WIDER Working Paper No. 2013/005

Growth of African economies

Productivity, policy syndromes, and the importance of institutions

Augustin Kwasi Fosu*

January 2013

Abstract

Recent evidence from an exhaustive political economy study of growth of African economies—the growth project of the African Economic Research Consortium (AERC) suggests that 'policy syndromes' have substantially contributed to the generally poor growth in sub-Saharan Africa during post-independence. The current article employs the unique data and insights generated by the growth project to further explore the importance of a 'syndrome-free' (SF) regime for growth in the region by examining: (i) the channels via which SF affects growth, total factor productivity (TFP) versus factors of production; and (ii) the role of institutions in mediating this impact, with special attention accorded the efficacy of the restraint on the executive branch of government in mitigating the potentially adverse effect of ethnicity.

Keywords: growth of African economies, productivity, policy syndromes, institutions
JEL classification: O11, O43, O55

*Deputy Director, UNU-WIDER, Helsinki, Finland, fosu@wider.unu.edu; Visiting Scholar, University of Ghana-Legon, Ghana; Research Associate, CSAE, University of Oxford, UK; and Research Associate, BWPI, University of Manchester, UK.

This study has been prepared within the UNU-WIDER project 'New Directions in Development Economics'.

UNU-WIDER gratefully acknowledges the financial contributions to the research programme from the governments of Denmark, Finland, Sweden, and the United Kingdom.

ISSN 1798-7237 ISBN 978-92-9230-582-6

UNU World Institute for Development Economics Research (UNU-WIDER)
Katajanokanlaituri 6 B, 00160 Helsinki, Finland

Typescript prepared by Abigail Arndt at UNU-WIDER.

1 Introduction

Recent evidence suggests that 'policy syndromes' have substantially contributed to the generally poor growth of African economies during post-independence.[1] Had sub-Saharan Africa (SSA)[2] been bereft of these syndromes, its per capita GDP growth could have averaged approximately 2 percentage points higher during the post-independence period (Fosu and O'Connell 2006: Table 6). The current paper employs the unique data and insights generated by the Growth Project to further explore the importance of a syndrome-free (SF) regime for growth in this region by examining: (i) the channels via which SF affects growth: total factor productivity (TFP) versus factors of production; and (ii) the role of institutions in mediating this impact. In particular, in the light of previous findings that ethnic division could lead to anti-growth policies (e.g., Easterly and Levine 1997) in Africa, coupled with findings that the executive branch of government was often a culprit in the perpetration of such policies (Fosu and O'Connell 2006), the present paper examines how the degree of restraint on the executive could mitigate such potentially adverse effects of ethnicity.

In the immediately following section, aggregate evidence on the saliency of TFP vis-à-vis contributions by factors of production in the African growth record is presented. Section 3 briefly discusses the various syndromes and their expected effects on the sources of growth. Section 4 explores the relative potency of the channels by, first, estimating how SF is correlated with TFP versus factors of production. Second, based on 1960-2000/2004 panel data, the SF impact on per capita GDP growth, via TFP, is estimated using an augmented production function.[3] The paper then explores the extent to which the adverse effect of SF can be mitigated via stronger institutions by treating SF endogenously. Section 5 concludes the paper.

2 Decomposition of growth in Africa

Based on the Collins-Bosworth decomposition, Table 1 reports data on the sources of GDP growth for SSA over 1960-2000.[4] These statistics indicate that when GDP in SSA as a whole

---

1 The AERC 'Growth Project' is a comprehensive study combining both cross-sectional analysis and a large number of detailed country cases to explain the African growth record since 1960, which is viewed herein as the post-independent era generally. It has resulted in two Cambridge University Press volumes: Ndulu et al. (2008a, 2008b). An epitomized version of the study is presented in Fosu and O'Connell (2006). 'Policy syndromes' are considered 'anti-growth' and comprise the following regimes: 'state controls', 'adverse redistribution', 'sub-optimal inter-temporal resource allocation', and 'state breakdown'. These are further delineated below. Note that the 'classification is based on policies, not growth outcomes' (Fosu and O'Connell 2006: 37). For further details, see ibid.

2 'Africa' and 'SSA' will be used interchangeably in the rest of the paper.

3 See also Fosu (2011), which provides evidence on how SF affects growth through TFP and presents in greater detail much of the qualitative evidence reported herein. As a point of departure, the present study treats SF endogenously and additionally explores how institutions might be employed to accentuate the prevalence of the growth-enhancing SF. There is an endogenous treatment of the syndromes in Ndulu et al. (2008a) also; however, there is little attention on the role of institutions per se in influencing growth via SF. Nor is there an attempt in Ndulu et al. to examine the effect of SF via productivity vis-à-vis factors of production.

4 As the SF data are for 1960-2000, the source-of-growth analysis is similarly limited. The decomposition is based on the production function: $q=Ak^{.35}h^{.65}$, where q, k and h are GDP per worker, physical capital per worker and human capital (average years of schooling) per worker, respectively, with respective capital and labor shares

grew relatively well in the 1960s through the mid-1970s, that growth was supported about equally by both investment and TFP growth. In contrast, the major decline in growth in the early 1980s, and again in the early 1990s, was accompanied by a large fall in TFP each time. The main source of the growth recovery in the late 1990s was once again TFP improvement.

Table 1: Growth decomposition for sub-Saharan Africa

Year	Growth of real GDP per worker	Contribution of growth in Physical capital per worker	Education per worker	Estimated residual*
1960-64	1.33	0.53	0.12	0.68
1965-69	1.74	0.80	0.20	0.75
1970-74	2.33	1.05	0.22	1.06
1975-79	0.19	0.74	0.24	-0.79
1980-84	-1.70	0.16	0.29	-2.16
1985-89	0.45	-0.22	0.34	0.33
1990-94	-1.74	-0.08	0.30	-1.95
1995-00	1.51	-0.12	0.26	1.37
Total	0.51	0.36	0.25	-0.09

Notes: *Measure of growth of total factor productivity (TFP). These data are based on 19 SSA countries with comparable data over time (see the Appendix A table). Despite the rather small sample size, note that these countries represent all sub-regions of SSA, as well as 72 per cent of SSA's population and the bulk of the region's GDP.

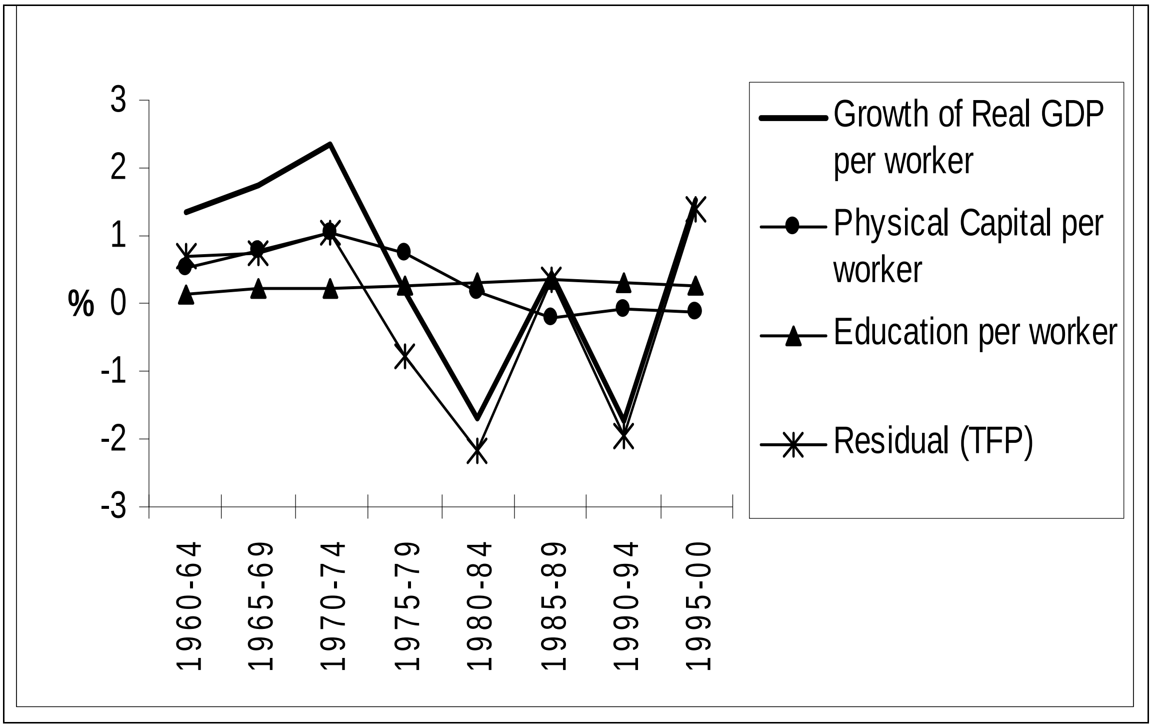
Source: based on Fosu (2011); original source: Ndulu and O'Connell (2003).

The above observations suggest that TFP must have played a major role in the growth performance of African economies. Devarajan et al. (2003), for instance, argue that it is the low productivity rather than the level of investment that has been the main constraint to African growth. Indeed, as Table 1 reveals, the overall modest per worker growth in SSA during the forty-year period was supported by positive, albeit modicum, contributions from physical capital and education, while TFP contribution was negative, though near-zero.

The overall sample period evidence showing insufficiently contrasting contributions of TFP and factors of production does not, however, do justice to the relative importance of these sources of growth inter-temporally. During 1960-74, SSA's fairly high annual per capita growth of about 2.0 per cent was primarily associated with both physical capital accumulation and TFP growth, at approximately 45 per cent shares each (Table 1). However, TFP was the main source of the negative growth in the 1980s and early 1990s; it was also the primary source of the positive growth beginning in the mid-1990s.

of 0.35 and 0.65. The exercise is conducted on per country basis, and then aggregated to arrive at the SSA figures for the 19 SSA countries that had consistent data over the sample period (see the Appendix A table for the respective countries and data). Note that these 19 countries represent all the sub-regions of SSA, as well as constitute over 70 percent of SSA's population and a lion's share of its GDP.

Figure 1: Growth decomposition for sub-Saharan Africa, 1960-2000



Source: based on data from Table 1.

Figure 1 based on Table 1 appears to tell the aggregate story of the qualitative importance of TFP. As this figure shows, the per capita growth rate moves rather well with TFP growth, compared with its movement with either physical or human capital accumulation. The contribution of education seems particularly uniform over time and seems unrelated to the evolution of growth.

The saliency of productivity is even more telling at the disaggregate country level. Even in the immediate post-independence period when average SSA growth was reasonably strong, several other countries actually experienced low growth in at least one half-decadal period, thanks to deterioration in TFP. These countries included Cameroon, Ghana, Madagascar, Malawi, Mauritius, Nigeria, Rwanda, Senegal, Uganda, and Zambia (Appendix A table).

Moreover, as to be expected, for the mid-1970s to early 1990s when productivity deterioration was generally the main source of the negative growth performance in SSA, most of the countries experienced considerable declines in TFP. More importantly, however, even in these doldrums several countries out of the 19 presented in the Appendix A table registered, in at least one half-decadal period, considerable positive growth powered by improvements in productivity, including Ghana, Kenya, Mauritius, Mozambique, Nigeria, Uganda, and Zimbabwe (ibid.).

The above rather casual empiricism suggests that TFP was generally a major contributor to explaining the growth record of African economies. To provide a more credible test of this hypothesis, however, we use the country data in the Appendix A table to compute the zero-order correlation coefficients between the per capita growth rate, on the one hand, and growth contributions from physical capital, education, and TFP, respectively, on the other hand, as (absolute values of the *t* ratio in parentheses) 0.328 (4.25); -0.081 (0.99); and 0.930 (31.06). Thus, growth is correlated most strongly with TFP, followed by physical capital, while there is little correlation with education. These results are in line with the above aggregate-level evidence and provide support for Devarajan et al. (2003).

3 The policy syndromes and syndrome-free impacts on sources of growth

Growth accounting decompositions discussed above have revealed the relative roles of human capital (education), physical capital accumulation, and TFP in the growth of African economies during the post-independence period. Numerous reasons have been presented in the literature as the culprits for the growth record. In particular, initial conditions have received attention, including colonial origins (e.g., Acemoglu et al. 2001), geography (e.g., Bloom and Sachs 1998), and the slave trade (e.g., Nunn 2008). While such studies are analytically attractive, they generally offer little in terms of policy prescription, since initial conditions are seldom reversible.[5]

The main thesis of the Growth Project is that policies matter for growth in Africa, despite the initial conditions.[6] The project defines the following 'policy syndromes' as detrimental to growth: 'state controls', 'adverse redistribution', 'suboptimal inter-temporal resource allocation', and 'state breakdown', with the absence of all of the above syndromes referred to as 'syndrome-free' (SF).[7] Discussed briefly below are these policy syndromes, including their half-decadal evolution during 1960-2000 (Table 2).

A country in a given year was classified as having 'state controls' if the government was judged to have 'heavily distorted major economic markets (labor, finance, domestic and international trade, and production) in service of state-led and inward-looking development strategies' (Fosu and O'Connell 2006: 38). During the immediate post-independent period in the late 1950s through the mid-1960s, a major reigning development paradigm was Fabian socialism, which involved strong reliance on government as the main agent of development. The choice of this mode of development was usually justified on the basis of limited markets and private capital. Another rationale, however, was apparently that the leaders of the newly created African nations were determined to free their respective economies from the existing colonial arrangement, which often had these countries supplying primary products in

---

5 Among the few exceptions is the disease implication of geography, such as malaria, which could be mitigated by for instance undertaking appropriate preventive policy action in malaria-prone geographical regions. Indeed, using a variant of the Nunn (2008) model, Bhattacharyya (2009) finds that malaria, and not the slave trade as observed by Nunn, is the most important factor explaining Africa's long-term development.

6 See footnote 1 for further details.

7 Much of the present section derives from Fosu (2008a), which presents a number of case studies to illustrate each syndrome and the SF regime. The definitions of the regimes, provided below, form the basis for the classification of each country-year into one or more of the categories by the editorial committee of the Growth Project. 'The first stage of this exercise was undertaken by Jean-Paul Azam, Robert Bates, Paul Collier, Augustin Fosu, Jan Gunning, Benno Ndulu, and Stephen O'Connell in August 2003, based on draft versions of the country cases…The classification was assessed by country authors at a November 20003 conference and refined in response to their comments. In August 2004 the editorial committee undertook a similar judgmental exercise to extend the sample to most of Africa (Fosu 2008a: footnote 1). Collier and O'Connell (2008: chapter 2) presents the full classification. Note that 'classification is based on policies, not growth outcomes' (Fosu and O'Connell 2006: 37). For example, though Sudan grew rather rapidly in the late 1990s it was not categorized during this period as 'syndrome-free' but instead as 'state breakdown'. Conversely, Malawi was designated 'syndrome-free' throughout the post-independence period, yet it stagnated in the 1980s, and so did Cote d'Ivoire in the early 1980s despite its syndrome-free classification during that period.

exchange for manufactures from their ‘colonial masters’.[8] Many African governments, therefore, opted for the inward-looking, import substitution, state-led development strategy.

Table 2: Evolution of policy syndromes in sub-Saharan Africa (half-decadal relative frequencies)

Period	Syndrome-free	Controls	Redistribution	Inter-temporal	State breakdown
1960-65	0.465	0.334	0.128	0.000	0.073
1966-70	0.373	0.323	0.194	0.009	0.100
1971-75	0.193	0.408	0.237	0.120	0.042
1976-80	0.106	0.432	0.245	0.149	0.068
1981-85	0.097	0.442	0.255	0.145	0.061
1986-90	0.149	0.381	0.276	0.118	0.076
1991-95	0.357	0.216	0.191	0.056	0.181
1996-00	0.435	0.147	0.176	0.039	0.203
1960-00	0.272	0.335	0.213	0.080	0.101

Notes: Computed from 47 African countries. All syndrome/syndrome-free classifications are defined in the text. The relative frequencies have been adjusted here to sum to 1.0 for each period, as multiple syndromes for a given country-year could occur.

Source: based on Fosu (2011); for source of the raw data see Ndulu et al. 2008a, 2008b.

The above strategy often entailed the use of controls to allocate scarce resources, resulting in the usual economic inefficiencies including rent-seeking activities. Thus, we should expect such controls to negatively impact TFP and hence growth.[9] While the relative frequency of this syndrome during 1960-2000 averaged about a third, it has been less than uniform over the period (Table 2). The relative frequency of state controls exceeded 30 per cent in the early 1960s, reached a half-decadal peak in excess of 40 per cent during the early 1980s, but ebbed considerably thereafter, representing only about 15 per cent by the late 1990s (Table 2), likely in response to the World Bank-orchestrated structural adjustment reforms undertaken in many African countries (Fosu 2008a).

3.1 Adverse redistribution

‘Adverse redistribution’ refers to a situation where redistributive policies favour the constituencies of the respective government leaders, usually regional in nature and with ethnic undertones, resulting in polarization (Fosu and O’Connell, 2006).[10] Such policies would often breed inefficient resource allocation via public investments. There are many

8 African leaders were also influenced by the school of thought at the time, informed by particularly the Prebisch and Singer hypothesis, that industrialization through manufactures was a more potent modality for development.

9 While controls were pervasive in nearly all markets, the fixed exchange rate regime of the external sector was especially noteworthy. This policy often resulted in overvaluation of the domestic currency in most African countries, constituting a major deterrent to growth (e.g., Ghura and Grennes 1993). The control policy also tended to introduce an urban bias that tended to subsidize urban dwellers at the expense of production incentives for rural producers of cash crops (Bates 1981).

10 It is important to stress, though, that redistribution need not be adverse, that is, if it promotes harmony. As Azam (1995) for instance argues, governments could use redistribution to buy peace, especially between the north and the south in many West African countries (e.g., Chad, Cote d’Ivoire, Ghana, and Nigeria).

examples among African countries of disproportionally huge public allocations of public goods or services in the constituencies of public officials, even though such investments could not be justified on the basis of the relative value of the marginal product.[11]

Also classified under this syndrome is the case of downright looting, such as the regimes of Mobutu in the Democratic Republic of the Congo (1973-97), Idi Amin in Uganda (1971-79), and Sani Abacha in Nigeria (1993-98) (Collier and O'Connell 2008: Table 2.A.2). Moreover, adverse redistribution is likely to undermine efficient resource mobilization, as it tends to attenuate the propensity to pay taxes (Kimenyi 2006). Indeed, the polarization engendered by this syndrome could lead to open conflict and state breakdown.[12]

As apparent from the above discussion, by breeding economic inefficiency the redistributive syndrome is likely to adversely affect growth through primarily TFP. The syndrome's relative frequency increased steadily right from the time of independence, and it was not until about the early 1990s that it began to reverse course (Fosu 2008a: Figures 3.1 and 3.2; Table 2 this paper). During 1960-2000, the redistributive syndrome constituted about 21 per cent of the country-years (Table 2).

3.2 Suboptimal inter-temporal resource allocation

'Suboptimal inter-temporal resource allocation' is a syndrome of revenue misallocation over time. It entails overspending in commodity booms and under-spending during the subsequent busts (Collier and O'Connell 2008; Fosu 2008a; Fosu and O'Connell 2006). Although a number of the projects undertaken in African countries during booms might have been economically justifiable, there were also numerous projects that were either ill-advised or were over-allocated resources relative to their absorptive capacities. Many of these projects were simply abandoned due to resulting fiscal difficulties when the booms ended; hence their values of marginal product fell short of the potential. Bust periods would often be characterized by much larger output declines than would have been the case with more prudent inter-temporal revenue management. The misallocation would often, therefore, result in inefficient overinvestment and as a decline in TFP.[13]

The relative incidence of this syndrome was rather small, though, representing only about 10 per cent of the country years during 1960-2000. It was quite minimal in the immediate post-independence period, but then began increasing in the early 1970s, achieving a relatively high plateau as of the mid-1970s amidst commodity booms in many African countries, and then fell starting from the latter part of the 1980s (Fosu, 2008a, Figures 3.1 and 3.2; Table 2 this paper).

---

11 African political history is replete with examples of redistributive policies partial toward certain ethnic groups, such as favouring the Tutsis in Burundi during 1975-87 (Nkurunziza and Ngaruko 2003), the Kalenjins in Kenya under President Arap Moi (Mwega and Ndungu 2004), the Temnes in Sierra Leone by the All People's Congress during 1969-90 (Davies 2004), and the Kabeyes in Togo by President Eyadema in 1976-90 (Gogue and Evlo 2004).

12 See, for instance, the cases of Burundi (Nkurunziza and Ngaruko 2003) and Sierra Leone (Davies 2004).

13 Examples of this scenario abound, including cases of Nigeria in the late1970s to early 1980s, Cameroon in the 1980s and early 1990s, and Zambia in the 1970s and eighties (see the Appendix A table).

3.3 State breakdown/failure

'State breakdown/failure' refers mainly to open warfare, such as civil wars, but also to acute elite political instability involving coups d'état that result in a breakdown of law and order (Fosu and O'Connell 2006).[14] In addition to causing tolls in human suffering, state breakdown tends to generate major interruptions in production and distribution, as well as in inefficient reallocation of resources from the productive and social sectors into the non-productive military sector. Hence, although it can reduce investment as well, this syndrome is likely to particularly exert deleterious impacts on TFP.

State breakdown constituted about 10 per cent of the country years during 1960-2000, a rate that is considerably lower than that of state controls (33 percent) or adverse redistribution (21 percent), though about the same as that for suboptimal inter-temporal resource allocation (Table 2). Despite general belief, moreover, state breakdown in terms of civil wars has historically been rather rare in Africa, that is, until more recently in the 1990s when its relative frequency increased to 20 per cent of the country years, from about 5 per cent in the 1970s (Table 2). In spite of this syndrome's historically low frequency, however, its impact can be quite large.[15]

As apparent from the above characterization, the policy syndromes are likely to be inter-connected. For example, adverse redistribution could lead to increased polarization, conflict, and state breakdown. Similarly, the existence of state controls would create opportunities for rent-seeking and adverse redistribution in favour of individuals who are politically or ethnically connected. And, under suboptimal inter-temporal resource allocation, commodity busts resulting in shrunk revenues might lead to adverse redistribution. Many specific country examples are provided in Fosu (2008a) to demonstrate this inter-connectedness among the syndromes. The following case for Togo is particularly telling (ibid.: 147):

> There was substantial regional redistribution in favor of the Kabyes, President Gnassingbe Eyadema's ethnic group…financed initially from revenue windfalls from phosphate and the coffee boom of the late 1970s. Even in response to the structural adjustment program (SAP) begun in the mid-1980s when retrenching of the public sector was in effect, the Kabyes are believed to have retained the lion's share of desirable employment. While such a strategy likely shored up President Eyadema's political base, it fanned inter-ethnic polarization, which may have subsequently contributed to acute political instability in the early 1990s, with major demonstrations and strikes.

Indeed, it is likely that in a state breakdown regime most of the other syndromes would be present as well, for rules of efficient resource allocation tend to break down. Thus, this policy syndrome is most probably the ultimate in terms of severity, as already alluded to. It is also apparent from the above discussion that commodity price fluctuations and natural resource

14 Most of the classifications into state breakdowns involved civil wars, which have indeed been found to be growth-inhibiting (e.g., Collier 1999; Gyimah-Brempong and Corley 2005). However, many studies have also uncovered adverse effects of the incidence of coups d'etat on growth in Africa (e.g., Fosu 2003, 2002, 1992; Gyimah-Brempong and Traynor 1999).

15 The impact of state breakdown on Africa's per capita annual GDP growth is estimated to be as much as 2.6 percentage points (Fosu and O'Connell 2006, Table 7). This estimate is only slightly larger than the 2.2 percentage point-estimate obtained for civil wars by Collier (1999).

availability played a pivotal role in the genesis of the policy syndromes, though such outcomes would not necessarily be inevitable under appropriate policy settings and institutional setups. Strong institutions should blunt the occurrence of these policy syndromes,[16] as they entail high-quality ‘rules of the game’ involved in resource allocation, thereby efficiently and equitably allocating resource revenues inter-temporally, and thereby obviating the policy syndromes.

The conceptual correlation among syndromes, furthermore, suggests that including them separately in a regression equation might not yield precise estimation of their independent effects (see Fosu and O’Connell 2006). Therefore, focusing on the complement of the union of the syndromes—the syndrome-free (SF) regime—is the more appropriate empirical treatment. From an institutional development perspective, furthermore, SF should constitute a form of ‘sufficient statistic’, so that focusing decisions on maximizing it, regardless of what the underlying syndromes are, would constitute the relatively efficient strategy. Thus, I turn next to the discussion of SF.

3.4 The syndrome-free regime

A country year is considered ‘syndrome-free’ (SF) if none of the above syndromes is present. That would be a regime with a combination of political stability and reasonably market-friendly policies (Fosu and O’Connell 2006). Quite interestingly, at more than one quarter of the country years, the frequency of SF was rather large in 1960-2000, and higher than that of any of the policy syndromes except the regulatory (Table 2). Indeed, in the immediate post-independence period of 1960-65, the relative frequency of SF was at about 50 per cent. The prevalence of SF, however, began to wane starting in the latter 1960s, especially in the 1970s when state controls and other syndromes became dominant. The downward trend continued until roughly the mid-1980s when it reversed course. The upward trend actually accelerated in the 1990s, most likely as a result of the World Bank and IMF-championed market-oriented reforms (Fosu 2008a).

Most African countries have undergone substantial economic and political reforms since the early 1990s. The relative frequency of state controls has, for instance, fallen from its peak of over 50 per cent in the early 1980s to just 15 per cent by the dawn of the millennium (Fosu and O’Connell 2008). The incidence of adverse redistribution has also declined to approximately 20 per cent by 2000 from its maximum of about 30 per cent in the late 1980s. As observed above, the only syndrome that has shown an upward trend recently is state breakdown. In contrast, SF reached the nadir of its frequency of about 10 per cent in the early 1980s; by 2000 the relative frequency of SF had skyrocketed to 45 percent, nearing the rate prevailing in the immediate post-independence era.

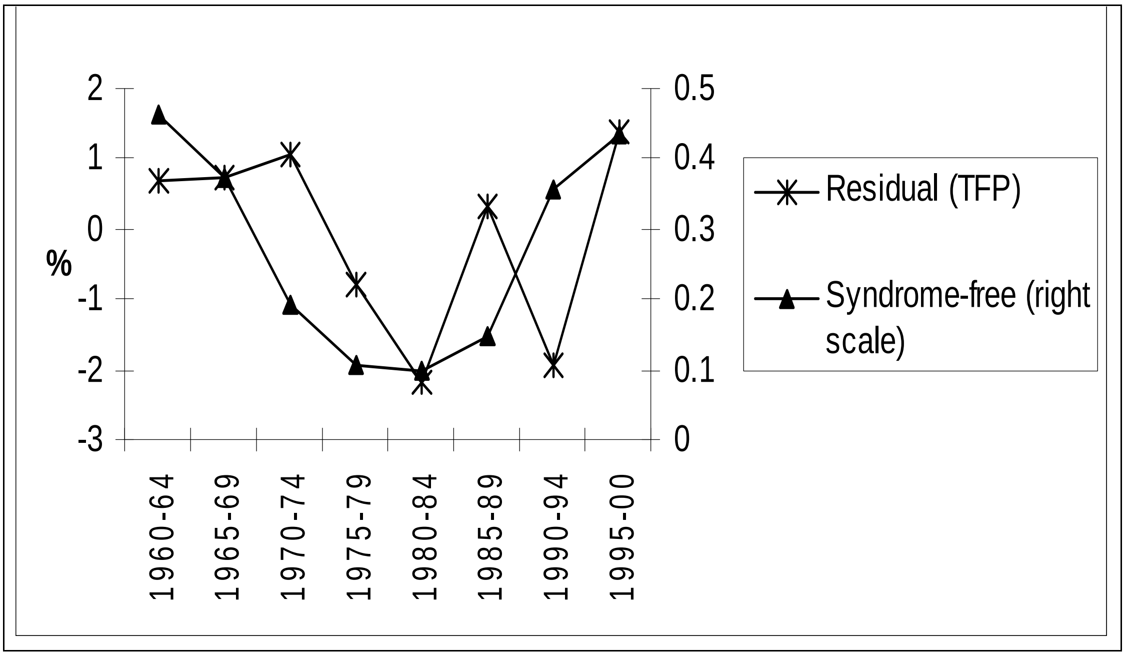
Fosu and O’Connell (2006) find for the 1960-2000 sample period that being SF was a necessary condition for sustainable growth and a near-sufficient condition for preventing a growth collapse. The authors further estimate a 2 percentage point increase in per capita annual growth attributable to SF (ibid: Table 6). This estimate represents nearly twice Africa’s growth gap with the rest of the world during 1960-2000, about a third of its gap with East Asia and Pacific, and more than the gap with South Asia (ibid.).

[16] For a most recent analysis on this subject of the ‘resource curse’ see Arezki et al. (2011).

4 Modelling the effects of SF and institutions/governance through TFP

Further explored in the present study is the role of the SF regime in explaining the economic growth of African economies. Given the above discussion that the effect of SF is likely to be primarily via TFP, Figure 2 presents superimposed graphs of SF and TFP growth using five year averages over 1960-2000. It is interesting that these two graphs move rather closely together. Coupled with the above observation that GDP growth was most closely related with TFP, rather than with the production inputs as shown in Figure 1, for instance, Figure 2 suggests a high inter-temporal co-movement between SF and growth.

Figure 2: Evolution of syndrome-free and total factor productivity, 1960-2000



Source: based on data from Tables 1 and 2.

We now employ an augmented production-function approach in order to quantitatively investigate the channels by which SF may have influenced growth: via production factor inputs versus TFP. This approach differs from those of Collier and O'Connell (2008) and Fosu and O'Connell (2006), both of whom use essentially reduced-form models that controlled for shocks and geographical endowment,[17] and could not isolate the productivity effect. Moreover, I employ herein a five-year, rather than annual, panel in an attempt to capture the longer-term impact of SF. Also examined is the importance of governance in the growth equation.

As preliminary evidence on the role of SF in growth, pair-wise zero-order correlation coefficients between SF, on the one hand, and per capita GDP growth and its sources, on other hand, are computed using the country data from the Appendix A table. These respective correlation coefficients for growth, physical capital, education, and TFP (with the absolute

17 Specifically, the controls in the Fosu-O'Connell model are 'partner growth', 'rainfall', 'coastal', and 'resource rich'; similar specifications are used in Collier and O'Connell (2008). However, these control variables seem inconsequential, since accounting for them did not appear to appreciably affect the estimated coefficient of the SF variable (see, e.g., Fosu and O'Connell 2006: Table 6).

values of the *t* ratio in parentheses) are 0.305 (3.92); 0.102 (1.25); -0.210 (2.63), and 0.295 (3.77). Thus, SF is strongly positively correlated with per capita growth and TFP, weakly positively correlated with physical capital accumulation, and, perhaps surprisingly, negatively correlated with education.

To further examine the channel by which SF affects growth, I postulate as the starting point a simple Cobb-Douglas production function:

$$Q = AL^{b}K^{c} \qquad (1)$$

where Q is output, L labor, and K capital; *A*, *b*, and *c* are the respective parameters. The growth version of equation (1) is:

$$q = a + bl + ck \qquad (2)$$

where *q*, *l* and *k* are the growth rates of output, labor and capital, respectively, and *a*, *b* and *c* are the respective estimable parameters.

Equation (2) is the classical production function, an augmented version of which has been estimated in many studies.[18] However, in order to more appropriately compare the current results with those of Fosu and O'Connell (2006), for instance, equation (2) is converted to per capita growth as:

$$y = a + (b-n)l + ck \qquad (3)$$

where *y* is per capita output growth; population is assumed to grow at the rate of *nl*, with *n*, the ratio of population to labor growth, greater (less) than unity if population grows faster (slower) than labor.

As the Hicks-neutral technological change measuring growth in total factor productivity (TFP), the parameter *a* may be especially susceptible to the policy-syndrome nature of the economy, as argued above. It has, furthermore, been observed within the sources of growth framework above that TFP appears to be a crucial source for the generally low growth of African economies since the 1960s.

Consistent with the above discussion, I hypothesize that SF would increase output growth by increasing TFP. For efficient policy prescription purposes we focus on SF, rather than the individual policy syndromes. In the final analysis, if SF has a positive effect on growth, for instance, the salient issue is what the policy instruments are that could increase it, regardless of what syndromes are being affected by such instruments, especially if any of these syndromes are (negatively) inter-correlated. Though estimating the independent effects of the syndromes (e.g., Collier and O'Connell 2008; Fosu and O'Connell 2006) might be of analytical interest, it would likely not shed much light policy-wise on how to raise growth overall, unless the cumulative effects of the syndromes were estimated. Fortunately, assessing the SF impact is one way to obtain this overall impact of the policy syndromes.

---

18 The production function model has traditionally been estimated, alternatively to the Barro-type model, for example, in numerous studies to assess the effectiveness of production factors, vis-à-vis, the role of productivity, on growth. See, for instance, Bosworth and Collins (2003) and also Fosu (2008b).

In addition to SF, we also hypothesize that institutions/governance would have implications for TFP and growth. First, 'good institutions/governance' should minimize the proliferation of the policy syndromes and hence augment SF. This is because the syndromes appear to be spawned by government action. Second, institutions/governance could have an independent impact on TFP as well if it led to policies other than those identified above. Hence, a in equation (3) may be expressed as:

$$a = a_1 + a_2 f + a_3 g + \boldsymbol{a_4 x} \quad (4)$$

where f and g are the SF and institutions/governance variables, respectively, $\boldsymbol{x}$ the vector of other variables, such as ethnic division and other fixed effects influencing TFP; a_1, a_2, a_3 and $\boldsymbol{a_4}$ are the respective coefficients. Combining equations (3) and (4), the model to be estimated may be specified as:

$$y_{it} = a_1 + a_2 f_{it} + a_3 g_{it} + \boldsymbol{a_4 x_{it}} + a_5 l_{it} + a_6 k_{it} + e_{it} \quad (5)$$

where the subscripts i and t are the respective country and time indexes; f and g are the measures of the syndrome-free regime and institutions/governance, respectively, l and k are the respective growth rates of labor and capital, and $\boldsymbol{x}$ is a vector of other control variables that might influence y; the respective coefficients of the above variables are to be estimated; and e is the error term, whose i.i.d. properties are yet to be examined.

5 Estimation and results

Equation (5) and its constrained versions are estimated using 5-year panel data for 1960-2000, though subsequent Instrumental Variable (IV) estimation is also employed to provide estimates for the longer 1960-2004 period. The definitions and sources of all variables included in the regression are provided in Table 3. In particular, SFREE, the measure of SF, equals unity if a given country is syndrome-free for the whole five-year observation period, zero otherwise.[19] As discussed above, SF is the (good) policy variable, as the policy syndromes may be viewed as 'bad' policies, directly or indirectly. The institutions/governance variable is measured by XCONST, the degree of constraint on the executive, which is likely the most relevant institutions/governance variable in the present analysis. This is because much of the evolution of the policy syndromes, as discussed above, revolves around the ability of the executive branch of government to make decisions very much at will, with little restraint.[20]

Random effects (RE) results are reported in Table 3 as essentially the basic models. The RE equations are selected over their fixed effects (FE) counterparts based on the Hausman specification test statistics (see Table 3), which suggest that the RE estimates are not subject to country effects endogeneity biases and are relatively efficient.

---

19 As explained above (footnote 7), the classification of each syndrome was determined by an editorial committee, based on the country case studies written by individuals familiar with the political economy of each of the respective countries, using the above descriptions of the syndromes. Thus, if the evidence pointed to the existence of a given syndrome in a given country in a given year, a unitary value was assigned; zero was assigned otherwise. Hence, for this study SFREE equals unity if and only if none of the syndromes exist during the five-year observation period, zero otherwise.

20 Also included is a measure of ethnic diversity which, a la Easterly and Levine (1997), is hypothesized here to negatively affect SF, independently or interactively with XCONST.

Table 3: Five-year panel estimation, random-effects results, 1960-2000

Dependent variable: GDPPCGA

Var./Eqn.	(1)	(2)	(3)	(4)
INVEST	0.223[a]	0.126[a]	0.120[a]	---
	(2.50)	(2.75)	(2.72)	
LABOR	0.190	0.145	0.084	---
	(0.59)	(0.45)	(0.28)	
ETHDIV	---	-3.292[b]	-2.044	---
		(-1.95)	(-1.23)	
XCONST	---	0.365[b]	0.197	---
		(2.06)	(1.10)	
SFREE	---	---	2.294[a]	2.338[a]
			(4.88)	(4.25)
CONSTANT	-1.955	0.369	-0.566	0.240
	(-1.54)	(0.25)	(-0.39)	(0.49)
R^2	0.106	0.095	0.143	0.060
SEE	4.388	4.301	4.045	4.418
Sample size	281	259	259	308
Hausman	0.42	0.56	1.60	0.03
	{0.81}	{0.91}	{0.81}	{0.85}

Notes and sources: [a]significant at 1% level (two-tailed). [b]significant at 5% level. [c]significant at 10% level. GDPPCGA = per capita GDP annual growth (%) (World Bank 2008); INVEST = investment share of GDP (%) (Center for International Comparisons 2004 (CIC), University of Pennsylvania); LABOR = annual growth average of total labor force (World Bank 2004); XCONST = degree of executive constraints (range [0, 7]: equals 7 if ‘strict rules for governance’, 1 if ‘no one regulates the authority’, and 0 if ‘perfect incoherence’; (Polity IV Dataset); ETHDIV = ethnic diversity (fractionalization), with a higher value indicating greater diversity (Fearon 2003); SFREE = syndrome-free dummy variable, which equals 1 if the 5-year period is syndrome-free, 0 otherwise (compiled from raw data, AERC Growth Project, e.g., Collier and O’Connell 2008); *t* ratios based on robust standard errors are in parentheses; *p* values for the Hausman statistic, to test the validity of the random effects relative to the fixed effects, are in brackets. Maximum of 47 African countries.

As to be expected, the effect of capital formation, measured by the investment share of GDP, is strongly positive and significant in all equations. In contrast, the estimated impact of the labor variable, though positive, is generally insignificant. This is not surprising, since the coefficient equals $(b-n)$, the difference between the coefficient of labor growth in the original production function, b, and the ratio of population growth to labor growth, n. This coefficient cannot be signed generally; it would be zero if $b=n$, and greater (less) than zero if $b>n$ ($b<n$). Thus the faster (slower) population grows relative to the labor force the more likely that the coefficient of labor would be negative (positive).

Consistent with findings by Easterly and Levine (1997) for a global sample, the estimated effect of ethnic division on growth is negative and significant in the basic equation (see equation (2) of Table 3). Similarly, the institutional/governance variable, XCONST, has a positive impact on growth. When the SF variable, SFREE, is included in the model, however, neither ETHDIV nor XCONST is significant (equation (3), Table 3). Indeed, once SFREE is controlled, the XCONST impact is cut by nearly one half, and with a considerable loss of precision. Similarly, the coefficient of ETHDIV has been reduced by about a third with SFREE's entry, and with its precision also substantially reduced. This outcome suggests that the effects of these two variables on growth might be channeled, in large part, through SFREE. Moreover, the coefficient of SFREE is positive and highly significant, and its value of 2.3 is remarkably comparable to the 2.0 estimate obtained in Fosu and O'Connell (2006), despite the difference in models.[21] Thus, the prevalence of SF is estimated to raise per capita GDP growth by 2.3 percentage points. This estimate is quite large, especially given the sample mean of per capita growth of only 0.8 per cent during 1960-2000.

Note that while the coefficient of LABOR *l* remains statistically insignificant, that of INVEST *k* retains its strong significance at the .01 level. A 10 percentage point increase in the investment ratio should increase per capita GDP growth by 1.2 percentage points. Alternatively, computing the elasticity for INVEST *k* at the means as 1.5, the investment effect is quite elastic: a 1.5 per cent rise in per capita GDP growth would be expected to accompany a 1 per cent increase in the investment ratio. Thus, consistent with findings by many other studies and with the above qualitative evidence, investment has been an important source of growth in Africa. As also observed above, however, TFP may have been even more consequential.

The SFREE effect, furthermore, appears invariant to the exclusion of *l* and *k* from the regression (compare for instance equations (3) and (4) of Table 3). Thus, the impact of SFREE appears to be primarily via TFP, rather than indirectly through the factors of production. This finding, then, supports the above observation of an insignificant, albeit positive, zero-order correlation between SF and contributions by physical capital, on the one hand, and a highly significant positive correlation coefficient between SF and TFP, on the other hand. Such a result was not possible under the Fosu-O'Connell reduced-form model, for instance.[22]

Further support for this TFP-channel impact of SFREE is provided by examining the pair-wise zero-order correlation coefficients, where once again the correlation between SFREE and INVEST is weak, despite a significantly positive correlation between SFREE and growth (Appendix B, Table B.2). Hence, there is now stronger evidence in support of the hypothesis that a dominant impact of TFP observed in the heretofore sources-of-growth analysis (see Table 1) could be attributed primarily to the prevalence, or absence thereof, of the policy syndromes.

5.1 Effect of institutions/governance

As observed above, the effects of ETHDIV and XCONST might be channeled through SFREE. That is, the nature of the institutional setting, as represented by ETHDIV and XCONST, can influence policy outcomes represented by SFREE. For example, ethnic

21 As indicated above, the Fosu-O'Connell model is in reduced form with the following controls: 'partner growth', 'rainfall', 'coastal', and 'resource rich', while the current model is the augmented production function, where investment is a regressor, so that SFREE should reflect TFP.

22 Note that the model estimated in Fosu and O'Connell (2006) does not include investment or labor.

diversity (fractionalization),[23] if not appropriately managed by for instance XCONST, could lead to polarization and create a pernicious 'political economy' environment that engenders the policy syndromes.[24] Such an economy would likely perpetuate controls that generate rent-seeking opportunities, which might in turn spawn adverse redistribution, sub-optimal inter-temporal resource allocation, and possibly even state breakdown, as discussed above. Thus, ETHDIV would exert a negative effect on SFREE.

Similarly, many of the policy syndromes could arguably be attributed to the unbridled powers of the executive in many African countries. Hence, improving institutions/governance by increasing XCONST, for instance, might be a way to limit the discretion of the executive for creating the policy syndromes, in the first place.[25] XCONST could, furthermore, serve as an effective policy instrument to attenuate the pernicious effect of ETHDIV.[26]

Thus even though there appears to be no evidence for endogeneity in the above estimates according to the Hausman tests,[27] from a policy-prescription perspective, we could consider a structural model where SFREE is treated as endogenous with respect to ETHDIV and XCONST. Given the observed deleterious effect of policy syndromes, an appropriate policy issue might be how to increase SFREE and growth through institutions/governance as measured by XCONST.

Tables 4 and 5 present results where SFREE is treated endogenously. The two-step Generalized Methods of Moments (GMM) results are presented in Table 4 using the following external instruments: ETHDIV, XCONST and PCWAR (post-Cold War dummy variable). The expected effects of the first two instruments have already been discussed above. In the case of PCWAR, this variable is expected to have a positive impact on SFREE due to the following rationale: (1) The allure of socialism had tarnished by 1990 with the breakup of the Soviet Union and (2) the Soviet Union was no longer a counterweight to Western fiscal assistance, compelling many African countries toward reform (e.g., Fosu, 2008a). Hence, the prevalence of SF should rise during the post-Cold War period.

---

23 Note that 'diversity' and 'division' are used interchangeably here, with both terms employed to indicate fractionalization as implied in Easterly and Levine (1997).

24 For example, Alesina and Drazen (1991) presents a 'wars-of-attrition' political economy framework explaining why growth-enhancing stabilization is more likely to be delayed in a more ethnically heterogeneous society. Alternatively, one could envisage a situation of ethnically based 'it is our turn' psychology.

25 For African countries the strong role of the executive appears to have largely contributed to the prevalence of the syndromes (see Fosu 2008a).

26 Easterly (2001) and Collier (2000), for example, argue that good institutions can resolve ethnic conflicts. Easterly, for instance, uses Knack and Keefer's (1995) comprehensive measure of institutional quality, which combines: (a) freedom from government repudiation of contracts, (b) freedom from expropriation, (c) rule of law, and (d) bureaucratic quality. XCONST is used in the present paper instead of these other variables in part because the other measures begin later in the 1970s or 1980s. Perhaps a more important rationale is that XCONST is more of a 'policy' instrument in terms of reflecting institutional quality than these others; for example, how does one achieve the above comprehensive measure of institutional quality that contains all of these components? Furthermore, as apparent from the above discussion, many African government executives tended to appropriate to themselves strong powers, bereft of checks and balances, in order to be able to precipitate the policy syndromes that benefited their respective constituencies, at least in the short run (see Ndulu et al. 2008a). A way to curb this modus operandi would, therefore, entail appropriately increasing XCONST.

27 Specifically, the Hausman test suggests that the omitted country fixed effects are not correlated with the included regressors.

The results shown in the first-stage equation (equation 1.1 of Table 4) clearly indicate that the above expectations about the coefficients of these three instruments are borne out. That is, the effects on SFREE of ETHDIV, XCONST, and PCWAR are negative, positive and positive, respectively.

Table 4: Five-year panel estimation, GMM results, with SFREE as endogenous, 1960-2000

	Stage **1** (SFREE instrumented)		Stage **2** (Structural model: Dep. Var. = GDPPCGA)	
Var./Eqn.	1.1	2.1	1.2	2.2
INVEST	0.005	0.006	0.085[b]	0.088[b]
	(1.38)	(1.65)	(2.38)	(2.45)
LABOR	0.026	0.028	0.044	0.047
	(1.01)	(1.05)	(0.16)	(0.17)
SFREE	-	-	3.109[b]	2.886[b]
			(2.30)	(2.07)
ETHDIV	-0.533[a]	-0.708[a]	-	-
	(-3.80)	(-4.85)		
PCWAR	0.140[b]	0.148[a]	-	-
	(2.27)	(2.41)		
XCONST	0.057[a]	-	-	-
	(3.44)	-		
ETHXC	-	0.072[a]	-	-
		(3.15)		
CONSTANT	0.371[a]	0.493[a]	-1.094	-1.089
	(2.87)	(3.88)	(-1.36)	(-1.35)
Centered R^2	0.152	0.145	0.120	0.123
SEE	0.426	0.428	4.050	4.044
Sample size	259	259	259	259
Hansen J	-	-	3.414 {0.19}	3.214 {0.20}

Notes and sources: [a]significant at 1% level (two-tailed). [b]significant at 5% level. [c]significant at 10% level. See Table 3 for definitions of variables and data sources; note additionally: ETHXC = ETHDIV*XCONST; PCWAR = unity if sub-period is 1990-94 or after, zero otherwise; *t* ratios based on robust standard errors are in parentheses; *p* values of Hansen J statistic, to test the validity of the instruments, are in brackets.

From a policy perspective, we next explore the extent to which XCONST may mitigate the pernicious effect of ETHDIV by including the interactive term involving these two variables, ETHXC, along with ETHDIV in the SFREE equation.[28] The results are presented in equation 2.1 of Table 4. The positive and highly significant coefficient of this variable, ETHXC, implies that XCONST reduces the negative effect of ETHDIV. For example, from equation (2.1), we have -0.708 ETHDIV + 0.072 ETHXC, so that the effect of ETHDIV on SFREE is

28 A specification that additionally included XCONST in the interactive equation was also estimated; however, there was a problem of severe multicollinearity.

estimated as zero when XCONST equals 9.8. This value, unfortunately, exceeds the upper limit of XCONST, which ranges from 0 to 7. The important point, though, is that governance, represented by XCONST, is capable of reducing the pernicious impact of ethnic division. At XCONST's upper limit of 7.0, for instance, the effect of ETHDIV would be only -0.204, less than one-half of the -0.542 value based on the SSA minimum average of 2.3 reached during the 'lost decade' of the 1980s. Thus, while XCONST cannot completely eradicate the deleterious effect on ETHDIV, it can go a long way in mitigating it.

Also presented in equations 1.2 and 2.2 of Table 4 are the second stage GMM estimated results, where SFREE is instrumented as shown in stage 1. Consistent with the previous random-effects results (Table 3), the labor coefficient is small and insignificant. The investment effect, however, remains positive and significant.[29] More importantly for the purpose of the current paper, the coefficient of SFREE remains robustly positive, with its size increasing slightly with endogeneization.[30] Furthermore, the Hansen J test, also reported in Table 4, fails to reject the null hypothesis that the instruments are valid, suggesting at least that we have reasonable instruments.

For robustness, Table 5 reports the IV results, where the instruments for SFREE are the external ones used in the above GMM estimation,[31] that is, PCWAR, ETHDIV and XCONST in equation 1.1, and PCWAR, ETHDIV and ETHXC in equation 2.1. Both sets of estimates are based on the *probit*. The IV also allows us to extend the analysis to 2004 by using the estimated values of SFREE. Interestingly, these results are similar to those of the GMM in Table 4. In particular, the coefficients of ETHDIV and XCONST are significantly negative and positive, respectively, while that of ETHXC is significantly positive.

Based on equation 2.1 of Table 5, the completely diversity-neutralizing value of XCONST is estimated at 9.5,[32] which is, remarkably, statistically indistinguishable from the 9.8 estimated under the GMM. Similarly, this current estimate is also not feasible, given the upper limit of 7.0 for XCONST. Nevertheless, at this upper limit, the estimated effect of ETHDIV is only -0.186, once again less than one-half of the implied value of -0.542 at the average minimum XCONST value attained in the 1980s.

---

29 Also estimated were models where investment was endogenously specified. The results are similar to the present ones, though the coefficient of INVEST tends to increase in size but decrease in statistical significance when INVEST is endogeneized. The robustness of SFREE, nonetheless, remains intact.

30 These results are similar to those obtained in Collier and O'Connell (2008, Table 2.12), despite the fact that slightly different instruments are employed here. That study, based on annual data, also uses, inter alia, PCWAR and the conjunction of ETHDIV and a self-constructed variable measuring 'rule by fear'. Employing a more apparent governance variable like XCONST here allows further exploration of the extent to which institutional quality can realistically be used as a 'policy' instrument to mitigate the pernicious effects of ethnic division, for instance.

31 Note that as 2SLS, the GMM employs the remaining variables in the regression as instruments for SFREE.

32 That is, 0.711/0.075 = 9.5.

Table 5: Five-year panel estimation, instrumental variable (IV) results, with SFREE as endogenous (*probit*), 1960-2004

	Stage **1** (SFREE instrumented)		Stage **2** Structural model (Dep. Var. = GDPPCGA)	
Var./Eqn.	1.1	2.1	1.2	2.2
INVEST	-	-	0.125[a]	0.131[a]
			(3.16)	(3.25)
LABOR	-	-	0.143	0.141
			(0.70)	(0.69)
SFREE	-	-	4.414[a]	4.484[a]
			(3.11)	(2.93)
ETHDIV	-0.525[a]	-0.711[a]	-	-
	(-3.93)	(-4.96)		
PCWAR	0.105[c]	0.109[c]	-	-
	(1.74)	(1.81)		
XCONST	0.059[a]		-	-
	(3.97)			
ETHXC		0.075[a]	-	-
		(3.66)		
CONSTANT	-	-	-2.357[a]	-2.432[a]
			(-2.63)	(-2.60)
Pseudo-R^2	0.101	0.094	-	-
R^2	-	-	0.081	0.079
SEE	-	-	4.023	4.027
Sample size	301	301	299	299

Notes and sources: [a]significant at 1% level (two-tailed). [b]significant at 5% level. [c]significant at 10% level. See Table 3 for definitions of variables and data sources; note additionally: ETHXC = ETHDIV*XCONST; PCWAR = unity if sub-period is 1990-94 or after, zero otherwise; t ratios based on robust standard errors are in parentheses; note that the sample size is extended to 2004, as SFREE can be estimated for 2001-2004; the coefficients at stage 1 are marginal effects.

Equations 1.2 and 2.2 of Table 5 present the IV results from estimating the structural growth models. The current results are very similar to those of their GMM counterparts: the estimated effects of INVEST and SFREE are positive and highly significant, while that of labor is insignificant. The SFREE coefficient, moreover, is larger and slightly more significant in the current specification than in the GMM. These outcomes are likely attributable to the application of more focused instruments than in the case of the GMM that entailed the use of INVEST and LABOR as additional (internal) instruments, thus resulting in more precise estimation of SFREE in the current case.[33] The estimated coefficient of SFREE from the IV of about 4.5 suggests that in the absence of policy syndromes, per capita growth

33 Other possible explanations might include the slight extension of the sample size by the use of the IV to estimate missing SFREE values for the additional 2001-2004 sub period. In addition, the *probit* is used in the first-stage of the IV estimation while the linear probability was applied in the GMM. Nonetheless, restricting the sample to 1960-2000 or using the linear probability at the first stage of the IV produced similar results as those reported herein.

in African economies could have averaged 4.5 percentage points higher, an amount that exceeds the growth deficits with all regions of the world.[34]

6 Conclusion

The current paper has, first, presented strong evidence in favour of the hypothesis that the growth record of African economies over the last four decades or so can primarily be attributed to TFP. The productivity explanation is not, however, limited to the dismal growth experienced generally by these economies in the 1980s and early 1990s as observed by previous studies. Conversely, the recent growth resurgence as of the mid-1990s could reasonably be attributed to major improvements in TFP.

Second, the paper has applied the 'policy-syndrome' taxonomy to explain the observed growth. Based on half-decadal 1960-2000/2004 panel data for up to 38 African countries, it is estimated that being free of such syndromes could have added as much as 4.5 percentage points annually to growth. This estimate exceeds the growth deficit with any region of the world since 1960. Thus, achieving a syndrome-free (SF) environment should represent a major policy objective.

Third, the paper finds that ethnic division (fractionalization) reduces the probability of attaining SF, while governance/institutional quality, represented by the degree of constraint on the executive of government, XCONST, can enhance SF. Furthermore, XCONST helps to mitigate the pernicious effect of ethnicity. Thus, holding the executive in greater check appears to be an important antidote to the policy syndrome woes of many African countries.

A crucial issue, then, is how to accentuate XCONST. Recent research suggests, for instance, that increasing electoral competitiveness can enhance growth in 'advanced-level' democracies in Africa (Fosu 2008b).[35] If so, then future research should examine how this form of democracy, in particular, may be capable of accentuating XCONST.

References

Acemoglu, Daron, Simon Johnson, and James Robinson (2001). 'Colonial Origins of Comparative Development: An Empirical Investigation'. *American Economic Review*, 91(5): 1369-1401.

Alesina, Alberto and Allan Drazen (1991). 'Why Are Stabilizations Delayed?'. *American Economic Review,* 81: 1170-1188.

Arezki, R., T. Gylfason, and A. Sy (eds) (2011). *Beyond the Curse: Policies to Harness the Power of Natural Resources.* Washington DC: International Monetary Fund.

Azam, Jean-Paul (1995). 'How to Pay for the Peace? A Theoretical Framework with Reference to African Countries'. *Public Choice,* 83: 173-84.

34 The highest SSA per capita growth deficit for 1960-2000 was with East Asia and Pacific and is estimated at about 3.4 percentage points (Ndulu and O'Connell 2003).

35 Fosu (2008b) finds that democratization beyond the threshold of approximately 4.4 for the indexes of electoral competiveness (on a 1-7 scale, with 7 as the highest level of democracy) would raise GDP growth among African countries. It is noteworthy that currently, SSA as a whole has transcended this threshold (ibid.).

Bates, Robert (1981). *Markets and States in Tropical Africa: The Political Basis of Agricultural Policies.* Berkeley, CA: University of California Press.

Bhattacharyya, Sambit (2009). ‘Root Causes of African Underdevelopment’. *Journal of African Economies*, 18(5): 745-780

Bloom, D. and J. Sachs (1998). ‘Geography, Demography and Economic Growth in Africa’. *Brookings Papers in Economic Activity*, 2: 207-273.

Bosworth, Barry P. and Susan M. Collins (2003). ‘The Empirics of Growth: An Update’. *Brookings Papers on Economic Activity*, 0(2): 113-179.

Collier, Paul (2000). ‘Ethnicity, Politics and Economic Performance’. *Economics and Politics*, 12(3): 229-272.

Collier, Paul (1999). ‘On the Economics of the Consequences of Civil War’. *Oxford Economic Papers*, 51: 168-183.

Collier, Paul and Stephen O’Connell (2008). ‘Opportunities and Choices’. In B. Ndulu, S. O’Connell, R. Bates, P. Collier, and C. Soludo (eds), *The Political Economy of Economic Growth in Africa 1960-2000.* Cambridge: Cambridge University Press.

Davies, Victor A.B. (2004). ‘Sierra Leone’s Growth Performance: 1961-2000’. Nairobi: AERC Growth Project.

Devarajan, Shantayanan, William R. Easterly, and Howard Pack (2003). ‘Low Investment Is Not the Constraint on African Development’. *Economic Development and Cultural Change*, 51(3): 547-71.

Easterly, William (2001). ‘Can Institutions Resolve Ethnic Conflict?’. *Economic Development and Cultural Change*, 49: 687–706.

Easterly, William and Ross Levine (1997). ‘Africa’s Growth Tragedy: Policies and Ethnic Divisions’. *Quarterly Journal of Economics*, CXII: 1203-1250.

Fearon, J.D. (2003). ‘Ethnic and Cultural Diversity by Country’. *Journal of Economic Growth*, 1: 195-222.

Fosu, Augustin K. (2011). ‘The African Economic Growth Record, and the Roles of Policy Syndromes and Governance’. In A. Noman, K. Botchwey, H. Stein, and J. Stiglitz (eds), *Good Growth and Governance in Africa: Rethinking Development Strategies.* Oxford: Oxford University Press.

Fosu, Augustin K. (2008a). ‘Anti-Growth Syndromes in Africa: A Synthesis of the Case Studies’. In B. Ndulu, S. O’Connell, R. Bates, P. Collier, and C. Soludo (eds), *The Political Economy of Economic Growth in Africa 1960-2000*. Cambridge: Cambridge University Press.

Fosu, Augustin K. (2008b). ‘Democracy and Growth in Africa: Implications of Increasing Electoral Competitiveness’. *Economics Letters*, 100(3): 442-444.

Fosu, Augustin K. (2003). ‘Political Instability and Export Performance in Sub-Saharan Africa’. *Journal of Development Studies*, 39(4): 68-82.

Fosu, Augustin K. (2002). ‘Political Instability and Economic Growth: Implications of Coup Events in Sub-Saharan Africa’. *American Journal of Economics and Sociology*, 61(1): 329-348.

Fosu, Augustin K. (1992). ‘Political Instability and Economic Growth: Evidence from Sub-Saharan Africa’. *Economic Development and Cultural Change*, 40(4): 829-841.

Fosu, Augustin K. and Stephen A. O'Connell (2006). 'Explaining African Economic Growth: The Role of Anti-growth Syndromes'. In Francois Bourguignon and Boris Pleskovic (eds), *Annual Bank Conference on Development Economics (ABCDE)*. Washington DC: The World Bank.

Ghura, Dhaneshwar and Grennes, Thomas J. (1993). 'The Real Exchange Rate and Macroeconomic Performance in Sub-Saharan Africa'. *Journal of Development Economics,* 42(1): 155-74.

Gogue, T.A. and K. Evlo (2004). 'Togo: Lost Opportunities for Growth'. Nairobi: AERC Growth Project.

Gyimah-Brempong, Kwabena and Marva E. Corley (2005), 'Civil Wars and Economic Growth in Sub-Saharan Africa'. *Journal of African Economies,* 14(2): 270-311.

Gyimah-Brempong, Kwabena and Thomas Traynor (1999). 'Political Instability, Investment and Economic Growth in Sub-Saharan Africa'. *Journal of African Economies,* 8(1): 52-86.

Kimenyi, M.S. (2006). 'Ethnicity, Governance and the Provision of Public Goods**'.** *Journal of African Economies, Supplement 1,* 15(0): 62-99.

Knack, Stephen and Philip Keefer (1995). 'Institutions and Economic Performance: Cross-Country Tests Using Alternative Institutional Measures'. *Economics and Politics,* 7: 207-227.

Mwega, Francis M. and Njuguna S. Ndungu (2004). 'Explaining African Economic Growth Performance: The Case of Kenya'. Nairobi: AERC Growth Project.

Ndulu, Benno and Stephen O'Connell (2003). 'Revised Collins/Bosworth Growth Accounting Decompositions'. Nairobi: AERC Growth Project.

Ndulu, B., S. O'Connell, R. Bates, P. Collier, and C. Soludo (eds) (2008a). *The Political Economy of Economic Growth in Africa 1960-2000*. Cambridge: Cambridge University Press.

Ndulu, B., S. O'Connell, J.-P. Azam, R.H. Bates, A.K. Fosu, J.W. Gunning, D. Njinkeu (eds) (2008b). *The Political Economy of Economic Growth in Africa 1960-2000, Vol. 2, Country Case Studies*. Cambridge: Cambridge University Press.

Nkurunziza, J.D. and F. Ngaruko (2003). 'Economic Growth in Burundi from 1960-2000'. Nairobi: AERC Growth Project.

Nunn, N. (2008). 'The Long-term Effects of Africa's Slave Trades'. *Quarterly Journal of Economics,* 123(1): 139-176.

World Bank (2008). World Development Indicators Online.

World Bank (2004). World Development Indicators CDROM.

Appendix A

Table A.1: Growth accounting decomposition, African economies, 1960-2000

		1960-64	1965-69	1970-74	1975-79	1980-84	1985-89	1990-94	1995-2000	Total
Cameroon	Growth in Real GDP per Worker	1.39	-0.49	3.15	6.70	4.63	-2.04	-6.60	1.95	1.10
	Contribution of Physical capital per worker	-0.19	0.75	1.43	2.25	3.52	1.78	-0.79	-0.79	0.98
	Contribution of Education per worker	0.12	0.17	0.30	0.35	0.36	0.38	0.28	0.21	0.27
	Residual*	1.46	-1.40	1.42	4.11	0.76	-4.20	-6.09	2.54	-0.15
Cote d'Ivoire	Growth in Real GDP per Worker	6.99	3.20	3.02	4.56	-6.16	-0.77	-3.75	0.72	0.82
	Contribution of Physical capital per worker	1.40	1.65	1.52	2.47	0.69	-1.21	-1.88	-0.81	0.43
	Contribution of Education per worker	0.13	0.13	0.34	0.39	0.42	0.43	0.32	0.29	0.31
	Residual*	5.45	1.42	1.17	1.70	-7.27	0.01	-2.20	1.24	0.08

Ethiopia	Growth in Real GDP per Worker	2.72	1.68	1.71	-0.20	-0.55	-2.35	-0.14	2.96	0.73
	Contribution of Physical capital per worker	3.23	2.32	0.88	-0.29	1.42	0.93	0.25	1.13	1.18
	Contribution of Education per worker	0.05	0.05	0.11	0.13	0.27	0.31	0.28	0.28	0.19
	Residual*	-0.55	-0.68	0.73	-0.04	-2.25	-3.58	-0.67	1.55	-0.63
Ghana	Growth in Real GDP per Worker	0.62	-0.26	1.54	-3.74	-4.17	1.52	1.05	1.77	-0.18
	Contribution of Physical capital per worker	1.90	0.65	-0.28	-0.06	-1.19	-1.28	0.05	1.17	0.10
	Contribution of Education per worker	0.37	1.06	0.43	0.25	0.18	0.15	0.15	0.15	0.34
	Residual*	-1.64	-1.97	1.39	-3.92	-3.17	2.65	0.85	0.44	-0.62
Kenya	Growth in Real GDP per Worker	0.94	4.14	5.02	1.83	-1.05	2.02	-1.91	-0.94	1.21
	Contribution of Physical capital per worker	-0.25	0.49	1.72	0.49	-0.52	-0.79	-0.66	-0.28	0.03
	Contribution of Education per worker	0.26	0.38	0.30	0.69	0.33	0.35	0.36	0.29	0.37
	Residual*	0.93	3.26	2.99	0.64	-0.86	2.46	-1.60	-0.96	0.81
Madagascar	Growth in Real GDP per Worker	-0.51	1.34	-0.90	-0.84	-3.97	-0.06	-2.56	0.21	-0.89
	Contribution of Physical capital per worker	-0.20	0.23	0.29	-0.19	-0.28	-0.29	-0.16	-0.57	-0.16
	Contribution of Education per worker	0.05	0.05	0.19	0.23	0.35	0.38	0.31	0.30	0.24
	Residual*	-0.36	1.06	-1.38	-0.87	-4.04	-0.14	-2.71	0.48	-0.97

Malawi	Growth in Real GDP per Worker	0.33	5.11	3.59	2.96	-1.65	-0.97	-0.65	3.90	1.67
	Contribution of Physical capital per worker	4.46	4.45	4.25	2.52	0.07	-0.90	-0.11	-1.29	1.54
	Contribution of Education per worker	0.06	-0.02	0.24	0.13	0.24	0.18	0.20	0.39	0.19
	Residual*	-4.19	0.67	-0.90	0.30	-1.96	-0.25	-0.74	4.80	-0.06
Mali	Growth in Real GDP per Worker	1.40	0.67	0.40	5.78	-2.94	-0.77	-0.96	2.74	0.82
	Contribution of Physical capital per worker	0.71	0.68	0.31	0.26	0.01	0.02	0.27	-0.20	0.24
	Contribution of Education per worker	0.02	0.05	0.11	0.13	0.09	0.08	0.08	0.10	0.08
	Residual*	0.67	-0.05	-0.02	5.39	-3.04	-0.87	-1.31	2.84	0.50
Mauritius	Growth in Real GDP per Worker	3.86	-1.88	3.42	4.04	-1.55	4.95	3.37	3.83	2.50
	Contribution of Physical capital per worker	0.39	-0.40	-0.08	1.02	-0.27	0.63	1.02	0.95	0.42
	Contribution of Education per worker	0.41	0.53	0.36	0.65	0.41	0.32	0.26	0.24	0.39
	Residual*	3.06	-2.01	3.14	2.37	-1.69	4.01	2.09	2.64	1.69
Mozambique	Growth in Real GDP per Worker	0.63	4.75	0.49	-6.56	-6.84	4.71	1.05	4.88	0.50
	Contribution of Physical capital per worker	-0.44	0.19	1.04	-0.88	-0.69	0.05	0.14	1.06	0.10
	Contribution of Education per worker	0.11	0.09	0.07	0.10	0.20	0.25	0.15	0.12	0.14
	Residual*	0.97	4.46	-0.63	-5.78	-6.35	4.41	0.76	3.70	0.26

Nigeria	Growth in Real GDP per Worker	1.95	-1.72	8.34	-0.87	-6.93	2.92	0.90	-0.02	0.52
	Contribution of Physical capital per worker	1.25	1.36	3.18	3.94	0.62	-1.18	0.13	0.41	1.19
	Contribution of Education per worker	0.10	0.10	0.08	0.07	0.43	0.52	0.53	0.53	0.31
	Residual*	0.59	-3.19	5.08	-4.87	-7.98	3.58	0.23	-0.96	-0.98
Rwanda	Growth in Real GDP per Worker	-6.76	4.89	-0.43	4.60	0.16	-0.37	-14.03	7.10	-0.26
	Contribution of Physical capital per worker	-0.08	-0.01	0.83	1.95	2.13	2.04	1.53	-1.50	0.82
	Contribution of Education per worker	0.10	0.12	0.28	0.25	0.13	0.19	0.23	0.18	0.19
	Residual*	-6.79	4.78	-1.54	2.40	-2.10	-2.60	-15.79	8.41	-1.27
Senegal	Growth in Real GDP per Worker	-0.24	-2.04	-0.03	0.67	-0.96	0.61	-1.18	2.38	-0.03
	Contribution of Physical capital per worker	-0.46	-0.79	-0.26	-0.21	-0.25	-0.01	0.06	0.17	-0.20
	Contribution of Education per worker	0.00	0.04	0.33	0.16	0.14	0.17	0.19	0.20	0.16
	Residual*	0.22	-1.29	-0.10	0.73	-0.84	0.44	-1.43	2.00	0.01
Sierra Leone	Growth in Real GDP per Worker	2.71	2.75	2.17	0.03	0.49	-0.36	-3.69	-7.37	-0.66
	Contribution of Physical capital per worker	-0.09	1.02	0.39	-0.18	-0.07	-0.85	-0.33	-1.08	-0.17
	Contribution of Education per worker	0.09	0.12	0.40	0.28	0.28	0.30	0.24	0.22	0.24
	Residual*	2.71	1.60	1.38	-0.07	0.27	0.19	-3.60	-6.51	-0.73

South Africa	Growth in Real GDP per Worker	3.46	3.75	3.32	-1.32	0.61	-1.72	-2.15	0.38	0.71
	Contribution of Physical capital per worker	-0.09	0.84	1.31	1.02	0.61	-0.39	-0.51	-0.14	0.33
	Contribution of Education per worker	-0.08	0.31	0.12	-0.18	0.58	0.28	0.52	0.43	0.26
	Residual*	3.63	2.60	1.89	-216	-0.58	-1.61	-2.17	0.09	0.12
Tanzania	Growth in Real GDP per Worker	2.20	3.31	2.57	-0.30	-2.16	0.92	-0.59	1.29	0.88
	Contribution of Physical capital per worker	-0.85	-0.02	0.92	0.66	-0.02	-0.04	0.45	-0.26	0.12
	Contribution of Education per worker	-0.19	-0.13	-0.08	0.02	0.21	0.16	0.10	0.14	0.04
	Residual*	3.25	3.46	1.72	-0.97	-2.34	0.80	-1.14	1.41	0.73
Uganda	Growth in Real GDP per Worker	2.18	0.09	-0.58	-5.84	1.16	0.56	2.82	4.22	0.63
	Contribution of Physical capital per worker	1.10	1.63	1.08	-0.02	0.08	0.09	0.18	1.29	0.68
	Contribution of Education per worker	0.13	0.21	0.11	0.20	0.16	0.59	0.30	0.21	0.24
	Residual*	0.95	-1.75	-1.77	-6.02	0.92	-0.12	2.34	2.71	-0.30
Zambia	Growth in Real GDP per Worker	0.96	0.97	1.59	-3.23	-2.07	-0.76	-4.05	-1.09	-1.01
	Contribution of Physical capital per worker	-0.63	0.75	0.94	-0.61	-1.66	-2.03	-2.02	-1.55	-0.88
	Contribution of Education per worker	0.26	0.23	0.32	0.55	0.24	0.14	0.59	0.28	0.33
	Residual*	1.33	-0.01	0.33	-3.17	-0.65	1.13	-2.63	0.18	-0.46

Zimbabwe	Growth in Real GDP per Worker	0.39	2.83	5.98	-4.60	1.56	0.53	0.02	-0.25	0.79
	Contribution of Physical capital per worker	-1.06	-0.68	0.42	-0.07	-1.08	-0.73	0.78	0.06	-0.27
	Contribution of Education per worker	0.25	0.23	0.25	0.23	0.56	1.25	0.53	0.31	0.45
	Residual*	1.20	3.29	5.31	-4.76	2.07	0.01	-1.29	-0.61	0.61

Source: based on Fosu (2011); original source: Ndulu and O’Connell (2003).

Appendix B

Table B.1: Summary statistics, 1960-2000

Variable	**Mean**	**Std. Dev.**	**Min**	**Max**	**n**
GDPPCGA	0.82	4.55	-30.45	32.37	308
INVEST	10.34	7.41	1.18	49.68	340
LABOR	2.39	1.05	-4.32	9.25	356
XCONST	2.63	1.77	0	7	313
ETHDIV	0.71	0.19	0.18	0.95	336
SFREE	0.29	0.46	0	1	376
PCWAR	0.25	0.43	0	1	376

Notes: See notes to Table 3 of text for variable definitions and data sources.

Table B.2: Correlogram of variables, 1960-2000

	GDPPCGA	INVESTMENT	LABOR	XCONST	ETHDIV	SFREE	PCWAR
GDPPCGA	1.000						
INVEST	0.225	1.000					
LABOR	0.039	0.015	1.000				
XCONST	0.171	0.108	0.079	1.000			
ETHDIV	-0.165	-0.064	0.016	-0.019	1.000		
SFREE	0.299	0.095	0.082	0.262	-0.244	1.000	
PCWAR	-0.082	-0.152	0.086	0.184	0.000	0.175	1.000

Notes: See notes to table 3 of the text for variable definitions and data sources.