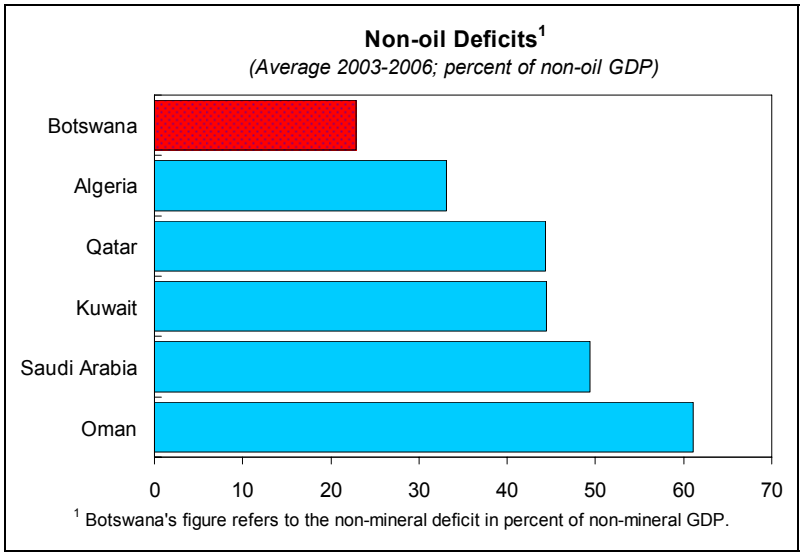
Norway:[2] Formerly known as the Petroleum Fund, the Government Pension Fund – Global is the recipient of petroleum revenues and transfers to the budget the amounts needed to finance the non-oil deficit. At end-2006, the fund's assets were worth 114 percent of GDP. Currently, it manages around US$350 billion. The Pension Fund's stringent transparency and accountability rules are setting benchmarks and other countries are using Norway's standards as models for their own funds. Fiscal policy in Norway is anchored by a guideline that the government's *structural non-oil deficit* is supposed not to exceed 4 percent of the total financial assets of the pension fund. The rationale for this guideline is that the long-run real return on these assets is assumed to be 4 percent (the annual net real return has been 4½ percent since 1997). Referring to the non-oil deficit in budget documents—as is the case in Norway—helps make the dependence on revenues from natural resources more transparent and thus contributes to a more long-term-oriented fiscal policy.

[2] See Norges Bank (2007) and Jafarov and Leigh (2007) for more details.

Chile:[3] Fiscal policy is anchored by a *structural surplus rule* that aims at maintaining a cyclically-adjusted surplus of ½ percent of GDP in the accounts of the central government. Under the rule, the government saves all copper-related revenues, including from private enterprises and the state copper company, in excess of the revenue level that would correspond to a long-term reference price. Other central government revenues are smoothed over the business cycle, using an estimate of potential output. These structurally-adjusted revenues (revenues with a zero output gap and world copper prices at their reference level) minus expenditure are to equal ½ percent of GDP. Chile adopted this rule in 2000 to smooth out the impact of volatile copper prices. By saving copper revenue when copper prices are high, the government can avoid the economy from overheating in an upswing and the savings can be used in a downturn.

Experience elsewhere: Other countries deposit a predetermined share of oil or total revenues in a fund. Some countries have changed, bypassed, or eliminated rules governing resource funds. Recent experience has highlighted that the specific setup of fiscal institutions is only as good as the political will or governance behind it.





To assess how sustainable fiscal policy is in the medium- to long-run, it is important to compare the actual fiscal stance against a benchmarked balance. A simple look at the non-oil or non-mining balance (even if the cyclical component is subtracted) is not sufficient to assess the long-run sustainability of fiscal policy. The non-oil balance in percent of non-oil GDP shows what the fiscal stance would look like if oil revenues and its GDP component were to disappear instantly from the economy. If they did, a sizeable overall fiscal surplus as a percent of GDP might turn into a substantial non-oil deficit as a percent of non-oil GDP (see in the charts, for example, Kuwait). However, a large non-oil deficit in

[3] See IMF (2007) and Kumhof and Laxton (2007) for more details.

itself need not raise concerns. A separate sustainability analysis is necessary to look, among other things, at how fast resources are likely to be exhausted.

B. The Permanent Income Hypothesis

There is a strong case for smoothing fiscal expenditure in resource-rich countries and thereby saving part of the revenues from these resources for the future. First, adjusting spending rapidly and abruptly is costly and inefficient. Thus, it is advisable to insulate the budget as much as possible from the impact of fluctuating resource revenues and allowing a smoother and more rational path for public spending (as, for example, Norway and Chile are doing). Second, when a nation's public wealth is primarily derived from exhaustible resources, the optimal use of revenues from them raises questions of sustainability and intergenerational equity: How much should a government save for future generations? What level of public consumption can be maintained after natural resources have been exhausted?

The degree of smoothing of expenditures is difficult to determine and should ultimately reflect government spending priorities.[4] In a middle-income country like Botswana, the government seeks to maintain a relatively constant or even increasing level of public services over time. To have the income in the future to sustain these services, it is important that the government balances the trade-off between spending and saving from the revenues that result from exploiting non-renewable resources.

The permanent income hypothesis suggests that a government spend only the "permanent" part of revenue and save the rest. The return on fiscal savings would help sustain spending in times when revenues from natural resources are temporarily low or as natural resources are exhausted. One way to look at this is to compute a "permanent" income, transforming the projected stream of mineral revenues (*revenues*) into a hypothetical annuity with the same present value as the revenues:

$$present\ value\ of\ revenues = \sum_{t=0}^{T} \frac{revenues_t}{(1+r)^t}\ ;\ present\ value\ of\ annuity = \sum_{t=0}^{T} \frac{annuity_t}{(1+r)^t},$$

$$\sum_{t=0}^{T} \frac{revenues_t}{(1+r)^t} = \sum_{t=0}^{T} \frac{annuity_t}{(1+r)^t}.$$

The annuity is hypothetical in the sense that it is used only to compute the "permanent" part of mineral revenues, but the minerals in the ground are not actually sold for a financial instrument.

[4] In a developing country with many still unmet needs, there could also be a case for spending mineral revenues upfront (Takizawa, Gardner, and Ueda, 2004). Ultimately, the level of spending should not depend on current revenues from non-renewable resources but should be determined in light of the likely quality of this spending, the government's capacity to manage it effectively, and its time preference, issues that are beyond the scope of this paper.

C. Mathematical Representation of How to Calculate Benchmarks

Calculating sustainability benchmarks assumes that "permanent" income equals the annuity plus non-mineral revenues. Expenditure is set equal to this "permanent" income, which implies smoothing expenditure over time. The *benchmarked overall balance* (*BOB*) implies saving the difference between actual mineral revenues (*MR*) and the annuitized mineral revenues (*A*). This follows from the following:

"Permanent" income (*PI*) = Annuity (*A*) + Non-mineral revenues (*NMR*) (1)

Expenditure (*Ex*) = "Permanent" income (*PI*) (2)

Revenue projection (*R*) = Mineral revenues (*MR*) + Non-mineral revenues (*NMR*) (3)

Benchmarked overall balance (*BOB*) = Revenue projection (*R*) – Expenditure (*Ex*) (4)

Inserting (1), (2), and (3) into (4) yields:

$$BOB = R - PI = MR + NMR - (A + NMR) = MR - A$$

with *MR* standing for mineral revenues, *NMR* non-mineral revenues, *A* the annuitized mineral revenues.

The benchmarked non-mineral balance is equal to the difference between non-mineral revenues and "permanent" income (non-mineral revenues and the annuity). The *benchmarked non-mineral balance* (*BNMB*) implies that it is sustainable to run a non-mineral deficit the size of the annuity (*A*), which follows from the following:

Benchmarked non-mineral balance (*BNMB*) = Non-mineral revenues (*NMR*) – Expenditure (*Ex*) (5)

Inserting (1) and (2) into (5) yields:

$$BNMB = NMR - PI = NMR - (A + NMR) = -A$$

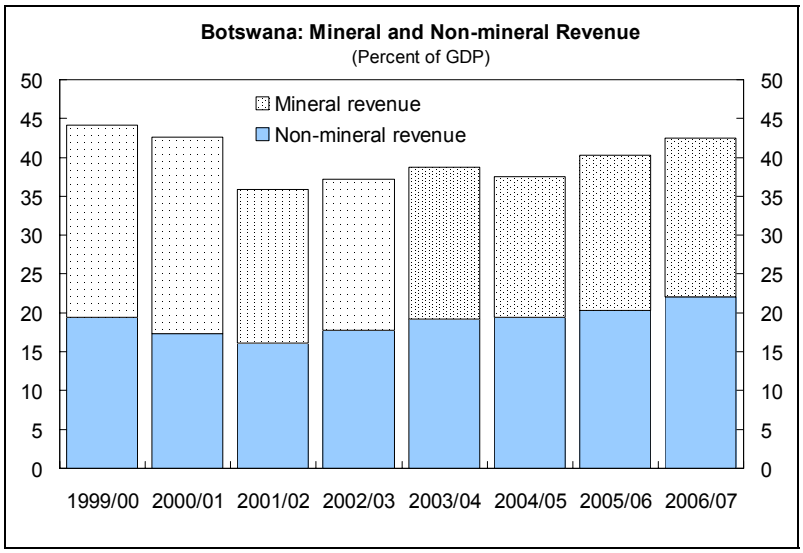
with *NMR* being non-mineral revenues and *A* the annuitized mineral revenues.

Before applying this methodology to Botswana, we briefly discuss the economic background in Botswana.

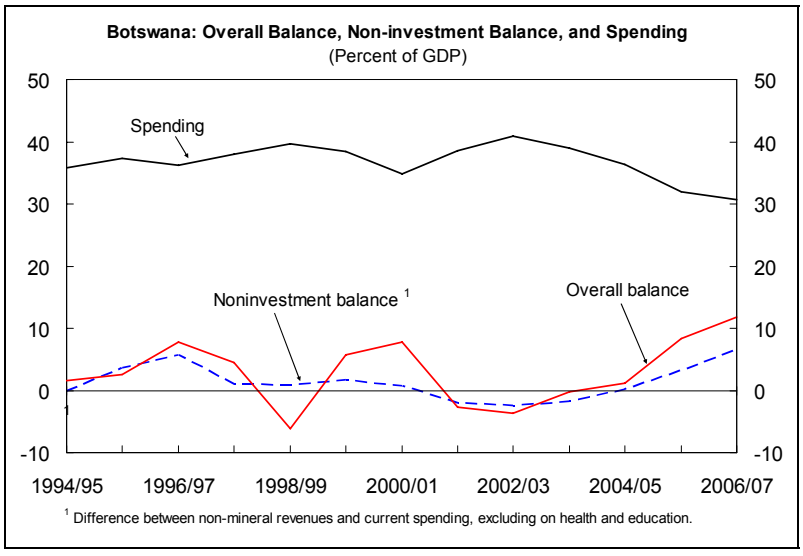
III. The Case of Botswana

A. Background

Botswana is a diamond-rich middle-income country that faces a likely sharp decline in the production of its most valuable resource within a generation.[5] Currently, diamond exports make up about 75 percent of total exports. Revenues from minerals constitute around half of government revenues (Text Figure). However, a steep decline in diamond production is expected around 2021—absent significant new discoveries or improvements in existing technologies.



The authorities in Botswana have met three of their fiscal objectives laid out in their policy documents (among them the mid-term review of the National Development Plan 9, which is to end in 2009). The government has (i) achieved a budget surplus in most years (Text Figure); (ii) kept spending below the ceiling of 40 percent of GDP, and (iii) has also mostly achieved a surplus in the "non-investment" balance—defined by the authorities to be the difference between non-mineral revenues and current spending (excluding expenditure on health and education, which the authorities regard as investment in human capital).



The "non-investment balance" is a useful indicator. A positive non-investment balance—keeping current spending (excluding expenditure on health and education) below non-mineral revenues—means that mineral revenues will be the main source of funds for

[5] See Iimi (2006) for a discussion of whether Botswana avoided the resource curse and Deléchat and Gaertner (2008) for an analysis assessing the external stability and the level of the exchange rate in Botswana.

expenditure on physical and human capital. However, there are certain drawbacks. Among them the problem that the non-investment balance does not take into account that with declining mineral revenues it then becomes necessary to find alternative funds to replace and expand capital infrastructure in the future.

B. Calculating Sustainable Non-mineral Balances for Botswana

The calculation of the annuity is based on several assumptions, which will be varied to test for robustness: (i) diamond production will sharply decline around 2021;[6] (ii) US dollar prices for diamonds will stay constant in real terms; (iii) the real return on *future* savings is 4½ percent;[7] (iv) the income from annuitized mineral revenue is spread until 2050 to keep the time horizon realistic from a political economy point of view and also to recognize the uncertainty about resource discoveries and the growth of non-mineral revenues; and (v) the hypothetical annuity is programmed to stay constant in terms of GDP:

$$\text{find } annuity_{t=0} \text{ so that } \sum_{t=0}^{T} \frac{annuity_t}{(1+r)^t} = \sum_{t=0}^{T} \frac{revenues_t}{(1+r)^t}$$

$$\text{with } annuity_t = annuity_{t-1} \cdot \left(1 + \left(\frac{GDP_t - GDP_{t-1}}{GDP_{t-1}}\right)\right).$$

While we also present a scenario in which the annuity is programmed to stay constant in real terms (see below), the assumption here is that the contribution to spending from mineral revenues—the annuity—is flat over time in terms of GDP. Programming it in terms of GDP ensures that initial savings are significant while mineral revenues are still high. Also, with regard to communicating the analysis to policy makers and the public, phrasing it in terms of GDP seems intuitive since fiscal goals are often stated in these terms as well.

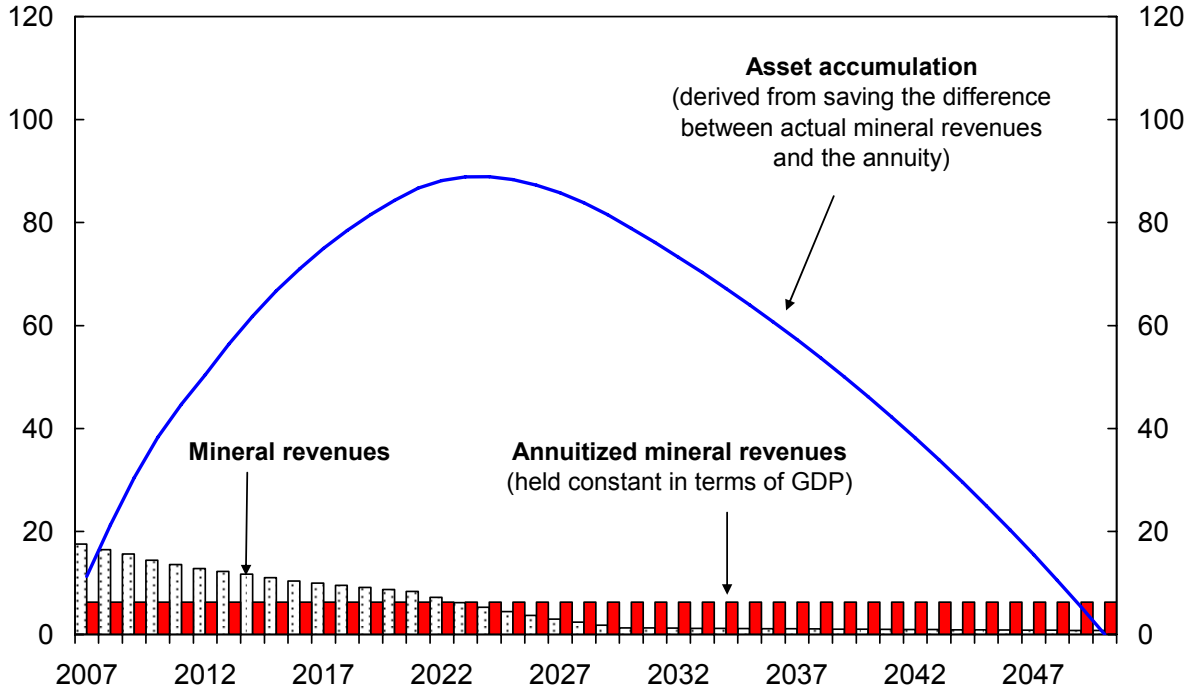
As demonstrated above, the amount saved each year equals the difference between actual mineral revenues and the value of the annuity (see also Figure 1). The annuity is thus a conceptual device to help determine the appropriate level of annual savings for accumulation in a wealth fund from which expenditures can be funded once mineral revenues decline. An annuity programmed to be constant in terms of GDP (here computed at 6⅓ percent of GDP) requires high initial savings. With declining mineral revenues, the amount saved each year decreases. In 2023, when mineral revenues are projected to be lower than the value of the annuity, the stock of assets starts declining from a peak of close to 90 percent of GDP until all savings are consumed in 2050.

---

[6] The analysis does not explicitly incorporate projections about minerals other than diamonds.

[7] The assumption on the return of savings is based on the experience of the Norwegian Pension Fund (Norges Bank, 2007). The past rates of returns of the Pula Fund are unknown. The stock of savings in the Pula Fund are not considered in this analysis to focus on the effect of *future* savings.

Figure 1. Botswana: Mineral Revenues, Annuity, and Asset Accumulation
(Percent of GDP)



Source: author's calculations.

Applying this methodology to Botswana, the benchmarked balances suggest that continued fiscal restraint is needed to achieve long-term fiscal sustainability (Table 1). The benchmarked non-mineral balances derived from a permanent income suggest a lower deficit in 2007 and 2015 (corresponding to a higher surplus in the overall balance) compared to the projected balance—with the exception of scenario (c), in which part of the restraint needs to take place later. The calculations suggest a range of sustainable non-mineral deficits of between -9 and -19 percent of non-mineral GDP in 2007, while the non-mineral deficit is projected at -17½ percent of non-mineral GDP—below the midpoint of the range. For the overall balance, the estimated benchmarked balances suggest a sustainable range of surpluses between 6 and 12 percent of GDP for 2007, while the overall balance is projected at 8 percent of GDP.

Table 1. Botswana: Fiscal Sustainability Benchmarks

	Non-mineral Primary Balance		Overall Balance	
	2007	2015	2007	2015
	(Percent of non-mineral GDP)		(Percent of GDP)	
Staff projections [1]	-17.6	-16.0	8.0	0.2
Sustainability benchmarks: Revenue projections minus expenditure that follows "permanent" income				
(a) Conservative assumptions Baseline revenues[1] and conservative interest rate assumption	-9.0	-7.4	12.1	5.6
(b) Less conservative assumptions Baseline revenues and optimistic interest rate assumption	-10.3	-8.5	11.3	4.8
(c) Less conservative assumptions–back-loaded adjustment Baseline revenues and optimistic interest rate assumption; annuity constant in real terms	-19.1	-10.9	5.9	3.0
(d) Optimistic assumptions Optimistic mineral revenues and optimistic interest rate assumption	-14.2	-11.8	8.9	5.9

Source: author's calculations.

[1] Revenue projections assume a slow increase in non-mineral revenues and a decrease in mineral revenues in terms of GDP. Expenditure projections assume that capital expenditure and expenditure on health and other critical areas increase in terms of GDP.

(a) The conservative interest rate assumption refers to a nominal interest interest rate of around 7¾ percent that corresponds to a real interest rate of 3 percent. The past rates of return on the Pula Fund are unknown. In comparison, the Norwegian Government Pension Fund has earned an annualized net real return of 4.6 percent since 1997.

(b) The optimistic interest rate assumption refers to a nominal interest interest rate of around 9¼ percent that corresponds to a real interest rate of about 4½ percent. Being more optimistic concerning the return on assets allows for somewhat larger non-mineral deficits and lower overall balances relative to (a).

(c) Programming the annuity to stay constant in real terms (rather than in terms of GDP) yields lower initial savings as suggested by the benchmarks. Thus, this scenario assumes a more back-loaded adjustment.

(d) Assuming a slower decline in the path of mineral revenues changes the value of the annuity and thereby allows for higher non-mineral deficits relative to (b).

The permanent income calculations indicate that the spending ceiling should be lowered. A high non-mineral primary deficit is not sustainable over time when mineral resources are exhaustible. This has implications for a sustainable spending level. While the current National Development Plan provides a ceiling of 40 percent of GDP, these calculations here suggest to consider limiting spending to around 30 percent of GDP. This assumes spending is limited to non-mineral revenues (assumed to increase from the current 22 percent of GDP to around 23½ percent in 2010/11) and annuitized mineral revenue of about 6⅓ percent of

GDP. The suggested 30 percent of GDP ceiling is very close to the estimated 2006/07 outcome of 31 percent of GDP. In that sense, there would be no need to cut spending, but also no room to increase spending to the 40 percent of GDP ceiling.

As indicated earlier there are limitations to this analysis. These calculations do not address whether the level of capital spending is optimal. The higher the return on public spending, the higher recurrent revenues, the higher a sustainable non-mineral deficit.

C. Sensitivity Analysis

The level and path of the benchmarked balances depend on key assumptions about the path of mineral revenues, the expected rate of return on savings, the time horizon, the path of the annuity, and the timing of the adjustment (Table1, and Figures 2 and 3).

- The larger the remaining mineral deposits are, the lower the benchmarked fiscal adjustment needed for sustainability.
- A more conservative interest rate assumption to calculate the return on savings requires a larger adjustment.
- If the horizon is lengthened to 2100 and mineral wealth spread until then, the value of the annuity is reduced by 2 percentage points of GDP and adjustment needs to be larger.
- If the annuity declines over time in terms of GDP, adjustment needs to take place later (see also Figure 3).
- The estimated needed adjustment increases the longer it is postponed. For example, if an adjustment only started in 2010, the value of the annuitized mineral revenue would decline by 2 percentage points of non-mineral GDP, and the benchmarked non-mineral deficit would become more ambitious at -8 percent of non-mineral GDP instead of -10 percent (with set of assumptions b).

An annuity programmed to be constant in *real terms* yields low initial savings (Figure 3). Since nominal GDP is growing faster than inflation, the annuity is declining in terms of GDP (its value starts at close to 12 percent of GDP and declines to 3½ percent of GDP). The stock of assets peaks at only about 55 percent of GDP. This scenario allows for a back-loaded adjustment.

Figure 2. Botswana: Sensitivity Analysis for Benchmarked Balances

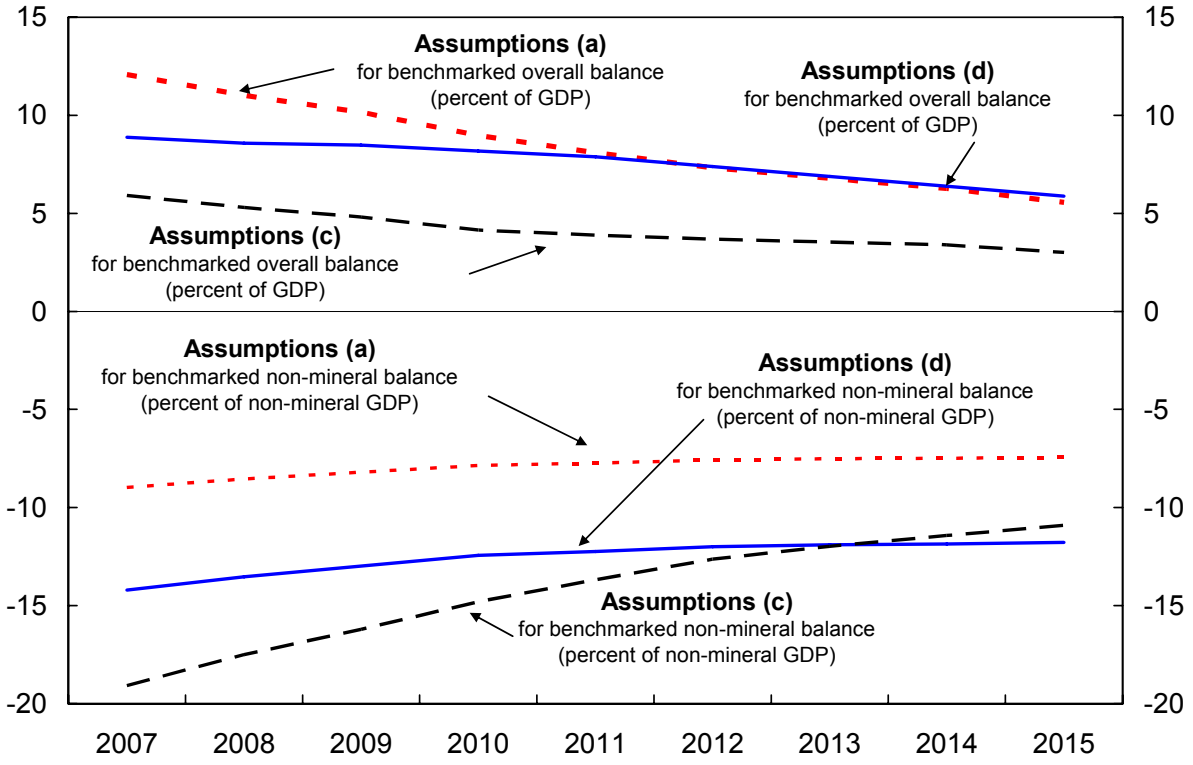
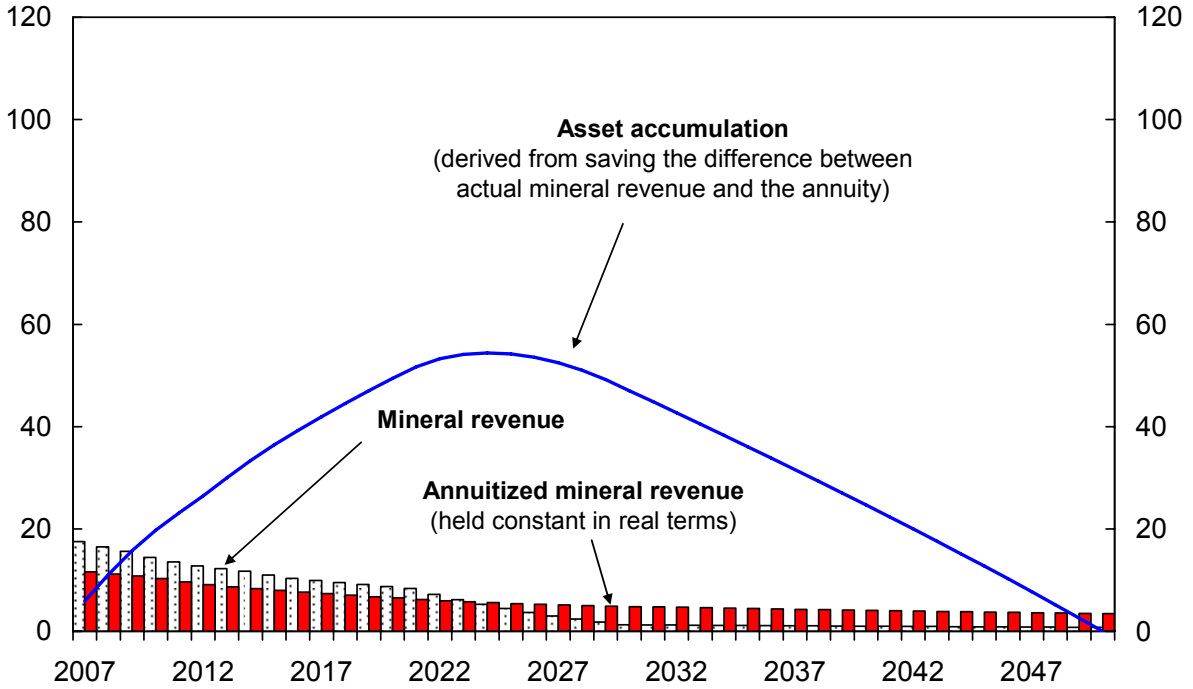


Figure 3. Botswana: Mineral Revenues, Annuity, and Asset Accumulation
(Percent of GDP)



Source: author's calculations.

IV. CONCLUSIONS

This paper supports the following conclusions: (i) taking the non-mineral primary balance into account can help clarify desirable fiscal policies in resource-rich countries; (ii) calculating benchmarked balances based on permanent income can contribute to making medium- to long-term fiscal policy choices.

The analysis is based on a set of assumptions that can be communicated to policy-makers relatively easily. (i) The income from natural resources is spread over a definite time period both to keep the time horizon realistic from a political economy point of view and also to recognize the uncertainty about resource discoveries and the growth of non-mineral revenues. (ii) The contribution to spending from mineral revenues (the annuity) is flat over time in terms of GDP. Programming the "permanent" part of mineral revenues to be constant in terms of GDP ensures that initial savings are significant when mineral revenues are projected to decline.

For Botswana, this paper suggests that (i) the authorities could consider supplementing their current fiscal goals with that of reducing the non-mineral primary deficit in their National Development Plan 10; (ii) the permanent income calculations indicate that the spending ceiling should be reduced since it is essential to save a substantial portion of mineral revenues now to ensure fiscal sustainability for a post-diamond period; and (iii) the estimated outcome for fiscal year 2006/07 is very close to the ceiling recommended here, suggesting that there is no need to cut spending but to refrain from increasing spending.

There are limitations to this analysis. (i) The calculations presented here assume that it is socially optimal to smooth expenditure over time. However, the degree of smoothing expenditure and therefore the optimal level of spending is uncertain.(ii) Botswana's potential to develop other natural resources and to strengthen non-mineral revenues are uncertain and might be larger than assumed in the sensitivity analysis. It is thus essential to guide fiscal policy by comparing the marginal benefit from spending to the return on a financial asset that could be acquired instead.

References

Barnett, Steven and Rolando Ossowski, 2003, "Operational Aspects of Fiscal Policy in Oil-Producing Countries," in Davis, Jeffrey, Rolando Ossowski, and Annalisa Fedelino (eds.), *Fiscal Policy Formulation and Implementation in Oil-Producing Countries* (Washington: International Monetary Fund), pp. 45–81.

Basdevant, Olivier, 2007, "Are Diamonds Forever? Using a Lifecycle Approach to Analyze Botswana's Reliance on Diamond Revenues," *IMF Country Report No. 07/228*, pp. 4–19 (Washington: International Monetary Fund).

Carcillo, Stéphane, Daniel Leigh, and Mauricio Villafuerte, 2007, "Catch-Up Growth, Habits, Oil Depletion, and Fiscal Policy: Lessons from the Republic of Congo," *IMF Working Paper No. 07/80* (Washington: International Monetary Fund).

Deléchat, Corinne and Matthew Gaertner, 2008, " Exchange Rate and External Stability Assessment in a Resource-Dependent Economy: The Case of Botswana" *forthcoming IMF Working Paper* (Washington: International Monetary Fund).

Economist, 2008, "Sovereign-wealth Funds—Asset-backed Insecurity," *The Economist,* January 19, pp. 78–80.

Hotelling, Harold, 1931, "The Economics of Exhaustible Resources," *Journal of Political Economy*, Vol. 39, pp. 137–75.

Iimi, Atsushi, 2006, "Did Botswana Escape from the Resource Curse?" *IMF Working Paper No. 06/138* (Washington: International Monetary Fund).

International Monetary Fund, 2007, "Chile: 2007 Article IV Consultation—Staff Report, Public Information Notice on the Executive Board Discussion; and Statement by the Executive Director for Chile," *IMF Country Report No. 07/333* (Washington: International Monetary Fund).

Jafarov, Etibar and Daniel Leigh, 2007, "Alternative Fiscal Rules for Norway," *IMF Country Report No. 07/197*, pp. 17–43 (Washington: International Monetary Fund).

Kumhof, Michael and Douglas Laxton, 2007, "Chile's Structural Fiscal Surplus Rule: A Model-based Evaluation," *IMF Country Report 07/332* (Washington: International Monetary Fund).

Norges Bank, 2007, *Norges Bank Investment Management: Quarterly Performance Report, Second Quarter 2007* (Oslo: Norges Bank).

Olters, Jan-Peter, 2007, "Old Curses, New Approaches? Fiscal Benchmarks for Oil-Producing Countries in Sub-Saharan Africa," *IMF Working Paper No. 07/107* (Washington: International Monetary Fund).

Takizawa, Hajime, Edward H. Gardner, and Kenichi Ueda, 2004, "Are Developing Countries Better Off Spending Their Oil Wealth Upfront?" *IMF Working Paper No. 04/141* (Washington: International Monetary Fund).