

Botswana Examined in Light of Three Economic Growth Models
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The Republic of Botswana poses a study in economic growth that is equal parts triumph and tragedy. Botswana is a rare economic success story in sub-Saharan Africa, and has experienced growth rates averaging in excess of 9% annually over the past 26 years. It rapidly moved from a primarily rural to a predominantly urban society, with the urban percentage of its population moving from 9% to 54.2% between 1971 and 2001¹, and as of 2006 had a per capita GDP of \$10,900, placing it comfortably in the rank of middle income countries². Botswana benefits from sound property rights, strong rule of law, and a stable democracy. According to Transparency International's corruption index, Botswana ranks 38th, above Italy, Malaysia, and South Korea.³ In many ways, Botswana is a model of successful and responsible policy for developing nations, although income is still distributed very unevenly, with half the population of Botswana living on less than \$2 a day⁴. Even more disturbing than the prevalence of extreme poverty is the prevalence of HIV/AIDS. The percentage of the population infected with HIV/AIDS is disputed, but Botswana is generally considered to have the second highest incidence of HIV/AIDS in the world, with the UN AIDS organization estimating the prevalence of HIV/AIDS among those aged 15 to 49 at 24%.⁵ Life expectancy at birth is now one of the lowest in the world at 34.9 years.⁶

¹ Table 1: 1971, 1981, 1991 and 2001 CENSUS DEMOGRAPHIC INDICATORS, Source: National Census 1971, 1981, 1991 and 2001, Central Statistics Office, Republic of Botswana, http://www.cso.gov.bw/html/tabdem04_dem1.html

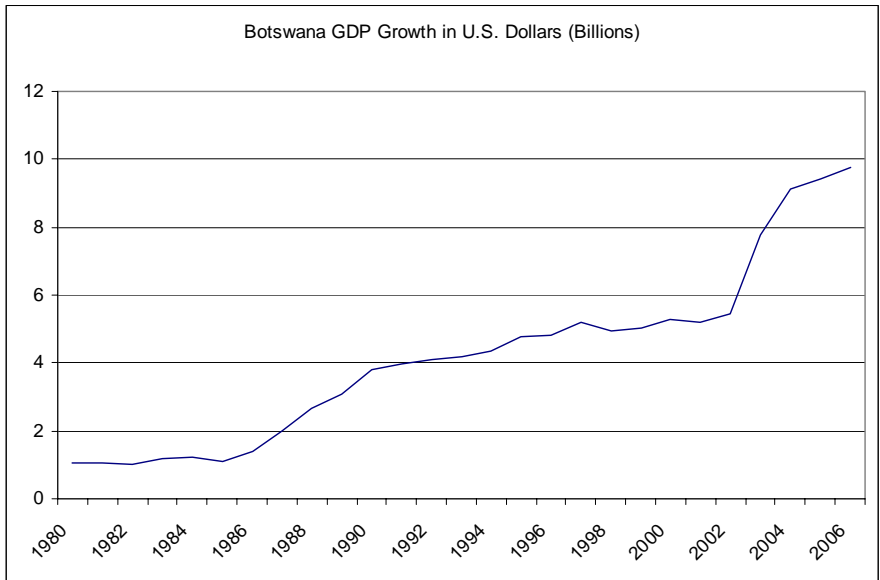
² CIA World Factbook, <https://www.cia.gov/library/publications/the-world-factbook/geos/bc.html>

³ http://www.transparency.org/policy_research/surveys_indices/cpi/2007

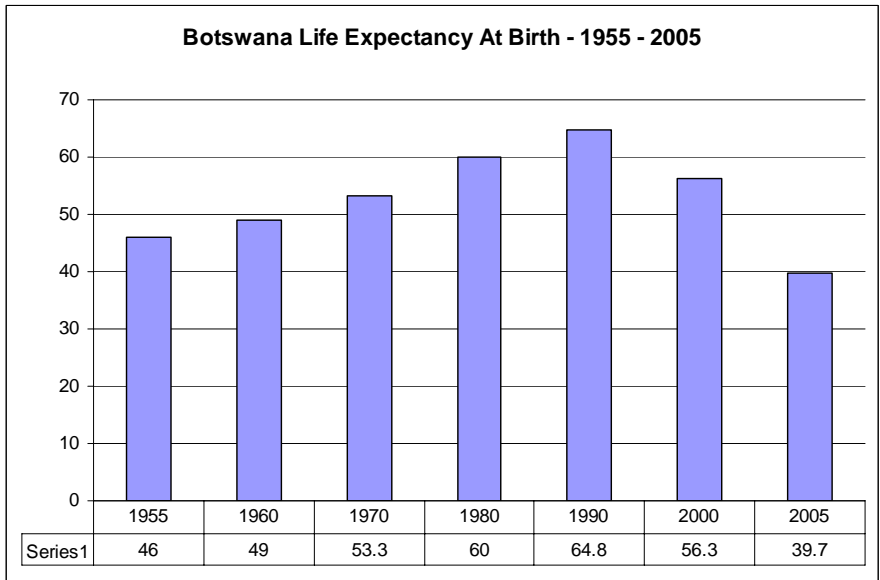
⁴ http://www.unaids.org/en/Regions_Countries/Countries/botswana.asp

⁵ Ibid.

⁶ http://hdrstats.undp.org/countries/data_sheets/cty_ds_BWA.html



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Botswana’s unique situation provides an interesting, although disturbing, test case for models of economic development. The existence of a nation achieving extraordinary growth rates while suffering devastating rates of disease provides a test case for the effectiveness of these models.

⁷ IMF International Statistics, taken from <http://econstats.com/weo/C022V019.htm>

⁸ UN Common Database Category: Human Development, taken from http://globalis.gvu.unu.edu/indicator_detail.cfm?Country=BW&IndicatorID=18#row

The Malthusian Model

One's first impression would be that the Malthusian model offers strong insights into Botswana. Malthus proposed that societies would converge to a state of general misery, because increases in productivity would lead to increases in population, which would bring consumption back down to a bare survival level. Half Botswana's population remains in a state of dire poverty despite rapid economic growth, and life throughout the country is haunted by the AIDS epidemic. However, Botswana's recent history contradicts Malthus' predictions. Malthus would anticipate that increased wealth would lead to an increase in population growth, but in Botswana the growth rate of the population declined from 4.7% in 1981 to 2.4% by 2001.⁹ This illustrates the well-known effect of increased incomes leading to lower birthrates, and is a rate far below GDP growth. (It should be noted that the impact of HIV/AIDS on the birthrate may also be a factor, since this tends to be a disease of young adults.) While the country suffers from massive rates of poverty and disease, the trend is toward reduced poverty and less prevalent HIV/AIDS.

In Malthus' model a chronic disease like HIV/AIDS afflicting a large proportion of the population would ultimately make little difference to levels of consumption and to economic growth. The early death of many HIV/AIDS sufferers would free resources for the healthy majority, who would reproduce more rapidly and raise population to the point where individuals consume no more than they would had HIV/AIDS not been prevalent. This in no way resembles what has taken place in Botswana, where GDP and nutrition

⁹ Table 1: 1971, 1981, 1991 and 2001 CENSUS DEMOGRAPHIC INDICATORS, Source: National Census 1971, 1981, 1991 and 2001, Central Statistics Office, Republic of Botswana, http://www.cso.gov.bw/html/tabdem04_dem1.html

standards improve at the same time as the economy grows and population growth diminishes.

The Solow Model

The Solow model argues that capital will drive development, and that capital will be drawn to undercapitalized economies. In undercapitalized economies the marginal product of capital is greater than that of more developed economies, and the returns on investment are greater. Of the models considered in this paper this one comes closest to describing Botswana's present state. The Botswana economy is growing dramatically, in spite of the prevalence of HIV/AIDS, and drew in foreign direct investment equal to approximately 9% of national GDP in recent years.¹⁰ The rapid transition from an agricultural economy that was at best marginal to an urbanized economy suggests a rapid transition of workers into more productive sectors of the economy, and the number of workers remaining in the agricultural economy (which represented only 3.6% of Botswana's GDP in the year 2000¹¹) suggests great latitude for more workers to move to more productive sectors. Also in keeping with Solow's model, Botswana has an extremely high savings rate, amounting to 44.8% of GDP in the year 2003.¹² In Solow's model an economy that is below its steady state has high saving rates, reflecting the high returns on savings in an economy that is developing rapidly.

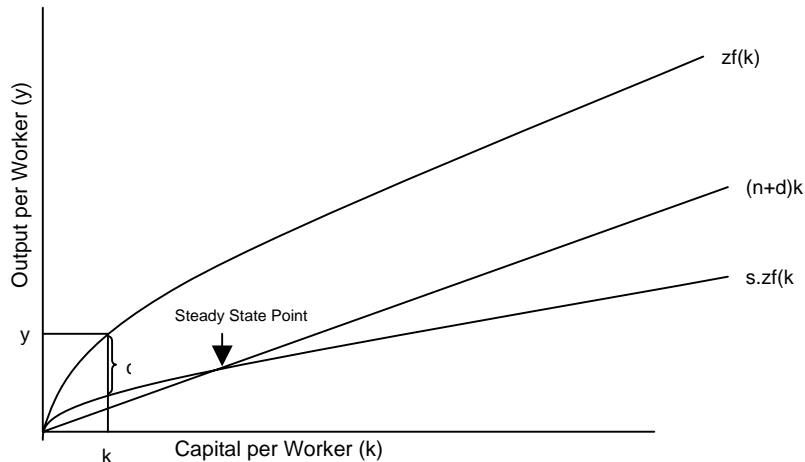
¹⁰ http://www.unctad.org/sections/dite_dir/docs/wir07_fs_bw_en.pdf, Foreign direct investment (FDI) overview, selected years

¹¹ <http://earthtrends.wri.org/text/agriculture-food/country-profile-25.html>

¹² <http://www.imf.org/external/np/sec/pn/2007/pn0773.htm>, "Botswana: Selected Economic Indicators"

Botswana's Economic Status as Approximated within the Solow Model

(Note that capital and output are below the steady state point)

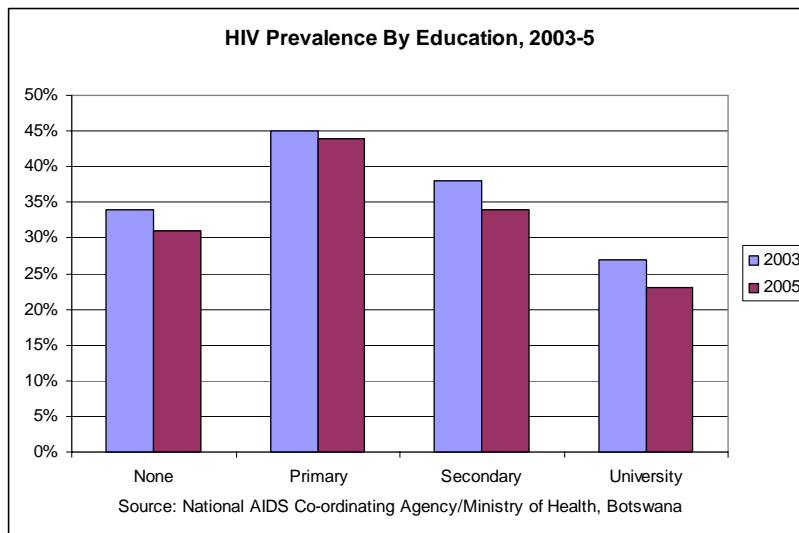


The Endogenous Growth Model

Botswana's situation challenges the basic premise of the endogenous growth model. This model addresses the divergence between the Solow model and the real world. Unlike in the Solow model, growth rates in poor countries are not necessarily higher than those in rich nations, nor do they necessarily have higher marginal products of capital. If anything, the growth of rich nations appears to be leaving that of poor nations even farther behind. The premise of the endogenous growth model, loosely stated, is that human capital is the missing factor in Solow's model. In the endogenous model the development of greater capabilities and skills on the part of a country's population accounts for the differing growth rates of rich and poor nations. Financial capital is still a fundamental factor in the growth of nations, but is only fully effective when coupled with improvements in human capital.

Botswana is making serious investments in its human capital, and as of the year 2002 had a youth literacy rate of 89%. Botswana also has a high rate of primary school enrollment, and secondary school enrollment rates of 52% of males and 61% of

females.¹³ Also, the transition from relatively unproductive agricultural work to an economy based on mining, tourism, and manufacturing also represents an increase in human capital. Against all these gains, the loss of human capital to HIV/AIDS remains overwhelming. Life expectancy in Botswana dropped by 25 years between 1990 and 2005, and the loss of life is predominantly among those in the most productive years of their lives, from age 15 to 49. Botswana has responded effectively to the challenge of HIV/AIDS, and life expectancy rates are slowly beginning to recover, but by any measure this is a massive loss. While HIV/AIDS is more prevalent amongst the less educated, rates of infection for the university educated are extremely high, striking at those who would otherwise become the most productive citizens. Beyond the hundreds of thousands of individual tragedies this represents, under these conditions it is hard to believe a growth in human capital can account for the rapid economic growth of Botswana.



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¹³ <http://earthtrends.wri.org/text/population-health/country-profile-25.html>

¹⁴ http://www.unbotswana.org/bw/undp/docs/economic_impact_study_final_report_for_nacaundp.pdf

Conclusion

Botswana's recent history suggests two conclusions about economic growth.

1. Endogenous growth theory should factor in what might be considered social capital, that is to say, factors such as the rule of law, respect for private property, openness to markets, and a lack of corruption. It is difficult to account for Botswana's ongoing economic success without considering these factors, given how much pressure HIV/AIDS puts on its human capital.

(Russia might serve as an example of a nation with enormous human capital and relatively underdeveloped social capital. Russia has a highly educated workforce, but is plagued by a high rate of corruption and arbitrary regulation and law enforcement. Most of Russia's recent growth results from the high price of oil, apart from which the development picture is highly mixed, with manufacturing productivity only 40% that of Brazil's.¹⁵)

2. At early stages of economic development, the endogenous model seems to be the best fit. At some point in a nation's development, when a critical mass of social and human capital is attained, the Solow model becomes a better fit. The endogenous model seems to best describe a stage of development where the preconditions for rapid economic growth are coming into being. Botswana serves as an example of a nation which, having established those preconditions, is best viewed in terms of the Solow model.

¹⁵ http://ns.worldbank.org.ru/files/rer/RER_13.3_eng.pdf, "III. COMPETITIVENESS, INNOVATION, AND SKILLED LABOR: SOME CONCLUSIONS FROM THE WORLD BANK/HIGHER SCHOOL OF ECONOMICS INVESTMENT CLIMATE SURVEY", December 2006