Terms of Trade and Growth of Resource Economies: A Tale of Two Countries

Augustin K. FOSU*

*Deputy Director, UN University-WIDER.

For presentation at the IMF Institute High Level Seminar, 'Natural Resources, Finance, and Development: Confronting Old and New Challenges', Algiers, Algeria, 4-5 November 2010

Fosu@wider.unu.edu

Outline

- Introduction
- Theoretical Discussion
- The Empirical Model & Estimation
- Empirical Results
- Discussion of Results
- Some Lessons & Concluding Observations

Fosu@wider.unu.edu

Introduction

- The 'Big Push' view (e.g., Murphy et al, *JPE*,1989; Sachs &Warner, *JDE*,1999).
- The 'Resource Curse' Hyp (RCH) (van der Ploeg, *JEL*, 2010)
- Incongruence: The Resource Curse vs. Singer-Prebish
- Existing Evidence on RCH: Cross-country generally
  - Negative effect of **resource abundance** (share in GDP/exports) on growth [e.g., Sala-i-Martin & Subramanian (S&S), IMF WP, 2003)]
- Effect of **commodity prices** on growth (cross-ctry generally)
  - Generally positive (e.g., Deaton & Miller, *JAE*, 1996)
  - Positive and negative SR and LR effects using panel (Collier and Goderis, CSAE WP, 2007) → RCH in LR
- Importance of Country-specific Evidence
- Why Botswana and Nigeria?

Fosu@wider.unu.edu

Growth and TOT: Botswana vs. Nigeria

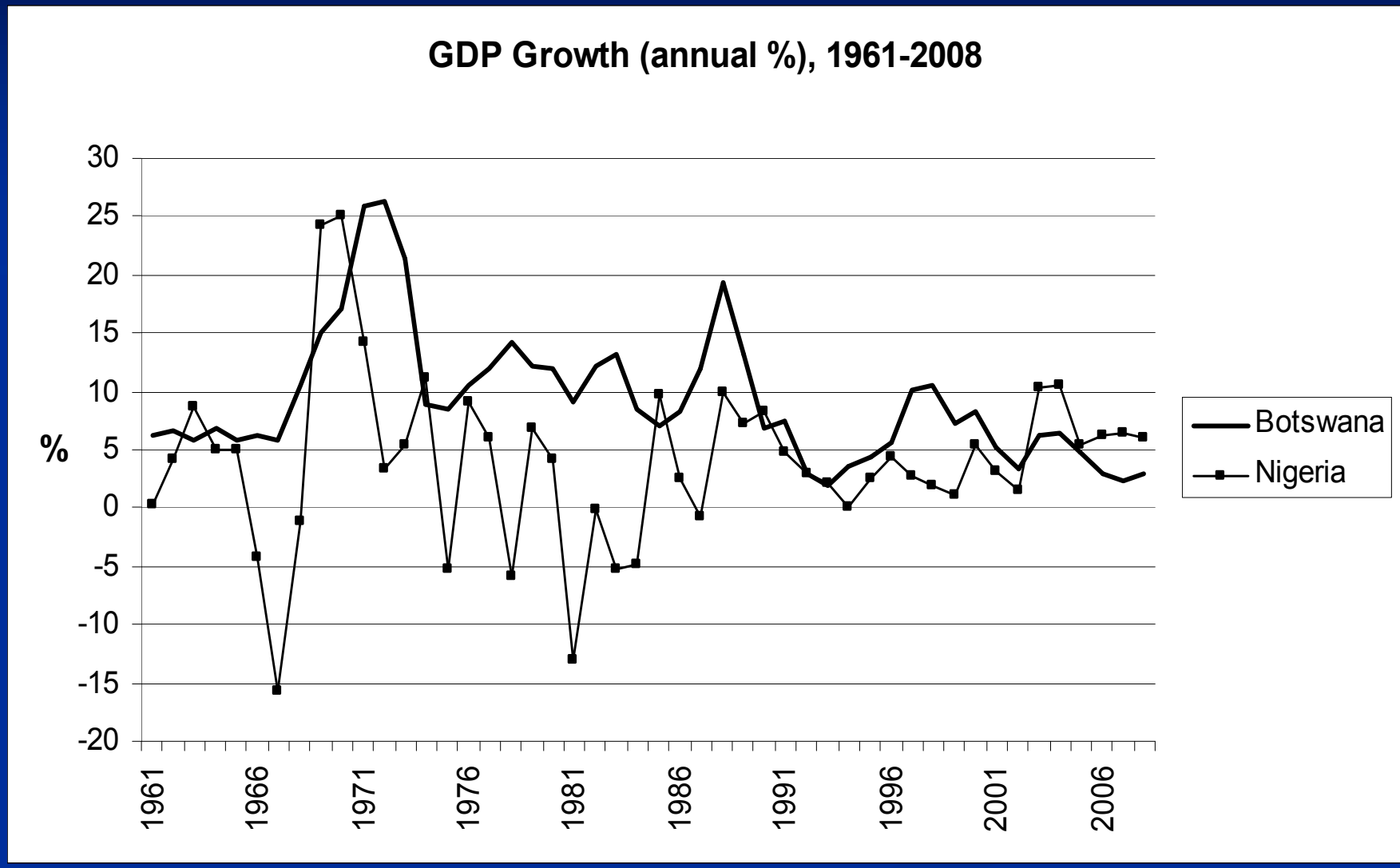
Mean GDP Growth and GTOT (annual average, %):

	Botswana	Nigeria
Mean GTOT	0.9	6.3
Mean GDP Growth	10.2	3.2

Notes: GTOT is the Net Barter Terms of Trade. Data are for 1966-2002, except GTOT for Botswana, which is for 1976-2002. GDP and TOT data are from World Bank WDI 2005 and World Bank Africa Database CDROM 2004, respectively.

Fosu@wider.unu.edu

Growth Performance: Botswana vs. Nigeria



Fosu@wider.unu.edu

Theoretical Discussion: Possible Channels of the Resource Curse

- Institutions and Governance
- Civil Conflicts
- Elite Political Instability
- Human Capital
- Openness
- 'Dutch Disease'?

Fosu@wider.unu.edu

Institutions & Governance: Resource Curse?

- Higher TOT (from NR) → Larger Resource Rent →
  - Higher Growth if 'good institutions'
  - Lower Growth if 'bad institutions': RC

(e.g., Mehlum et al., *EJ*, 2006)

- Higher TOT (from NR) → Larger Resource Rent → **Institutions corroded** → Lower Growth: RC

(e.g., S&S, IMF WP, 2003)

Fosu@wider.unu.edu

Institutions & Governance: Botswana vs. Nigeria (& SSA)

	Botswana			Nigeria			SSA		
Years:	75-79	95-99	00-04	75-79	95-99	00-04	75-79	95-99	00-04
Pol Rgts	6.0	6.0	6.0	3.2	1.8	4.0	2.3	3.4	3.6
Civ Libs	5.2	6.0	6.0	4.2	2.8	3.6	2.7	3.5	3.8
LIEC	6.0	7.0	7.0	1.0	1.0	7.0	2.8	5.5	5.9
EIEC	6.0	7.0	7.0	2.0	2.0	7.0	2.8	5.4	5.6
XC	5.0	6.6	7.0	2.8	2.2	5.0	2.6	3.3	3.7

Source: See Fosu (2010). "Terms of Trade and Growth of Resource Economies: A Tale of Two Countries," paper submitted for IMF Institute High Level Seminar, Algiers, 4-5 November 2010.

Fosu@wider.unu.edu

Civil Conflicts: Botswana vs. Nigeria

- Higher TOT (from NR) → Larger Resource Rent → Civil Conflicts (e.g., Collier & Hoeffler, *OEP*, 2004)→ Lower Growth
- Civil Wars/State Breakdown tend to reduce growth: per capita GDP growth reduction of more than 2.0 %age points annually (e.g., Collier, *OEP*, 1999; Fosu & O'Connell, *ABCDE*, 2006)
- Botswana vs. Nigeria: 1960 -1999 'civil conflicts' (at least 1000 deaths annually (Collier and Hoeffler, *OEP*, 2004; table 1):
  - Botswana: None
  - Nigeria: 2 (January 1966 to January 1970, and December 1980 to January 1984).

Fosu@wider.unu.edu

Elite Political Instability (EPI): Botswana vs. Nigeria

- Higher TOT (from NR) → Larger Resource Rent → EPI (Kimenyi & Mbaku, *PC*, 2003) → Lower Growth (e.g., Fosu, *EDCC*, 1992; *EL*, 2001a; *AJES*, 2002)
- Botswana vs. Nigeria: 1956-2001
  - Botswana: None
  - Nigeria: 6 'successful' coups, 2 failed coups & 6 coup plots; 7th out of 46 SSA countries (McGowan, *JMAS*, 2003)

Fosu@wider.unu.edu

Human Capital: Public Spending on Educ & Hlth: Botswana vs. Nigeria (1975-94 average)

- Higher TOT (from NR) → Larger Resource Rent → Lower Human Cap. (e.g., Gylfason, *EER*, 2001)
- Botswana vs. Nigeria:

	Botswana		**Nigeria**	
	Educ	**Hlth**	**Educ**	**Hlth**
Per Cap. (1987 US$)	88.5	23.0	4.0	1.1
Expend. Share (%)	18.7	5.2	7.6	1.9

Source: Fosu (2010)

Fosu@wider.unu.edu

Openness: Botswana vs. Nigeria

- Higher TOT (from NR) → Larger Resource Rent → Lower Openness (e.g., Auty, 2001) → Lower Growth (e.g., Sachs & Warner, *JAE, 1*997)
- S-W Measure of Openness - Botswana vs. Nigeria (Mehlum et al., *EJ*, 2006): 0.00-1.00
  - Botswana: 0.42
  - Nigeria: 0.00

Empirical Model & Estimation

- Empirical Model – Polynomial Distributed Lag Model estimated for Botswana and Nigeria
  - Dependent Variable: GDP Growth
  - Independent Variable: GTOT with lags
  - Possible improvement: Country-specific effects
  - Possible problems: Omitted variables and degrees of freedom
- Expected: Sum of lag coefficients of GTOT (long-term effect of GTOT) positive for Botswana but non-positive for Nigeria

Fosu@wider.unu.edu

Empirical Results: Botswana

Distributed-Lag Analysis: GDP Growth vs. GTOT – **Botswana**

Sum of lag coefficients (t value) = **2.26 (5.00)**

Number of lags = 10; Degree of polynomial = 3

Sample period = 1976-2002; Adjusted sample period = 1986-2002

R^2 = 0.867, Adj. R^2 = 0.834

F statistic [p value] = 28.4 [0.000]

DW = 2.09

Akaike Information Criterion = 4.16

Schwartz Criterion = 4.36

Fosu@wider.unu.edu

Empirical Results: Nigeria

Distributed-Lag Analysis: GDP Growth vs. GTOT – **Nigeria**

Sum of lag coefficients (t value) = **-0.350 (-1.70)**

Number of lags = 15; Degree of polynomial = 4

Sample period = 1966-2002; Adjusted sample period = 1981-2002

R^2 = 0.513, Adj. R^2 = 0.400

F statistic [p value] = 4.48 [0.012]

DW = 2.30

Akaike Information Criterion = 5.81

Schwartz Criterion = 6.06

Fosu@wider.unu.edu

Discussion of Results

- RCH holds in Nigeria but not in Botswana
- Some caveats:
  - RCH could still hold in Botswana despite the positive long-term effect of GTOT
  - Possible degrees of freedom problems
  - Possible omitted variable problems, especially the inability to account for the effects of TOT volatility
- Caveats should not pose any real critical problems, though
  - E.g., negative GTOT effect may be reflecting **TOT volatility** effect, BUT:
  - Negative TOT volatility effect is less than certain for African economies (review: Fosu, *JAE*, 2001)
  - Negative effect of TOT volatility supports RCH

Fosu@wider.unu.edu

Some Lessons & Concluding Observations (1)

- 'Good institutions' = ? (Mehlum et al. (*EJ*, 2007), e.g., does not help re. DCs, which all have below-threshold IQ values
- But Norway has 'good institutions' a la Mehlum et al. and 'clever policies' a la Cappelen and Mjoset (WIDER RP, 2009): Some lessons = ?
  - Integration of resource sector into economy via proactive government (e.g., Statoil; creating supply of and demand for skills via industry-educational linkages)
  - Minimizing the revenue-impact of oil price vagaries via the Petroleum Fund
  - Forestalling potential predatory government action via binding policy rules
- Nigeria's recent experience with its Excess Crude Account (ECA) implies need to heed particularly 3rd lesson above

Fosu@wider.unu.edu

Some Lessons & Concluding Observations (2)

- Botswana has lessons also, **qualitatively**, a la Mehlum et al
  - Relatively 'good institutions'
  - No evidence of institutional corrosion
- But, how feasible for Nigeria?
  - Much less homogeneous and larger population than Botswana's (and Norway's)
  - Implications of higher ethnic fractionalization for the quality of policies (Easterly & Levine, *QJE*, 1997)
  - Besides, resource revenues are likely to continue eroding IQ
  - **S&S** Solution (Hopeless): Distribute oil revenues to all (adult) Nigerians (S&S, IMF WP, 2003)

Fosu@wider.unu.edu

Some Lessons & Concluding Observations (3)
Some Hopeful News

- But population heterogeneity need not be destiny; Nigeria's score on ethnic polarization < Botswana's (Montalvo and Reynal-Querol, *AER*, 2005)
- Nigeria's governance is improving
  - 5/6 governance measures, esp. 'voice and accountability', have improved between 1998 and 2008 (Fosu, 2010, table 6)
  - PR, CL, XC, LIEC and EIEC scores increasing (table above)
  - Democratization tends to raise growth in 'advanced-level' democracies in Africa (Fosu, *EL*, 2008)
  - 'Developmental governance' requires significant executive restraint (Alence, *JMAS*, 2004)
- **Non-S&S** Solution (Hopeful): Maintain the democratization momentum that could result in 'advanced-level' democracy, with significant XC.

Fosu@wider.unu.edu

Thank you!

Fosu@wider.unu.edu