DOCUMENT OF INTERNATIONAL MONETARY FUND AND NOT FOR PUBLIC USE

OFF-SITE
ROOM IS11-400   **0450**

SM/01/72

CONTAINS CONFIDENTIAL
INFORMATION

February 27, 2001

To: Members of the Executive Board

From: The Secretary

Subject: **Botswana—Selected Issues and Statistical Appendix**

The attached paper provides background information to the staff report on the
2000 Article IV consultation discussions with Botswana (SM/01/67, 2/26/01), which is
tentatively scheduled for discussion on Monday, March 12, 2001. At the time of circulation
of this paper to the Board, the Secretary's Department has received a communication from
the authorities of Botswana indicating that they consent to the Fund's publication of this
paper.

Questions may be referred to Mr. John Green (ext. 34797), Mr. Mfunwa (ext. 35973), and
Ms. Sgherri (ext. 35969).

Unless the Documents Section (ext. 36760) is otherwise notified, the document will be
transmitted, in accordance with the procedures approved by the Executive Board and with the
appropriate deletions, to the WTO Secretariat on Wednesday, March 7, 2001; and to the
African Development Bank, the European Commission, the European Investment Bank, the
Food and Agriculture Organization, and the United Nations Development Programme,
following its consideration by the Executive Board.

Att: (1)

Other Distribution:
Department Heads

INTERNATIONAL MONETARY FUND

BOTSWANA

Selected Issue and Statistical Appendix

Prepared by a staff team consisting of John H. Green (head), Alexander Kyei,
Mzwanele Mfunwa, Silvia Sgherri, Paul Atang (all AFR), and
Maitland MacFarlan (RES)

Approved by African Department

February 26, 2001

Contents   Page

Figures

Tables

Contents   Page

I. MACROECONOMIC IMPACT OF HIV/AIDS IN BOTSWANA[1]

A. Introduction

1.   The HIV/AIDS pandemic in sub-Saharan Africa and other parts of the developing world threatens to be a humanitarian and economic catastrophe of almost unprecedented proportions. The closest parallels in terms of disease-driven disasters may be found in the outbreaks of bubonic plague in the fourteenth century.[2] From a broader perspective, comparisons could also be drawn with the major wars and political purges of the twentieth century. In Botswana—the country with the highest HIV prevalence rate, according to official data—the unfolding disaster now overshadows what should otherwise be seen as an African success story—especially in terms of prudent resource management and well-directed economic development.

2.   A few indicators illustrate the scale and implications of HIV/AIDS in the case of Botswana:

- Recent estimates indicate that nearly 300,000 of the 14-49 year old population— 36 percent of this group—are infected with HIV.

- Life expectancy has fallen sharply: by some estimates, this has declined from 60 years in 1990 to 40 at present, and is projected to fall to under 30 by 2010.

- The death rate per thousand population has accelerated from 15 in 1990 to 30 in 2000, and is projected to reach 45 by 2007; in the absence of AIDS, the "normal" death rate would have declined steadily to around 11 per thousand over this period.

- On current projections, by 2010 two children out of five would be orphans—totaling more than 200,000 orphans.

3.   Far from being a somewhat abstract and distant threat, the effects of the pandemic are increasing evident in the day-to-day life and planning of individuals and organizations. Few

---

[1] Prepared by Maitland MacFarlan and Silvia Sgherri.

[2] Even this analogy is weakened by the fact that the bubonic plague hit unexpectedly (albeit repeatedly), with each outbreak exacting a heavy death toll within a short space of time. In contrast, the onset of AIDS for HIV-positive patients follows with a substantial lag (usually of eight to ten years) but with a high degree of certainty for those without access to anti-retroviral drug treatments. As discussed in the paper, the drawn-out impact of HIV/AIDS may have important implications for social and economic behavior. For discussion of the bubonic plague, including some parallels with AIDS, see McNeill (1977). The impact of the plague is also discussed in Tuchman (1978).

families appear untouched, with extended family structures called on to provide care and support. The frequency of funerals, dominated by those of the young, has increased sharply.[3] Rising death rates threaten the provision of key public services; for example, the death rate among primary teachers has increased tenfold since 1994, from 0.7 to 7 per thousand, and around 100 agricultural extension officers out of 3,000 were lost to AIDS in 1999. Institutions in the private sector report various measures to protect their operations, including the requirement of AIDS insurance by banks as part of their lending and a buildup of skilled personnel in various organizations as a buffer against expected losses.

4.   The human consequences of AIDS will become worse, at an accelerating pace, over the next few years. While there is inevitably some uncertainty about how much wider the pandemic will spread, and how quickly it will pass, the future of those currently infected with HIV is tragically predictable and unavoidable. As discussed below, current treatment options—that is, those that are both available and affordable—may help reduce new infections, provide greater comfort for the sick, and delay death in some cases. But premature death, generally within around 10-12 years of initial infection, is nevertheless almost certain for those currently afflicted in the absence of advanced treatment.

5.   There is substantial uncertainty, however, about the macroeconomic impact of HIV/AIDS, the focus of this paper. These economic implications are the subject of a growing literature of country-specific and more general studies, many of which draw on demographic projections and a range of other assumptions to model the long-term impact of HIV/AIDS on GDP, GDP per capita, and related variables.[4] Such a model is also included in the current paper, and, as in other work in this area, particular attention is paid to the sensitivity of model results to variations in the underlying assumptions. A key concern in this regard is to reflect in model simulations what might happen if the approaching acceleration in AIDS-related deaths leads to a profound change in social and economic conditions—including, for example, a collapse of domestic and external investor confidence. With few if any historical parallels to draw on, the ability of Botswana (or any other economy) to withstand a shock of the magnitude of the AIDS disaster will be unclear for some time.

6.   The paper is organized as follows. Subsection B provides an overview of the macroeconomic effects of HIV/AIDS, focusing on the key channels through which the pandemic is likely to affect the macroeconomic outlook and on the uncertainties involved. Subsection C presents model-based estimates of the impact of HIV/AIDS on output and other key macroeconomic variables. The potential effects of HIV/AIDS on the long-term fiscal

---

[3] For example, funerals in rural villages, which account for one-half the population, now commonly occur throughout each weekend and may soon spread into weekdays, rather than being Saturday-only ceremonies as in the past.

[4] See references cited in Subsection C.

position of Botswana are considered briefly in Subsection D, and Subsection E concludes. Details of the theoretical model and of the data are given in the Appendix.

B. Macroeconomic Overview of the Implications of HIV/AIDS

7.   As noted above, there is now a rather substantial literature applying standard models of economic growth to an assessment of the long-term effects of HIV/AIDS on economic performance, particularly in sub-Saharan Africa. In the specific case of Botswana, for example, a recent comprehensive report by the Botswana Institute for Development Policy Analysis (BIDPA, 2000) applies a Cobb-Douglas model to derive projections of the effect of HIV/AIDS on aggregate and per capita output out to 2021, on the distribution of income among different groups, and on the long-term fiscal position of Botswana. These results are drawn on and, in some cases, updated and extended in the current paper, using a similar framework.

Impact on labor supply

8.   This approach focuses, therefore, on the impact of HIV/AIDS on the medium- to long-term productive capacity of the economy.[5] Several channels of influence can be identified. A central role is played by labor supply, as implied by demographic profiles incorporating the effects of HIV/AIDS (see Subsection C for details). The effects of the pandemic on productivity and human capital are also likely to be significant. Productivity will suffer as a result both of AIDS-related health problems among workers themselves— leading, for example, to increased sick leave, reduced work intensity, and increased labor turnover—and as individuals take time away from work to care for sick family members, attend funerals, and meet other such responsibilities. The prospects for growth and diversification in Botswana will be set back by the loss of skilled labor—a particularly serious concern, given that skill shortages are already problematic and that there is probably limited scope for substitution using unskilled labor, which is currently in excess supply. While the relative returns to investment in skills and training are likely to increase, this trend could well be dominated by the weakening in incentives and opportunities for such investment that would arise from a combination of sharply reduced life expectancies, a decrease in general economic confidence, and potential shortages of personnel able to provide training.[6]

---

[5] Demand-side effects, such as might arise from changes in consumer or investor confidence, are usually handled by varying the associated model parameters (e.g., for saving and investment rates) rather than by being modeled explicitly, but this is clearly an area where there is scope for further extensions and elaborations of the models involved.

[6] Anticipating losses among current personnel and growing difficulties in finding replacements, several companies report that they are building up a buffer stock of skilled

(continued)

Impact on saving and investment

9. A further key channel for the macroeconomic impact of HIV/AIDS is through the effects of the pandemic on investment and saving. With national saving currently exceeding investment by a substantial margin, as reflected in a high and rising level of foreign exchange reserves, Botswana does not face the same degree of financing constraint on investment as other African countries. How long the current situation will prevail is unclear. Overall, the risks for both the saving and the investment outlook are probably on the downside, although not necessarily to the same degree.

10. On the saving side, changes in the sectoral composition of growth—involving, in particular, lower growth in the high-saving mining sector, partially offset by stronger growth in nonmining areas—would likely lead to lower private saving in the period ahead. Adding in the effects of HIV/AIDS, saving is likely to decline further as a share of GDP (see Subsection C). There is some evidence, more generally, that the saving rate in developing countries may be negatively related to the HIV prevalence rate.[7] Considering private saving, while some people (notably those with scarce skills and rising earnings) may be able to increase their saving, the bulk of households will probably be compelled to reduce both saving and non-AIDS related consumption in order to finance additional health care costs, cover the costs of additional dependents, and meet other adverse effects of AIDS on family expenditure or income. Public saving will almost certainly decline as a share of GDP, particularly as a result of increased government spending on health and various forms of social support. On the assumption that antiretroviral drug treatments (ARTs) are *not* made generally available, BIDPA (2000) finds that national saving would probably still be largely enough to finance the current rate of investment (also around 25-26 percent of GDP). Potential financing constraints could be further eased by drawing on Botswana's unused international borrowing capacity and its foreign reserves.

11. The outlook for saving and investment is uncertain, however. HIV/AIDS may significantly change investment prospects. Shortages of skilled labor, and its higher cost, would tend to increase the demand for investment at a given level of output. But this may well be offset by the negative effects on investment resulting from the impact of AIDS on economic growth, on confidence, and on other aspects of the investment climate. The impact of HIV/AIDS on health care spending and, hence, saving may be more severe than suggested above, particularly as estimates of HIV prevalence rates have increased substantially since the BIDPA study.

---

labor, and an accountancy college has doubled its student intake (apparently with sizable AIDS deaths expected among future graduates).

[7] World Bank (2000).

12.   The outlook for saving would be further affected if ARTs are at some point made more widely available to HIV-positive patients. This would require substantial initial investment in upgrading and extending the health sector infrastructure that is needed to support such treatments. These issues are discussed in more detail in Subsection D. The huge cost impact of ARTs, even at sharply lower drug prices, is largely a result of the sheer number of patients that would potentially be eligible for treatment, coupled with the fact that these treatments represent ongoing, lifetime expenditures, rather than once-and-for-all outlays. Bringing ART costs within manageable levels would almost certainly require a major increase in international support, probably including lower drug prices, combined with restraint in nonpriority areas of the domestic budget. Exploring the details of these support measures is beyond the scope of this paper, but the composition of such a package would clearly have a significant influence on the outlook for the fiscal position, national saving, the external balance, and other macroeconomic variables.

Impact on the banking sector

13.   The banking sector in Botswana also faces a range potential pressures as a result of HIV/AIDS. These could include possible increases in loan losses, as mortality rates rise among borrowers, and business sector difficulties—including in the banking sector itself—as a result of skill shortages. Several factors would tend to mitigate these concerns, however. First, with substantial foreign ownership, the banks have access to a wider base of funding and expertise than would be available to purely domestically owned and operated banks. Second, banks' business lending is concentrated in a few large corporations (including some multinationals) and parastatals, rather than spread over a wide range of small and medium-sized enterprises. To the extent that this lending (especially to parastatals) could carry Explicit or implicit government guarantees, banks' own exposures to corporate financial difficulties may be limited. Third, risks associated with personal loans to public sector and parastatal employees (who total nearly one-half of formal employment) appear to be reduced through automatic source deductions of loan payments and, in at least some cases, through a form of guarantee.[8] Fourth, banks now require that unsecured personal lending be backed by AIDS insurance.[9] Given the uncertainties over current and future HIV prevalence, this insurance should help to transfer the associated financial risks not just outside the banking sector but also outside Botswana, as at least some of the insurance carriers are part of large international groups.

---

[8] The extent of and basis for these guarantees is not entirely clear, but it appears that the loans are backed in some cases by future pension rights and other benefits accruing to the borrower.

[9] One estimate indicated that this insurance cost 500 Pula per year on a 10,000 Pula personal loan (i.e., equivalent to an additional 5 percentage points on the loan rate).

14.   Nevertheless, some important risks and uncertainties remain. There may be sizable moral hazard problems arising from the loan insurance and guarantee schemes, particularly in a context where AIDS is leading to a significant drop in the life expectancy of those affected. With many individuals apparently already over leveraged,[10] and banks not fully insulated against loan losses (for example, the public sector guarantee appears be limited to 80 percent of each loan), banks may still have substantial exposure to future defaults. Such difficulties could be exacerbated if companies providing AIDS insurance have underestimated the scale of the pandemic. A further uncertainty arises from the future path of national savings and, hence, the extent of banks' ability to provide intermediation services. While banks are currently awash with liquidity (as indicated by their extensive investment in Bank of Botswana certificates), this situation could turn around if saving—both private and public—diminishes as a result of an AIDS-induced economic slowdown and sharply increased spending on health care. As noted above, increased skill shortages may also constrain banks' ability to provide a full range of services and increase their costs. Indeed, some banks already report difficulties in attracting a full complement of staff, and the costs of medical insurance, pensions, and other benefits are rising rapidly.[11]

Perspectives on earlier findings

15.   Before considering the model-based results of the effects of HIV/AIDS that are presented in the next section, several perspectives on earlier findings may be useful. In particular, given the enormity of the human problem arising from AIDS, the macroeconomic effects of the pandemic, as suggested by most recent studies could be seen as surprisingly modest. In the BIDPA analysis, for example, GDP growth in Botswana declines by 1 to 2 percent a year as a result of AIDS. Using more recent demographic projections that incorporate higher rates of HIV prevalence, the current paper estimates that nonmining GDP growth would fall by 3 to 4 percent a year on average over the coming decade. Nevertheless, it may be surprising that output and incomes continue growing at all when one-third to one-half of the current working age population is expected to die within about ten years.

16.   One perspective on this concern is that Botswana may be relatively well-placed economically to withstand the human devastation imposed by AIDS, at least compared with other sub-Saharan African countries. Around 60 percent of GDP is generated through the mining sector, itself accounting for 30 percent of output, and the public sector (including utilities and public sector construction). These activities provide a strong and reasonably robust base for the economy, particularly given that the mining sector is not a large employer (with total employment of only around 8,000 people) and, hence, may be less susceptible to future skill shortages than growing and/or more labor intensive sectors.

---

[10] This observation is based on discussion with the individual banks.

[11] For example, supplementary medical insurance premia have reportedly increased by over 40 percent over the last three years.

17.   However, both mining and government appear unlikely to be major sources of future growth—or at least, not as important as in the past. Mining production is now plateauing, with little additional capacity planned, so that the sector will not add significantly to economic growth directly or indirectly (e.g., through the government sector). The need for diversification, involving private sector development and drawing on foreign investment and expertise, is therefore widely recognized. But prospects of moving toward a more diversified economic structure would appear to be particularly threatened by HIV/AIDS. Three reasons can be noted. First, as argued above, AIDS is likely to aggravate current skill shortages, reduce human capital investment, and hence add to the difficulties already apparent in the economy in supporting a wider range of activities. Second, the climate for physical investment—both from domestic sources and drawing on foreign capital—may deteriorate markedly as the impact of AIDS takes its toll on economic activity and confidence. Third, a less tangible but possibly significant risk could come from a broader weakening in the fabric of society as mortality rates, orphan numbers, dependency ratios, and other sources of social pressure rise to unprecedented levels.

18.   The model simulations reported in the next subsection address some of these concerns. Attention is given, for example, to the macroeconomic implications of a larger shock to productivity and investment than assumed in previous estimates of the effects of AIDS (including the BIDPA analysis). In this perspective, the model assesses the impact of AIDS on the economy under different hypothetical scenarios accounting for:

- a permanent decline in the rate of capital inflows;
- a permanent decline in the rate of capital accumulation;
- a permanent decline in total factor productivity; and
- greater losses of working time associated with each AIDS case.

C. Modeling the Economic Impact of AIDS

The model

19.   The theoretical framework adopted in this paper closely follows earlier attempts to model the macroeconomic impact of AIDS.[12] It is based on a Solow growth model that has been modified to allow for two sectors (formal and informal) and two labor skill categories (skilled and unskilled). These enhancements allow the model to take into account key features of Botswana's economy, namely, the shortage of skilled labor and a high capital intensity in the formal sector.

---

[12] Among the recent studies that have attempted to calibrate the effect of HIV/AIDS on economic growth, see Over (1992), Arndt and Lewis (2000), Bonnel (2000) and ING Barings (2000) for South Africa, Cuddington (1993) for Tanzania, Cuddington and Hancock (1995) for Malawi, BIDPA (2000) for Botswana, and Haacker (2000) for a cross-country analysis.

20.   The two sectors are characterized by Cobb-Douglas production functions. Each exhibits constant returns to scale in which output is calculated as a function of inputs (labor and capital) and productivity. Theoretical details of the model, its parameters, and data sources are discussed in the Appendix.

21.   The model comprises three labor markets: skilled labor in the formal sector, unskilled labor in the formal sector, and unskilled labor in the informal sector. (All skilled workers are employed in the formal sector). The three labor markets behave differently. In the skilled formal market, wages adjust to equate demand and supply. In the unskilled formal sector there is a fixed minimum wage, which is assumed to be higher than the equilibrium wage. As a result, unemployment arises among unskilled workers in the formal sector. These unemployed workers make up the supply of labor in the informal sector, where market forces operate to equate demand and supply.

22.   The model incorporates the impact of AIDS on the economy in several ways:

- The major and most direct effect of the pandemic is captured by the change in the size and age structure of the labor force.

- The model takes into account lower productivity of AIDS-infected workers by including an effective labor supply parameter.

- AIDS-related health spending is assumed to affect both consumption and saving behavior and, therefore, capital accumulation. Following Cuddington and Hancock (1995), increases in health care expenditures are assumed to be met by reductions in saving (80 percent) and nonhealth consumption (20 percent). Capital formation in the informal sector is assumed to be limited by the amount of saving generated in the sector itself. By contrast, investment in the more capital-intensive formal sector can make use of domestic and foreign saving. The model also provides for transfers from the formal sector to the informal sector to support health care spending in the latter.

23.   The model is calibrated to reproduce the actual values of nonmining output and other key variables for 1998/99 (April/March). It focuses on the nonmining sector to avoid special features associated with diamond production including the fact that the diamond industry, with its small number of workers and high capital intensity, would be less affected by AIDS than other industries. The main demographic data and projections that underlie model results are shown in Figure 1.

Simulation results: AIDS scenario versus a counterfactual no-AIDS scenario

24.   This part of the paper develops scenario projections of key macroeconomic variables under alternative AIDS assumptions, including a no-AIDS counterfactual scenario. The model provides equilibrium levels and growth rates for nonmining output, capital stock, consumption, AIDS-related health spending, and per capita income in both formal and

Figure 1. Botswana: Selected Demographic Indicators, 1990-2010
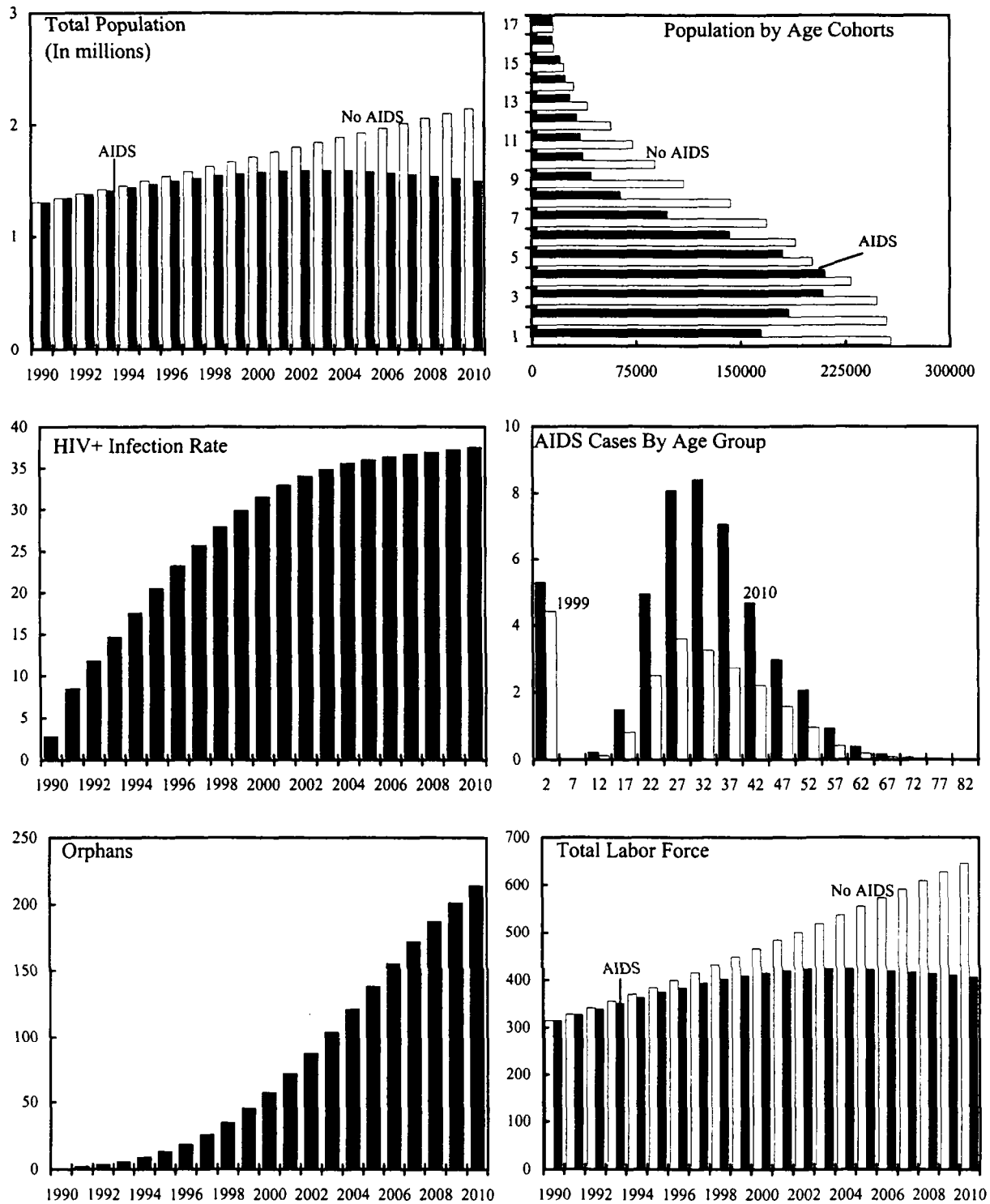
Source: ABT Associates, South Africa; and Fund staff estimates.

informal sectors. Furthermore, it generates outcomes for employment and wages for skilled and unskilled workers. It also permits changes in key parameters to test the sensitivity of results to assumptions on indirect AIDS effects, including its impact on productivity and foreign investment.

The no-AIDS counterfactual scenario

25.   Under the assumption of no AIDS, nonmining GDP would grow at an annual rate of 5.7 percent between 1999 and 2010 (or 2.2 percent in per capita terms), leveling off at a rate of 5.2 percent toward the end of the simulation horizon (Table 1, Table 2, and Figure 2). Capital accumulation is the main contributor to output growth over the period, reflecting the large capital share that is assumed to characterize the formal sector and this sector's 92 percent share of the nonmining economy.[13] Labor's contribution to growth diminishes over the period because growth of the working-age population would have slowed even without the AIDS crisis.

The AIDS baseline scenario

26.   The AIDS baseline incorporates the projected effects of AIDS on the population and labor force. With AIDS, growth in the nonmining economy would slow to 2.4 percent a year over the period 1999-2010 and stabilize at 1.4 percent in 2010, compared with 5.2 percent in the no-AIDS scenario (Table 1, lower panel and Table 3). This reduction in economic growth comes mainly through two channels. First, with AIDS, both national consumption and national saving are assumed to fall in order to finance AIDS-related care. As a consequence, capital accumulation would slow and its contribution to growth would diminish to about 1.2 percent a year—almost 3 percentage points below the no-AIDS counterfactual. Second, the direct impact of AIDS on Botswana's labor force would cut nonmining growth by about 1 percent, compared with the no-AIDS counterfactual. The overall projected reduction in economic growth due to AIDS—around 4 percentage points—is larger than in the BIDPA (2000) study because the estimated prevalence of HIV/AIDS in Botswana has increased since

---

[13] Whereas the formal sector features a capital-output ratio close to 2 and a capital share parameter of 0.80, the informal sector is assumed to be highly labor intensive, with a capital-output ratio around 0.97 and a capital share parameter of 0.05. Total factor productivity (TFP) is also assumed to grow at different rates in the two sectors: 0.4 percent in the formal sector and 0.05 percent in the informal sector. This seems to be broadly consistent with the duality of the Botswana economy and the binding labor constraints characterizing its formal sector.

Table 1. Botswana: Alternative AIDS Scenarios, Selected Years 1/
(Contributions to output growth, percent)

A. No-AIDS counterfactual scenario

	TFP	Labor Efficiency	Labor	Capital	Nonmining Output
1999	0.38	0.00	0.94	4.81	6.14
2001	0.38	0.00	0.90	4.72	6.01
2003	0.38	0.00	0.86	4.60	5.85
2005	0.38	0.00	0.81	4.49	5.69
2007	0.38	0.00	0.76	4.31	5.47
2010	0.38	0.00	0.69	4.12	5.20

B. AIDS baseline scenario

	TFP	Labor Efficiency	Labor	Capital	Nonmining Output
1999	0.38	-0.10	0.45	3.10	3.82
2001	0.38	-0.13	0.26	2.72	3.23
2003	0.38	-0.13	0.06	2.23	2.54
2005	0.38	-0.13	-0.13	1.75	1.87
2007	0.38	-0.05	-0.19	1.40	1.54
2010	0.38	-0.05	-0.22	1.28	1.38

Source: Fund staff estimates.

1/ Output values calibrated on non-mining GDP, constant prices 1998.

Table 2. Botswana: No-AIDS Counter factual Scenario
(Percentage change, unless otherwise stated)

	2000	2002	2004	2006	2008	Average
Macroeconomic Impact						
GDP (billions of pula) 1/						
Non-mining economy	18.7	21.0	23.5	26.2	29.1	24.4
Formal sector	17.2	19.4	21.7	24.3	27.1	22.7
Informal sector	1.5	1.6	1.7	1.8	2.0	1.8
GDP growth						
Non-mining economy	6.1	5.9	5.8	5.6	5.4	5.7
Formal sector	6.2	6.0	5.9	5.7	5.5	5.8
Informal sector	4.0	3.9	3.6	3.4	3.2	3.6
Capital Stock growth						
Non-mining economy	4.8	4.7	4.5	4.4	4.3	4.5
Formal sector	5.0	4.9	4.8	4.6	4.5	4.7
Informal sector	0.2	0.2	0.2	0.2	0.2	0.2
Distribution Effects						
Output per worker (pula)						
Non-mining economy	40,049	41,820	43,701	45,680	47,715	44,319
Formal sector	56,292	59,064	62,006	65,090	68,240	62,951
Informal sector	9,220	9,231	9,243	9,255	9,266	9,246
Output per worker growth						
Non-mining economy	2.2	2.2	2.2	2.2	2.2	2.2
Formal sector	2.4	2.4	2.5	2.4	2.4	2.4
Informal sector	0.1	0.1	0.1	0.1	0.1	0.1
Labor Market						
Employment growth						
Non-mining economy	0.9	0.9	0.8	0.8	0.7	0.8
Formal sector	0.8	0.7	0.7	0.7	0.6	0.7
of which:						
Skilled	0.5	0.4	0.4	0.4	0.4	0.4
Unskilled	0.3	0.3	0.3	0.3	0.2	0.3
Informal sector	3.8	3.6	3.4	3.2	3.0	3.4
Wages (pula)						
Skilled wages	22,396	23,361	24,381	25,458	26,578	24,726
Unskilled wages (F)	6,621	6,964	7,329	7,712	8,099	7,445
Unskilled wages (I)	3,758	3,778	3,797	3,813	3,825	3,797
Unskilled wage ratio	1.8	1.8	1.9	2.0	2.1	2.0

Source: Fund staff estimates.
1/ Constant prices 1998.

Figure 2. Botswana: AIDS and No AIDS Scenarios, 1991-2010

Non-mining GDP
(In billions of pula)

No AIDS

AIDS

1991 1993 1995 1997 1999 2001 2003 2005 2007 2009

Non-mining GDP Growth
(Percent Change)

AIDS

No AIDS

1991 1993 1995 1997 1999 2001 2003 2005 2007 2009
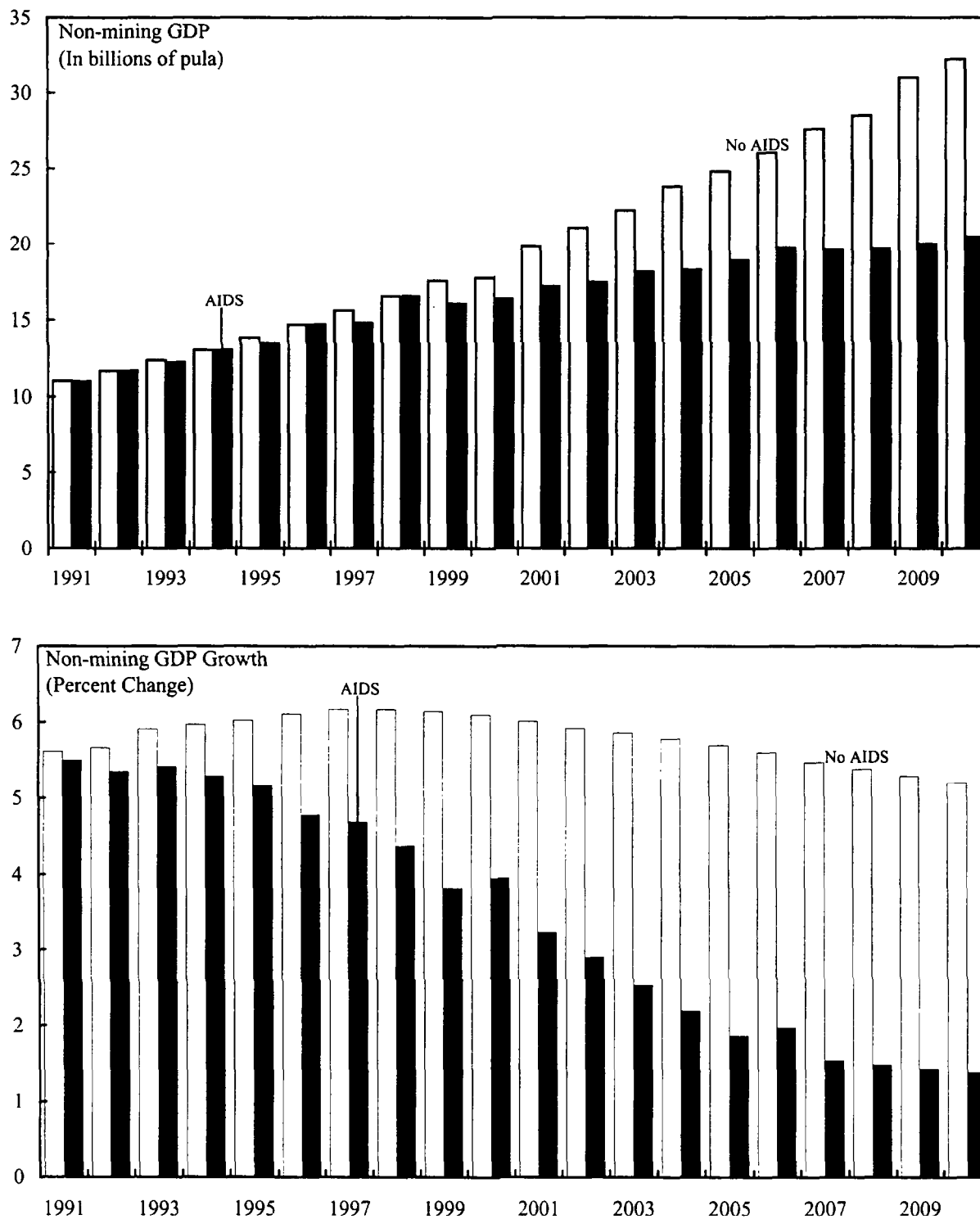
Source: ABT Associates, South Africa; and Fund staff estimates.

Table 3. Botswana: AIDS Baseline Scenario
(Percentage change, unless otherwise stated)

	2000	2002	2004	2006	2008	Average
Macroeconomic Impact						
GDP (billions of pula) 1/						
Nonmining economy	16.7	17.7	18.6	19.3	19.9	18.6
Formal sector	15.4	16.5	17.3	18.1	18.7	17.3
Informal sector	1.3	1.3	1.3	1.2	1.2	1.2
GDP growth						
Nonmining economy	4.0	2.9	2.2	2.0	1.5	2.4
Formal sector	4.2	3.1	2.4	2.2	1.6	2.6
Informal sector	1.1	0.1	-0.7	-0.9	-1.1	-0.3
Capital Stock growth						
Nonmining economy	3.3	2.5	2.0	1.8	1.4	2.1
Formal sector	3.6	2.7	2.1	1.9	1.4	2.2
Informal sector	0.1	0.0	0.0	0.0	0.0	0.0
AIDS-related health spending (percent of GDP)						
Nonmining economy	1.1	1.3	1.5	1.6	1.6	1.5
Formal sector	0.8	0.9	1.1	1.1	1.1	1.0
Informal sector	5.1	6.6	8.0	9.0	9.6	7.9
Distribution Effects						
Output per worker (pula)						
Nonmining economy	40,170	41,938	43,865	46,044	48,116	44,558
Formal sector	56,436	59,140	62,052	65,293	68,322	63,025
Informal sector	8,927	8,846	8,766	8,714	8,687	8,780
Output per worker growth						
Nonmining economy	2.5	2.2	2.3	2.6	2.2	2.3
Formal sector	2.7	2.4	2.4	2.7	2.3	2.4
Informal sector	-0.3	-0.5	-0.4	-0.2	-0.1	-0.3
Labor Market						
Employment growth						
Nonmining economy	0.4	0.2	0.0	-0.2	-0.2	0.0
Formal sector	0.3	0.1	0.0	-0.1	-0.2	0.0
of which:						
Skilled	0.2	0.1	0.0	-0.1	-0.1	0.0
Unskilled	0.1	0.1	0.0	0.0	0.0	0.0
Informal sector	1.4	0.6	-0.2	-0.7	-0.9	0.0
Wages (pula)						
Skilled wages	22,845	24,005	25,301	26,786	28,218	25,800
Unskilled wages (F)	6,591	6,898	7,225	7,583	7,914	7,327
Unskilled wages (I)	3,600	3,561	3,519	3,483	3,455	3,515
Unskilled wage ratio	1.8	1.9	2.1	2.2	2.3	2.1

Source: Fund staff estimates.

1/ Constant prices 1998.

the BIDPA study was prepared.[14] In addition, the current model incorporates the feedback effects of lower saving on capital accumulation and, therefore, potential output growth.

27.   AIDS is likely to affect the formal and informal sectors differently because of differences in capital intensity. In the formal sector, the impact of AIDS through the capital accumulation channel can be expected to outweigh the impact through the labor force channel, because this sector is capital intensive. Therefore, and because capital accumulation remains positive throughout the simulation period while the labor force declines, the formal sector expands over the simulation period, albeit at a much reduced pace. By contrast, the decline in labor supply growth—and eventually turning negative—in the AIDS scenario has a larger impact on output in the labor-intensive informal sector. Output in this case falls off at the end of the period, as the number of workers in the economy begins to decline.

28.   Labor productivity developments also reflect differences in the two sectors. Formal sector productivity is higher in the AIDS scenario than in the no-AIDS counterfactual because the capital-labor ratio rises under the impact of AIDS. In contrast, labor productivity in the informal sector is slightly lower in the AIDS scenario because the capital-labor ratio declines compared with the no-AIDS case. In consequence, and because wages are driven by labor productivity, the model suggests that AIDS would widen the income gap between skilled workers in the formal sector and unskilled workers in the informal sector.

Alternative scenarios and sensitivity analysis

29.   Estimates of the macroeconomic consequences of AIDS are subject to considerable uncertainty. The key uncertainty concerns the extent of HIV infection and the progression of the disease—including the possibility of a medical breakthrough. Other uncertainties relate to model assumptions, especially the many embedded parameters, the true values of which are largely unknown. The robustness of model results to changes in these parameters can be assessed through sensitivity analysis. The following variations from the baseline AIDS scenario are considered:

- *The rate of capital inflows.* the rate of capital inflows is reduced from 0.4 of nonmining GDP in the baseline case to 0.3.

- *The rate of capital accumulation*: the rate of capital accumulation in the formal sector is reduced by 5 percentage points through an increase in the depreciation rate of the capital stock from 7 percent to 12 percent.

---

[14] A 4 percentage point reduction in nonmining growth implies approximately a 2.8 percentage point reduction in total economic growth (4 percentage points times the 70 percent share of nonmining activity in the economy).

- *The rate of total factor productivity (TFP)*. AIDS halves TFP growth in both the formal and informal sectors.

- *Working time losses associated with each AIDS case.* These are assumed to double compared with the base case, as a result of increased workers' time off for sick leave and to look after sick family members.

Permanent decline in the rate of capital inflows

30.   If the rate of capital inflows is reduced from 0.4 to 0.3 of nonmining GDP, the levels of GDP and output per worker are substantially reduced; however, their corresponding growth rates are only slightly affected—a reduction of 0.2 percent a year (Table 4). This is because in the model a reduction in the rate of capital inflows reduces the level of savings and of the capital stock but does not affect the rate of capital accumulation (see Appendix). The size of the formal sector is substantially reduced; as a consequence, labor demand for both skilled and unskilled labor falls significantly and the wage differential for unskilled labor between the two sectors shrinks. The informal sector is not affected, as foreign capital flows only to the formal sector.

Permanent decline in the rate of capital accumulation in the formal sector

31.   On the assumption that the pandemic generates a permanent reduction of 5 percentage points in the rate of capital accumulation in the formal sector, the model indicates that GDP growth would decline to around 2 percent a year from 2.4 percent under the base scenario (Table 5). This shock is comparable to a permanent reduction in investor confidence in the formal sector. By construction, the impact on the informal sector is the same as under the baseline AIDS scenario. As a result, the wage gap between unskilled labor in the formal and informal sectors declines.

Permanent reduction in the rate of total factor productivity growth in both sectors

32.   If TFP growth is halved in both the formal and informal sectors, growth in the nonmining economy is projected to slow to 1.4 percent a year (Table 6). Compared with the baseline AIDS scenario, both sectors now have slower capital accumulation, together with weaker wage and per capita income growth.

Doubling working time losses associated with AIDS cases

33.   If working-time losses double, then effective labor supply expressed in terms of efficiency units would decrease in both sectors. Under this scenario, nonmining GDP growth is reduced on average by 0.3 percentage point compared with the AIDS baseline (Table 7). Given its higher labor intensity, the informal sector would be more affected than the formal sector.

Table 4. Botswana: Lower Rate of Capital Inflows Scenario
(Percentage change, unless otherwise stated)

	2000	2002	2004	2006	2008	Average
Macroeconomic Impact						
GDP (billions of pula) 1/						
Non-mining economy	10.1	10.6	11.1	11.5	11.8	11.1
Formal sector	8.8	9.3	9.8	10.2	10.6	9.8
Informal sector	1.3	1.3	1.3	1.2	1.2	1.2
GDP growth						
Non-mining economy	3.7	2.7	2.0	1.8	1.3	2.2
Formal sector	4.1	3.0	2.3	2.2	1.6	2.5
Informal sector	1.1	0.1	-0.7	-0.9	-1.1	-0.3
Capital Stock growth						
Non-mining economy	3.1	2.3	1.8	1.7	1.3	1.9
Formal sector	3.5	2.6	2.0	1.9	1.4	2.2
Informal sector	0.1	0.0	0.0	0.0	0.0	0.0
AIDS-related health spending (percent of GDP)						
Non-mining economy	1.9	2.2	2.6	2.7	2.7	2.4
Formal sector	1.4	1.7	1.9	1.9	1.9	1.8
Informal sector	5.1	6.6	8.0	9.0	9.6	7.9
Distribution Effects						
Output per worker (pula)						
Non-mining economy	24,181	25,129	26,168	27,366	28,521	26,567
Formal sector	32,122	33,594	35,185	36,983	38,684	35,747
Informal sector	8,927	8,846	8,766	8,714	8,687	8,780
Output per worker growth						
Non-mining economy	2.3	2.0	2.1	2.4	2.1	2.1
Formal sector	2.6	2.3	2.4	2.7	2.3	2.3
Informal sector	-0.3	-0.5	-0.4	-0.2	-0.1	-0.3
Labor Market						
Employment growth						
Non-mining economy	0.4	0.2	0.0	-0.2	-0.2	0.0
Formal sector	0.3	0.1	0.0	-0.1	-0.2	0.0
of which:						
Skilled	0.2	0.1	0.0	-0.1	-0.1	0.0
Unskilled	0.1	0.1	0.0	0.0	0.0	0.0
Informal sector	1.4	0.6	-0.2	-0.7	-0.9	0.0
Wages (pula)						
Skilled wages	13,003	13,636	14,346	15,172	15,977	14,634
Unskilled wages (F)	3,751	3,919	4,097	4,295	4,481	4,156
Unskilled wages (I)	3,600	3,561	3,519	3,483	3,455	3,515
Unskilled wage ratio	1.0	1.1	1.2	1.2	1.3	1.2

Source: Fund staff estimates.
1/ Constant prices 1998.

Table 5. Botswana: Lower Rate of Capital Accumulation Scenario
(Percentage change, unless otherwise noted)

	2000	2002	2004	2006	2008	Average
Macroeconomic Impact						
GDP (billions of pula) 1/						
Non-mining economy	11.2	11.8	12.3	12.6	13.0	12.2
Formal sector	9.9	10.5	11.0	11.4	11.8	11.0
Informal sector	1.3	1.3	1.3	1.2	1.2	1.2
GDP growth						
Non-mining economy	3.6	2.5	1.8	1.7	1.3	2.0
Formal sector	3.9	2.8	2.1	2.0	1.5	2.3
Informal sector	1.1	0.1	-0.7	-0.9	-1.1	-0.3
Capital Stock growth						
Non-mining economy	2.9	2.1	1.6	1.5	1.2	1.8
Formal sector	3.3	2.4	1.8	1.7	1.3	2.0
Informal sector	0.1	0.0	0.0	0.0	0.0	0.0
AIDS-related health spending (percent of GDP)						
Non-mining economy	1.7	2.0	2.3	2.5	2.5	2.2
Formal sector	1.2	1.5	1.7	1.7	1.7	1.6
Informal sector	5.1	6.6	8.0	9.0	9.6	7.9
Distribution Effects						
Output per worker (pula)						
Non-mining economy	26,873	27,854	28,919	30,151	31,371	29,343
Formal sector	36,216	37,735	39,361	41,205	42,996	39,956
Informal sector	8,927	8,846	8,766	8,714	8,687	8,780
Output per worker growth						
Non-mining economy	2.1	1.8	1.9	2.3	2.0	2.0
Formal sector	2.4	2.1	2.1	2.5	2.2	2.2
Informal sector	-0.3	-0.5	-0.4	-0.2	-0.1	-0.3
Labor Market						
Employment growth						
Non-mining economy	0.4	0.2	0.0	-0.2	-0.2	0.0
Formal sector	0.3	0.1	0.0	-0.1	-0.2	0.0
of which:						
Skilled	0.2	0.1	0.0	-0.1	-0.1	0.0
Unskilled	0.1	0.1	0.0	0.0	0.0	0.0
Informal sector	1.4	0.6	-0.2	-0.7	-0.9	0.0
Wages (pula)						
Skilled wages	14,660	15,317	16,049	16,904	17,758	16,356
Unskilled wages (F)	4,229	4,402	4,583	4,786	4,980	4,645
Unskilled wages (I)	3,600	3,561	3,519	3,483	3,455	3,515
Unskilled wage ratio	1.2	1.2	1.3	1.4	1.4	1.3

Source: Fund staff estimates.
1/ Constant prices 1998.

Table 6. Botswana: Lower TFP Scenario
(Percentage change, unless otherwise stated)

	2000	2002	2004	2006	2008	Average
Macroeconomic Impact						
GDP (billions of pula) 1/						
Non-mining economy	15.2	15.9	16.3	16.6	16.8	16.2
Formal sector	14.0	14.6	15.1	15.4	15.6	15.0
Informal sector	1.3	1.3	1.3	1.2	1.2	1.2
GDP growth						
Non-mining economy	3.0	1.9	1.2	1.0	0.5	1.4
Formal sector	3.1	2.1	1.4	1.2	0.6	1.5
Informal sector	1.1	0.1	-0.7	-1.0	-1.1	-0.4
Capital Stock growth						
Non-mining economy	2.5	1.7	1.2	1.0	0.6	1.3
Formal sector	2.7	1.9	1.3	1.1	0.6	1.4
Informal sector	0.1	0.0	0.0	0.0	0.0	0.0
AIDS-related health spending (percent of GDP)						
Non-mining economy	1.2	1.5	1.7	1.9	1.9	1.7
Formal sector	0.9	1.1	1.2	1.3	1.3	1.2
Informal sector	5.1	6.6	8.1	9.1	9.6	7.9
Distribution Effects						
Output per worker (pula)						
Non-mining economy	36,638	37,538	38,527	39,677	40,678	38,865
Formal sector	51,079	52,468	53,965	55,661	57,093	54,415
Informal sector	8,904	8,818	8,734	8,677	8,646	8,746
Output per worker growth						
Non-mining economy	1.5	1.3	1.3	1.6	1.3	1.3
Formal sector	1.7	1.4	1.4	1.7	1.3	1.4
Informal sector	-0.4	-0.5	-0.5	-0.2	-0.2	-0.3
Labor Market						
Employment growth						
Non-mining economy	0.4	0.2	0.0	-0.2	-0.2	0.0
Formal sector	0.3	0.1	0.0	-0.1	-0.2	0.0
of which:						
Skilled	0.2	0.1	0.0	-0.1	-0.1	0.0
Unskilled	0.1	0.1	0.0	0.0	0.0	0.0
Informal sector	1.4	0.6	-0.2	-0.7	-0.9	0.0
Wages (pula)						
Skilled wages	20,676	21,297	22,004	22,835	23,580	22,269
Unskilled wages (F)	5,965	6,120	6,283	6,465	6,613	6,327
Unskilled wages (I)	3,590	3,550	3,506	3,468	3,438	3,502
Unskilled wage ratio	1.7	1.7	1.8	1.9	1.9	1.8

Source: Fund staff estimates.
1/ Constant prices 1998.

Table 7. Botswana: Higher Work Loss due to AIDS Scenario
(Percentage change, unless otherwise stated)

	1999	2001	2003	2005	2007	2010	Average
Macroeconomic Impact							
GDP (billions of pula) 1/							
Non-mining economy	15.9	16.9	17.7	18.3	18.9	19.6	18.0
Formal sector	14.6	15.7	16.5	17.1	17.8	18.5	16.9
Informal sector	1.2	1.2	1.2	1.2	1.2	1.1	1.2
GDP growth							
Non-mining economy	3.7	2.9	2.2	1.5	1.4	1.2	2.1
Formal sector	3.9	3.1	2.4	1.7	1.5	1.4	2.3
Informal sector	1.0	0.0	-0.8	-1.6	-1.2	-1.4	-0.7
Capital Stock growth							
Non-mining economy	3.1	2.5	2.0	1.5	1.3	1.2	1.9
Formal sector	3.3	2.7	2.2	1.6	1.4	1.2	2.1
Informal sector	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0
AIDS-related health spending (percent of GDP)							
Non-mining economy	1.1	1.3	1.5	1.7	1.7	1.7	1.5
Formal sector	0.7	0.9	1.0	1.1	1.1	1.1	1.0
Informal sector	5.4	6.1	7.7	9.3	9.9	10.8	8.3
Distribution Effects							
Output per worker (pula)							
Non-mining economy	38,692	40,250	41,802	43,454	45,414	48,292	43,269
Formal sector	54,305	56,742	59,148	61,673	64,566	68,777	61,304
Informal sector	8,707	8,555	8,386	8,220	8,157	8,071	8,327
Output per worker growth							
Non-mining economy	1.8	1.8	1.9	2.0	2.0	2.1	2.0
Formal sector	2.1	2.0	2.1	2.1	2.1	2.1	2.2
Informal sector	-0.8	-1.0	-1.0	-1.0	-0.4	-0.3	-0.7
Labor Market							
Employment growth							
Non-mining economy	0.5	0.3	0.1	-0.1	-0.2	-0.2	0.0
Formal sector	0.4	0.2	0.0	-0.1	-0.1	-0.2	0.0
of which:							
Skilled	0.2	0.1	0.0	-0.1	-0.1	-0.1	0.0
Unskilled	0.1	0.1	0.0	0.0	0.0	-0.1	0.0
Informal sector	1.7	1.0	0.2	-0.6	-0.8	-1.0	0.0
Wages (pula)							
Skilled wages	21970	22994	24059	25215	26578	28588	25094
Unskilled wages (F)	6343	6623	6894	7173	7489	7946	7127
Unskilled wages (I)	3511	3447	3372	3294	3252	3193	3334
Unskilled wage ratio	1.8	1.9	2.0	2.2	2.3	2.5	2.1

Source: Fund staff estimates
1/ Constant prices 1998.

An AIDS scenario with multiple shocks

34. A further scenario is estimated incorporating a combination of the shocks outlined above, although at reduced intensity in most cases.[15] Nonmining GDP growth in this scenario falls to 1.6 percent on average over the next ten years (Table 8). It is noteworthy that the growth rate arising from multiple small shocks is similar to that of the earlier scenario incorporating a larger TFP shock alone. Even under multiple shocks, the major reason for slower growth than in the baseline is the reduction in TFP growth. However, the lower rates of capital inflows and capital accumulation lead, as before, to a significantly lower *level* of activity in the nonmining economy than in the baseline. Under this combined shock, the nonmining economy comes close to dissaving.

D. Fiscal Implications

35. HIV/AIDS is likely to lead to a significant increase in public expenditures in the years ahead, especially because of rising health spending. With output growth expected to slow, public revenues will also be lower than in a no-AIDS context. Largely because of the uncertainty surrounding prospective health spending—particularly the types of HIV/AIDS treatments that will be available, their cost, and likely take-up rates—it is not possible to arrive at a single "most probable" fiscal profile for Botswana over the next five to ten years. This subsection aims, instead, to indicate the rough order of magnitude of some public expenditure scenarios implied by AIDS and its consequences, drawing where possible on the model results presented in Subsection C. This subsection does not address a broader concern relating to the operations and efficiency of the public sector itself—whether there is a risk that rising rates of illness and death, especially among skilled personnel, will significantly impair the ability of public agencies to administer tax systems and spending programs, provide quality advice and support to government, and handle other responsibilities.

Health care

36. In the central AIDS scenario presented in Table 2, AIDS-related health spending is projected to rise by around 1.6 percentage points of GDP over the next ten years. This apparently mild impact is based, however, on conservative assumptions regarding treatment approaches. First, such treatments essentially takes the form of palliative care for those with AIDS—comforting the sick but, ultimately, probably not prolonging their life significantly in most cases. An alternative approach that extends to the provision of ARTs, which can delay or even stop the development of full-blown AIDS among those infected with the HIV virus,

---

[15] Specifically, the rate of capital inflows is reduced to 0.35 of nonmining GDP (compared with 0.4 in the baseline scenario); the rate of capital accumulation is reduced by 3.5 percentage points; TFP growth is reduced by one-fourth in both sectors (i.e., 0.3 percent rather than 0.4 percent in the formal sector); and working-time losses double, as in the previous scenario.

Table 8. Botswana: AIDS Multiple Shock Scenario
(Percentage change, unless otherwise stated)

	1999	2001	2003	2005	2007	2010	Average
Macroeconomic Impact							
GDP (billions of pula) 1/							
Non-mining economy	9.4	9.9	10.2	10.4	10.7	10.9	10.3
Formal sector	8.1	8.6	9.0	9.3	9.5	9.8	9.1
Informal sector	1.2	1.2	1.2	1.2	1.2	1.1	1.2
GDP growth							
Non-mining economy	3.1	2.3	1.6	0.9	0.9	0.8	1.6
Formal sector	3.4	2.6	1.9	1.2	1.2	1.0	1.9
Informal sector	1.0	0.0	-0.8	-1.6	-1.3	-1.4	-0.7
Capital Stock growth							
Non-mining economy	2.5	2.0	1.5	1.0	0.9	0.8	1.5
Formal sector	2.9	2.3	1.7	1.2	1.1	0.9	1.7
Informal sector	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0
AIDS-related health spending (percent of GDP)							
Non-mining economy	1.9	2.2	2.6	2.9	3.0	3.0	2.6
Formal sector	1.3	1.6	1.9	2.1	2.1	2.1	1.9
Informal sector	5.4	6.1	7.7	9.3	9.9	10.8	8.3
Distribution Effects							
Output per worker (pula)							
Non-mining economy	22,842	23,491	24,109	24,765	25,632	26,897	24,742
Formal sector	30,203	31,264	32,272	33,323	34,617	36,489	33,217
Informal sector	8,706	8,553	8,383	8,217	8,152	8,064	8,323
Output per worker growth							
Non-mining economy	1.3	1.2	1.3	1.4	1.6	1.6	1.5
Formal sector	1.6	1.5	1.6	1.6	1.8	1.8	1.7
Informal sector	-0.8	-1.0	-1.0	-1.0	-0.4	-0.3	-0.7
Labor Market							
Employment growth							
Non-mining economy	0.5	0.3	0.1	-0.2	-0.2	-0.3	0.0
Formal sector	0.4	0.2	0.0	-0.1	-0.1	-0.2	0.0
of which:							
Skilled	0.2	0.1	0.0	-0.1	-0.1	-0.1	0.0
Unskilled	0.1	0.1	0.0	0.0	0.0	-0.1	0.0
Informal sector	1.7	1.0	0.2	-0.6	-0.8	-1.0	0.0
Wages (pula)							
Skilled wages	12,219	12,669	13,127	13,624	14,250	15,167	13,595
Unskilled wages (F)	3,528	3,649	3,761	3,876	4,015	4,216	3,862
Unskilled wages (I)	3,511	3,447	3,370	3,292	3,250	3,191	3,333
Unskilled wage ratio	1.0	1.1	1.1	1.2	1.2	1.3	1.2

Source: Fund staff estimates.
1/ Constant prices 1998.

is considered briefly below. Second, lifetime AIDS treatment costs per patient are assumed to equal the level of average annual earnings that prevailed in 1998/99, equivalent to around 40 percent of GDP per capita. These costs appear to vary widely from country to country, and costs of over 100 percent of GDP per capita have been observed in several countries.[16]

37.   The increased health spending noted above is an economy-wide result; the model as specified does not distinguish between public and private sector impacts. However, with the bulk of health spending—and almost all AIDS-related expenditures—currently financed by the public sector, it would appear reasonable to assume that most of the 1.6 percentage points of GDP increase in spending would also come from the public sector. Under the assumed model parameters, 20 percent of increased health spending is financed through a reduction in nonhealth consumption, and 80 percent through reduced saving. Hence, public saving might decrease by around 1 to 1¼ percentage points of GDP per year under these assumptions. This impact could rise to over 2 percent of GDP in the scenario set out in Table 8. These estimates would, however, rise rapidly—indeed, at a disproportionate rate—if higher treatment costs are assumed, because national saving (and, hence, capital accumulation and economic growth) would decline as health care costs rise.

38.   As noted above, these estimates do not provide for introduction of the combination therapies that are now widely used in advanced economies. In this regard, the number one issue affecting the outlook for health spending—and, arguably, the key decision now facing the Botswana economy as a whole—concerns the extent to which ARTs are made available to HIV-positive patients. At western prices—amounting to at least $10,000 (around P 50,000) per patient per year—such treatment costs would be prohibitive from a budgetary perspective (Figure 3). Expenditures on ARTs could exceed total government revenues, even if take-up rates were substantially less than the 100 percent level assumed in the figure. Even if prices were reduced to around $2,000 (or P 10,000), ARTs would absorb a large share of projected fiscal revenues. At prices of around $300 (P 1,500), however—as recently proposed by a manufacturer of generic versions of these drugs—the implied health spending appears more fiscally feasible. While the last-mentioned scenario may be hypothetical at this point, given that the drugs concerned are still under patent protection, it does serve to illustrate the point that these advanced-treatment options would be possible in Botswana only with international support—whether in the form of lower drug prices or direct assistance.

39.   A further impediment to the widespread adoption of ARTs is the inadequate development of the health sector infrastructure that would be needed to support these regimes. The expenditure estimates above do not include any provision for further capital costs in the health sector, or for additional staffing, training, and other forms of development.

---

[16] See Haacker (2000). It should be noted, however, that even in countries where treatment costs per patient exceed 100 percent of GDP per capita, actual expenditure per patient may well be less than assumed in Botswana because of the latter's relatively high level of GDP per capita.

Figure 3. Botswana: Illustrative HIV Treatment Cost Scenarios, 2001 to 2010
(In billions of U.S. Dollars)
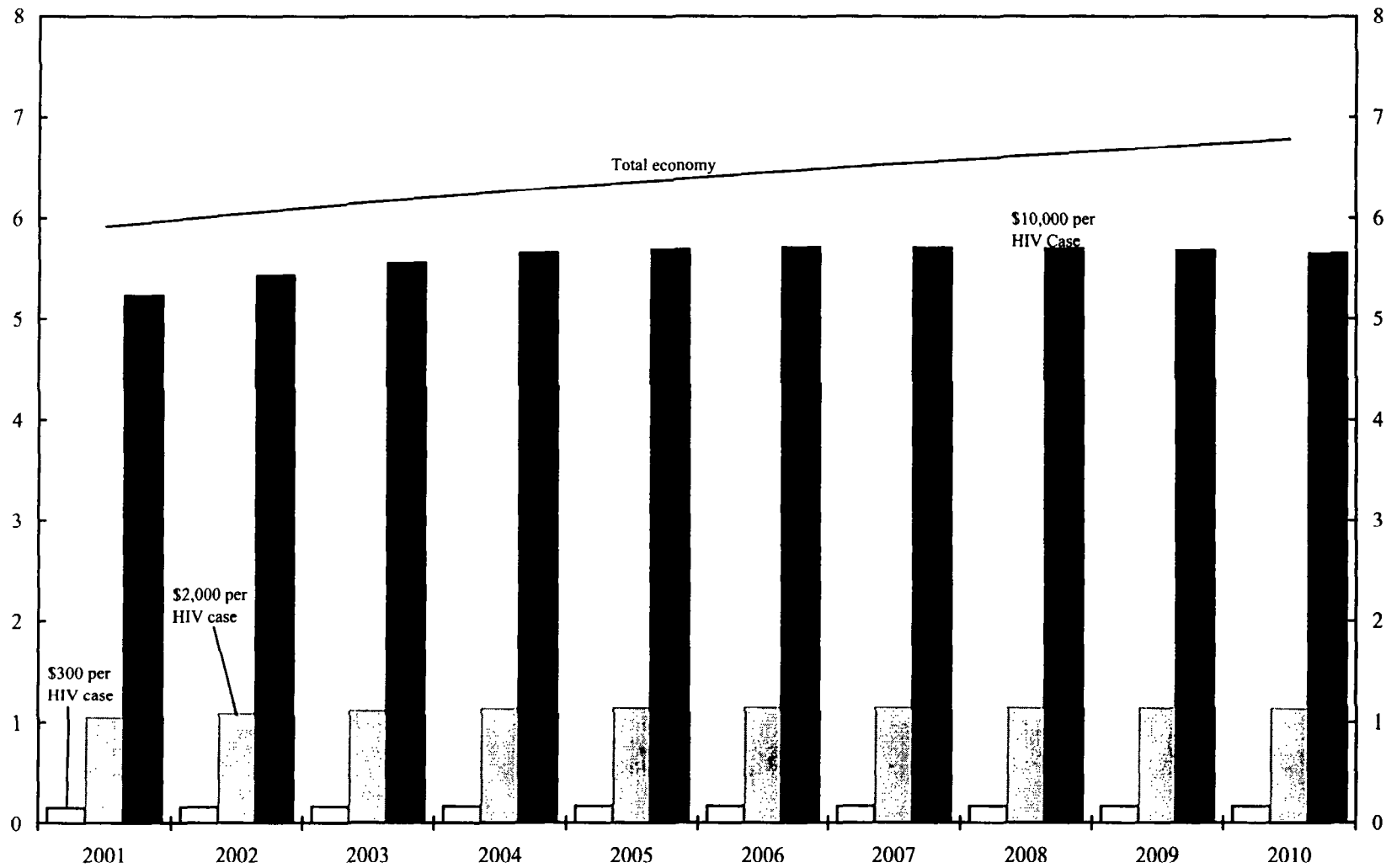
Source: ABT Associates, South Africa; and Fund staff estimates.

Other areas of public spending

40.   The spread of HIV/AIDS will also affect other areas of public spending. In particular, there are likely to be pressures for a significant rise in spending on social support, given the expected increases in poverty and in the number of orphans. Analysis in BIDPA (2000) of the effects of HIV/AIDS on income distribution suggests that there could be a 10 percent increase in individuals with incomes below the poverty line after ten years (compared with the no-AIDS scenario), and that a 3 to 4 percent increase in real public spending (equivalent to around 1¼ to 1½ percent of GDP) would be needed to alleviate this rise in poverty. Updated estimates would almost certainly be higher than these, given the increase in HIV prevalence rates indicated by more recent data, together with the slower rates of economic growth suggested by the current paper. With the number of orphans expected to explode to over 200,000 by 2010 (compared with around 60,000 at present), increased spending on orphans' allowances could amount to a further 1 to 2 percent of GDP.[17]

41.   A further source of public spending pressure could come from higher labor costs as skill shortages drive up wage rates. Recruitment and training costs are also likely to increase as rising mortality among public employees leads to higher labor turnover. These employment-related items could increase public spending by ½ of 1 to 1 percent of GDP, including a small offset that comes from lower public sector pension expenditures.[18] In the education sector, expenditure "savings" implied by lower numbers of school-age children may be largely counterbalanced both by the higher costs of recruiting and paying teachers (included in the preceding estimate), and increased demands on this sector to meet the education and skill needs of the economy.

Revenues

42.   HIV/AIDS may affect the prospective flow of public revenues through changes both in the revenue base and in effective tax rates on that base. The largest impact on revenues will come from the slowdown in GDP growth. If the share of fiscal revenue in GDP were to remain constant, revenues would be 36 percent lower than otherwise because GDP growth under the central AIDS scenario in Table 3 is much slower than in the no-AIDS scenario. In addition, there is a risk that the revenue share of GDP could fall (in the absence of offsetting policy adjustments). Such a decline could result, for example, from increased difficulties in

---

[17] As in BIDPA (2000), this estimate is based on an orphans' allowance of P 216 per month. Actual spending would depend in part on how many orphans register for and then receive this benefit.

[18] Estimates from BIDPA (2000). As with other spending components, updated estimates may well be higher, given the increase in estimated HIV prevalence rates since the BIDPA study.

tax administration, if labor turnover and skill shortages rise sharply in the public sector, and possibly also from reduced tax compliance as AIDS-related economic and social pressures increase. Unrelated to AIDS, changes in the composition of the economy—notably, the expected slowing of growth in the mining sector, which generates around two-thirds of current government revenues—may also reduce the revenue share of GDP. Interest earnings on Botswana foreign exchange reserves, contributing around 14 percent of current government revenues, would also decline if these reserves are drawn on to finance public spending. But substantial uncertainty and controversy surrounds the issue of how the reserves should be used, including whether they should support the cost of ARTs and other areas of health spending.

E. Conclusions

43.   The principal conclusions of the analysis are as follows:

- AIDS will have a significantly negative impact on the rate of economic growth in Botswana over the coming decade. Simulations incorporating a range of potential effects on the nonmining economy arising from the epidemic suggest that the rate of GDP growth in the nonmining sector could fall from a projected 5½ percent a year without AIDS to between 1½ and 2½ percent a year on average with AIDS. As a result, in 2010 the economy would be 33 - 40 percent smaller than it would have been without AIDS.

- The major impact of AIDS comes from projected lower rates of growth in effective labor productivity and capital accumulation. As would be expected, the labor-intensive sectors are particularly affected through the labor supply channel, while growth in capital-intensive sectors is reduced mainly as a result of slower capital accumulation.

- Nonnegligible redistribution effects across sectors and labor skills are also likely to arise as a result of AIDS. These stem from changes in the relative growth rate of the formal and informal sectors compared with the growth of their labor supply. The main sectoral impact on income distribution arises from the shortage in skilled labor and from a shift of unskilled labor from the informal to the formal sector and from a shrinking of the unskilled wage differential between the two sectors.

- The fiscal situation in Botswana will almost certainly deteriorate as a result of HIV/AIDS. Even under quite conservative assumptions about AIDS treatment strategies, public expenditures could rise by over 5 percentage points of GDP as a result of higher healthcare spending, together with increased social support and public sector employment costs. Public revenues could also fall as a share of GDP if economic and social pressures lead to weaker tax administration and compliance. Fiscal pressures could be substantially higher if anti-retroviral drug treatments were to be made available, highlighting the need for increased international support and/or lower drug prices to make such treatments feasible.

References

Abt Associates South Africa Inc. 2000, "An Impact Assessment of HIV/AIDS on Current and Future Population Characteristics and Demographics in Botswana."

Arndt, Channing and Jeffrey Lewis, 2000, "The Macro Implications of HIV/AIDS in South Africa: A Preliminary Assessment," World Bank Africa Region Working Paper No. 9 (Washington: World Bank).

Bonnel, Rene, "HIV/AIDS: Does it Increase or Decrease Growth?", South African Journal of Economics (forthcoming).

Botswana Institute for Development Policy Analysis (BIDPA), 2000, *Macroeconomic Impacts of the HIV/AIDS Epidemic in Botswana* (Gaborone, Botswana: BIDPA).

Cuddington, J.T., 1993, "Further Results on the Macroeconomic Effects of AIDS: The Dualistic, Labor-Surplus Economy," *World Bank Economic Review*, Vol. 7 (September), pp. 403-17.

Cuddington, J.T. and J.D. Hancock, 1993, "The Macroeconomic Impact of AIDS in Malawi: A Dualistic, Labour Surplus Economy," *Journal of African Economies*, Vol. 4 (May), pp.1-28.

Haacker, Marcus, 2000, "The Impact of HIV/AIDS in Southern Africa" (unpublished, Washington: International Monetary Fund).

ING Barings, South African Research, 2000, "Economic Impact of AIDS in South Africa. A Dark Cloud on the Horizon."

Joint United Nations Programme on HIV/AIDS (UNAIDS), 2000, "Report on the Global HIV/AIDS Epidemic."

McNeill, W.H., 1977, *Plagues and Peoples* (New York: Doubleday).

Over, A. Mead, 1992, "The Macroeconomic Impact of HIV/AIDS in Sub-Saharan Africa," World Bank AFTPN Working Paper No 3. (Washington: World Bank).

National AIDS Coordinating Agency (NACA), 2000, "Botswana 2000 HIV/STD Syndrome Sentinel Seroprevalence Survey. A Technical Report," (unpublished, Gaborone, Botswana).

Rosen, S., Thea, D.M., Simon, J., Vincent, J.R., and W. MacLeod, 2001, "The Impact of HIV/AIDS in the Workforce on Businesses in South Africa", Boston University School of Public Health, paper presented at the IFC, Washington D.C., January 2001.

Tuchman, Barbara, 1978, *A Distant Mirror: the Calamitous 14th Century* (New York: Ballantine Books).

United Nations Development Programme (UNDP), 2000, "Botswana Human Development Report 2000.

U.S. Census Bureau, 1999, "Focus on HIV/AIDS in the Developing World."

World Bank, 1999, "Confronting AIDS: Public Priorities in a Global Epidemic. A World Bank Policy Research Report," revised edition (Oxford: University Press).

World Bank, 2000, "Economic Analysis of HIV/AIDS", Multisectoral AIDS Program Annex 5.

A. Theoretical Model

Here we provide analytical details of the theoretical model used in section C. Parameters are given in Table 9.

Health spending allocation

The immediate impact of AIDS is on health spending. Following Cuddington and Hancock (1995), AIDS-related health care costs incurred by individuals in the formal and informal sectors are represented by H_f and H_i, respectively.

$$H_f = m_f a_f L_f + m_f^c a_f^c N_f^c \tag{1}$$

$$H_i = m_i a_i L_i + m_i^c a_i^c N_i^c \tag{2}$$

where m is the yearly medical cost per AIDS cases, a is the number of adult AIDS cases, L is labor force, and N^c is the population below 15 years. Subscript f and i denote formal and informal sector, respectively, whereas superscript c stands for children whose parents are working in either sector[19].

Capital accumulation and consumption

Health care expenditures in (1) and (2) are met by reducing both saving and consumption. Moreover, the model assumes that informal sector capital formation is limited by the amount of saving generated by the sector itself. Foreign reserves are available only for investment in the more capital-intensive formal sector. Nonetheless, the model allows for transfers from the formal to the informal sector as a form of medical insurance. The capital accumulation process in the two sectors of the economy can be represented as follows:

$$\Delta K_{f,t} = \sigma_f Y_{f,t} + \sigma_f (Y_{f,t} + Y_{i,t}) - x_f (H_{f,t} + \omega H_{i,t}) - \delta_f K_{f,t-1}$$

$$\Delta K_{i,t} = \sigma_i Y_{i,t} - x_i (1 - \omega) H_{i,t} - \delta_i K_{i,t-1}$$

where σ denotes the saving rate, foreign saving is assumed to be a fixed share of real national GDP, and δ is the depreciation rate. Note that x represents the proportion of AIDS-related medical costs that are paid for by reducing saving in either sector, whereas ω is the

---

[19] Note that children and child AIDS-related health costs are allocated across formal and informal sectors in the same proportion as the adult population.

Table 9. Botswana: Initial Model Parameters

Symbol	Description	Value	Symbol	Description	Value
	Formal Sector			*Informal Sector*	
m_f	Yearly medical cost per adult AIDS cases	14,495	m_i	Yearly medical cost per adult AIDS cases	14,495
m_cf	Yearly medical cost per children AIDS cases	14,495	m_ci	Yearly medical cost per children AIDS cases	14,495
σ_f	saving rate	0.4	σ_i	saving rate	0.4
σ_ff	rate of capital inflow	0.4			
x_f	AIDS costs met by reducing saving	0.8	x_i	AIDS costs met by reducing saving	0.8
ω	% AIDS costs transfers	0.8	$1-\omega$	% AIDS costs transfers	0.2
δ_f	depreciation rate	0.07	δ_i	depreciation rate	0.07
α_f	constant - production function	4.1	α_i	constant - production function	1,110
γ_f	exogenous technological trend	0.004	γ_i	exogenous technological trend	0.0005
β_s	skilled labor share of output	0.12			
β_u	unskilled labor share of output	0.08	β_i	unskilled labor share of output	0.95
λ_s	productivity lost per AIDS case - skilled	1			
λ_u	productivity lost per AIDS case - unskilled	1	λ_i	productivity lost per AIDS case - unskilled	1
$\rho1\_s$	constant - age efficiency	6.2			
$\rho2\_s$	linear term - age efficiency	0.067			
$\rho3\_s$	quadratic term - age efficiency	-0.0012			
$\rho1\_u$	constant - age efficiency	5.6	$\rho1\_u$	constant - age efficiency	5.6
$\rho2\_u$	linear term - age efficiency	0.027	$\rho2\_u$	linear term - age efficiency	0.027
$\rho3\_u$	quadratic term - age efficiency	-0.0006	$\rho3\_u$	quadratic term - age efficiency	-0.0006
w_s	wage - skilled	21,245			
w_u	wage - unskilled	6,281	w_i	real wage - unskilled	3,538
Y_f/Y	share of total output - formal	0.92	Y_i/Y	share of total output - informal	0.08
K/Y_f	capital-output ratio	1.95	K/Y_I	capital-output ratio	0.97

share of medical costs incurred by individual in the informal sector that are covered by reducing formal sector saving. Rearranging, yields:

$$\Delta K_{f,t} = [\sigma_f + \sigma_{ff}(1 + \frac{Y_{i,t}}{Y_{f,t}}) - x_f(\frac{H_{f,t}}{Y_{f,t}} + \omega\frac{H_{i,t}}{Y_{f,t}})]Y_{f,t} - \delta_f K_{f,t-1}$$

$$\Delta K_{i,t} = [\sigma_i - x_i(1 - \omega)\frac{H_{i,t}}{Y_{i,t}}]Y_{i,t} - \delta_i K_{i,t-1}$$

In per capita terms, the capital accumulation process reduces to:

$$\Delta k_{f,t} = [\sigma_f + \sigma_{ff}(1 + \frac{Y_{i,t}}{Y_{f,t}}) - x_f(\frac{H_{f,t}}{Y_{f,t}} + \omega\frac{H_{i,t}}{Y_{f,t}})]y_{f,t} - \frac{\delta_f + n_f}{1 + n_f}k_{f,t-1}$$

$$\Delta k_{i,t} = [\sigma_i - x_i(1 - \omega)\frac{H_{i,t}}{Y_{i,t}}]y_{i,t} - \frac{\delta_i + n_i}{1 + n_i}k_{i,t-1}$$

where lower letters indicate corresponding per capita levels and n stand for the rate of population growth in each sector.

The steady-state capital stock for the two sectors can, be derived by letting Δk_f and

Δk_i equal to zero and solving for $\bar{k}_f$ and $\bar{k}_i$, respectively. It follows:

$$\bar{k}_f = \frac{1 + n_f}{\delta_f + n_f}[\sigma_f + \sigma_{ff}(1 + \frac{Y_{i,t}}{Y_{f,t}}) - x_f(\frac{H_{f,t}}{Y_{f,t}} + \omega\frac{H_{i,t}}{Y_{f,t}})]y_{f,t} \tag{3}$$

$$\bar{k}_i = \frac{1 + n_i}{\delta_i + n_i}[\sigma_i - x_f(1 - \omega)\frac{H_{i,t}}{Y_{i,t}})]y_{i,t} \tag{4}$$

The above medical expenditure and saving equations imply non-medical consumption equal to:

$$C_f = (1 - \sigma_f)Y_f - (1 - x_f)H_f - (1 - x_f)\omega H_i$$
$$C_i = (1 - \sigma_i)Y_i - (1 - x_i)(1 - \omega)H_i$$

for the formal and informal sector, respectively. Dividing both sides of the consumption equations by total labor force in the corresponding sector (i.e. L_f and L_i) yields expressions for per capita consumption by sector.

$$c_f = (1 - \sigma_f)y_f - (1 - x_f)h_f - (1 - x_f)\omega\, h_i \tag{5}$$

$$c_i = (1 - \sigma_i)y_i - (1 - x_i)(1 - \omega)h_i \tag{6}$$

Production functions and efficiency units

In line with the BIDPA (2000), output in both sectors can be represented by a Cobb-Douglas production function exhibiting constant returns to scale. Specifically, the formal sector employs three inputs: skilled labor, unskilled labor, and capital. The informal sector, instead, uses only two factors: unskilled labor and capital. The corresponding production functions are given below.

$$Y_f = \alpha_f e^{\gamma_f(t-t_0)} Z_s^{\beta_s} Z_u^{\beta_u} K_f^{(1-\beta_s-\beta_u)} \tag{7}$$

$$Y_i = \alpha_i e^{\gamma_i(t-t_0)} Z_i^{\beta_i} K_i^{(1-\beta_i)} \tag{8}$$

where Z indicates effective labor supply measured in efficiency units. The term γ represents an exogenous technological trend, while the constant term a is used to calibrate the model to fit the data in the base year 1998. Finally, the β's signify the shares of output attributable to each factor.

AIDS impacts directly on labor supplies by changing the size, the structure, and the level of experience (i.e. efficiency) of the labor force. Following Cuddington and Hancock (1995) we measure effective labor supply in the formal sector in terms of efficiency units.

$$Z_s = \sum_{j=15}^{64} (1 - \lambda_s a_{j,s})\left[\rho_{1s} + \rho_{2s}(j-15) + \rho_{3s}(j-15)^2\right]L_{j,s}$$

$$0 Z_u = \sum_{j=15}^{64} (1 - \lambda_u a_{j,u})\left[\rho_{1u} + \rho_{2u}(j-15) + \rho_{3u}(j-15)^2\right]L_{j,u}$$

where L_j is the number of workers in cohort j, a_j is the number of AIDS cases in cohort j, and λ is the fraction of work-year lost per AIDS case as a result of sick leave or absence for care of an AIDS-infected family member. As the productivity gains from work experience cannot be evaluated directly, as in Cuddington and Hancock (1995) we assume a non-linear relationship between earnings and productivity which is proxied by a second order polynomial with parameters ρ's. In this way, we can also derive indices of experience for each skill category.

$$\overline{\rho}_s = \frac{Z_s}{L_s} \tag{9}$$

$$\overline{\rho}_u = \frac{Z_u}{L_u} \tag{10}$$

Plugging these indices into the formal sector production function, we obtain:

$$Y_f = \alpha_f e^{\gamma_f(t-t_0)}\left(\overline{\rho}_s^{\beta_s}\,\overline{\rho}_u^{\beta_u}\right)\left(L_s^{\beta_s}L_u^{\beta_u}\right)K_f^{(1-\beta_s-\beta_u)} \tag{11}$$

Similarly, for the informal sector, it holds:

$$Y_i = \alpha_i e^{\gamma_i(t-t_0)}\left(\overline{\rho}_i^{\beta_i}\right)\left(L_i^{\beta_i}\right)K_f^{(1-\beta_i)} \tag{12}$$

where:

$$\overline{\rho}_i = \frac{Z_i}{L_i} = \sum_{j=15}^{64}(1-\lambda_i a_{j,i})\left[\rho_{1u}+\rho_{2u}(j-15)+\rho_{3u}(j-15)^2\right]\frac{L_{j,i}}{L_i} \tag{13}$$

We can rewrite equations (11) and (12) in per capita terms as:

$$y_f = \alpha_f e^{\gamma_f(t-t_0)}\left(\overline{\rho}_s^{\beta_s}\,\overline{\rho}_u^{\beta_u}\right)\left(\frac{L_s}{L_f}\right)^{\beta_s}\left(\frac{L_u}{L_f}\right)^{\beta_u}k_f^{(1-\beta_s-\beta_u)} \tag{14}$$

$$y_i = \alpha_i e^{\gamma_i(t-t_0)}\left(\overline{\rho}_i^{\beta_i}\right)k_i^{(1-\beta_i)} \tag{15}$$

Substituting back into equations (3) and (4) and rearranging, we can derive the steady-state capital stock in the two sectors as functions of income allocation between sectors, labor force allocation between skill categories, health care costs and labor efficiency indexes. These variables are assumed to remain unchanged throughout the simulation period (implicitly we are here assuming that AIDS does not generate any redistribution effect apart from the one on age/experience structure of the labor force.).

$$\overline{k}_f = \left\{\frac{1+n_f}{\delta_f + n_f}\left[\sigma_f + \sigma_{ff}(1+\frac{Y_{i,t}}{Y_{f,t}}) - x_f(\frac{H_f}{Y_f}+\omega\frac{H_i}{Y_f})\right]\alpha_f e^{\gamma_f(t-t_0)}\left(\overline{\rho}_s^{\beta_s}\,\overline{\rho}_u^{\beta_u}\right)\left(\frac{L_s}{L_f}\right)^{\beta_s}\left(\frac{L_u}{L_f}\right)^{\beta_u}\right\}^{\frac{1}{\beta_s+\beta_u}} \tag{16}$$

$$\overline{k}_i = \overline{\rho}_i\left\{\frac{1+n_i}{\delta_i + n_i}\left[\sigma_i - x_f(1-\omega)\frac{H_i}{Y_i}\right]\alpha_i e^{\gamma_i(t-t_0)}\right\}^{\frac{1}{\beta_i}} \tag{17}$$

Labor allocation

As in the BIDPA (2000), we assume that the economy is divided into a formal and an informal sector. Labor is subsequently divided into skilled and unskilled categories. As we implicitly assume that all skilled workers are employed in the formal sector, the model comprises three labor markets: skilled formal sector, unskilled formal sector, and unskilled informal sector.

The three labor markets behave differently. The skilled formal sector is assumed to be a perfectly competitive market, where wages adjust to equate demand and supply at any time. In the unskilled formal sector, instead, there is a fixed minimum wage that is higher than the equilibrium wage. As a result, unemployment arises among unskilled workers in the formal sector.

As labor demand in the informal sector is derived from the excess of unskilled labor supply in the formal sector, let us first focus on the allocation of skilled and unskilled labor within the formal sector. We assume that firms in the formal sector choose the optimal composition of skilled/unskilled labor as solution of a constrained minimization problem. Namely, we suppose that firms in the formal sector choose the skill composition of its labor force in such a way that the total cost of production is minimized subject to (i) a given production function, (ii) a given minimum wage for unskilled workers, (iii) a labor supply featuring long-run demographic constraints (i.e., the existence of a vertical long-run labor supply). Because of (iii), the constrained minimization problem can be restated in terms of average cost per unit of labor:

$$\min_{\frac{L_s}{L_f},\frac{L_u}{L_f}} w_s \frac{L_s}{L_f} + w_u \frac{L_u}{L_f} + i\bar{k}_f \tag{18}$$

$$\text{s.t. } \bar{y}_f = \alpha_f e^{\gamma_f(t-t_0)} \left(\bar{\rho}_s^{\beta_s} \bar{\rho}_u^{\beta_u}\right) \left(\frac{L_s}{L_f}\right)^{\beta_s} \left(\frac{L_u}{L_f}\right)^{\beta_u} \bar{k}_f^{(1-\beta_s-\beta_u)} \tag{19}$$

$$\text{s.t. } w_u = w_u^{min} \tag{20}$$

Substituting out for $\dfrac{L_u}{L_f}$ in (19) and plugging it back into (18) - when (20) also holds true -

we can minimize the average cost with respect to $\dfrac{L_s}{L_f}$. The first order condition yields the

optimal conditional demand function for skilled labor in the formal sector.

$$\left(\frac{L_s}{L_f}\right)^* = \left(\frac{\beta_s w_u^{min}}{\beta_u \rho_u w_s^*}\right)^{\frac{\beta_u}{\beta_s + \beta_u}} \left(\frac{\bar{y}_f}{\alpha e^{\gamma_f(t-t_0)}}\right)^{\frac{1}{\beta_s + \beta_u}} (\rho_s)^{-\frac{\beta_s}{\beta_s + \beta_u}} (\bar{k}_f)^{1 - \frac{1}{\beta_s + \beta_u}} \tag{21}$$

Since the skilled labor market is assumed to be perfectly competitive, with wages w_s adjusting to equate demand and supply, then both L_s^* and w_s^* are directly observable in the market:

$$\left(\frac{L_s}{L_f}\right)^* = \left(\frac{L_s}{L_f}\right)^d = \left(\frac{L_s}{L_f}\right)^s \quad \text{and} \quad w_s^* = w_s.$$

By contrast, the equilibrium wage and equilibrium level of unskilled labor in the formal sector are not directly observable because the unskilled informal sector is not assumed to clear. We can, however, derive their suboptimal values under constraints (19) and (20) by plugging equation (19) into equation (21). Rearranging, yields the classical result that the relative cost of any factor must be equal to the relative share of output attributable to that factor.

$$\frac{w_u^{min} \bar{L}_u}{w_s^* L_s^*} = \frac{\beta_u}{\beta_s}$$

This implies that, in the formal sector, the optimal combination of labor across skills categories is such that:

$$\left(\frac{\bar{L}_u}{L_f}\right) = \frac{\beta_u w_s^*}{\beta_s w_u^{min}}\left(\frac{L_s}{L_f}\right)^*. \tag{22}$$

Note that, if $w_u^{min} = w_u^*$ then the unskilled labor market clears, with $\left(\frac{\bar{L}_u}{L_f}\right) = \left(\frac{L_u}{L_f}\right)^*$.

Otherwise, if $w_u^{min} > w_u^*$ then $\left(\frac{\bar{L}_u}{L_f}\right) < \left(\frac{L_u}{L_f}\right)^*$ and underemployment arises.

Underemployed unskilled workers in the formal sector make up the supply of labor in the informal sector, where market forces operate to equate demand and supply. The congruent share of unskilled labor accruing to the informal sector can, therefore, be derived from the excess of unskilled labor supply in the formal sector:

$$L_i = L_f \cdot \left[\left(\frac{L_u}{L_f} \right)^* - \left(\frac{\overline{L_u}}{L_f} \right) \right] \qquad \text{that is} \qquad L_u^* = L_u + L_i \,. \tag{23}$$

The system of equations (1)-(2)-(5)-(6)-(14)-(15)-(16)-(17)-(21)-(22)-(23) can thus be simulated under alternative AIDS assumptions to make medium-term projections for key economic variables. It permits variation of key parameters, enabling thereby identification of the areas where policy intervention may help to minimize the impact of AIDS on the economy.

B. The Data

In order to apply the model, it is necessary to calibrate it so that its projections match the actual (known) values of relevant economic variables in some base period. In this case 1998/99 is chosen as the base year. Besides providing updated nonmining GDP values, national account figures allow us to compute the level of capital stock for the whole economy. Moreover, by using the same data assumptions as in BIDPA (2000), it is possible to estimate the size of informal sector's GDP and capital stock. Average wage rates in the two sectors are obtained from the average monthly earnings published by Central Statistical Office (CSO).

Demographic and AIDS statistics have been taken from a study on the demographic impact of HIV/AIDS in Botswana published in August 2000 by the Abt Associates South Africa Inc. and commissioned by the Botswana Ministry of Finance and Development Planning with the support of the United Nations Development Programme.

Best estimate projections[20] indicate that 17 percent of the total population of Botswana was infected with HIV in 1999, versus the 11 percent prevalence rate in 1995 and the an expected 22 percent in 2010. Infection rates among adults aged 15-59 are substantially higher, estimated to rise from 21 percent in 1995, to 30 percent in 1999, and to over 37 percent in 2010 if no intervention or change of behaviour is assumed. The data illustrates that the AIDS epidemic in Botswana is still at a relatively early stage, despite high prevalence. Less than 20,000 AIDS cases are projected for 1999, but the burden is expected to surge to more than 50,000 by 2010.

---

[20] Best demographic estimates for Botswana have been generated with the Spectrum AIM model, a model specifically designed to calculate the demographic consequences of the HIV virus. It is readily available from internet at http://www.tfgi.com. Its key assumptions are the following: (1) A common antenatal seroprevalence epidemic curve for all Districts, with District epidemics differing only in their timing. (2) Calibration of the projections against male/female age profiles of antenatal and reported AIDS case data. (3) Median adult survival times of 8.5 years from infection to AIDS, and one year after developing AIDS. Median child survival just under 2 years. (4) Average fertility reduction of 34 percent among HIV-infected women. (5) Mother-to-child transmission rates of 30 percent.

We draw on the Abt (2000) demographic study to obtain projections of the age profile of the Botswana population over time. Since updated employment data are not available (next Labor Force Statistics is due in 2005), we make use of the 1995/96 Labor Force Statistics to extrapolate data on the structure of the labor force up to 2010. To do this, we assume a fixed participation rate per age cohort. This implies that AIDS has no effect on the participation rate, while it can reduce total employment and total output.

We also use estimates of AIDS cases to evaluate AIDS-related health spending and adopt a conservative approach regarding the AIDS treatment cost per patient. Namely, we let it to be equal to the average wage prevailing in 1998/99. This is less than 40 percent of per-capita GDP in the same year (P 14,495 versus P 38,439). Note that the BIDPA report shows treatment costs per head ranging between 1 and 4 times per-capita GDP.

Table 10. Botswana: GDP by Type of Expenditure at Current Prices, 1993/94-1999/00 1/

	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00
				(In millions of pula)			
Total consumption	6,892	7,805	8,721	10,319	11,589	15,252	15,349
General government	3,049	3,547	4,007	4,908	5,453	6,579	7,524.5
Central government	2,740	3,155	3,561	4,195	4,854	5,841	6,709.6
Local government	309	392	446	516	599	738	814.9
Private	3,843	4,258	4,715	5,411	6,136	8,673	7,824
Total investment	3,018	3,149	3,371	4,604	6,056	7,917	6,714
Gross fixed capital formation	2,814	3,135	3,632	4,276	5,170	6,263	6,619
Public	1,410	1,378	1,672	2,240	2,696	2,935	3,451
Private	1,404	1,757	1,960	2,036	2,475	3,329	3,168
Changes in stocks	204	14	-261	328	886	1,654	94
Net exports of goods and services	1,152	1,299	2,111	3,111	2,517	91	3,145
Exports of goods and services	5,412	6,071	7,412	9,882	11,393	10,052	14,108
Of which: exports of goods	4,808	5,347	6,766	9,158	10,304	8,560	12,426
Imports of goods and services	-4,260	-4,772	-5,300	-6,771	-8,875	-9,961	-10,963
Of which: imports of goods	-3,729	-4,080	-4,527	-5,926	-7,762	-8,571	-8,774.4
Gross domestic savings 2/	4,149	4,456	5,482	7,422	8,574	6,272	9,859
Public	1,146	1,289	1,547	2,053	2,319	1,917	2,943
Private	3,004	3,167	3,936	5,368	6,255	4,355	6,916
Total GDP	11,041	12,262	14,204	17,740	20,163	21,524	25,208
				(In percent of total GDP)			
Total consumption	62.4	63.7	61.4	58.2	57.5	70.9	60.9
General government	27.6	28.9	28.2	27.7	27.0	30.6	29.9
Central government	24.8	25.7	25.1	23.6	24.1	27.1	26.6
Local government	2.8	3.2	3.1	2.9	3.0	3.4	3.2
Private	34.8	34.7	33.2	30.5	30.4	40.3	31.0
Total investment	27.3	25.7	23.7	26.0	30.0	36.8	26.6
Gross fixed capital formation	25.5	25.6	11.8	12.6	13.4	13.6	13.7
Public	12.8	11.2	11.8	12.6	13.4	13.6	13.7
Private	12.7	14.3	13.8	11.5	12.3	15.5	12.6
Changes in stocks	1.9	0.1	-1.8	1.8	4.4	7.7	0.4
Net exports of goods and services	10.4	10.6	14.9	17.5	12.5	0.4	12.5
Exports of goods and services	49.0	49.5	52.2	55.7	56.5	46.7	56.0
Of which: exports of goods	43.5	43.6	47.6	51.6	51.1	39.8	49.3
Imports of goods and services	-38.6	-38.9	-37.3	-38.2	-44.0	-46.3	-43.5
Of which: imports of goods	-33.8	-33.3	-31.9	-33.4	-38.5	-39.8	-34.8
Gross domestic savings 2/	37.6	36.3	38.6	41.8	42.5	29.1	39.1
Public	10.4	10.5	10.9	11.6	11.5	8.9	11.7
Private	27.2	25.8	27.7	30.3	31.0	20.2	27.4

Sources: Central Statistics Office; and Fund staff estimates.

1/ National accounts year beginning July 1.
2/ GDP minus consumption.

Table 11. Botswana: GDP by Type of Expenditure at Constant 1993/94 Prices, 1993/94-1999/00 1/

	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00
				(In millions of pula)			
Consumption	6,892	7,126	7,287	7,676	8,390	8,730	9,246
Public	3,049	3,259	3,405	3,682	3,970	4,194	4,538
Private	3,843	3,867	3,882	3,995	4,420	4,536	4,708
Gross investment	3,018	2,820	2,625	3,459	4,125	5,613	4,560
Public	929	924	902	1,144	1,308	1,641	1,499
Private (including changes in stocks)	2,090	1,896	1,723	2,315	2,816	3,972	3,061
Net exports of goods and services	1,152	1,327	1,804	1,868	1,111	-685	981
Exports of goods and services	5,412	5,686	6,207	6,986	7,405	5,952	7,694
Imports of goods and services	-4,260	-4,358	-4,403	-5,118	-6,293	-6,637	-6,713
Gross domestic expenditure	9,910	9,946	9,912	11,135	12,515	14,343	13,805
GDP at constant prices	11,041	11,398	12,030	12,704	13,729	14,296	15,394
				(Annual percentage change)			
Consumption	3.7	3.4	2.3	5.3	9.3	4.0	5.9
Public	3.1	6.9	4.5	8.1	7.8	5.6	8.2
Private	4.1	0.6	0.4	2.9	10.7	2.6	3.8
Gross investment	-2.8	-6.6	-6.9	31.8	19.3	36.1	-18.8
Public	-1.3	-0.5	-2.4	26.8	14.4	25.4	-8.7
Private (including changes in stocks)	-3.4	-9.2	-9.1	34.4	21.6	41.0	-22.9
Net exports of goods and services	11.1	15.3	35.9	3.6	-40.5	-161.6	-243.3
Gross domestic expenditure	1.6	0.4	-0.3	12.3	12.4	14.6	-3.8
GDP at constant prices	4.0	3.2	5.5	5.6	8.1	4.1	7.7

Sources: Central Statistics Office; and Fund staff estimates.

1/ National accounts year beginning in July.

Table 12. Botswana: GDP by Type of Economic Activity at Current Prices, 1993/94-1999/00 1/

	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00
	(In millions of pula)						
Agriculture	467	484	588	602	689	654	665
Mining	3,956	4,145	4,800	6,908	7,665	6,693	8,389
Manufacturing	430	616	727	883	1,011	1,128	1,237
Water and electricity	240	271	276	320	371	458	540
Construction	710	775	884	1,017	1,154	1,360	1,424
Trade and hotels	882	1,178	1,435	1,784	2,018	2,339	2,730
Transport	407	464	514	575	667	814	934
Banking, insurance, and business services	1,144	1,345	1,615	1,775	2,079	2,410	2,743
General government	1,707	1,883	2,122	2,478	2,919	3,751	4,105
Social and personal services	470	535	610	682	746	870	994
GDP at current prices	11,041	12,262	14,204	17,740	20,163	21,524	25,208
	(In percent of total GDP)						
Agriculture	4.2	3.9	4.1	3.4	3.4	3.0	2.6
Mining	35.8	33.8	33.8	38.9	38.0	31.1	33.3
Manufacturing	3.9	5.0	5.1	5.0	5.0	5.2	4.9
Water and electricity	2.2	2.2	1.9	1.8	1.8	2.1	2.1
Construction	6.4	6.3	6.2	5.7	5.7	6.3	5.6
Trade and hotels	8.0	9.6	10.1	10.1	10.0	10.9	10.8
Transport	3.7	3.8	3.6	3.2	3.3	3.8	3.7
Banking, insurance, and business services	10.4	11.0	11.4	10.0	10.3	11.2	10.9
General government	15.5	15.4	14.9	14.0	14.5	17.4	16.3
Social and personal services	4.3	4.4	4.3	3.8	3.7	4.0	3.9
GDP at current prices	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Sources: Central Statistics Office; and Fund staff estimates.

1/ National accounts year beginning July 1.

Table 13. Botswana: GDP by Type of Economic Activity at Constant 1993/94 Prices, 1993/94-1999/2000 1/

	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00
				(In millions of pula)			
Agriculture	467	459	490	453	480	443	405
Mining	3,956	3,899	4,076	4,311	4,722	4,588	5,136
Manufacturing	430	532	573	594	626	661	683
Water and electricity	240	256	257	269	295	333	360
Construction	710	723	747	788	822	917	939
Trade and hotels	882	1,086	1,193	1,359	1,423	1,502	1,594
Transport	407	436	438	456	498	579	589
Banking, insurance, and business services	1,144	1,232	1,352	1,368	1,501	1,636	1,697
General government	1,707	1,762	1,855	2,009	2,196	2,333	2,474
Social and personal services	470	504	531	558	575	618	645
GDP at constant prices	11,041	11,398	12,029	12,704	13,729	14,296	15,394
Non-mining private GDP at constant prices	5,379	5,736	6,098	6,384	6,811	7,374	7,784
				(Annual percentage change)			
Agriculture	-4.4	-1.7	6.6	-7.5	5.9	-7.6	-8.7
Mining	5.0	-1.4	4.5	5.8	9.5	-2.8	11.9
Manufacturing	-13.8	23.5	7.8	3.7	5.4	5.7	3.2
Water and electricity	14.7	6.7	0.2	4.6	9.9	12.9	8.0
Construction	6.5	1.7	3.3	5.5	4.3	11.5	2.4
Trade and hotels	62.9	23.1	9.8	13.9	4.7	5.6	6.1
Transport	4.2	7.2	0.4	4.3	9.1	16.2	1.7
Banking, insurance, and business services	9.0	7.6	9.7	1.2	9.7	9.0	3.7
General government	5.2	3.3	5.2	8.3	9.3	6.3	6.0
Social and personal services	3.1	7.2	5.4	5.0	2.9	7.5	4.4
GDP at constant prices	4.0	3.2	5.5	5.6	8.1	4.1	7.7
Nonmining private GDP at constant prices	3.0	6.6	6.3	4.7	6.7	8.3	5.6

Sources: Central Statistics Office; and Fund staff estimates.

1/ National accounts year beginning July 1.

Table 14. Botswana: Beef Sales, 1993/94-1998/99 1/

	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99
Boneless beef sales by category		(In thousands of tons)				
Gross sales	23	20	19	19	21	18
		(In millions of pula)				
Gross sales	215	240	208	238	247	205
Beef sales by country		(In thousands of tons)				
Total	23	20	19	19	21	...
United Kingdom	6	6	5	8	12	...
South Africa	6	6	4	3	5	...
Other	11	8	10	8	5	...
		(In millions of pula)				
Total	215	240	208	238	247	241
United Kingdom	72	85	78	127	138	135
South Africa	39	36	34	28	35	20
Other	104	119	97	84	74	86
Memorandum item:		(In thousands)				
Total cattle processed	159	167	146	127	163	140

Source: Botswana Meat Commission.

1/ Year beginning October 1.

Table 15. Botswana: Mineral Production and Value, 1993-99

(In units indicated)

	1993	1994	1995	1996	1997	1998	1999
Diamonds							
Volume (in millions of carats)	15	16	17	18	20	20	21
Copper-nickel matte							
Value (in millions of pula) 1/	338	444	558	736	759	456	402*
Volume (in thousands of tons)	51	51	50	53	42	37	29*
Unit value (in pula per ton)	6,662	8,628	11,184	13,793	18,021	12,343	
Coal							
Value (in millions of pula) 1/	25	26	25	21	25	30	19*
Volume (in thousands of tons)	890	900	898	765	775	924	707*
Unit value (in pula per ton)	28	28	28	27	32	32	
Soda ash							
Value (in millions of pula) 1/	41	81	98	52	132	137	75*
Volume (in thousands of tons)	126	174	202	118	200	190	169*
Unit value (in pula per ton)	322	464	487	442	658	720	
Salt							
Value (in millions of pula) 1/	5	22	39	12	37	30	13*
Volume (in thousands of tons)	98	186	392	108	185	140	120*
Unit value (in pula per ton)	54	119	99	110	202	212	

Source: Central Statistics Office.

1/ Estimated value of production.
* Data covers the first, second and third quarter only.

Table 16. Botswana: Agricultural Producer Prices, 1993/94-1999/00 1/

(In pula per ton)

	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00
Sorghum	351	341	380	319	422	486	574
White maize	366	366	464	437	437	466	644
Pulses	645	645	695	737	797	783	876
Sunflower seeds	385	593	620	310	625	625	728
Shelled groundnuts	1,423	1,093	1,361	1,116	1,356	1,356	1,491

Source: Botswana Agricultural Marketing Board.

1/ Crop year beginning in April 1.

Table 17. Botswana: Statutory Minimum Wage Rates, 1993-2000 1/

	1993	1994	1995	1996	1997	1998	1999	2000
				(In thebes per hour)				
Manufacturing, service, and repair trades	125	125	135	145	159	175	190	205
Building, construction, exploration, and quarrying	125	125	135	145	159	175	190	205
Hotel, catering, and entertainment	125	125	135	145	159	175	190	...
Garages, motor trade, and road transport	125	125	135	145	159	175	190	205
Wholesale distributive trade	119	119	129	139	152	165	180	205
Retail distributive trade	112	112	121	131	143	155	170	185
Retail and wholesale nightwatchmen	104	104	113	123	135	150	165	...
Other nightwatchmen	104	104	113	123	135	150	165	180
				(Annual percentage change)				
Manufacturing, service, and repair trades	8.7	0.0	8.0	7.4	9.7	10.1	8.6	7.9
Building, construction, exploration, and quarrying	8.7	0.0	8.0	7.4	9.7	10.1	8.6	7.9
Hotel, catering, and entertainment	8.7	0.0	8.0	7.4	9.7	10.1	8.6	...
Garages, motor trade, and road transport	8.7	0.0	8.0	7.4	9.7	10.1	8.6	7.9
Wholesale distributive trade	9.2	0.0	8.4	7.8	9.4	8.6	9.1	13.9
Retail distributive trade	9.8	0.0	8.0	8.3	9.2	8.4	9.7	8.8
Retail and wholesale nightwatchmen	10.6	0.0	8.7	8.8	9.8	11.1	10.0	...
Other nightwatchmen	10.6	0.0	8.7	8.8	9.8	11.1	10.0	9.1

Source: Central Statistics Office.

1/ Data for May.

Table 18. Botswana: Consumer Price Index of Tradables and Nontradables, 1993:Q1-2000:Q3

	All Items	Nontradables	Tradables	Internal Terms of Trade 1/	All Items	Nontradables	Tradables	Internal Terms of Trade 1/
	(Period average. November 1996=100)				(Annual percentage change)			
Weights	100.0	24.7	75.3		100.0	24.7	75.3	
1993 I	68.8	66.1	69.2	104.6	16.3	17.3	15.8	-1.3
1993 II	71.2	69.0	71.2	103.3	14.2	16.1	13.1	-2.6
1993 III	73.5	75.5	72.7	96.2	13.9	26.1	10.8	-12.1
1993 IV	75.1	76.7	74.5	97.1	13.1	24.9	10.4	-11.6
1994 I	76.6	78.6	75.7	96.4	11.3	18.8	9.4	-7.9
1994 II	79.1	81.9	77.9	95.1	11.0	18.8	9.4	-7.9
1994 III	81.0	84.3	79.9	94.9	10.2	11.6	10.0	-1.4
1994 IV	82.4	84.8	81.7	96.3	9.8	10.6	9.7	-0.8
1995 I	84.8	87.4	84.2	96.3	10.7	11.2	11.1	-0.1
1995 II	87.2	89.3	86.7	97.1	10.2	9.0	11.3	2.1
1995 III	89.5	90.6	89.5	98.7	10.5	7.5	11.9	4.1
1995 IV	91.2	91.3	91.5	100.2	10.6	7.6	12.0	4.1
1996 I	93.6	94.0	93.7	99.7	10.3	7.6	11.4	3.5
1996 II	96.1	95.3	96.6	101.4	10.3	6.8	11.4	4.4
1996 III	98.5	97.5	99.0	101.6	10.0	7.6	10.7	2.9
1996 IV	100.0	99.8	100.1	100.3	9.7	9.3	9.5	0.1
1997 I	102.2	101.3	102.6	101.3	9.3	7.8	9.5	1.6
1997 II	105.9	102.6	106.1	103.4	10.2	7.6	9.8	2.0
1997 III	106.9	103.6	108.2	104.4	8.6	6.3	9.2	2.8
1997 IV	108.2	104.1	109.8	105.5	8.1	4.3	9.7	5.2
1998 I	109.6	106.1	111.0	104.6	7.2	4.7	8.2	3.3
1998 II	112.1	108.9	113.5	104.2	5.9	6.1	6.9	0.8
1998 III	113.4	110.6	114.5	103.5	6.0	6.8	5.9	-0.9
1998 IV	114.8	111.6	116.1	104.0	6.2	7.2	5.7	-1.4
1999 I	117.6	114.8	118.7	103.4	7.3	8.3	7.0	-1.2
1999 II	120.1	115.7	121.8	105.3	7.1	6.3	7.4	1.0
1999 III	122.6	121.2	123.5	101.9	8.2	9.5	7.9	-1.6
1999 IV	124.8	125.1	124.9	99.8	6.9	12.1	7.6	-4.5
2000 I	127.1	126.2	127.7	101.2	8.1	9.9	7.5	-2.4
2000 II	130.6	128.3	131.7	102.7	8.7	10.9	8.1	-2.8
2000 III	133.8	136.1	133.0	97.7	9.1	12.3	7.7	-4.6

Sources: Central Statistics Office; and Fund staff estimates.

1/ Ratio of price index of tradables to price index of nontradables.

Table 19. Botswana: Cost of Living Index, 1991-2000

(November 1996=100)

	Food	Alcohol and Tobacco	Clothing and Footwear	Housing	Fuel and Power	Furniture etc.	H/hold Operation	Health, Personal Care	Transport etc.	Leisure	Education	Other	All items Index	Annual inflation
Weights	25.5	13.5	5.8	12.2	2.6	5.1	3.9	5.7	19.7	1.6	3.8	0.6	100	%
1991 Dec.	55.8	60.8	52.9	56.7	80.1	57.8	60.3	52.2	57.4	66.4	55.1	57.9	57.5	12.6
1992 Dec.	66.8	69.6	65.1	66.7	83.5	65.8	71.4	58.0	66.0	76.8	60.1	68.5	67	16.5
1993 Dec.	72.9	75.4	74.5	75.0	89.7	72.0	76.7	86.6	75.6	80.7	76.4	73.1	75.5	12.7
1994 Dec.	80.7	81.9	83.7	83.3	94.2	78.4	84.8	90.6	85.0	89.5	81.6	85	82.9	9.8
1995 Dec.	89.7	91.7	91.9	90.4	93.8	93.3	93	94.5	94.1	95.2	91.0	93.3	91.8	10.8
1996 Dec.	100.7	100.3	101.1	100.0	103.5	101.6	100.4	100.4	100.5	99.6	100.0	100.6	100.6	9.6
1997 Dec.	109.9	111.2	109.7	103.5	105.4	110.4	110	104.7	108.1	103.2	105.2	106.7	108.4	7.8
1998 Dec.	116.0	122.5	113.5	110.2	106.3	116.0	118.2	107.7	113.2	107.4	123.9	119.7	115.3	6.4
1999 Dec.	122.1	134.9	117.4	126.0	118.5	123.7	129.2	116.8	123.2	109.8	141.0	128.6	125	8.4
2000 Dec.	127.1	146.9	120.6	145.5	145.2	134.4	141.9	120.7	142.2	111.3	143.2	134.5	135.9	8.7
1997 Jan.	101.6	101.0	100.9	100.1	103.6	102.8	101.1	100.2	101.3	101.0	104.6	100.7	101.3	9.1
Feb.	102.6	101.6	102.0	100.9	103.4	104.0	102	100.5	103.0	101.6	105.2	102.1	102.2	9.4
Mar.	103.3	103.9	103.1	100.9	104.2	105.6	102.2	102.2	102.7	102.5	105.2	102.1	103.2	9.3
Apr.	104.4	106.3	104.1	101.3	105.7	106.1	104	102.1	103.0	102.2	105.2	103.1	104.1	9.3
May	105.5	108.0	104.8	101.7	105.6	106.2	105	102.4	107.4	100.7	105.2	104.1	105.3	9.7
June	106.4	109.5	105.9	102.0	106.0	106.1	106.8	103.0	107.6	101.4	105.2	105.9	105.9	9
July	107.3	109.8	106.9	102.2	105.8	107.1	107.3	103.3	107.6	102.2	105.2	106.4	106.6	8.9
Aug.	107.8	109.8	107.4	102.4	104.6	107.2	107.7	103.5	107.3	102.1	105.2	107.1	106.8	8.5
Sep.	108.7	110.6	107.5	103.3	104.6	107.7	108.6	104.0	107.7	103.2	105.2	106.2	107.4	8.5
Oct.	109.8	110.9	109.8	103.3	104.5	108.4	109.7	104.2	108.0	103.6	105.2	106.6	107.9	8.5
Nov.	109.9	110.8	110.0	103.4	104.8	109.2	109.7	104.6	108.1	103.1	105.2	106.6	108.2	8.2
Dec.	109.9	111.2	109.7	103.5	105.4	110.4	110	104.7	108.1	103.2	105.2	106.7	108.4	7.8
1998 Jan.	110.3	111.4	109.4	103.7	105.3	111.3	110.9	104.8	108.4	103.7	118.9	108.1	109.1	7.7
Feb.	110.9	111.9	110.5	103.8	104.9	111.1	111.3	106.3	108.4	104.3	118.9	108.7	109.4	7.0
Mar.	111.8	113.7	110.9	104.0	104.8	111.6	112.4	106.7	109.3	103.9	118.9	110.8	110.3	6.9
Apr.	112.0	117.8	112.9	107.8	104.1	111.9	112.8	107.3	109.1	104.8	120.7	112.2	111.7	7.3
May	112.5	119.4	113.5	108.0	104.1	112.0	113.2	106.8	109.6	105.4	120.7	112.8	112.2	6.6
June	112.4	119.6	113.5	109.2	104.1	111.9	114	106.7	109.9	105.5	120.7	112.8	112.4	6.1
July	113.1	120.5	113.1	109.3	104.1	112.1	114.6	106.9	110.1	106.4	120.7	112.7	112.9	5.9
Aug.	113.4	121.1	113.1	109.3	104.0	112.4	114.6	107.2	112.4	106.6	123.8	119	113.6	6.4
Sep.	113.3	121.0	112.4	109.6	104.6	114.5	115.8	107.0	112.4	106.7	123.7	119.2	113.7	5.9
Oct.	114.0	121.7	112.7	109.8	104.8	114.9	116.2	107.4	113.0	107.2	123.9	119.2	114.3	5.9
Nov.	115.7	122.0	113.6	110.1	106.3	115.5	117.4	107.5	113.0	107.2	123.9	119.6	114.9	6.2
Dec.	116.0	122.5	113.5	110.2	106.3	116.0	118.2	107.7	113.2	107.4	123.9	119.7	115.3	6.4
1999 Jan.	116.7	122.9	113.4	111.1	106.0	116.9	118.3	107.8	115.0	107.4	139.2	119.8	116.4	6.7
Feb.	118.9	123.7	113.7	111.3	107.8	117.3	119.9	108.8	115.8	108.1	139.2	121.3	117.5	7.4
Mar.	120.6	126.8	114.4	112.1	107.7	118.2	122.4	109.4	115.8	108.4	139.2	121.1	118.9	7.8
Apr.	120.7	128.6	115.8	112.2	107.6	118.7	122.9	109.9	118.3	109.3	139.2	121.4	119.7	7.2
May	120.9	129.6	116.2	112.3	107.7	119.1	123.6	110.2	118.5	109.4	139.9	122.1	120.1	7.0
June	120.8	130.5	115.9	111.4	109.8	120.7	123.9	110.9	119.7	110.0	140.4	128.3	120.5	7.2
July	120.8	130.9	115.8	111.6	109.7	121.2	123.8	112.2	120.1	110.1	140.4	128.7	120.7	6.9
Aug.	121.4	132.6	116.7	124.5	110.9	121.4	124.3	114.3	120.8	110.3	140.4	128.8	123.2	8.5
Sep.	121.7	132.8	116.8	126.3	112.9	121.9	127.1	115.6	122.2	110.5	140.7	128.8	124	9.1
Oct.	121.8	133.0	117.3	126.7	117.6	122.4	127.7	116.4	123.4	110.0	141.2	128.5	124.6	9.0
Nov.	122.0	133.3	116.7	126.2	118.2	123.0	128.1	116.6	123.4	109.7	141.0	128.6	124.7	8.5
Dec.	122.1	134.9	117.4	126.0	118.5	123.7	129.2	116.8	123.2	109.8	141.0	128.6	125	8.4
2000 Jan.	122.7	134.9	117.8	126.2	125.4	124.1	129.4	117.5	126.9	110.2	141.8	128.7	126.1	8.3
Feb.	124.0	136.3	118.3	127.0	125.7	124.3	130.7	117.9	127.5	110.3	143.0	129.9	127	8.1
Mar.	125.0	140.8	118.6	127.7	125.9	124.6	133.3	117.9	127.6	110.8	143.0	133.4	128.2	7.8
Apr.	126.5	141.9	118.1	127.8	133.2	129.1	133.6	117.9	131.5	110.4	143.0	133.9	129.8	8.4
May	126.9	142.9	118.6	128.7	135.1	129.6	133.8	118.0	134.3	109.8	143.0	135.4	130.6	8.7
June	127.3	143.3	118.7	129.3	135.2	130.0	136.7	118.6	135.3	109.3	143.6	135.6	131.3	9.0
July	128.0	143.6	118.9	143.2	137.0	130.6	137.4	119.1	135.6	109.7	143.6	133.3	133.5	10.6
Aug.	127.9	144.1	119.1	144.1	137.8	131.9	137.7	119.7	135.6	110.9	143.2	134	133.8	8.6
Sep.	127.3	144.4	119.3	145.2	137.8	132.7	140.6	119.9	136.7	111.3	143.2	134.3	134.2	8.2
Oct.	127.4	145.4	119.5	145.3	145.8	133.0	141.1	120.5	141.0	111.3	143.2	134.3	135.3	8.6
Nov.	127.2	146.7	120.4	145.5	145.3	133.5	141.4	120.6	141.1	111.9	143.2	134.5	135.6	8.7
Dec.	127.1	146.9	120.6	145.5	145.2	134.4	141.9	120.7	142.2	111.3	143.2	134.5	135.9	8.7

Source: Ministry of Finance and Development Planning

Table 20. Botswana: Cost of Living Indices for Tradable and Nontradable Goods, January 1996-August

(Twelve-month percentage change)

	Nontradables	Domestic Tradables	Imported Tradables	All Tradables	All Items
Weights	24.7	29.8	45.5	75.3	100.0
1996					
January	7.6	10.9	11.8	11.5	10.5
February	7.6	10.7	11.6	11.4	10.4
March	7.5	10.8	11.4	11.2	10.2
April	6.5	11.5	11.1	11.2	10.1
May	6.7	12.2	11.2	11.6	10.3
June	7.0	12.2	11.2	11.5	10.5
July	7.4	12.5	10.7	11.3	10.4
August	7.3	12.8	9.4	10.6	9.9
September	8.0	12.7	9.0	10.2	9.8
October	9.1	12.0	8.4	9.6	9.8
November	9.9	11.5	8.2	9.4	9.8
December	9.0	10.9	8.6	9.4	9.6
1997					
January	7.7	10.7	8.8	9.5	9.2
February	8.3	10.8	8.8	9.4	9.3
March	7.3	10.4	9.0	9.5	9.3
April	7.1	10.0	9.8	9.9	9.3
May	8.2	9.3	10.2	9.9	9.7
June	7.6	9.1	9.6	9.5	9.0
July	6.8	8.6	9.6	9.2	8.9
August	6.2	7.5	10.0	9.2	8.4
September	5.8	7.6	10.1	9.2	8.5
October	4.7	7.7	11.2	10.0	8.4
November	4.1	7.6	11.0	9.9	8.2
December	4.0	7.2	10.1	9.1	7.8
1998					
January	4.8	6.6	9.6	8.6	7.7
February	4.3	6.2	9.2	8.2	7.0
March	5.0	5.6	8.7	7.7	6.9
April	7.1	6.4	8.1	7.5	7.3
May	5.4	6.2	7.6	7.2	6.6
June	5.9	5.1	6.7	6.2	6.1
July	6.1	5.3	6.3	6.1	5.9
August	7.4	5.3	6.3	6.0	6.4
September	7.0	4.9	5.8	5.5	5.9
October	7.2	5.2	5.2	5.2	5.9
November	7.2	5.8	6.0	5.9	6.2
December	7.3	5.9	6.0	6.0	6.4
1999					
January	8.2	5.6	6.6	6.3	6.7
February	8.3	6.5	7.2	7.0	7.4
March	8.3	6.8	8.2	7.7	7.8
April	6.4	5.6	7.7	7.5	7.2
May	6.7	5.9	7.8	7.1	7.0
June	5.7	6.4	8.4	7.7	7.2
July	5.7	5.8	8.3	7.5	6.9
August	11.0	6.5	8.4	7.7	8.5
September	11.9	6.7	9.2	8.4	9.1
October	12.2	6.4	9.0	8.1	9.0
November	12.1	6.2	7.8	7.3	8.5
December	12.0	6.7	7.9	7.5	8.4
2000					
January	9.8	7.4	8.3	8.0	8.3
February	10.0	6.6	7.5	7.2	8.1
March	9.8	8.4	6.7	7.3	7.8
April	9.8	8.2	8.0	8.0	8.4
May	10.9	7.7	8.4	8.1	8.7
June	11.9	7.6	8.3	8.1	8.9
July	16.7	7.6	8.5	8.2	10.6
August	10.2	7.1	8.2	7.8	8.6
September	10.1	7.0	7.2	7.1	8.2
October	9.7	7.1	8.3	7.9	8.6
November	9.8	6.9	8.7	8.1	8.7

Source Central Statistics Office.

Table 21. Botswana: Central Government Operations, 1995/96-2001/02 1/

	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01 Revised
				(In millions of pula)		
Total revenue and grants	5,464	7,395	8,281	7,678	11,963	12,962
Total revenue	5,427	7,312	8,169	7,540	11,843	12,926
Tax revenue	4,020	5,198	6,767	5,640	9,944	11,207
Mineral revenue	2,591	3,640	4,681	3,187	6,687	7,557
Trade and excise taxes 3/	829	896	1,186	1,261	1,931	2,124
General sales tax	219	248	328	401	484	578
Other	380	414	572	791	842	948
Nontax revenue	1,407	2,113	1,402	1,900	1,899	1,719
Interest	232	235	252	209	166	228
Property income	1,064	1,740	984	1,253	1,232	891
Other	112	138	166	439	501	600
Grants	37	83	112	138	120	36
Total expenditure and lending	5,194	6,092	7,406	9,065	10,427	11,881
Current expenditure	3,510	4,044	4,929	6,265	7,048	8,357
Wages and salaries	1,227	1,377	1,686	2,153	2,419	2,632
Interest	92	91	86	93	93	110
Other	2,191	2,576	3,156	4,019	4,537	5,615
Capital expenditure	1,672	2,240	2,696	2,935	3,451	3,584
Net lending	13	-191	-218	-134	-71	-60
Primary balance (deficit -)	361	1,394	961	-1,295	1,628	1,191
Overall balance (deficit -)	270	1,302	875	-1,388	1,536	1,081
Financing	-270	-1,302	-875	1,388	-1,536	-1,081
Foreign (net)	-46	85	86	28	-35	-127
Drawing	67	230	234	194	130	48
Amortization	-113	-145	-148	-166	-165	-174
Domestic	-224	-1,387	-961	1,360	-1,500	-954
				(in percent of GDP)		
Total revenue and grants	39.8	43.9	42.3	31.6	43.0	42.2
Total revenue	39.6	43.4	41.8	31.0	42.5	42.1
Tax revenue	29.3	30.8	34.6	23.2	35.7	36.5
Mineral revenue	18.9	21.6	23.9	13.1	24.0	24.6
Trade and excise taxes 3/	6.0	5.3	6.1	5.2	6.9	6.9
General sales tax	1.6	1.5	1.7	1.6	1.7	1.9
Other	2.8	2.5	2.9	3.3	3.0	3.1
Nontax revenue	10.3	12.5	7.2	7.8	6.8	5.6
Interest	1.7	1.4	1.3	0.9	0.6	0.7
Property income	7.8	10.3	5.0	5.2	4.4	2.9
Other	0.8	0.8	0.8	1.8	1.8	2.0
Grants	0.3	0.5	0.6	0.6	0.4	0.1
Total expenditure and lending	37.9	36.1	37.9	37.3	37.5	38.7
Current expenditure	25.6	24.0	25.2	25.8	25.3	27.2
Wages and salaries	8.9	8.2	8.6	8.9	8.7	8.6
Interest	0.7	0.5	0.4	0.4	0.3	0.4
Other	16.0	15.3	16.1	16.5	16.3	18.3
Capital expenditure	12.2	13.3	13.8	12.1	12.4	11.7
Net lending	0.1	-1.1	-1.1	-0.6	-0.3	-0.2
Primary balance (deficit -)	2.6	8.3	4.9	-5.3	5.8	3.9
Overall balance (deficit -)	2.0	7.7	4.5	-5.7	5.5	3.5
Financing	-2.0	-7.7	-4.5	5.7	-5.5	-3.5
Foreign (net)	-0.3	0.5	0.4	0.1	-0.1	-0.4
Drawing	0.5	1.4	1.2	0.8	0.5	0.2
Amortization	-0.8	-0.9	-0.8	-0.7	-0.6	-0.6
Domestic	-1.6	-8.2	-4.9	5.6	-5.4	-3.1
Memorandum item:						
GDP (fiscal year; in millions of pula)	13,718	16,856	19,557	24,287	27,842	30,694

Sources: Ministry of Finance and Development Planning; and Fund staff estimates

1/ Fiscal year beginning April 1.
2/ Trade and excise taxes are received from the revenue pool of the Southern African Customs Union (SACU).

Table 22. Botswana: Components of Central Government Revenue, 1994/95-2001/02 1/

(In millions of pula)

	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01 Revised
Tax revenue	3,633	4,016	5,198	6,767	5,640	9,886	11,151
Mineral revenue	2,349	2,591	3,640	4,681	3,187	6,687	7,557
Trade and excise taxes 3/	712	829	896	1,186	1,261	1,931	2,124
General sales tax	169	219	248	328	401	484	578
Nonmineral income tax	387	357	385	537	737	731	831
Export duties	0	1	0	0	0	0	0
Taxes on property	4	4	6	7	16	15	21
Motor vehicle tax	7	14	15	18	26	26	29
Business and professional licenses	4	1	6	8	12	12	10
Nontax revenue	764	1,411	2,113	1,402	1,900	1,962	1,719
Interest	201	232	235	252	209	166	228
Property income	453	1,064	1,740	984	1,253	1,232	891
Fees, charges, and reimbursements	93	103	112	133	378	485	517
Sale of fixed assets and land	18	13	26	32	61	78	83
Grants	76	37	83	112	138	120	36
Recurrent	40	5	8	2	1	1	0
Development	35	32	75	110	136	119	36
Total revenue and grants	4,472	5,464	7,395	8,281	7,678	11,968	12,906

Source: Ministry of Finance and Development Planning.

1/ Fiscal year beginning April 1.
2/ Trade and excise taxes are received from the revenue pool of the Southern African Customs Union (SACU).

Table 23. Botswana: Economic Classification of Central Government Expenditure, 1994/95-2001/02 1/

	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01 Revised	2001/02 Budget
Total expenditure and net lending	4,277	5,195	6,092	7,406	9,065	10,427	11,881	13,059
Current expenditure	3,011	3,510	4,044	4,928	6,265	7,048	8,357	9,552
Expenditure on goods and services	2,173	2,534	2,822	3,987	5,084	5,726	6,726	7,700
Wages and salaries	1,102	1,227	1,377	1,686	2,153	2,419	2,632	3,027
Other purchases of goods and services 3/	1,071	1,307	1,446	2,301	2,931	3,308	4,094	4,673
Interest payments	84	92	91	86	93	93	110	116
Subsidies and transfers	753	884	1,130	...	1,089	1,229	1,521	1,736
Pensions	60	403	131	185	216	244	302	214
Transfers to local authorities	358	403	472	568	706	867	977	1,101
Financial Assistance Policy grants	36	72	72	102	161	105	168	270
Other	299	320	455	...	6	13	74	151
Capital expenditure and net lending	1,266	1,685	2,048	2,478	2,800	3,380	3,524	3,507
Capital expenditure	1,378	1,672	2,240	2,696	2,935	3,451	3,584	3,600
Net lending	-112	13	-191	-218	-134	-71	-60	-93
Gross lending	103	113	104	68	42	22	19	29
Repayment	-215	-101	-295	-286	-176	-94	-79	-122
			(In percent of total expenditure and net lending)					
Total expenditure and net lending	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Current expenditure	70.4	67.6	66.4	66.5	69.1	67.6	70.3	73.1
Expenditure on goods and services	50.8	48.8	46.3	53.8	56.1	54.9	56.6	59.0
Wages and salaries	25.8	23.6	22.6	22.8	23.8	23.2	22.2	23.2
Other purchases of goods and services 3/	25.1	25.2	23.7	31.1	32.3	31.7	34.5	35.8
Interest payments	2.0	1.8	1.5	1.2	1.0	0.9	0.9	0.9
Subsidies and transfers	17.6	17.0	18.6	...	12.0	11.8	12.8	13.3
Pensions	1.4	7.8	2.2	2.5	2.4	2.3	2.5	1.6
Transfers to local authorities	8.4	7.8	7.7	7.7	7.8	8.3	8.2	8.4
Financial Assistance Policy grants	0.8	1.4	1.2	1.4	1.8	1.0	1.4	2.1
Other	7.0	6.2	7.5	...	0.1	0.1	0.6	1.2
Capital expenditure and net lending	29.6	32.4	33.6	33.5	30.9	32.4	29.7	26.9
Capital expenditure	32.2	32.2	36.8	36.4	32.4	33.1	30.2	27.6
Net lending	-2.6	0.2	-3.1	-2.9	-1.5	-0.7	-0.5	-0.7
Gross lending	2.4	2.2	1.7	0.9	0.5	0.2	0.2	0.2
Repayment	-5.0	-1.9	-4.8	-3.9	-1.9	-0.9	-0.7	-0.9

Sources: Ministry of Finance and Development Planning; and Fund staff estimates.

1/ Fiscal year beginning April 1.
2/ Includes subsidies and transfers from 1997/98 onwards.

Table 24. Botswana: Functional Classification of Central Government Expenditure, 1994/95 -2001/02 1/

	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01 Revised	2001/02 Budget
				(In millions of pula)				
General public services	281	326	377	452	505	716	881	997
General administration	87	110	144	177	199	250	287	337
Public order and safety	25	30	80	107	45	271	285	241
Defense	168	186	153	168	261	195	309	419
Social services	501	620	824	967	1,295	1,440	1,336	1,862
Education	247	330	500	560	666	663	567	742
Health	44	31	58	110	95	92	146	403
Housing and urban and regional development	155	117	227	255	284	290	325	535
Other community and social services	9	15	14	38	135	247	173	171
Of which : food and social welfare programs				...	...	...		
Economic services	594	726	1,039	1,276	1,047	1,289	1,409	1,843
Agriculture, forestry, and fishing	79	92	318	135	91	79	117	127
Mining	74	242	44	34	167	84	37	83
Roads, other transport, and communications	130	121	172	221	253	401	460	691
Electricity and water supply	89	209	272	634	331	509	517	709
Commerce, industry, and other	223	61	233	252	205	214	278	232
Unallocated	1.5	0.1	0.1	0.0	0.5	6.4	1.3	8.0
Public debt interest	... ...	...	...	...	...	...	...	
Transfers to local authorities	... ...	...	...	...	...	...	...	
Financial assistance policy (FAP) grants	... ...	...	...	...	...	...	...	
Total	1,546	1,858	2,393	2,863	3,109	3,646	3936.48	5128.38
				(In percent of total)				
General public services	18.2	17.5	15.8	15.8	16.2	19.6	22.4	19.4
General administration	5.7	5.9	6.0	6.2	6.4	6.9	7.3	6.6
Public order and safety	1.6	1.6	3.3	3.7	1.4	7.4	7.2	4.7
Defense	10.9	10.0	6.4	5.9	8.4	5.4	7.9	8.2
Social services	32.4	33.4	34.4	33.8	41.7	39.5	33.9	36.3
Education	16.0	17.7	20.9	19.5	21.4	18.2	14.4	14.5
Health	2.8	1.7	2.4	3.8	3.1	2.5	3.7	7.9
Housing and urban and regional development	10.0	6.3	9.5	8.9	9.1	8.0	8.3	10.4
Other community and social services	0.6	0.8	0.6	1.3	4.3	6.8	4.4	3.3
Of which : food and social welfare programs	0.0	0.0	0.0	...	...	...	...	...
Economic services	38.4	39.1	43.4	44.6	33.7	35.3	35.8	35.9
Agriculture, forestry, and fishing	5.1	5.0	13.3	4.7	2.9	2.2	3.0	2.5
Mining	4.8	13.0	1.8	1.2	5.4	2.3	0.9	1.6
Roads, other transport, and communications	8.4	6.5	7.2	7.7	8.1	11.0	11.7	13.5
Electricity and water supply	5.7	11.3	11.4	22.1	10.7	14.0	13.1	13.8
Commerce, industry, and other	14.4	3.3	9.8	8.8	6.6	5.9	7.1	4.5
Unallocated	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.2
Public debt interest	...	...	...	...	...	...	...	...
Transfers to local authorities	...	...	...	...	...	...	...	...
Financial assistance policy (FAP) grants	...	...	...	...	...	...	...	...
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Ministry of Finance and Development Planning.

1/ Fiscal year beginning April 1.

Table 25. Botswana: Monetary Survey, 1993-2000

	1993	1994	1995	1996	1997	1998 Dec.	1999 Mar.	Jun.	Sep	Dec	2000 Mar	Jun	Sep.
						(In millions of pula; end of period)							
Net foreign assets	10,525	12,027	13,346	19,392	22,303	27,728	27,827	27,725	27,201	30,037	31,020	32,633	33,539
Bank of Botswana	10,509	11,961	13,249	19,091	21,619	26,485	26,478	26,499	25,830	28,852	29,679	31,616	32,313
Commercial banks	17	66	97	301	684	1,243	1,350	1,227	1,371	1,184	1,341	1,017	1,226
Net domestic credit	-4,066	-4,874	-4,701	-5,446	-13,500	-16,277	-15,907	-15,481	-14,630	-16,075	-17,209	-17,972	-18,526
Net claims on the government	-5,626	-6,717	-6,477	-7,242	-15,398	-19,227	-19,093	-18,928	-18,361	-20,251	-21,463	-22,446	-23,179
Bank of Botswana	-5,598	-6,705	-6,460	-7,204	-15,364	-19,212	-19,090	-18,907	18,361	20,251	21,463	22,446	23,179
Commercial banks	-28	-12	-17	-39	-34	-15	-3	-21					
Claims on nongovernment	1,560	1,843	1,776	1,797	1,898	2,951	3,186	3,447	3,731	4,176	4,255	4,474	4,652
Claims on parastatals	94	148	95	70	61	267	320	351	406	528	517	550	535
Claims on the private sector	1,466	1,695	1,682	1,726	1,836	2,684	2,866	3,096	3,326	3,648	3,738	3,924	4,117
Other items (net)	-4,373	-4,795	-6,235	-11,099	-5,243	-6,693	-6,947	-6,990	-7,134	-8,001	-8,455	-8,654	-8,931
Of which													
Valuation adjustment 1/	-6,111	-7,504	-8,547	-14,881	-5,335	-7,603	-7,982	-7,816	-7,737	-8,500	-9,378	-10,399	-10,186
Money plus quasi-money	2,086	2,358	2,410	2,848	3,560	4,759	4,973	5,255	5,438	5,962	5,356	6,007	6,083
Money	700	785	818	886	969	1,320	1,530	1,481	1,502	1,533	1,425	1,561	1,599
Quasi money 2/	1,386	1,573	1,592	1,962	2,591	3,439	3,443	3,774	3,935	4,429	3,931	4,445	4,484
Memorandum items:													
Broad money (M3)	2,589	2,880	3,537	4,489	5,316	6,679	6,906	7,271	7,517	8,486	7,831	8,296	8,598
Of which													
Bank of Botswana certificates	502	522	1,127	1,641	1,756	1,920	1,933	2,016	2,080	2,525	2,475	2,289	...
Broad money (M4)	3,224	3,701	3,756	4,785	5,798	7,618	7,914	8,291	8,647	9,582	8,909	9,393	9,798
Of which													
Foreign currency accounts	67	97	219	296	482	939	1,008	1,020	1,130	1,096	1,078	1,097	...
						(Annual change as a percent of beginning-of-year money stock)							
Net foreign assets 3/	-7.0	5.2	11.7	-12.0	437.4	88.7	81.7	28.6	-15.1	48.5	53.6	82.3	106.3
Net domestic credit	-20.3	-38.8	7.4	-30.9	-282.8	-78.0	-17.6	11.8	37.6	4.2	-21.8	-41.8	-65.4
Claims on the government (net)	-29.1	-52.3	10.2	-31.7	-286.4	-107.6	-42.3	-12.2	15.2	-21.5	-39.8	-59.0	-80.8
Claims on the private sector	7.8	10.9	-0.5	1.9	3.9	23.8	19.1	19.6	18.1	20.3	14.6	13.9	13.3
Money plus quasi-money	12.4	13.0	2.2	18.1	25.0	33.7	22.0	18.0	15.4	25.3	6.4	12.6	10.8

Sources: Bank of Botswana; and Fund staff estimates.

1/ Equivalent to the revaluation profit (loss) for the year reported on the books of the Bank of Botswana.
2/ Includes private deposits at the Bank of Botswana but excludes holdings of Bank of Botswana certificates.
3/ Excludes the effect of foreign assets valuation adjustments.

Table 26. Botswana: Summary Accounts of Bank of Botswana, 1993-00 1/

(In millions of pula; end of period)

	1993	1994	1995	1996	1997	1998	1999 Mar.	1999 Jun.	1999 Sep.	1999 Dec.	2000 Mar	2000 Jun	2000 Sep
Foreign assets	10,509	11,961	13,249	19,091	21,619	26,485	26,478	26,499	25,830	28,852	29,679	31,615	32,313
Balances at foreign banks 2/	2,506	0	0	0	0	0	0	0	0	0	0	0	0
Treasury bills and securities 2/	7,857	0	0	0	0	0	0	0	0	0	0	0	0
Pula Fund	0	2,810	4,248	5,394	17,654	23,562	24,419	24,348	24,097	24,454	26,724	28,132	28,196
Liquidity portfolio	0	7,702	7,540	12,690	3,721	2,545	1,686	1,803	1,414	4,075	2,619	3,156	3,791
Matched assets/liability portfolio 3/	0	1,283	1,258	0	0	0	0	0	0	0	0	0	0
Fund accounts	146	166	203	239	243	378	373	348	319	324	336	328	327
Holding of SDRs	86	101	119	141	153	205	167	165	170	180	186	198	201
Reserve position	59	65	85	97	90	173	206	182	149	144	150	131	126
Loans and advances to financial institutions	0	0	0	0	0	0	0	0	0	0	0	0	0
Fixed assets	50	84	97	99	100	108	113	117	120	122	123	129	131
Other assets	15	18	24	17	12	19	17	25	21	16	38	20	25
Assets = liabilities	10,575	12,062	13,369	19,206	21,730	26,612	26,608	26,641	25,972	28,991	29,839	31,764	32,469
Reserve money	395	392	405	453	572	707	844	657	657	741	648	761	651
Currency in circulation	275	303	319	356	417	498	484	495	471	540	448	505	523
Currency outside banks	180	195	223	247	276	353	367	385	441	404	403	441	481
Pula currency in banks	95	108	96	109	141	145	117	110	30	136	45	64	42
Bankers' deposits	120	89	87	98	155	210	360	163	186	201	200	256	2,128
Private sector time deposits	36	46	48	47	63	26	57	55	253	172	124	167	180
Bank of Botswana certificates outstanding	1,203	1,451	1,964	2,816	3,308	3,246	2,997	3,556	3,351	4,230	3,667	3,874	3,995
Bankers	701	928	1,460	1,847	2,424	2,258	2,162	2,662	2,379	2,809	2,400	2,728	2,706
Others	502	522	504	969	884	988	835	894	972	1,421	1,267	1,146	1,289
Government deposits	5,598	6,705	6,460	7,204	15,364	19,212	19,090	18,907	18,374	20,266	21,465	22,488	23,131
Capital and reserves	2,152	2,923	3,320	6,086	1,866	3,202	3,366	3,236	3,136	3,387	3,724	4,231	4,153
Paid-up capital	4	4	4	4	25	25	25	25	25	25	25	25	25
General reserve	226	234	272	327	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600
Revaluation reserve	1,922	2,685	3,045	5,755	241	1,577	1,741	1,611	1,511	1,762	2,099	2,606	2,528
Other liabilities	1,191	547	1,172	1,833	558	219	254	230	201	194	212	283	195

Source: Bank of Botswana.

1/ Effective January 1997, in accordance with the new Bank of Botswana Act, the balance sheet was reclassified resulting in adjustments in the Pula Fund
and government deposits, with corresponding adjustment in the liquidity portfolio and revaluation reserves.
2/ Effective January 1994, balances with foreign banks, as well as treasury bills and securities, have been broken down into "Pula Fund," "Liquidity portfolio,"
and "Matched assets/liability portfolio."
3/ Effective December 1996, the item "Matched assets/liability portfolio" has been discontinued.

Table 27. Botswana: Summary Accounts of Commercial Banks, 1993-00

(In millions of pula; end of period)

	1993	1994	1995	1996	1997	1998				1999				2000		
						Mar.	Jun.	Sep.	Dec.	Mar.	June	Sep.	Dec.	Mar.	June	Sep.
Commercial bank reserves	204	166	173	198	286	322	279	327	346	476	290	328	379	212	324	170
Cash	105	114	103	130	157	122	102	107	160	132	128	112	229	123	136	148
Balances at Bank of Botswana	99	53	70	68	129	200	177	220	186	345	162	215	150	89	188	22
Foreign assets	146	166	189	432	790	1,030	1,287	1,425	1,400	1,581	1,343	1,579	1,320	1,526	1,242	1,548
Credit to domestic economy	1,563	1,847	1,779	1,799	1,900	2,011	2,314	2,675	2,975	3,204	3,466	3,745	4,190	4,255	4,499	4,689
Claims on local governments	3	4	3	2	2	3	10	10	14	18	16	13	15	2	2	2
Claims on parastatals	94	148	95	71	61	52	139	203	267	320	351	406	528	469	550	535
Claims on private sector	1,466	1,695	1,682	1,727	1,836	1,956	2,164	2,462	2,693	2,866	3,099	3,326	3,648	3,785	3,948	4,152
Of which																
Claims on households	604	647	782	850	943	1,003	1,069	1,240	1,380	1,459	1,709	1,843	1,995	1,933	2,166	2,214
Other assets	735	1,191	1,582	2,158	1,803	1,950	2,115	2,056	1,789	1,503	1,964	1,677	2,021	1,515	1,920	1,985
Fixed assets	120	112	93	111	113	113	113	118	129	131	136	145	159	158	159	159
Others 1/	615	1,079	1,489	2,048	1,689	1,837	2,002	1,938	1,659	1,372	1,828	1,531	1,863	1,357	1,761	1,826
Assets = liabilities	2,648	3,370	3,723	4,587	4,778	5,312	5,994	6,484	6,508	6,764	7,211	7,558	8,161	8,569	8,312	8,793
Demand deposits of the public	1,211	1,424	1,667	2,064	2,663	3,106	3,608	4,016	4,087	4,140						
Time and savings deposits	795	794	779	868	1,143	1,122	1,161	1,315	1,308	1,375	1,405	1,586	1,811	1,656	1,693	1,959
Savings deposits	337	349	344	379	422	436	445	479	500	521	546	568	596	602	643	651
Time deposits	457	445	435	489	721	686	716	836	808	855	859	1,018	1,215	1,054	1,050	1,308
Liabilities to other banks	68	79	76	118	112	187	182	112	126	194	135	179	131	191	211	306
Liabilities to Bank of Botswana	0	3	0	0	2	0	0	2	0	0	0	1	0	1	0	30
Government deposits	31	16	19	40	35	27	46	43	29	21	40	65	66	54	46	72
Capital and reserves	244	308	337	402	464	490	536	536	568	609	626	676	732	751	875	853
Other liabilities	299	746	845	1,094	358	380	462	459	391	426	464	457	542	603	468	540

Source: Bank of Botswana.

1/ Comprises other investments: balances due from domestic banks, bills purchased and discounted, Bank of Botswana certificates, and other unclassified assets.

Table 28. Botswana: Selected Financial Ratios and Aggregates of Commercial Banks, 1993-00

(In millions of pula, unless otherwise indicated; end of period)

| | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | | | | 1999 | | | | 2000 | |
						Mar.	Jun.	Sep.	Dec.	Mar.	Jun.	Sep.	Dec.	Mar.	Jun.
Liquid assets 1/															
Required	389	435	493	263	330	352	374	407	449	453	466	485	528	551	516
Actual	794	787	1,114	1,504	1,960	2,030	2,276	2,288	1,917	1,849	2,117	1,859	2,242	1,570	2,085
Excess	405	351	621	1,241	1,630	1,678	1,902	1,882	1,468	1,396	1,652	1,375	1,714	1,019	1,569
Ratio of actual to required	2.0	1.8	2.3	5.7	5.9	5.8	6.1	5.6	4.3	4.1	4.5	3.8	4.2	2.8	4.0
Primary reserves 2/															
Required	91	71	80	86	107	114	122	132	146	147	151	158	172	179	168
Actual	99	53	70	68	129	200	177	220	186	345	162	216	150	89	188
Excess	8	-18	-10	-18	22	86	56	88	40	197	11	58	-22	-90	20
Ratio of actual to required	1.1	0.7	0.9	0.8	1.2	1.8	1.5	1.7	1.3	2.3	1.1	1.4	0.9	0.5	1.1
Deposit liabilities	2,006	2,218	2,465	2,972	3,841	4,255	4,815	5,374	5,424	5,536	5,978	6,246	6,757	6,135	6,758
Credit	1,612	1,847	1,779	1,799	1,900	2,011	2,314	2,675	2,965	3,204	3,465	3,745	4,191	4,256	4,501
Ratio of credit to deposit liabilities	0.8	0.8	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7

Source: Bank of Botswana.

1/ Required liquid assets are 10 percent of commercial banks' daily average deposit balances. Eligible liquid assets include cash, current account balance
with the Bank of Botswana (BoB) in excess of the primary required reserve, balances due from domestic banks, foreign notes and coins, Bank of Botswana certificates,
and private sector bills eligible for discount at the BoB.
2/ Primary required reserves, consisting of current account balances with the BoB, are 3.25 percent of average daily deposit balances.

Table 29. Botswana: Selected Interest Rates, 1993- 00

(In percent; end of period)

	1993	1994	1995	1996	1997	1998	1999	2000
Bank of Botswana								
Lending rate (bank rate)	14.25	13.50	13.00	13.00	12.50	12.50	13.25	14.25
.Public Debt Service Fund 1/								
Financial parastatals	12.10	12.10	12.10	12.10	12.10	12.10	12.10	12.10
Nonfinancial parastatals	14.60	14.60	14.60	14.60	14.60	14.60	14.60	14.60
Commercial banks								
Deposit rates								
Savings accounts	12.25	9.50	5.75	7.69	7.59	7.09	7.34	7.99
Call deposits	12.50	10.50	9.25	9.13	9.25	9.06	8.72	9.64
31 days' notice	12.50	12.40	9.50	8.75	8.75	8.13	8.50	9.50
88 days' notice	12.50	12.40	9.65	9.56	9.56	8.54	9.19	9.30
Fixed deposits								
6 months	13.50	11.80	10.53	10.02	9.76	9.03	9.78	9.82
12 months	14.00	12.00	10.50	10.28	9.91	9.13	10.38	10.61
Prime lending rate	15.00	14.50	14.50	14.50	14.00	14.00	14.81	15.75
Botswana Building Society								
Deposit rates								
Indefinite period paid-up shares	11.50	11.50	10.50	10.00	10.00	9.00	8.50	10.00
Subscription shares	11.00	11.00	10.00	9.00	9.50	8.00	7.00	8.50
Fixed-time deposits								
Ordinary savings accounts	2.00	2.00	2.00	2.00	2.50	2.00	2.00	2.50
Special savings accounts	11.00	11.00	8.00	8.00	8.00	7.00	7.00	7.50
Lending rates								
Mortgage loans 2/	15.00	15.00	15.00	14.50	14.50	14.00	14.00	14.00
Short-term loans 3/	16.50	16.50	17.50	17.50	17.50	17.00	17.00	17.00
Botswana Savings Bank								
Ordinary savings accounts	5.00	3.50	3.50	3.50	3.50	3.50	3.50	3.50
Special savings accounts	9.00	6.50	6.50	7.50	7.50	7.50	7.50	7.50

Source: Bank of Botswana.

1/ In 1991, a two-tier rate structure was introduced, with the lower rate applying to financial parastatals and the higher rate to nonfinancial parastatals.
2/ Loans over P 50,000 are charged an additional percentage point.
3/ Interest rates on short-term loans vary according to the security offered by the borrower.

Table 30. Botswana: Distribution of Commercial Bank Credit by Economic Activity, 1993-00

	1993	1994	1995	1996	1997	1998 Mar.	1998 Jun.	1998 Sep.	1998 Dec.	1999 Mar.	1999 Jun.	1999 Sep.	1999 Dec.	2000 Mar.	2000 Jun.
								(In millions of pula; end of period)							
Agriculture	38	33	25	35	34	37	36	30	29	29	28	34	19	36	30
Mining	68	77	55	50	16	33	36	48	59	74	37	43	182	177	174
Manufacturing	146	165	145	138	147	129	163	161	192	267	227	254	220	292	203
Construction	92	107	90	60	54	60	134	144	135	100	131	119	83	275	85
Electricity and water	9	6	11	7	8	12	17	17	16	21	21	22	112	25	22
Transport and communications	34	37	60	82	90	78	101	300	145	164	140	164	208	129	188
Trade	201	195	163	175	189	196	221	231	261	282	324	347	212	321	314
Business services	196	360	277	284	292	340	315	194	387	373	394	398	526	382	466
Finance	36	9	26	9	6	2	2	19	2	3	3	3	12	93	58
Other business	44	59	49	38	58	66	70	77	78	95	83	100	80	122	243
Financial parastatals	94	148	95	71	61	52	139	203	267	320	351	406	528	469	550
Local government	3	2	3	2	2	3	10	10	14	18	16	13	15	2	2
Central government	0	2	3	2	0	38	0	0	0	0	2	0	0	0	0
Households	653	647	782	849	943	1,003	1,069	1,240	1,380	1,459	1709	1843	1995	1933	2166
Total	1,612	1,847	1,779	1,799	1,900	2,011	2,314	2,675	2,965	3,204	3466	3745	4191	4256	4500
								(In percent of total)							
Agriculture	2.3	1.8	1.4	1.9	1.8	1.8	1.6	1.1	1.0	0.9	0.8	0.9	0.4	0.9	0.7
Mining	4.2	4.2	3.1	2.8	0.8	1.6	1.6	1.8	2.0	2.3	1.1	1.1	4.3	4.2	3.9
Manufacturing	9.1	9.0	8.2	7.7	7.7	6.4	7.0	6.0	6.5	8.3	6.5	6.8	5.2	6.9	4.5
Construction	5.7	5.8	5.0	3.3	2.8	3.0	5.8	5.4	4.6	3.1	3.8	3.2	2.0	6.5	1.9
Electricity and water	0.5	0.3	0.6	0.4	0.4	0.6	0.7	0.6	0.5	0.6	0.6	0.6	2.7	0.6	0.5
Transport and communications	2.1	2.0	3.4	4.5	4.7	3.9	4.4	11.2	4.9	5.1	4.0	4.4	5.0	3.0	4.2
Trade	12.5	10.5	9.2	9.7	9.9	9.8	9.6	8.6	8.8	8.8	9.3	9.3	5.1	7.5	7.0
Business services	12.1	19.5	15.5	15.8	15.4	16.9	13.6	7.3	13.1	11.6	11.4	10.6	12.6	9.0	10.4
Finance	2.2	0.5	1.5	0.5	0.3	0.1	0.1	0.7	0.1	0.1	0.1	0.1	0.3	2.2	1.3
Other business	2.7	3.2	2.8	2.1	3.1	3.3	3.0	2.9	2.6	3.0	2.4	2.7	1.9	2.9	5.4
Financial parastatals	5.8	8.0	5.3	3.9	3.2	2.6	6.0	7.6	9.0	10.0	10.1	10.8	12.6	11.0	12.2
Local government	0.2	0.1	0.1	0.1	0.1	0.1	0.4	0.4	0.5	0.6	0.5	0.3	0.4	0.0	0.0
Central government	0.0	0.1	0.1	0.1	0.0	1.9	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Households	40.5	35.0	43.9	47.2	49.6	49.9	46.2	46.4	46.5	45.5	49.3	49.2	47.6	45.4	48.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Bank of Botswana

Table 31. Botswana: Sources of Commercial Bank Deposits, 1993-00

	1993	1994	1995	1996	1997	1998 Mar.	1998 Jun.	1998 Sep.	1998 Dec.	1999 Mar.	1999 Jun.	1999 Sep.	1999 Dec.	2000 Mar.	2000 Jun.
						(In millions of pula; end of period)									
Government	214	189	269	258	295	290	428	409	339	251	468	473	346	370	375
Central	31	16	19	40	36	27	46	43	29	21	40	65	66	54	46
Local	183	173	250	218	259	263	382	366	310	230	428	408	280	316	329
Parastatals	217	250	324	307	500	577	619	593	685	439	506	1,054	855	758	529
Private enterprises	1,016	1,169	1,232	1,637	2,176	2,455	2,716	3,250	3,371	3,447	3,695	3,271	3,926	3,439	3,815
Households	559	610	641	770	871	933	1,052	1,122	1,030	1,087	1,309	1,448	1,629	1,568	2,039
Total	2,006	2,218	2,465	2,972	3,842	4,255	4,815	5,374	5,424	5,225	5,978	6,246	6,757	6,135	6,758
						(In percent of total)									
Government	10.7	8.5	10.9	8.7	7.7	6.8	8.9	7.6	6.3	4.8	7.8	7.6	5.1	6.0	5.5
Central	1.6	0.7	0.8	1.4	0.9	0.6	1.0	0.8	0.5	0.4	0.7	1.0	1.0	0.9	0.7
Local	9.1	7.8	10.1	7.3	6.7	6.2	7.9	6.8	5.7	4.4	7.2	6.5	4.1	5.1	4.9
Parastatals	10.8	11.3	13.1	10.3	13.0	13.6	12.9	11.0	12.6	8.4	8.5	16.9	12.7	12.4	7.8
Private enterprises	50.6	52.7	50.0	55.1	56.6	57.7	56.4	60.5	62.1	66.0	61.8	52.4	58.1	56.1	56.4
Households	27.8	27.5	26.0	25.9	22.7	21.9	21.8	20.9	19.0	20.8	21.9	23.2	24.1	25.6	30.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Bank of Botswana.

Table 32. Botswana: Auctions of Bank of Botswana Certificates, January 1996-August 2000 1/

	Allotted	Reserved for Bank of Botswana	Stop-Out Price 2/	Interest Rate (In percent)	
	(In millions of pula)		(In pula)	Simple	Effective
1996					
January	0.0	0.0	0.0	0.0	0.0
February	257.6	7.5	97.1	11.9	12.4
March	710.7	179.3	94.0	12.3	12.7
April	260.0	0.0	93.8	12.3	12.6
May	455.0	0.0	91.4	12.7	12.9
June	497.5	2.6	96.0	12.0	12.5
July	420.0	0.0	92.8	12.5	12.8
August	449.0	11.5	90.0	13.0	13.1
September	567.3	22.7	91.6	12.8	13.0
October	843.0	0.0	90.4	13.0	13.1
November	0.0	0.0	0.0	0.0	0.0
December	636.1	0.0	90.6	12.9	13.1
1997					
January	300.0	0.0	88.3	13.3	13.3
February	0.0	0.0	0.0	0.0	0.0
March	490.7	49.4	92.9	12.3	12.5
April	125.0	0.0	93.4	12.2	12.5
May	429.0	111.0	94.1	12.1	12.5
June	794.0	124.3	94.5	12.1	12.5
July	366.6	15.5	93.9	12.3	12.6
August	144.7	15.3	91.5	12.5	12.6
September	724.3	36.7	93.1	12.2	12.4
October	529.9	196.1	92.9	12.2	12.4
November	397.0	0.0	93.9	11.9	12.2
December	521.3	78.7	93.0	12.0	12.2
1998					
January	592.1	207.9	94.8	11.1	11.4
February	445.5	89.5	96.9	10.9	11.3
March	243.8	256.2	96.0	10.4	10.7
April	411.9	0.0	95.0	10.3	10.6
May	247.4	252.7	95.3	10.1	10.4
June	339.7	28.3	96.2	10.2	10.5
July	439.0	0.0	95.0	10.2	10.4
August	0.0	0.0	0.0	0.0	0.0
September	1,493.3	184.7	94.6	10.6	10.9
October	457.8	76.2	94.1	10.9	11.1
November	431.4	158.7	95.7	10.7	11.0
December	0.0	0.0	0.0	0.0	0.0
1999					
January	452.7	124.3	92.1	11.5	11.7
February	546.1	119.9	94.3	10.8	11.6
April	968.8	181.3	94.7	11.7	12.1
May	482.7	137.3	96.4	11.5	12.0
June	393.7	186.3	93.4	12.0	12.2
July	610.0	110.1	93.6	12.0	12.3
August					
September	623.0	27.0	94.2	11.9	12.2
October	538.6	41.4	88.6	12.9	12.9
November	408.0	122.1	94.3	12.1	12.5
December	838.3	141.7	93.4	12.8	12.6
2000					
January	569.9	70.1	92.8	12.5	12.8
February	806.1	93.9	91.5	13.1	13.3
March	224.8	175.2	95.2	12.5	12.9
April	430.6	9.4	91.1	13.0	13.2
May	447.3	42.7	93.4	12.7	13.1
June	0.0	0.0	0.0	0.0	0.0
July	704.6	75.4	92.1	13.0	12.2
August	471.7	80.3	92.9	12.9	13.3

Sources: Bank of Botswana.

1/ In any month with more than one auction, the stop-out price and interest rates are arithmetic averages.
2/ The stop-out price is the price below which no bid for BoBCs will be entertained by the Bank of Botswana.

Table 33. Botswana: Value of Outstanding Bank of Botswana Certificates, January 1996-August 2000 1/

(In millions of pula; end of period)

	Commercial Banks	Other Financial Institutions	Other Private Sector	Total
1996				
January	1,481	15	444	1,941
February	1,465	15	396	1,876
March	1,505	16	458	1,978
April	1,625	15	512	2,152
May	1,793	18	592	2,403
June	1,693	19	691	2,403
July	1,766	19	601	2,386
August	1,751	19	676	2,446
September	1,718	22	743	2,482
October	1,857	22	809	2,688
November	1,889	25	773	2,687
December	1,847	28	941	2,816
1997				
January	1,999	29	849	2,876
February	2,033	30	893	2,956
March	1,982	30	1,024	3,036
April	2,151	32	952	3,135
May	2,271	31	1,012	3,315
June	2,226	31	1,115	3,372
July	2,273	34	700	3,007
August	2,186	34	775	2,995
September	2,357	35	871	3,263
October	2,489	38	735	3,262
November	2,546	36	873	3,455
December	2,424	37	848	3,308
1998				
January	2,681	40	779	3,500
February	2,675	41	814	3,530
March	2,461	42	708	3,210
April	2,619	41	480	3,140
May	2,727	41	599	3,366
June	2,688	43	728	3,459
July	2,514	44	644	3,202
August	2,459	45	812	3,316
September	2,539	39	1,051	3,629
October	2,461	39	891	3,391
November	2,343	42	884	3,268
December	2,258	44	945	3,246
1999				
January	2,243	45	911	3,199
February	2,309	47	1,002	3,358
March	2,162	52	783	2,997
April	2,532	51	793	3,376
May	2,434	53	948	3,434
June	2,662	54	840	3,556
July	2,280	56	838	3,174
August	2,303	56	950	3,309
September	2,379	55	917	3,351
October	2,427	52	931	3,410
November	2,494	55	1,035	3,583
December	2,809	53	1,368	4,230
2000				
January	2,567	54	1,434	4,054
February	2,481	53	1,574	4,108
March	2,400	54	1,213	3,667
April	2,715	54	1,387	4,156
May	2,628	54	1,570	4,253
June	2,728	52	1,094	3,874
July	2,870	53	1,211	4,134
August	2,909	49	1,418	4,376

Sources: Bank of Botswana, *Annual Report* and *Financial Statistics*.

1/ Based on the discounted value.

Table 34. Botswana: Balance of Payments, 1993-99 1/

(In millions of U.S. dollars, unless otherwise indicated)

	1993	1994	1995	1996	1997	1998	1999
Current account balance	427	212	300	495	721	268	504
Trade balance	267	510	555	750	895	78	674
Exports, f.o.b.	1,722	1,874	2,160	2,218	2,820	2,073	2,668
Of which							
Diamonds	1,379	1,384	1,437	1,721	2,095	1,438	2,132
Vehicles and parts	38	112	345	345	· 324	227	144
Imports, f.o.b	-1,455	-1,364	-1,605	-1,468	-1,924	-1,994	-1,994
Of which							
Food	-260	-240	-256	-248	-253	-253	-261
Chemical and rubber products	-134	-132	-148	-150	-175	-171	-174
Metal and metal products	-148	-128	-139	-129	-205	-195	-162
Machinery and electrical equipment	-252	-240	-252	-236	-339	-410	-396
Vehicle and transport equipment	-193	-164	-299	-207	-385	-314	-254
Services	-134	-136	-184	-181	-230	-172	-156
Transportation	-131	-129	-149	-140	-175	-165	-162
Travel	41	48	17	16	43	72	87
Other services	-45	-54	-52	-57	-99	-143	-81
Income	294	-224	-32	-253	-145	120	-266
Compensation of employees	14	16	13	-14	-10	-15	-26
Investment income	279	-240	-46	-239	-134	135	-236
Of which							
Earnings on reserves	458	136	360	438	545	528	348
Current transfers	1	62	-39	179	201	242	252
Of which							
Southern African Customs Union (SACU)	...	...	176	176	237	253	252
Capital and financial account	45	60	-19	49	23	-171	-223
Capital account	85	19	14	6	17	32	21
Financial account	-40	41	-34	42	6	-203	-244
Direct investment	-296	-24	30	72	104	92	35
Portfolio investment	0	0	-31	-5	-33	-52	-35
Other investment	256	65	-33	-25	-65	-244	-244
Of which							
Net government long-term borrowing	67	6	-12	-20	51	22	10
Other net private long-term borrowing	45	62	32	32	-13	27	21
Short-term borrowing	81	-19	36	58	71	20	18
Net errors and omissions 2/	-1,231	-802	-737	-693	-1,184	-363	-569
Reserve assets (increase -) 2/	-759	-530	-457	-150	-440	-266	-289
Memorandum items:							
Current account balance (in percent of GDP)	10.3	4.9	6.3	10.4	13.9	5.4	10.0
Trade balance (in percent of GDP)	6.5	11.8	11.6	15.7	17.2	1.6	13.3
End-of-year gross official reserves	4,097	4,628	5,084	5,234	5,675	5,941	6,229
(in months of imports of goods and services)	27.6	31.3	27.5	34.7	28.8	35.7	37.5
Exchange rates							
U.S. dollars per pula (period average)	0.41	0.37	0.36	0.30	0.27	0.24	0.22
U.S. dollars per pula (end of period)	0.39	0.37	0.35	0.27	0.26	0.24	0.22

Sources: Botswana authorities; and Fund staff estimates and projections.

1/ Based on pula-denominated estimates converted at period-average exchange rate.
2/ Includes valuation adjustment.

Table 35. Botswana: Value of Principal Exports and Imports, 1993-99

	1993	1994	1995	1996	1997	1998	1999
	(In millions of U.S. dollars)						
Diamonds	1,379	1,384	1,437	1,721	2,095	1,477	2,097
Nondiamond	401	465	706	728	751	729	539
Meat	66	64	65	62	63	79	48
Copper nickel	91	96	118	134	127	61	120
Textiles	39	66	53	59	68	39	54
Soda ash	21	14	8	21	30	32	23
Vehicles	38	112	345	345	324	331	144
Other	147	113	117	107	138	187	149
Total exports, f.o.b.	1,780	1,849	2,143	2,449	2,846	2,206	2,641
Food, beverages, and tobacco	315	288	305	292	297	306	305
Wood and paper products	96	95	145	126	140	144	177
Textile and footwear	128	146	144	129	146	150	129
Chemical and rubber products	163	159	177	176	205	211	203
Fuel	113	93	98	110	127	125	107
Metal and metal products	179	153	166	152	241	249	189
Machinery and electrical equipment	307	288	300	278	398	410	463
Vehicle and transport equipment	235	197	357	243	452	465	297
Other goods	227	218	222	220	253	265	326
Total imports, c.i.f.	1,768	1,637	1,914	1,727	2,260	2,326	2,195
	(In percent of total)						
Diamonds	77.5	74.9	67.0	70.3	73.6	67.0	79.4
Nondiamond	22.5	25.1	33.0	29.7	26.4	33.0	20.4
Meat	3.7	3.5	3.0	2.5	2.2	3.6	1.8
Copper nickel	5.1	5.2	5.5	5.5	4.5	2.8	4.6
Textiles	2.2	3.6	2.5	2.4	2.4	1.8	2.0
Soda ash	1.2	0.7	0.4	0.9	1.1	1.5	0.9
Vehicles	2.1	6.1	16.1	14.1	11.4	15.0	5.5
Other	8.2	6.1	5.5	4.4	4.9	8.5	5.7
Total exports, f.o.b.	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Food, beverages, and tobacco	17.8	17.6	15.9	16.9	13.1	13.1	13.9
Wood and paper products	5.5	5.8	7.6	7.3	6.2	6.2	8.1
Textile and footwear	7.2	8.9	7.5	7.4	6.5	6.5	5.9
Chemical and rubber products	9.2	9.7	9.2	10.2	9.1	9.1	9.3
Fuel	6.4	5.7	5.1	6.4	5.6	5.4	4.9
Metal and metal products	10.1	9.4	8.7	8.8	10.7	10.7	8.6
Machinery and electrical equipment	17.3	17.6	15.7	16.1	17.6	17.6	21.1
Vehicle and transport equipment	13.3	12.0	18.6	14.1	20.0	20.0	13.5
Other goods	12.8	13.3	11.6	12.7	11.2	11.4	14.8
Total imports, c.i.f.	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Botswana authorities.

Table 36. Botswana: External Trade Indices, 1990/91-1999/2000

	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00
Values (in millions of pula)										
Exports of goods	3,641	3,827	3,654	4,808	5,347	6,766	9,158	10,304	8,560	12,426
Exports of services	467	520	429	605	724	645	723	1,088	1,492	1,682
Total Exports (Goods and Services)	4,107	4,347	4,083	5,412	6,071	7,412	9,882	11,393	10,052	14,108
Imports of goods	-3,303	-3,158	-3,116	-3,729	-4,080	-4,527	-5,926	-7,762	-8,571	-8,774
Imports of services	-466	-490	-509	-532	-693	-773	-845	-1,114	-1,389	-2,189
Total Imports (Goods and Services)	-3,769	-3,648	-3,625	-4,260	-4,772	-5,300	-6,771	-8,875	-9,961	-10,963
Volume (1993/94 prices, millions of pula)										
Exports of goods	4,962	4,957	4,513	4,807	5,018	5,666	6,436	6,632	4,959	6,662
Exports of services	518	549	462	604	668	541	550	772	994	1,032
Total Exports (Goods and Services)	5,480	5,506	4,975	5,412	5,686	6,207	6,986	7,405	5,952	7,694
Imports of goods	-4,648	-3,907	-3,358	-3,729	-3,714	-3,739	-4,448	-5,458	-5,656	-5,322
Imports of services	-634	-587	-580	-532	-644	-664	-670	-835	-981	-1,391
Total Imports (Goods and Services)	-5,283	-4,493	-3,938	-4,260	-4,358	-4,402	-5,118	-6,293	-6,637	-6,713
Price indices (1993/93=100)										
Exports of goods	73.4	77.2	81.0	100.0	106.6	119.4	142.3	155.4	172.6	186.5
Exports of services	90.0	94.7	92.9	100.0	108.4	119.4	131.5	140.9	150.1	163.0
Total Exports (Goods and Services)	74.9	78.9	82.1	100.0	106.8	119.4	141.5	153.9	168.9	183.4
Imports of goods	71.1	80.8	92.8	100.0	109.8	121.1	133.2	142.2	151.6	164.9
Imports of services	73.4	83.5	87.8	100.0	107.5	116.5	126.2	133.4	141.6	157.3
Total Imports (Goods and Services)	71.3	81.2	92.0	100.0	109.5	120.4	132.3	141.0	150.1	163.3

Source: National accounts

Table 37. Botswana: Direction of Trade, 1993-99

	1993	1994	1995	1996	1997	1998	1999
			(In millions of pula)				
Exports, f.o.b.	4,312	4,965	5,942	8,142	10,391	9,324	12,228
Southern African Customs Union (SACU)	379	691	1,277	1,490	1,485	1,333	1,271
Zimbabwe	135	134	182	251	383	343	291
Other Africa	57	49	49	51	114	102	137
United Kingdom	639	1,245	2,223	4,424	5,840	5,240	8,130
Other Europe	3,083	2,801	2,147	1,827	2,444	2,193	2,221
United States	14	35	52	78	102	91	86
All other	4	10	11	22	23	21	91
Imports, c.i.f.	4,285	4,407	5,307	5,735	8,256	9,839	10,164
SACU	3,541	3,437	3,925	4,474	5,982	6,972	7,783
Zimbabwe	196	259	293	329	368	418	397
Other Africa	17	23	18	23	38	61	27
United Kingdom	112	110	135	147	163	161	272
Other Europe	192	260	319	241	580	915	664
Korea, Republic of	...	92	378	250	785	699	264
United States	141	83	107	74	89	152	188
All other	85	144	132	196	251	460	569
			(In percent of total)				
Exports, f.o.b.	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Southern African Customs Union (SACU)	8.8	13.9	21.5	18.3	14.3	14.3	10.4
Zimbabwe	3.1	2.7	3.1	3.1	3.7	3.7	2.4
Other Africa	1.3	1.0	0.8	0.6	1.1	1.1	1.1
United Kingdom	14.8	25.1	37.4	54.3	56.2	56.2	66.5
Other Europe	71.5	56.4	36.1	22.4	23.5	23.5	18.2
United States	0.3	0.7	0.9	1.0	1.0	1.0	0.7
All other	0.1	0.2	0.2	0.3	0.2	0.2	0.7
Imports, c.i.f.	100.0	100.0	100.0	100.0	100.0	100.0	100.0
SACU	82.6	78.0	74.0	78.0	72.5	70.9	76.6
Zimbabwe	4.6	5.9	5.5	5.7	4.5	4.2	3.9
Other Africa	0.4	0.5	0.3	0.4	0.5	0.6	0.3
United Kingdom	2.6	2.5	2.5	2.6	2.0	1.6	2.7
Other Europe	4.5	5.9	6.0	4.2	7.0	9.3	6.5
Korea, Republic of	...	2.1	7.1	4.4	9.5	7.1	2.6
United States	3.3	1.9	2.0	1.3	1.1	1.5	1.8
All other	2.0	3.3	2.5	3.4	3.0	4.7	5.6

Source: Customs and Excise Department.

Table 38. Botswana: Public Sector External Debt, 1993-99

	1993	1994	1995	1996	1997	1998	1999
	(In millions of U.S. dollars; end of period)						
Total external public debt 1/	613	620	619	477	478	483	518
Bilateral loans	137	161	167	128	112	114	148
United States	27	26	26	25	24	23	22
United Kingdom	24	22	18	17	0	0	0
China	16	40	47	13	20	18	23
France	1	1	2	1	1	1	1
Belgium	1	1	2	1	1	1	1
Kuwait	14	14	18	14	13	11	13
Germany	1	1	0	0	0	0	0
Nigeria	7	7	6	7	7	6	0
Japan	39	44	42	45	43	53	86
Saudi Arabia	6	5	5	3	3	2	2
Multilateral loans	464	450	447	348	366	368	370
African Development Bank*	165	165	150	141	127	123	86
African Development Fund	85	94	96	82	80	86	108
Arab Bank for Economic Development in Africa	14	20	23	21	19	19	20
European Economic Community	21	18	33	31	30	33	0
European Investment Bank	39	26	37	6	44	52	79
International Bank for Reconstruction and Development	92	77	60	31	20	13	26
International Development Association	12	12	12	11	11	10	10
International Fund for Agriculture Development	2	2	2	2	1	1	0
Nordic Development Fund	2	4	5	5	5	5	7
Nordic Investment Bank	13	13	11	3	17	16	0
Organization of Petroleum Exporting Countries	7	8	9	8	7	6	6
UN Capital Development Fund	11	10	8	6	4	3	18
Commercial banks	8	5	3	1	0	0	10
Export credits	4	3	2	1	0	0	0
Memorandum items:							
	(In percent)						
Total external public debt							
(in percent of GDP)	16	15	13	11	10	10	3
(in percent of exports of goods and services)	34	30	26	22	16	22	9

Sources: Ministry of Finance and Development Planning; and Fund staff estimates.

1/ Government and government-guaranteed disbursed outstanding debt, with original maturity of one year and more.
* African Development Bank/Fund for 1999

Table 39. Botswana: Developments in the Exchange Rate of the Pula, 1990-00

(Index, 1990=100; period average)

| | Effective Exchange Rate | | Bilateral Exchange Rate | | |
	Real	Nominal	South African Rand	U.S. Dollar	Zimbabwe Dollar
1990	100.0	100.0	100.0	100.0	100.0
1991	96.1	96.8	101.8	108.7	76.9
1992	97.2	93.8	102.8	113.4	54.5
1993	100.9	91.9	103.1	130.2	49.2
1994	99.8	88.4	105.1	144.3	43.3
1995	101.0	86.8	106.3	149.0	42.1
1996	99.4	82.5	107.5	178.7	43.9
1997	98.6	80.0	110.2	196.2	40.3
1998	95.8	78.1	106.4	227.1	25.6
1999	101.3	78.5	105.7	246.7	15.6
2000	106.6	79.5	103.8	263.5	15.4
1996 I	101.9	85.2	107.4	156.6	40.5
1996 II	99.4	82.7	107.2	178.9	45.6
1996 III	99.0	81.7	107.4	185.8	45.1
1996 IV	97.4	80.5	107.9	193.5	44.4
1997 I	95.8	79.3	110.5	192.7	43.5
1997 II	96.4	79.2	111.1	192.0	41.6
1997 III	97.4	79.4	110.3	197.9	41.1
1997 IV	98.6	80.0	108.9	202.3	35.1
1998 I	99.5	80.2	108.3	207.2	29.3
1998 II	100.0	80.3	106.7	213.1	30.0
1998 III	96.1	78.5	104.4	250.5	27.2
1998 IV	95.8	78.1	106.4	237.7	15.9
1999 I	96.8	77.9	106.5	240.4	15.5
1999 II	97.9	77.8	105.4	247.9	16.1
1999 III	99.4	78.0	105.6	250.1	15.9
1999 IV	101.3	78.5	105.4	248.5	15.9
2000 I	101.5	78.4	104.6	247.7	16.3
2000 II	100.2	77.5	104.1	253.7	17.6
2000 III	103.1	77.6	103.4	274.1	14.9
2000 IV	106.6	79.5	103.0	278.7	13.0

Source: IMF, *International Financial Statistics .*