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Endogenous constraints, coefficients of economic distance, and economic performance of African countries – An exploratory essay

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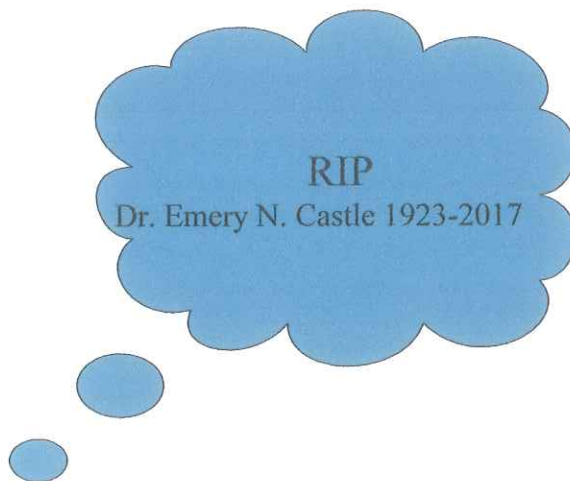
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Abstract: Existing literature has overstressed the importance of exogenous constraints in the economic performance of African countries at the expense of endogenous constraints, although the latter are longer-lasting and more self-propagating than the former. In this exploratory essay I put endogenous factors upfront, and introduce and define the concept of economic distance. I argue that the coefficient of economic distance is a better measure of what is going on than things like the Africa dummy, for example. The evidence I consider suggests that policy and future research will benefit from focused studies of endogenous constraints on economic performance. The essay is incomplete without its empirical complement, but it succeeds in holding up a mirror in front of these countries. The implication is that continued emphasis on exogenous constraints is a misallocation of scarce policy and research resources.

Keywords: Endogenous constraints; Economic distance; coefficient of economic distance; endogenous growth; developing countries; African countries

JEL Code: O47, O41; O1, O55, C2, O57, C19



In the absence of social capital, producers and consumers at the micro level need consider only independent preference functions. It is assumed that decisions are coordinated by markets operating within a legal framework provided by an exogenous government. The presence of social capital means that individuals' decisions must be coordinated by some means in addition to the market. In the jargon of economics, preference functions lose independence and become interdependent. The incorporation of social capital into economic systems requires that at least some social activities become endogenous to that system – 2002, p. 335.

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0. PROBLEM

The goal of this exploratory essay is to seek a better understanding of the factors and forces behind the economic performance of African countries. I set three manageable objectives for accomplishing the goal. The first objective outlines endogenous constraints, stressing how and why they are longer-lasting and more important to performance than exogenous constraints. For instance, although history and geography are important as Nunn (2009; 2008) and Nunn and Puga (2012) have argued, the growth and welfare limiting effects of colonialism and other legacies have tended to decay over time albeit at differential rates, while those of internal corruption appear to be intensifying and self-propagating. The second objective introduces and defines the notion of economic distance and formulates a simple measure of the coefficient of economic distance. The coefficient of economic distance contrasts to the coefficient of geographic distance common to gravity models of trade and to the so-called “Africa dummy” variable familiar to cross country growth regressions. The final objective assesses the implications of the first two objectives for economic performance using conventional economic theory.

The essay is important, because many experts regularly associate Africa with unending welfare limiting problems. However, little effort goes into a closer look at the nature, not just the list, of welfare constraints. This is incomprehensible, because economists have constructed a very good analytical structure for describing how economic agents pursue their self-interests. If agents are consumers, the objective for reaching the goal is utility maximization; the producers’ objective for the same goal is the maximization of surplus (profit narrowly defined). Both consumers and producers face constraints to their objectives (limited budgets and increasing cost of scarce resources).

While the economic theory is good, the nature of the constraints has received spotty attention, and even the little attention it has received has stressed exogenous constraints more than endogenous constraints. For example, Ndulu (2007) argues that a major constraint to Africa’s growth is the lack of investment: Investment to improve the business climate, investment for infrastructure, and investment for institutional capacity. Others have expanded on Ndulu’s list to include as constraints all kinds of allocative, social, and x-inefficiencies: unbalanced structure of African economies; non-optimal population growth; lack of physical capital due to low growth; lack of domestic savings, debts, crowding out, and lack of credit; lack of human capital and weak institutions for building it; poor governance and rampant corruption; dysfunctional markets, especially insurance markets; over-reliance on natural resources; and barriers to trade.

Not all, but a good deal of the constraints Ndulu and others point out are exogenous and economic. In reality exogenous constraints are just the “proximate” and endogenous constraints are the “deep” inhibitors (exhibitors) of performance. The reason this point is often missed is that endogenous constraints are often non-economic and hence challenging to quantify. Clearly, utility and profit are functions of choice. For the consumer, choice depends on the budget (exogenous) and preferences. Preferences can be exogenous, endogenous, or both (Fiocca, 1994; cf. Sterdy, 1959). Hence, Hoselitz (1952; 1960) is correct that “economic development consists not merely in a change of production

techniques, but also, in the last resort, in a reorientation of social norms and values, [so that] any analysis of economic development which is to be fruitful and complete must include a set of propositions relating changes in production techniques to changes in values” (quoted in Corbridge, 1995, 17). Hayek (1964, p. 5) came to the same conclusion in asserting that “useful institutions which serve the intercourse of men, such as language, morals, law, writing, or money” can constrain or promote welfare (cf. Fiocca, 1994, p. 15). Thus, among endogenous constraints are to be included moral rules of thumb, procedures, commitments, routines, trust, reciprocity, power, truth, altruism, and so on (Fiocca, 1994, pp. 9-11).

Afghah (1998) has put together a list of “economic and non-economic factors essential for economic development” (Letunic and Dragicevic, 2014; Acemoglu, Johnson, and Robinson, 2001a,b; 2012). I argue here that many of the non-economic factors on Afghah’s list are endogenous constraints in the African context. Other examples would include: the institutional order (Hoselitz, 1952), what Lewis (1965; 1954) has called the “will to economize,” and “family, class, race, and religion, rural-urban differences, national character, size of social unit, effect of culture on institutions, and the interaction of cultural values and economic change” (Kindleberger, 1965, p. 20). Hence, in this exploratory essay I examine the effects of factors like these on the economic growth of Sub-Saharan African countries.

The essay is organized as follows: Section 1 briefly describes the theoretical foundations of the issues of interest. Sub-section 1.1 justifies the role of endogenous constraints, and Sub-section 1.2 introduces and defines the concept of economic distance and the associated coefficient of economic distance. Sub-section 1.3 pulls together the two previous sub-sections into a simple endogenously constrained production function. Section 2 is about practical matters regarding key variables of interest and the data required to implement the model also outlined in the same section. Section 3 concludes with a concession that the paper is incomplete, because it lacks its empirical complement. Still it provides a reasonable basis for policy and gives future empirical research a decent headstart.

1. THEORY

1.1 Endogenous constraints

Human life is a real-valued function of social objectives (Jones, 2016; Hall and Jones, 2007). In any given economy the value of the life-function is the benefits accruing to producers and consumers in that economy. For the latter the benefits are utility; for the former they are a surplus, broadly, or profit, narrowly. However, because of scarcity, both consumers and producers face constraints. Producers have limited factors of production for any given state of technology, and consumers have limited budgets. In both cases, the opportunity costs are inevitable, and hence, microeconomic theory asserts that identical consumers use their budgets (M) to maximize total satisfaction (u) from the quantities of goods and services (Q) they consume given corresponding prices (P), i.e.,

$$S = \max u(Q) + \lambda(M - PQ). \quad (1)$$

Producers on the other hand, supply as much Q as possible given the total cost of production (C). Producing Q is costly because inputs (X) are limited and have opportunity costs (w) in their alternative uses. This is another way of saying producers maximize the following constrained self-interest:

$$W = \max f(X) + \mu(C - wX - w_0). \quad (2)$$

In reality consumers and producers do not operate in isolation from each other; they interact through markets over which government has control even as their self-interests remain unique to them, and often competing. If we let $Q = f(X, \chi)$ and $C = w_X X - w_\chi \chi - w_0 = C(X, \chi)$, then a social solution to the competing self-interests of consumers and producers is one that maximizes the discounted sum of benefits for society over time (SWF) given by

$$SWF = \max \int_0^\infty [u(f(X, \chi) + \lambda(Pf(X, \chi) - C(X, \chi))] e^{-\rho t} dt, \quad (4)$$

where ρ is the social discount rate. The Greek χ (*Chi*) in (4) accounts for the effects of economic market failures in the form of externalities and public/common resources, or political market failures in the form of inequality, poverty and so on. This assumption is not explicit in (1) and (2). Amavilah (2016a; 2014b' 2014c) has expressed the Hamiltonian of the kind underlying (4) as

$$H = u(f(X, \chi) + \lambda(\Phi(X, \chi)), \quad (4')$$

where $u(\cdot)$ is net social satisfaction and $\Phi(X, \chi) = Pf(X, \chi) - C(X, \chi)$ is net social surplus, such that for $\partial H / \partial f(X, \chi) = \partial H / \partial u(f(X, \chi)) = 0$,

$$\partial H / \partial \lambda = Pf(X, \chi) - C(X, \chi) = \Phi(X, \chi). \quad (5)$$

Although there is no need to estimate the utility function part of (4), I still justify the structure of the argument with Galor and Weil (2000), de la Croix and Doepke (2003) and Dzhumashev and Kazakevitch (2013). There,

$$SWF \equiv u(q, \lambda) = [1 + \theta \lambda] q e^{-\rho t}, \text{ s.t. } \Phi \equiv q = (A\lambda)^\alpha Z^{1-\alpha}, \quad (6)$$

where q is equal to GDP at factor cost, and is endogenously constrained by technology-related factors ($A\lambda$), for $0 < \alpha < 1$ being the technological coefficient. Next, note that in (6) Z is a Solow-Swan output/income, and hence exogenously constrained by conventional factors of production and technical change, i.e.,

$$Z = e^{g^t} N^\beta K^{1-\beta}, \quad (7.1)$$

where g is a Hicks-neutral rate of technical change, N is the economically active population – a fraction of which is in the labor force (L), i.e., $L = vN$ (cf. Lucas, 1988; 1993; 2009). In other words, (7.1) is at the personal level of income/output, whereas at the functional level of income/output it would be

$$Z = e^{g^t} L^\beta K^{1-\beta} = e^{g^t} (vN)^\beta K^{1-\beta}, \quad (7.2)$$

where β and $1-\beta$ are Solow/Swan coefficients of labor and physical capital, respectively. Now, using (7.2) we can restate (6) as

$$SWF \equiv u(q_{ij}, \lambda) = \max \int_0^\infty [1 + \theta\lambda] q_{ij} + [(A\lambda)^\alpha (vN)^\beta K^{1-\beta}]^{1-\alpha} e^{(g-p)t} dt, \quad (8)$$

where $[1 - \theta\lambda]q_{ij}$ is the general utility function which depends on economic distance (q) and endogenous constraints (λ). Below I characterize q and explain briefly how to measure it. For now suffice it to say that (8) suggests that social goals are subject more to endogenous constraints than exogenous constraints.

1.2 Economic distance and coefficient of economic distance

I define an economic distance as a *special relative difference* in economic outputs (inputs) between two economies, or *general relative differences* in economic outputs (inputs) among many economies. In the special case, for example, suppose i and j are two economies, q_i and q_j are outputs, and x_i and x_j are factors of production for the two economies. In conventional gravity models the distances $E_{ij} = d(q_i, q_j)$ and $E_{ij} = d(x_i, x_j)$ are geographical, and hence they determine fixed trade costs. While they have seen wide empirical uses, gravity models are not well-anchored in economic theory, making unique and precise interpretation very difficult. For instance, since the geographic distance is constant, the gravity model predicts that the long-run presumably does not exist, because fixed costs never become zero. This result is inconsistent with the fact that globalization and technological change have reduced the importance of geographical distance by lowering both the marginal cost and fixed distance cost of trade (Buch, Kleinert, and Toubal, 2004).

Mazurek (2012) has argued that “economic outcomes across countries are not independent because of international trade and the existence of technological, information, human and physical capital and other spillovers” (p. 278).

In this essay I derive my notion of economic distance directly from Constandanse-Westermann’s (1972) concept of “biological distance” as “a measure of the size of the ‘distance’ or ‘difference’ [affinity] between two [or more] populations, calculated from all available [quantitative and qualitative] data on their biological characters” (p. 1ff, [...] added). Replacing “biological” with “economic” it becomes clear that while the geo-distance in conventional gravity models is time invariant (constant), economic distance is relative (variable), and it provides a better proxy for variables like the “Africa dummy” common to growth regressions. This is important because we know that African countries are not homogenous in their technical capabilities (Amavilah, 2006). Moreover, economic distance is not an efficiency concept like distance from some theoretical (target) frontier. Two equally efficient economies can be distant from one another; one efficient economy can trail an inefficient economy. For example, since $q_i = f(x_i)$ and $q_j = f(x_j)$, the special relative and general relative economic distances can be parallel or non-parallel (converge or diverge), and the economies involved can grow at the same rate or differential rates. In this way Mazurek (2012) asserts that “relative economic distance is closely related to the concepts of σ -convergence [divergence] and β -convergence [divergence]” (Mazurek, 2012, p. 278) in that economic distance is relative and variable; geo-distance is absolute and constant.

The economic distance between i and j or among i ’s and j ’s is:

$$\begin{aligned} E_{ij} &= \varphi(q_i, q_j) = \varphi(|q_i - q_j|) = \varphi q_{ij}^* \Rightarrow \varphi = E_{ij}/q_{ij}^* \quad (a) \\ E_{ij} &= \varphi f(x_i, x_j) = \varphi(|x_i - x_j|) = \varphi x_{ij}^* \Rightarrow \varphi = E_{ij}/x_{ij}^* \quad (b) \end{aligned} \tag{9}$$

Thus, the economic distance in time and over time between/among points on the same plane, or points on parallel or non-parallel planes, can be solved using a version of the Distance Formula, see any calculus textbooks like Larson, Hostetler, and Edwards (2007), Stewart (1995), Apostol (1962) and so on. From (9) the coefficient of economic distance (φ) is the true multiplier of E , and it has the same meaning as the parameter of the geographic distance (D) in gravity models *iff* $E = D$, which is unlikely since $D \in E$. Again, (9) suggests that the economic distance can be due to differences in factor productivity and due to the cumulative and roundaboutness nature of production according to the Young-Myrdal-Kaldor framework of circular and cumulative growth (Choi, 1983, Young, 1928; Myrdal, 1971; Kaldor, 1966; 1961).

Although (9) is conceptually correct, since it is not possible to have output without inputs, the economic distance due to input differences (9b) is automatically reflected in the economic distance due to output differences. Hence, it is reasonable to accept Mazurek’s (2012) “novel approach” for evaluating “relative economic distance” and “general relative economic distance,” and Mazurek then

calculates E_{ij} over time ($t = 1, 2, 3, \dots, \tau$) as

$$E_{ij} = \left[\frac{\pi q_{ij}^*}{n = 2} \right] 100, \quad (10.1)$$

where $0\% < E_{ij} < 100\%$, and $-1 < \pi < 1$ is the “Pearson correlation coefficient of the time series” $q_{ij}^* = d(q_i, q_j) = |q_i - q_j|$. Given (10.1) the general relative economic distances among $n > 2$ economies becomes:

$$\tilde{E}_{ij} = \left[\sum_{i=1}^{n>2} E_{ij} \right] 100, \quad i > j. \quad (10.2)$$

While they are easy to understand and practical to use, (10.1) and (10.2) are problematic in a number of ways, including the following two. First, they can be used sensibly only in non-parametric estimations. Second, the formulations no longer distinguish clearly the economic distance from their coefficients, making it difficult to tell which is E , ρ , and the like. My preference is not to work in percentages. Instead, I state (10.2) in semi-logs as

$$\ln[E_{ij} - 100] \equiv e_{ij} = q_{ij}^{*\pi/n}, \quad (10.3)$$

where $\pi/n = \phi$ is the proper coefficient of special economic distance. Then (10.3) becomes

$$\tilde{e}_{ij} = \sum_{i=1}^{n>2} e_{ij} \quad (10.4)$$

noting that in (10.4) $\bar{\phi} = \bar{\pi}/\bar{n}$ is an average coefficient of general relative economic distance.

Analysis of (10) leads to the following observations. First, for $n=2$, $-1 \leq q_{ij}^* < 0$, and $\pi < 0$, there is “convergence” of either the j th economy towards the i th economy from above (j th economy is declining while the i th is constant), of the i th economy towards the j th economy from below (i th economy is catching up to the j th), or of both towards each other but from opposite directions at equal or unequal rates. However, closing the economic distance does not necessarily guarantee permanent convergence or divergence. Second, it is clear that for $0 \leq \pi < 0.5$, $E_{ij} = q_{ij}^* = 1$ and

for $q_{ij} \leq 0.5$ and $1 \leq \pi \leq 0.5$, $E > q_{ij}^*$. Again, in many applications of the gravity model, the distance is measured in geographical terms, and or proxied with such dummies as policy factors, common language, membership to regional groups, etc. However, the fact that being different is not being more or less (in)efficient means that geographic distance and economic distance are not necessarily the same. If that is the case, then (10.3) is really a single index summation (integration), $e_{ij} = \sum_{l=m}^M q_{ij}^{*\pi/n}$,

and (10.4) is a double index summation (integration), $\tilde{e}_{ij} = \sum_{i=1}^{n>2} \sum_{m=1}^M e_{ij}$, for $m = 1, 2, 3, \dots, M$ being the values of the proxies used to represent E , and $n = 1, 2, 3, \dots, N$ being the number of countries in the sample. This is a better variable because it assume neither similarity nor dissimilarity of African countries from each and one another.

1.3 Endogenously constrained production function with coefficient of economic distance

Setting the Hamiltonian of (8) to zero is just another way of saying,

$$Y = (\lambda A)^{\alpha(1-\alpha)} (vN)^{\beta(1-\alpha)} K^{(1-\beta)(1-\alpha)} q_{ij}^{*(\pi/n)(1-\alpha)}. \quad (11)$$

where $Y = Pq$ is nominal GDP as opposed to real GDP = q . Then the input marginal effects of (11) are as follows:

$$\begin{aligned} \frac{\partial Y}{\partial \lambda} &= \alpha(1-\alpha)(\lambda A)^{[\alpha(1-\alpha)]-1} (vN)^{\beta(1-\alpha)} K^{(1-\beta)(1-\alpha)} q_{ij}^{*(\pi/n)(1-\alpha)} = 0 \\ \frac{\partial Y}{\partial N} &= (\lambda A)^{\alpha(1-\alpha)} \beta(1-\alpha)(vN)^{[\beta(1-\alpha)]-1} K^{(1-\beta)(1-\alpha)} q_{ij}^{*(\pi/n)(1-\alpha)} = 0 \\ \frac{\partial Y}{\partial K} &= (\lambda A)^{\alpha(1-\alpha)} (vN)^{\beta(1-\alpha)} (1-\beta)(1-\alpha) K^{[(1-\beta)(1-\alpha)]-1} q_{ij}^{*[\pi/n(1-\alpha)]} = 0 \\ \frac{\partial Y}{\partial q_{ij}} &= \frac{\pi(\lambda A)^{\alpha(1-\alpha)} (vN)^{\beta(1-\alpha)} K^{(1-\alpha)(1-\beta)} q_{ij}^{*[\pi/n(1-\alpha)]-1}}{n(1-\alpha)} = 0 \end{aligned} \quad (12)$$

The first statement of (12) assumes that A and λ are variable, independent, and separable from one another, so that A can be considered to be Solow/Swan. From this Amavilah (2014a,b) has rationalized Parente and Prescott's (1994; 2001) "world knowledge" as the sum of technology and human capital. After a few substitutions (11) can be restated as:

$$\begin{aligned}
Y &= (\lambda A)^\alpha ((vN)^\beta K^{1-\beta} q_{ij}^{*\pi/n})^{1-\alpha} \\
&= (\lambda \omega e^{g^t})^\alpha (vN)^\beta K^{1-\beta} q_{ij}^{*\pi/n})^{1-\alpha} \\
&= (\lambda \omega e^{g^t H})^\alpha ((vN)^\beta K^{1-\beta} q_{ij}^{*\pi/n})^{1-\alpha} \\
&= (\lambda \omega e^{g^t + \zeta^S})^\alpha ((vN)^\beta K^{1-\beta} q_{ij}^{*\pi/n})^{1-\alpha} \\
&= (\lambda \omega e^{g^t + \zeta^S} ((\xi L))^\alpha ((vN)^\beta K^{1-\beta} q_{ij}^{*\pi/n})^{1-\alpha} \\
&= (\lambda \omega e^{g^t + \zeta^S} (\xi vN))^\alpha (vN)^\beta K^{1-\beta} q_{ij}^{*\pi/n})^{1-\alpha}
\end{aligned} \tag{13}$$

where $L = vN$ is labor, a fraction of working-age population (N), $H = \xi L = \xi vN$ is human capital – a proportion of labor (L), and S is social capital. In its intensive form (11) can be expressed in three ways – depending on whether one divides both sides of (11) by N , L , or H , leading to:

$$\begin{aligned}
y_N &= [k_N^{1-\beta} (n_N)^\beta (\xi v h_N e^{\zeta^S + g^t})^\alpha q_{ij}^{*\pi/n})^{1-\alpha} \Rightarrow \text{per capita GDP} \\
y_L &= [k_L^{1-\beta} (\xi v h_L e^{\zeta^S + g^t})^\alpha q_{ij}^{*\pi/n})^{1-\alpha} \Rightarrow \text{labor (worker) productivity} \\
y_H &= [k_H^{1-\beta} (v n_H)^\beta (e^{\zeta^S + g^t})^\alpha q_{ij}^{*\pi/n})^{1-\alpha} \Rightarrow \text{human capital productivity}
\end{aligned} \tag{14}$$

From (14) y_N provides a better oillustration, because endogenous constraints can be understood to affect national productivity directly or indirectly through the factors of production.

2. PRACTICE

In this section first I specify an empirical form of (14). In Table 1 I list without discussion potential variables needed to implement the framework. The list is clearly not exhaustive and is guided by the search for variables for which some data might be available. Correctly evaluated and implemented endogenous constraints are more performance-relevant (limiting/promoting) than exogenous constraints and the coefficient of economic distance is more meaningful and informative than regional dummies like the Africa dummy. As I mentioned above, the economic distance and its coefficient allow for similarities and dissimilarities of economies.

2.1 Empirical estimation

The first statement of (14) can be restated as

$$y_N = q_{ij}^{*\pi/n(1-\alpha)} k_N^{(1-\beta)(1-\alpha)} n_N^{\beta(1-\alpha)} (\xi v h_N)^{\alpha(1-\alpha)} e^{(1-\alpha)[\zeta S + g]t}, \quad (15)$$

where y_N is per capita GDP, $q_{ij}^* = (GDP_i - GDP_j)$, or in rates $\ln q_{ij}^* = \ln GDP_i / \ln GDP_j$, is the economic distance between/among economies, k_N is per capita physical capital generated domestically from saving (share of gross domestic investment of GDP), $n_N = vN/N = L/N$ is per capita labor (labor participation ratio), $h_N = (\xi L)/N = (\xi v N)/N$ is human capital per capita, variously measured as years of schooling (h_{sN}) as in Barro and Lee (2013), or expenditures on education (h_{eN}) as in Cohn (1979), or expenditures (investment) in health (h_{hN}) as in Gyimah-Brempong and Wilson (2004). Foreign direct investment (FDI) and remittances enter separately as suggested in Ssozi and Asongu (2016). Foreign aid does not enter separately; it is a part of the dependency variable, an element of social capital (consumption), S (Jerven, 2015; 2011; 2010).

Note that (15) is linear in the variables, but nonlinear in the parameters. This means, given the variables, one must first estimate α and β from (7.1), recover ζ , and g as the Solow/Swan residual, and then figure out (15) by nonlinear methods. Instead of doing all that, we log-linearized (15), and get

$$y^* = \varphi^* q_{ij}^* + \alpha^* k^* + \beta^* n^* + \gamma^* h^* + \zeta^* S + g^* t \quad (16)$$

for $y^* = \log(y_N)$, $\varphi^* = \pi/n(1-\alpha)$, $q_{ij}^* = (10.3)$, $k^* = \log(k_N)$, $\alpha^* = (1-\beta)(1-\alpha)$, $\beta^* = \beta(1-\alpha)$, $n^* = \log(n_N)$, $\gamma^* = \alpha(1-\alpha)$, $h^* = \log(\xi v h_N)$, $\zeta^* = (1-\alpha)\zeta$, S is social capital, and $g^* = (1-\alpha)g$.

Given similar units of measurement, $H_i(t)/N_i(t) = 1/N_i(t) \int \int_t^{Tm} h_i dh_i dt \approx 1/N_i(t) \sum_t^T \sum_i^m \psi h_i$, ψ being

the weights of the m components of human capital, which are formal education, health, on-the-job training, and experience, and t and T are the starting and terminal points of a time period.

After estimating (16) and obtaining the apparent α^* , β^* , γ^* , ζ and g^* , we can take either historical estimates of g , β , and α from African growth literature, from the direct estimates of (7.1), or both, and then solve (16) for the real α , β , and g . From the literature we know already that the average investment-to-GDP ratio in African countries has been around 19.5% over the last four decades. The residual has also been estimated to be negative ($g < 0$) or significantly small. Barro (1991) found it to be -0.013, and Collier and Gunning (1999) have it at -0.001. These two and other similar findings have led to what Jerven (2011; undated) has called “the quest for the Africa dummy” and Engelbert’s (2000) attempt at “solving the mystery of the Africa dummy.” As Jerven (undated, p. 3) shows, in the 1990s many researchers used dummy variables in their explanations of how African

growth has been apparently slower than that of other regions: Black market premium (-0.012 in Barro and Lee, 1993), corruption (-0.017 in Mauro, 1995), openness (+0.02 for Sachs and Warner, 1995), ethnicity (-0.013 for Easterly and Levine, 1997), aid (-0.014 for Burnside and Dollar, 1997), and social capital (-0.02, Temple, 1998). Although Knedlil and Reinowski (2008) argued that R&D, infrastructure, access to high tech, and the business climate are more important to African growth than the Africa dummy, this type of research is ongoing todate, but emphasis has moved away from misspecification and specification bias to stressing the appropriateness of the estimation techniques.

Eq. (16) can be easily linked to Mankiw, Romer, and Weil (1992), Romer (1994; 1993; 1990; 1989), Lucas (1988, 1993), and or Aghion and Howitt (2006; 1992) to characterize the dynamics of A , k^* and h^* (Greiner, Semmler and Gong, 2005). However, I do not go into that direction. Instead I modify the empirical setup employed by Asongu and Asongu (2017) and Asongu and Nwachukwa (2017) *with particular stress on endogenous aspects of social capital*. I adopt the quality of growth index (QCI) as the dependent variable, i.e , $QCI = y^*$, such that

$$y^* = Constant + \varphi^* q_{ij}^* + \alpha^* k^* + \beta^* n^* + \gamma^* h^* + \zeta^* S + g^* t + \mu_i + e_p \quad (17)$$

where the coefficient of economic distance (φ) equals the coefficient of geographic distance or the convergence parameter if and when $q_{ij}^* \equiv y_{t-p}^*$, $t-p$ is the optimal length of the time lag, g^* represents the growth of Solow/Swan's technical change equal to fixed time effect if $t = 1$, and μ is a fixed country effect. One might in fact use the lagged value of the economic distance to alleviate the identification problem and make the interpretation of convergence more straightforward. Two countries can perform differently because of μ and still be close because of φ . Ideally, given data for 1960-2016, for example, we can estimate (17) in four scenarios: Scenario 1: 1960-2017 – full model; Scenario 2: 1960 -1974 post-independence growth period; Scenario 3: 1975-1994 period: Africa's lost decades; and Scenario 4: 1995-todate: "Africa rising" decades. Again, Table 1 shows potential key variables for this model, some of which I describe next..

2.2 Variables and data

Language: Many of the endogenous variables are the non-economic factors outlined in Hoselitz (1952), Afghah (1998), and Amavilah (2017). Among these culture tops the list, especially the *language aspects of culture* (Salzmann, 2004). Culture itself is a complex sum of many attributes; often it means different things to different people. Experts like Malinoswki (1944,1945) would include among the attributes of culture, codes of manners, attire, language, rituals, norms of conduct and belief systems (Coleman, 1988; 1990). Each attribute is critical to the sum. Kornai (1981), for example, suggests that norms control economic organization and behavior (Amavilah, 2010; 2014c; 2016).

The problem is that culture is often taken to be exogenous. The assumption is mistaken, because key

aspects of culture are both indigenous (native) as well as endogenous to the economy. Consider language again. It is tempting to argue that people speak the languages they were “born with” – first languages. However, using the insights from Robinson (1970) it is easy to infer that language is endogenous – it arises from necessity. In fact, language is the second human software invention, second invention only after the invention of tools (hardware). As such language depends on the state of the economy and evolves with it. This is no brand new insight. Without reading Steiner (1975) and the implicit debate between his world and Chomsky’s (1965) world of syntax, one might believe that the negative coefficient often associated with language as a proxy for ethno-fractionalization in growth regressions makes good sense. Upon a second look, it becomes clear that the negative effect of language diversity comes from the biblical parable of the Towers of Babel. There we are told God was unhappy with the arrogance of the rebel tower builders. He (God) increased language heterogeneity to reduce such arrogance and encourage emigration from Babel to other parts of the world. As a result 7000 world languages emerged. The erroneous conclusion is that productivity in Babel decreased, and hence the negative sign on the coefficient of language. The last part of the preceding statement doesn’t seem correct, because it misses that as Babelians emigrated, the population that stayed behind fell and its standard of living went up. Where Babelians went population increased, and with more workers production increased. This scenario is not different from the effects of European colonization of the so-called New World. Using Britain as an example, the country’s population went down as people went to live permanently in North America, Australia, New Zealand, and other places, while the standard of living in Britain increased. *The Columbian Exchange* was another externality – positive or negative - of colonization (Crosby, 1972, Nunn and Qian, 2010).

Again, the economy and language are jointly determined. Here is another interesting anecdote. At its peak gold mining in South Africa attracted miners who spoke different languages from all over Southern Africa and beyond. The mining economy grew fast and with it a new language, *fanakalo/Chilapalapa*, a pidgin from Zulu, English, and Afrikaans. Productivity and language growth rose together. Later when Apartheid was introduced and official languages (Afrikaans and English) instituted, rather than increase, productivity declined. Hence, it is not so clear that language homogenization is an advantage after all (Mezzana, 2010; Amavilah, 2006).

The adoption of one foreign official language is both a blessing and a curse. It is a blessing in that it enables interactions within countries, and knowledge and technology transfers between countries. Many African leaders and associated elites are blessed in this way. The curse is that the masses do not speak or even understand any of the foreign languages their leaders use to talk to them. In some cases up to three levels of translations are needed, and the more translations the weaker the transmission and slower the spread of the message. In this way whatever knowledge and technology language assisted to bring into the country ultimately does not spread, or it spreads very slowly. Understood this way language is endogenous, and its effect on performance is at least ambiguous. In fact, history shows that African countries that adopted foreign official languages have performed poorly relative to their Asian counterparts that kept their local languages. On the other hand, Latin America is more language homogenous than Asia, but no better-off (Amavilah, 2006).

Culture and risk: In *Risk and Culture* Douglas and Wildavsky (1982) reveal that risk-averse societies have less vibrant entrepreneurial activities than risk-assuming societies (Knight, 1951[1933]; 1921). The result is differential rewards. Kay (2005) asserts that culture explains why some countries are rich and others remain poor, suggesting that markets, even free markets, are just not enough to drive national well-being.

Tradition, class, marriage, family, and all that: Other related endogenous constraints are tradition, class, family and all that. Although it uses household and family interchangeably (see Canning, et al, 1994), the pure economic theory of the household is really that of the individual. Presumably household (family) decisions are made by the head of the family – the husband despite efforts for “sex equality” (Mill and Mill, 1970), or against marriage as “private property” (Engels (1902[1884]; 1968). In other social sciences like sociology the family plays strong functional and structural roles in the economy (Bell and Vogel, 1968). However, even with such recognition, the family, class, and tradition are still viewed as exogenous variables. This viewpoint is not wholly incorrect; not long ago one’s family, class and tradition were all predetermined. The rich were the rich, and the poor were the poor, and tradition decided social status, geographical residence, and even biological difference and genetic inheritance (Bowles, 1999; Bowles and Gintis, 2000; 2002; Mokomane, 2012). In other words, while the structure of the modern family has changed a lot, in many places the function of the family has not.

Karx Marx (1906) and Marx and Engels (1972[1848]) initiated a social revolution unlike any other that continues to-date, and Africa has not been immuned from it. The revolution has made the family, class, and tradition endogenous to the economy, meaning the economy, family, marriage, fertility, class and traditions are jointly determined (Becker, 1993; 1992; 1991; 1974; 1973; Becker, Glaeser, and Murphy, 1999; Haddad, Hoddinott, and Alderman, 1997; Phumaphi, 2011; Safilios-Rothschild, 1980).² We view these as constraints because in Africa extended family and the resulting inheritance structures serve as insurance, and therefore reduce incentives to save. Without saving there is no investment; without investment, no capital; without capital, no growth.

For the lack of data we proxy the family, class, and tradition with the ratio of the rural population to the urban population – Hoselitz’s urban-rural ‘cleavage.’ A high ratio means that the economy is generally traditional and the family and class play traditional roles. In that case the family, class, and tradition have a negative effect on national economic output, but not necessarily on own wellbeing is only empirically determinate. Where the economy has dominant effect the family structure and size has changed, the social classes have converged to the middle, and old traditions have become economizing (Malinowski, 1944; Lewis, 1965). Urban people not only save more than rural people because they have higher incomes, but also because they have more and alternative means of feeding themselves (Ssozi, Asongu, and Amavilah, 2017). Also technologies like family planning are more easily accepted and spread in non-traditional families (Phumaphi, 2011).

²See Volume 81 (1) of the *Journal of Demographic Economics* for different interpretations of Becker’s contribution to population economics alone.

Religion: Another endogenous constraint on the economic performance of African countries is religion, and not in the Marxian view that religion is an “opium to the masses,” but because it has played a huge role there as in all countries. The rapid spread of foreign religions (Catholic, Protestant, and Islam) was made possible by the fact that people everywhere have a predisposition to religion. Africans were not taught by foreigners to be religious, only to give up their old religions and follow new ones. Max Weber’s (1998[1930]) *Protestant Ethic and the Spirit of Capitalism*, assumed religion was important to economic activity, and went on to study which of the main religions was more influential for the development and productivity of the capitalist enterprise. Weber was uncommitted about whether or not the *Religions of the East* (1958; 1952; 1951; 1947) could have positive effects on human progress. Looking back at Weber’s work, Ming-Yih Liang (2010) has illustrated how the spirit of Confucianism has contributed to the Asian growth miracle, suggesting that research on the role of religion in economic performance is still ongoing today. Barro and McCleary (2003) find that there is a negative causal link between church affiliation and economic growth, and a positive one between religious beliefs and economic growth. Campante and Yanagizawa-Droft (2015) discovered that in Islam longer fasting reduces productivity but increases well-being, while Eum (2011) found no effect of religion on economic performance. Iannaccone’s (1998) review essay of the “economics of religion” as opposed to “religious economics” demonstrates the importance of religion as a source of employment, household production, human capital, and institutional and market environment with huge policy implications. Clearly, religion itself is endogenous even as religious beliefs are exogenous. Since there is no easy way to separate the two, one can measure religion as the percentage of each country’s population that does not identify itself with any of the major world religions. Adjustable formulas are readily available, see, e.g., Eum (2011, p.9). A low ratio suggests that religion is exogenous (Ogunbado, 2012; Lawson, 1985).

Wasteful mass consumption (C_w): I defined C_w as the product of the ratio (C_m/C) of imported consumption goods and services (C_m) to all consumption expenditures (C) divided by the ratio (K_m/K) of imported capital (K_m) to all capital (K). In other words, $C_w = (C_m K)/(C K_m)$. To be wasteful $C_m > K_m$, which reduces total consumption (C) without raising total stock of physical capital (K). Wasteful consumption penalizes both consumption and production thereby reducing welfare (Veblen, 1899; James, 1987). This appears to have been the case in Africa where ten years following political decolonization ushered in neocolonialism and left newly-independent countries between the hammer of Cold War and economic imperialism on the one hand, and the anvil of the desire for economic independence on the other hand. Many African countries attempted domestic capital formation, most of it in the form of fixed investments in “white elephants” – huge projects with low private, and even lower social, rates of return, increasing the prospects for *corruption* ever since (Mauro, 1995). Corruption is another indicator of endogenous wasteful consumption. Money in foreign accounts is investment in those countries, and a consumption good from whence it came.

Economic and political dependency (Depend): Not only are mass consumption and associated corruption endogenous to economic performance, they are a source of another endogenous variable of interest: Economic and political dependency, measured as the ratio of foreign aid and foreign debt to GDP ($(\text{Foreign Aid} + \text{Foreign Debt})/\text{GDP} = \text{Inflows}$) to capital outflows, i.e.,

Depend = Inflows/Outflows. We assume foreign aid is exogenous, but the debt structure is based on a concessionary formula which is a function of a country's GDP. The distinction between capital flows and capital stock opens up an opportunity to show that for the heavily indebted countries economic and political dependency is a serious burden on the economy, because if the inflows/outflows ratio is greater than one, then a country depends on foreign donors and lenders for all its budgetary support.

Institutions (G): The gap between the country's aspirations and its technical capabilities has given rise to government ineffectiveness, leading to weak institutions (Fosu, 2013; 2012) and hence to what Olsen (1983) has called "institutional sclerosis or arthritis" (Choi, 1983). The tertiary (public) sector ballooned, thereby reinforcing the economic and political dependency described above. This line of research indicates that institutions are endogenous constraints (Gradsteing and Konrad, 2006).

In sum: The variables above are all endogenous constraints that are interdisciplinary; they range from the anthropological to the sociological. In fact, they can be grouped together in one concept: ***Social capital*** (Castle, 2002). *In other words, a key endogenous constraint of the economic growth of African countries is social capital.* This should not be surprising. At the beginning of this essay I referred to Hoselitz's (1952) characterization of non-economic constraints of economic performance. Early development economists like Lewis (1965 [1955]), Meier, Bauer, and Seers (1984), Hirschman (1982; 1958), Sen (1983; 1999), Adelman (1988), and Adelman and Taft Morris (1967) were aware of these constraints. Unfortunately the awareness was swept under the carpet, so that "for more than 40 years ... the role of national and local institutions – political, legal and social – were largely neglected" (Woolcock, 1997a; 1997b) as interest shifted to ideological quantifications, or what Mishan (1974) has called "translating prejudices into respectable-looking numerals" (pp. 93-94).

In economics it took North's (1990), Ostrom and Ostrom's (1977) and Ostrom's (2009; 1977) work to reinstate the role of formal and informal institutions in the economic performance of countries. However, in other areas of study such a role has long been celebrated as apparent from Putman (1993; 1995), Fukuyama (1995), Evans (1979) and their references. Castle (2002) has attempted a working definition of social capital drawing upon Loury (1977) and Coleman (1990). He finds two characteristics of social capital that make it capital: durability and usefulness in consumption and production. Unlike Coleman (1990), however, Castle insists that social capital is not incidental to other public activities, but "it may require conscious decisions and sacrifice" (p. 333) – it is a result of purposeful investment. In fact, Castle goes on to say that "the presence of social capital means that individuals' decisions must be coordinated by some means in addition to the market" (p. 335), which is in line with Olson's (1983; 1982; 1965) model of collective action. The characterization is also consistent with Arrow's (1974, 1969, 1962) description of human capital. Economies rich in social capital tend to outperform those that are poor in social capital. Social capital encompasses microeconomic behavioral dispositions like those outlined in Glaeser, Laibson, and Sacerdote (2000) and macro-institutional dimensions like those addressed in Hall and Jones (1999), Easterly (2001; 1997), and Temple and Johnson (1998). Trust, for example, is a function of social networks and a source of social capital. Social capital is one of the foundations of the proximate factors of

production. The failure of governments to promote economic growth, and the negative effects of ethno-linguistic fractionalization are both signs of weak, or absence, of social capital.

The notion of modernization as the scrapping of traditional social relationships, because they are obstacles to progress, is really a rejection of a key source of economic growth (Amavilah, 2016). In Africa it led to the phenomenon Turnbull (1962) has termed “the lonely African,” in which old relationships are to be abandoned for being archaic, but new relationships were found unacceptable for being exploitative. Clearly “the lonely African,” often a highly educated individual, is superior among his/her people in the ways of knowing and understanding foreign cultures and other learned things, but he/she is inferior to his /her colleagues native to those cultures. Such superiority-inferiority duality is more constraining to economic performance than the defunct bio-psychological inferiority complex implicit in IQ test scores. The over-emphasis on free markets ignores that “the presence of social capital [alone] means that individuals’ decisions must be coordinated by some means in addition to the market” (Castle, 2002, p. 335; cf. Amavilah, 2010). This is because “social capital is defined as those group relations, or norms and networks, which facilitate accomplishment by social; and economic systems” (Castle, 2002, p. 336; Bowles, 1999). Hence, instead of being an exogenous constraint, social capital is an endogenous constraint on economic behavior (Kornai, 1983). A key difference between the two is that the growth of capital depends on that of social capital.

Table 1 - Key variables one would need to implement the framework

Dependent variables (y*)	Quality growth indicators: Inequality- adjusted HDI, etc.
Proximate independent variables (X)	Working population (N) per capita; Labor (L) per capita; Human capital per capita (H): Average years of schooling, Educational spending per capita, Health spending per capita; Physical capital (K) per capita; Inflation
Institutional variables	Government effectiveness; Bureaucracy; Rule of law; Corruption; State legitimacy; Policy index; Secure rights of property; Secure rights of personal liberty; Enforceable contractual rights; Responsive government, one that will hear complaint and make redress; Honest government free of rent-seeking
Global links	FDI per capita, Remittances per capita, Trade openness = exports/GDP, Diplomacy, Development aid, Regional grouping, Colonial legacy, etc.

6. Endogenous constraints = Social capital	Social development: Adelman-Morris index (Jerven, 2006), Culture, Language, Wasteful consumption, Religion, Tradition, Class, Family, Dependency, Ideology, Morality, Trust, Reciprocity, Truth, Power, Altruism, Institutional order, "The will to economize," Rural-urban cleavage, National character, Risk and uncertainty, Attire, Manners, Rituals, Norms
Economic distance variable(s) (q^*)	Economic outcome differences: GDP distance, Employment distance, Policy factors; Institutions; Migration flows, etc.
Africa dummy variables	Landlockedness, Ethno-fractionalization, Civil wars, Geography, Climate/weather, Adjacency, Geographical distance, Common language, Common currency, Tariff barriers, etc.

4. CONCLUDING REMARKS

Existing literature has overstressed the importance of exogenous constraints in the economic performance of African countries. In this essay I have attempted to call attention to endogenous constraints of economic performance in developing countries. I ask a simple question: "Which is more important as a hindrance to the economic performance of developing countries: Exogenous or endogenous constraints?" To address the question I define and illustrate the concept of economic distance, and outline a model for estimating the impact (coefficient) of economic distance. Subsequent analysis, albeit exploratory, shows that endogenous variables constrain economic performance more than exogenous variables. The essay is incomplete without its empirical companion. However, it sets up future research and current policy thought. It appears, the problem/solution is, at least in part, in the hands of "the man in the mirror."³ Continued focus on exogenous constraints is a misallocation of scarce policy and research resources.

³ This is a take on singer Michael Jackson's (1987) hugely popular song of the same name, see <https://www.youtube.com/watch?v=P5vz6iwV38U>.

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⁴This list is neither exhaustive nor specific. First, I wrote the essay, only after I finished it did I start thinking about who might I have influenced me on this particular topic. In case of any omissions due credit should go to whoever earned it, and I take the blame for any misrepresentations.

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