Does Colonial Origin Really Matter for Economic Growth in sub-Saharan Africa?*

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Abstract

This paper investigates the channels through which colonial origin affects economic growth in sub-Saharan Africa (SSA). Our findings suggest that colonial origin matters for growth in SSA and its likely transmission mechanism is human capital. In particular, our results suggests that British former colonies have acquired their superior economic performance over their French counterparts mainly because the negative effects of human capital growth on per capita GDP growth has been comparatively less severe in British former colonies. We do not find statistical evidence in support of the market distortion, trade openness, geography and natural resources channels. However, some channels that are statistically insignificant, notably, geography and natural resources, seem to be economically as important as the one that is statistically significant. The contribution of the study is in simultaneously exploring several feasible transmission channels between colonial origin and growth, which to the best of our knowledge, is yet to be explored in the literature. This approach has enabled us introduce some nuance into the colonial origins - growth debate.

Keywords: Colonial Origin, Human Capital, Institutions, Hausman-Taylor, sub-Saharan Africa

JEL Codes: F54, O47, I20, N17.

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1 Introduction

Over the past decades, a substantial volume of social science literature has dwelled on the subject of colonisation and economic performance of former colonies around the world. Economists became interested in colonial legacies in their search for the reasons why some countries have grown relatively slower than others. Notably, recent cross country empirical evidence suggests that the identity of the colonising power (or colonial origin) might help explain the observed growth differential amongst former colonies around the world[1]. In particular, it is claimed that on average, former British colonies have grown faster than former French colonies although much controversy still surrounds the likely mechanisms of transmission of any such colonial legacy.

For instance, some economists have attempted to establish a causal relationship between one aspect of colonial legacy - the coloniser's legal tradition (or legal origin) and a broad range of variables that are important for economic growth[2]. A key feature in many of these large empirical studies, is that when regional dummies for sub-Saharan Africa and Latin America are introduced in the regressions[3] or when other aspects of colonial policy such as human and physical capital indicators at the end of colonial rule are controlled for[4], the coefficient of the legal origin dummy generally tends to diminish in value and significance. Interestingly also, when one considers only the sub-Saharan African (henceforth, SSA) dataset, the internationally observed growth differential between Common Law and Civil Law countries disappears.

Furthermore, most of these empirical studies have fallen short of asserting any direct impact of legal origin on economic growth. In their recent findings, Acemoglu & Johnson (2005) and Klerman et al (2008) have concluded that legal origin cannot explain economic growth performance. Dam (2006) in Roe & Siegel (2009), also presents a range of conceptual and factual evidence in support of why the legal origins explanations are

[1] See for instance, the works by Klerman et al (2008), Rostowski & Stacescu (2006), Bertocchi & Canova (2002), and Grier (1999).

[2] These cross-country studies show that countries that followed the English Common Law legal tradition (henceforth referred to as Common Law countries) by colonisation or conquest, have on average grown faster than countries that followed the Civil Law tradition (henceforth, Civil Law countries), specifically, the French Civil Law countries. The protagonists of this debate are Raphael La Porta, Florencio Lopez-de-Silanes, Andrei Shleifer and Robert Vishny , henceforth LLSV (1997, 1998, 1999) & LLS (2008). See also Levine et al (2000, 2002).

[3] Mahoney (2001:517) reports a drop in the coefficient of the Common Law dummy from 0.714 (significant at the 1% level) to 0.561(significant at the 5% level) when dummies for sub-Saharan Africa and Latin America are introduced in the regressions. It is equally important to note that, the dummies for these two regions are each highly statistically and economically significant.

[4] See Grier (1999), Bertocchi & Canova (2002) and Klerman et al (2008).

flawed.

Even supposing that the evidence on legal origins is robust, as Klerman et al (2008) have argued, it will still be difficult to attribute the differences in economic performance between Common Law and Civil Law countries *uniquely* to legal origin (or law) because other aspects of colonial policy such as education, trade, exchange regimes, fiscal and monetary policies or the style of local governance might also matter. Against this backdrop, our study seeks to investigate the channels through which colonial origin affects growth, using SSA as case study. But first the theoretical foundations of the study is in order.

1.1 Theoretical Foundations

Historical sources claim that as of the late nineteenth century, Britain was the only imperial power that was committed to free trade, whilst the other European powers, notably France, were still building up their rival industries through protectionism[5]. Correspondingly, whilst British colonial economies were not under the obligation to export only to England, French colonial economies were compelled to trade mainly with France[6]. As such, it can be argued that one of the important legacies of British colonisation on its former colonies has been a long exposure to world competition through trade openness[7], which might possibly explain why British former SSA colonies adjusted much rapidly to structural adjustment programmes implemented in the late 1980's in comparism to their French counterparts[8].

Another channel through which the legacy of colonisation might have been perpetuated, which does not yet seem to find expression in the literature is the distortionary impact of different colonial taxation systems on private investment incentives. Historical sources[9] claim that the dual system of administration of their colonies, characterised by punitive taxation and forced labour on the general population was a distinctive feature

[5] Grier (1999:320) reports that since 1830, Britain has had a free trade policy and as from 1846, British colonies were no longer forced to give British goods preferential treatment. Hence these colonies have had a long history of free trade, while the French enforced mercantilist and protectionist measures throughout the colonial period. For additional evidence see also, Maddison (1971:35), Bolton (1973:24) and Duignan & Gann (1975).

[6] See Fieldhouse (1966:306)

[7] During the inter-war period, Nigeria alone exported five times as much as all the French colonies in West Africa, Rostowski & Stacescu (2006:12).

[8] The evidence also points to the fact that former British SSA colonies grew much faster than French SSA colonies after structural adjustment.

[9] See for instance, Crowder (1968:185) and Asiwaju (2000).

of French colonial rule in sub-Saharan Africa[10]. The implications of this unique approach to local administration is to be found in the colonial legacy of taxation pursued in the post-colonial era.

For instance, Maddison (1971) has argued that one of the important legacies of British colonisation is that its former colonies inherited relatively lower levels of taxation, because indirect rule is cheaper to administer compared to direct rule. Austin (2008:1011) also argues that until very late in the colonial period, there was no direct taxation in southern Ghana and Nigeria - two of the most successful British colonies in tropical Africa. If this evidence is true, then it could imply that British former colonies are associated with relatively lower degrees of distortions of economic activity through taxation which could in turn imply greater private investment incentives or more free trade on the domestic scale.

Furthermore, it is well documented that educational policy was potentially the area of greatest distinction between different imperial administrations of colonies. Accordingly, it is claimed that England pursued more enlightened educational policies in its colonies than did France whose educational philosophy centered around the idea of assimilation. For instance, it is widely held that primary instruction in British former colonies was administered through village schools using native teachers and the local vernacular languages of the people, whilst in French former colonies, pupils were generally boarded from home to far away schools where they were taught in the French language, using French textbooks, and by French teachers. This is suggestive of a different approach to educational provision with different repercussions on post-independence human capital accumulation and development.

Yet another important factor that shaped colonial institutions and hence the colonial heritage, that has often been overlooked in the colonisation and growth literature is geography[11] or the influence of the disease environment. As Acemoglu et al (2001) have shown, the major colonial powers did not choose empires randomly. Klerman et al (2008) argue that England, being the dominant colonial power in the late nineteenth century tended to colonise places of strategic advantage[12] such as coastal locations or colonies

[10] Crowder (1968:186) argues that the "code d'indigénat", which was instituted in French sub-Saharan Africa aimed at achieving the employment of native labour through the imposition of relatively high taxes on blacks and in default of payment they would incur a sentence of forced labour.

[11] Sachs (2003) and Engerman & Sokoloff (2002) have shown that geography matters for economic growth and its effect could either be direct or indirectly through institutions.

[12] Britain in Egypt is often quoted as a good example as it provided a naval vantage point in the mediterranean, as well as a gateway to India through the Suez Canal, Thorn (2000:11).

with natural resource endowment. This first mover advantage or "selection bias" might possibly suggest that British colonies were endowed with superior institutions in the first place, according to Acemoglu & Johnson (2005) hypothesis[13].

As evidence, Klerman et al (2008) show that colonial origin does not matter after geographical factors are controlled for, which lends support to the selection bias hypothesis that differences in initial conditions rather than in colonial policy (legal, educational, or other) are the best explanation for different growth rates amongst former colonies. However, Klerman et al (2008) results on geography are inconclusive as they themselves admit.

Finally, an important colonial legacy that also merits attention in the empirical literature is the impact of the Franc CFA currency board which links France to most of its former SSA colonies. The Franc CFA currency board, it is argued, has been instrumental in lowering inflation and the black market exchange premium while enhancing the contribution of imports to GDP growth. Considering the fact that almost all former British SSA colonies have floating exchange regimes, these different exchange regime structures might well serve as a plausible channel for explaining the different growth outcomes in the two former empires.

From the preceding discussion, it is clear that the legal origins theory, no matter how elaborate and expansive its proponents make it to be[14], is unlikely to be the *sole* or even the main source of influence of colonial legacy on the post-independence economic performances of former colonies. Klerman et al (2008:4) also agree that there is no rationale for broadening the conception of legal origin to include all aspects of colonial policy when indeed one can simply substitute this broad conception of legal origin with the identity of the colonial power.

Because colonial origin encompasses all aspects of colonial legacy including legal origin, studies seeking a holistic understanding of the influence of colonisation on former colonies' post-independence economic performances should instead be analysing the impact of colonial origin on growth, rather than just the impact of legal origin on growth.

Our tasks in this paper is to investigate further the channels through which colonial

[13]The depth of colonial engagement in moulding growth-conducive institutions is a function of the first mover advantage.

[14]Following the persistent lack of significance of legal origins in growth regressions, La Porta et al (2008:286) in their latest article, have adopted a somewhat broader and seemingly ambiguous conception of the notion of legal origin *"as a style of social control of economic life"* implying legal origin should stand for "strategies of social control that can either support private market outcomes or implement specific state policies".

origin affects growth, using only the SSA dataset. The interest in a sub-Saharan Africa-specific case study is based on two main reasons.

The first and most important reason why a separate study of SSA might prove insightful to the current debate is that SSA offers a more balanced framework of analysis than the world pool owing to the fact that nearly all French colonies studied in the world sample are from SSA, while British colonies in the sample are spread more evenly across the globe. The preceding point is dramatised by the fact that nearly all SSA countries experienced abysmal growth performances during most of the period of these cross-country studies. To eliminate this possible selection bias against French former colonies, it is appropriate not only to compare them with other countries in the same region but also with countries that faced similar growth challenges such as structural adjustment programmes, during the same period of time.

Secondly, as mentioned earlier in the paper, one of the currently contentious issues in colonial origins debate is the effect of geography. Because European powers did not choose empires randomly, the possibility of "selection bias" explaining the observed growth differential amongst former colonies is possible. However, the proxies that have been used in the literature to capture the selection bias channel of transmission have been to say the least, dubious in nature.

For instance, in their regressions controlling for the influence of geography, Klerman et al (2008) use a different dummy for Latin America which includes the Caribean islands and this change restores some statistical significance to the British former colony dummy variable. While their dummy for SSA excludes islands off the coast of Africa (e.g. Madagascar) and South Africa. Again, changing the SSA dummy this way had the effect of dramatically raising the coefficients and significance of the former British, former Belgian and former Dutch colony dummy variables. Klerman et al (2008) themselves are quick to admit that their results are highly dependent on their definition of the regional dummies for Latin America and sub-Saharan Africa and on which set of countries is analysed.

To be thorough on this, we propose to segregate the SSA dataset from the world sample and in the place of regional dummies as proxies for geography, we propose to use more meaningful proxies such as, a dummy for landlockedness, and a dummy to capture the presence of natural resources in the country[15], in the hope of unraveling the exact nature of the relationship between colonial origin, geography and growth, at least within the context of SSA.

[15]Lack of consistent data covering the period of analysis precludes the use of variables that capture the disease environment such as the percentage of the country's area with malaria or yellow fever.

In summary, this paper will investigate the following likely channels of transmission between colonial origin and growth viz.

■ *The human capital channel*: which will be proxied by three alternative variables, namely, the average years of schooling in population aged 15 and above during 1960-2000 (AYS15), secondary enrolment rates during 1960-2000 (SEC), and average life expectancy during 1960-2000 (LIFE).

■ *The trade openness channel:* which will be proxied by two variables namely, openness to international trade during 1960-2000 (OPEN) and export share in GDP during 1960-2000 (EXP).

■ *The market distortion channel:* which will be captured by the black market exchange rate premium during 1960-2000 (BMP). For robustness, we also use government consumption as share of GDP during 1960-2000 (GCON).

■ *The geography channel:* which will be captured by a dummy for landlockedness (LANDLOCK).

■ *The selection bias channel:* which will be proxied by a dummy for natural resource endowment[16], capturing notably, the presence of oil, gold, cocoa or diamonds in the country (DNRES).

Table 1 above presents results from partial correlations of the different causal mechanisms on colonial origin, controlling for initial income. The results show that in comparison with French colonial origin, British colonial origin is strongly associated with higher human capital endowment as proxied by all three human capital measures listed above. The results also show that British colonial origin is associated with greater trade openness as proxied by openness and export share in GDP. Table 1 further shows that British colonial origin is associated with greater market distorsion as proxied by the black market exchange premium. British colonial origin countries are also associated with greater natural resource endowments than French colonial origin countries.

This paper is organised as follows. Section 2 is the methodology section. Section 3 presents our most important results and checks for their robustness. Section 4 compares our results to those in the literature, notably by Klerman et al (2008), Rostowski & Stacescu (2006), Bertocchi & Canova (2002) and Grier (1999). Section 5 concludes.

[16]Rhoda (1973:19), Bolton (1973:24) and Douglas (1978:265) have argued that an important motive for acquiring colonies was the search for raw materials for use in production in the imperial economy.

Table 1: Partial Correlations of Different Transmission Mechanisms on Colonial Origins

	AYS15[1]	SEC[1]	LIFE[1]	EXP[1]	OPEN[1]	INV[1]	BMP[1]	GCON[!]	NRES[1]	LANDLOCK[1]
BCORG	1.373***	8.422***	4.277***	9.068***	25.568***	4.732***	66.384***	-2.801	0.099*	0.065
	(0.263)	(1.861)	(0.835)	(2.260)	(6.199)	(1.186)	(23.929)	(1.831)	(0.054)	(0.062)
OCORG	-0.412	-2.770	-2.059*	-0.401	0.592	-0.409	145.213***	6.193***	0.324***	-0.019
	(0.288)	(2.495)	(1.119)	(2.932)	(8.351)	(1.459)	(34.265)	(2.347)	(0.072)	(0.082)
LOGPCGDP60	0.472**	6.492***	2.052***	15.472***	3.908	-0.707	21.397	-4.494***	0.192***	-0.155***
	(0.217)	(1.485)	(0.666)	(2.069)	(5.762)	(1.111)	(20.526)	(1.468)	(0.041)	(0.047)
CONSTANT	-1.552	-33.662***	30.199***	-84.189***	38.077	13.761*	-137.555	54.514***	-1.183***	1.449***
	(1.653)	(10.734)	(4.818)	(15.507)	(42.906)	(8.235)	(148.144)	(10.602)	(0.299)	(0.340)
No OBS	192	275	275	259	282	291	254	261	296	296
R-SQUARED	0.25	0.14	0.15	0.28	0.07	0.08	0.07	0.08	0.12	0.05

Robust standard errors are presented in parentheses. 1% level of significance is denoted by ***, 5% by ** and 10% by *

(1) These results are robust to the exclusion of Botswana. (2) Without Botswana, BCORG coefficient increases in magnitude and becomes significant at 5%. French colonial origin (FCORG) is the omitted category.

2 Methodology

This section describes the empirical model, the estimators, the estimation strategy and also presents the variables and datasets used in the paper.

2.1 Empirical Model

The question we seek to answer is whether colonial origin really matters for economic growth in SSA during 1960-2000. If yes, what are its channels of transmission and if no, why does it not matter?

To answer this question, we specify the regression model as follows:

$$GROW_{it} = \alpha + \beta_i COLO_i + \gamma_i TRANSM_{it} + \delta_i X_{it} + \mu_i + \varepsilon_{it} \quad (1)$$

where $GROW_{it}$ is the natural logarithm of per capita GDP growth. $COLO_i$ is a matrix of colonial origin dummies comprising $BCORG$ (which takes the value 1 for British colonial origin and zero otherwise), $FCORG$ (which takes the value 1 for French colonial origin and zero otherwise) and $OCORG$ (which takes the value 1 for non-British and non-French colonial origins and zero otherwise)[17]. $TRANSM_{it}$ is a matrix of control variables that serve as likely transmission channels between colonial origin and growth while X_{it} is

[17] Ofcourse, only two of the colonial origin dummies enter the regression at a time, while the third dummy serves as base.

the matrix of other control variables that are standard in the growth literature, notably, initial real per capital incomes, population growth, investment, inflation and ethnolinguistic fractionalisation. μ_i is a vector of individual country effects reflecting unobservable country heterogeneity and ε_{it} is a vector of error terms.

2.2 Choice of Estimator

We perform our analysis on the empirical model specified in equation 1 above using a core dataset of thirty eight (38) SSA countries during 1960-2000. The ideal estimator for estimating nonstationary heterogeneous panels in which the number of groups and number of time-series observations are both large is the Pooled Mean Group Estimator (PMGE) proposed by Pesaran, Shin, and Smith (1999). This estimator also provides estimates of the traditional fixed effects (FE) model. The advantage of estimating the FE model is that it allows for heterogeneity of individual country effects which is important for cross-country studies such as this one. However, because of the assumption of homogeneity of slope coefficients, the FE estimator is incapable of estimating the coefficients of the colonial origin dummies.

The random effects (RE) estimator, on the other hand, assumes exogeneity of all the regressors and the random individual effects. This implies that in the presence of endogeneity, estimates obtained from the RE model will be biased, and hence inferences from these are likely to be misleading. This is equally true for the OLS estimator which also assumes exogeneity of all regressors and the random individual effects.

Against these two contrasting worlds of all or nothing correlation between the individual effects and the regressors, Hausman and Taylor (1981) in Baltagi et al (2003) proposed a model where *some* of the regressors are correlated with the individual effects. The Hausman-Taylor (HT) model thus bridges the two extreme worlds of all (FE world) or nothing (RE world) choice of correlation between the individual effects and the regressors. As Baltagi et al (2003:362) have argued, the HT model is preferable whenever the model requires *some* of the regressors, but not all, to be correlated with the individual effects.

The HT model can be written as:

$$y_{it} = X_{it}\beta + Z_i\eta + \alpha_i + \mu_{it} \tag{2}$$

where $i = 1, 2, ..., N$ *and* $t = 1, 2, ..., T$.
α_i *is* $IID(0, \sigma_\alpha^2)$ *and* μ_{it} *is* $IID(0, \sigma_\mu^2)$.

Both α_i and μ_{it} are independent of each other and among themselves.
The Z_i are individual time − invariant variables.

Hausman and Taylor split $X = [X_1, X_2]$, and $Z = [Z_1, Z_2]$ into two sets of variables such that X_1 is $n \times k_1$, X_2 is $n \times k_2$, Z_1 is $n \times g_1$, Z_2 is $n \times g_2$ and $n = NT$.

X_1 and Z_1 are assumed exogenous and not correlated with α_i and μ_{it},while X_2 and Z_2 are endogenous due to their correlation with α_i but not with μ_{it}.

Under equation 2 above, OLS will yield biased and inconsistent estimates, while the FE estimator which eliminates the endogeneity resulting from the presence of the α_i term in the model, gives consistent estimates. However, the FE estimator also eliminates the time-invariant variables, Z_i, hence cannot yield estimates of η. The RE estimator, which is GLS on equation 2, ignores the endogeneity due to α_i and therefore will yield biased though consistent estimates.

Hausman and Taylor suggest an instrumental variable estimator which premultiplies equation 2 by $\Omega^{\frac{-1}{2}}$ where Ω is the variance covariance term of the error component $\alpha_i + \mu_{it}$, and then performs two-stage least squares (2SLS) using as instruments $[Q, X_1, Z_1]$. Q being the within transformation matrix with $\widetilde{y} = Qy$ having a typical element $\widetilde{y_{it}} = y_{it} - \overline{y_i}$ and $\overline{y_i}$ is the individual mean. As Baltagi et al (2003) show, this turns out to be equivalent to running 2SLS with $\left[\widetilde{X}, \overline{X_1}, Z_1\right]$ as the set of instruments[18].

It is important to emphasize that when the model is identified, that is, if there are at least as many time-varying exogenous regressors X_1, as there are individual time-invariant endogenous regressors Z_2, i.e. $k_1 \geqslant g_2$, then the HT estimator is more efficient than the FE estimator. The HT estimator is identical to the FE estimator in estimating β if the model is under-identified, that is where $k_1 < g_2$, and in this case, one cannot obtain estimates of η.

2.3 Estimation Strategy

The empirical strategy consists of two stages. In the first stage, we test the hypothesis that colonial origin matters for growth in SSA using the RE estimator. We estimate 15 different model specifications of the RE model with per capita GDP growth as the dependent variable in all specifications. Model 1 includes only colonial origin dummies as

[18] Baltagi et al (2003) also argue that the HT estimator is based on an instrumental variable estimator which uses both the between and within variation of the strictly exogenous variables as instruments. More specifically, the individual means of the strictly exogenous regressors are used as instruments for the time invariant regressors that are correlated with the individual effects, Baltagi (2001).

the explanatory variables. Model 2 includes in addition to the colonial origin dummies, the black market exchange rate premium to account for the influence of the market distortion transmission channel. Model 3 includes, in addition to all the variables in model 2, the interaction terms of colonial origin with black market exchange premium.

More generally, the interaction terms for each transmission channel are obtained by multiplying each colonial origin dummy by the variable that proxies for the channel and its purpose is to tell us whether the impact of that channel on growth in a specific colonial origin context is more important than in another colonial origin context[19].

Model 4 introduces the influence of another transmission channel, that is, openness to international trade, while model 5 controls for the impact of possible differences in openness amongst different colonial origins. Model 6 introduces the influence of the human capital transmission channel while model 7 controls for differences in human capital amongst different colonial origins. Models 8 introduces the influence of the geography channel while model 9 controls for differences amongst different colonial origins. Model 10 introduces the influence of the natural resources (or selection bias) channel while model 11 controls for differences amongst different colonial origins.

Model 12 includes, besides the colonial origin dummies, all the five different transmission channels. Model 13 includes in addition to all the variables in model 12, the interaction terms of all the transmission channels with colonial origin dummies. Model 14 includes, in addition to all the variables in model 13, a variable called DUREE to control for the duration of colonial rule. Model 15 includes in addition to all the variables in model 14, five control variables that are standard in empirical growth models, namely, initial real per capital incomes, population growth, investment, inflation growth and ethnolinguistic fractionalisation.

Considering the fact that the results obtained in stage one above are biased, although consistent, inferences made on them are likely to be misleading. Thus, the second stage of the estimation strategy will consist of submitting the strategy used in stage one under an alternative and more appropriate estimator notably, the HT estimator.

Stage two estimation comprises four model specifications of the HT model with per capita GDP growth as the dependent variable in all specifications, as before. Model 1 includes only the five transmission channels, besides the colonial origin dummies. Model

[19]The growth model with interaction terms can be expressed as: $Y = a + bX_1 + cX_2 + dX_1X_2 + \mu_i$, where X_1 and X_2 represent the matrix of transmission channels and the vector of colonial origin dummies respectively. $\frac{\partial Y}{\partial X_1} = b + dX_2$ tells us whether the impact of a channel, X_1, is different in British colonies as opposed to French colonies.

2 includes all the interaction terms, besides all the variables in model 1. Model 3 controls for the duration of colonial rule and includes all the variables in model 2. Model 4 controls for the standard determinants of growth (same five controls used in stage one above) and includes all the variables in model 3. We also test for the sensitivity of the results of model 4 to the presence of outliers, notably, Botswana.

2.4 Variables and Data

We classify SSA countries into three broad colonial origin families - British colonial origin (BCORG) for colonies that acquired their independence from Britain, French colonial origin (FCORG) for countries that acquired independence from France and other colonial origin (OCORG) for countries that acquired independence from European powers other than Britain and France. By basing colonial origin on the identity of the coloniser through which independence was acquired, we are assuming in line with the tradition in the literature that it is the colonial power that granted independence that significantly shaped the country's post-colonial future[20].

The decision to bundle all the non-British and non-French SSA colonial origins (mainly Portuguese, Belgian, Italian and Spanish) into one common group (Other Colonial Origins) is for purely practical reasons as the number of countries in these categories are relatively small. Countries that witnessed a relatively short period of colonisation (e.g. Ethiopia) or which were never colonised (e.g. Liberia) are excluded from my sample. We also exclude South Africa, Cape Verde and the Comoros Island from my core sample of analysis. The reason for excluding South Africa is mainly because it acquired its independence from Britain in 1910, roughly 50 years earlier than most of the SSA countries in my sample, and furthermore, it followed a very distinctive post-independence historical path from the rest of the countries in my pool. Cape Verde and the Comoros Island are excluded for lack of consistent data. See appendix A for a classification of the countries in our dataset.

The dependent variable in all regressions is per capita GDP growth (GROW) obtained from The Africa Research Program datasets. Because economic growth is a long run phenomenon, we abstract from short run fluctuations by transforming the annual period growth into five year period averages of per capita GDP growth over the period 1960-2000

[20] This might be a significant limitation, especially for those countries that had more than one European colonial experience. A notable example of this is Cameroon. One way to get around this constraint could have been to introduce interaction terms to capture these specific cases. However, this option is not feasible as it greatly reduces the degrees of freedom thus creating a small sample problem.

which effectively reduces the timespan of analysis from 40 annual period observations to eight 5 year period observations per country[21]. We also use five year averages for all variables that span over the 1960-2000 period.

Our preference for five year averages instead of using simple cross section averages over the entire 40 year period is to avoid a substantial loss of information that is inherent with cross section studies. Further, in cross section analysis the results tend to be driven mainly by cross-country variations, thus reducing cyclical variations in the individual countries[22].

Besides the colonial origin dummies, our other choice explanatory variables is a set of variables that capture the five different transmission mechanisms between colonial origin and growth. These include viz.

■ The average years of schooling in the population aged 15 and above during 1960-2000 (AYS15) to capture the human capital transmission channel. The conventional growth literature suggests that higher educational attainment levels are good for growth as it raises the overall productivity of the economy. However, recent empirical studies, notably by Pritchett (2001) and Buraside et al (2003) suggests that growth in human capital is detrimental for per capita GDP growth. The interaction terms of colonial origin with the average years of schooling in population aged 15 and above, are AYSBRI, AYSFRE, and AYSOTH, for British, French and Other colonial origins respectively.

■ The average share of exports and imports in GDP during 1960-2000 (OPEN) to capture the trade openness transmission mechanism. The literature suggests that SSA countries that were more open to trade have indeed grown faster than those that were not[23]. Rodrik (2002) however holds a dissenting view. Thus, there is no unanimity as to the expected sign of the openness variable in the growth regressions. The interaction terms of colonial origin with openness are OPENBRI, OPENFRE and OPENOTH, for British, French and Other colonial origins respectively.

■ An annual index of the black market exchange rate premium during 1960-2000 (BMP) to capture the market distortion mechanism. Easterly (2002) finds a strong negative association between black market premiums and growth. The interaction terms of colonial origin with market distortion are BMPBRI, BMPFRE and BMPOTH, for British, French and Other colonial origins respectively.

[21] We note that the last period from 1994-2000 consists of 6 years, instead of 5 as in all the previous time periods.

[22] As Quah (1993a,1993b) in Grier (1999:321) has argued, cross sectional regressions of time averaged data are uninformative because of possible trend breaks and variance changes in the individual country time series.

[23] See for instance, Sachs & Warner (1997).

■ A dummy variable (LANDLOCK) taking the value of 1 for SSA countries that are landlocked and zero otherwise, to capture the geography transmission mechanism. The literature suggests that landlockedness is a major handicap to economic performance by raising transport costs[24]. The interaction terms of colonial origin with geography are LANDBRI, LANDFRE and LANDOTH, for British, French and Other colonial origins respectively.

■ Finally, we introduce a dummy variable (DNRES) taking the value of 1, if the country has a rich endowment of natural resources, notably oil, gold, diamonds or cocoa and zero otherwise; to capture the natural resource or selection bias transmission channel. The literature suggests that the colonisers' did not choose empires randomly hence, the presence of natural resources might have influenced their choices and consequently, the depth of colonial engagement. This suggests that the presence of natural resources could proxy for better institutions and superior economic performance. In a recent influential study by Ndulu et al (2008), resource endowments have been identified as one of the positive drivers of growth in SSA.

However, an earlier study by Collier et al (2006) identified the presence of natural resources as one of the main drivers of societal conflict which can be negatively associated with growth. Svensson (2000) provides evidence to show that countries that are both commodity (like cocoa or oil) producers and ethnically divided are likely to be more corrupt[25]. Thus, if the findings by Mauro (1995) are correct, natural resources rich countries which are also ethnically divided should grow slower. Hence, the expected sign of DNRES in the regressions is imprecise. The interaction terms of colonial origin with natural resource endowments are NRESBRI, NRESFRE and NRESOTH, for British, French and Other colonial origins respectively.

In addition to this set of transmission mechanisms, we introduce a variable, DUREE, to capture the duration of colonial rule. DUREE is obtained by subtracting the respective country independence year from the year of colonisation.

Furthermore, we introduce another set of five controls which are standard in the growth literature. These are:

■ The natural logarithm of initial real per capita GDP in 1960 (LOGPCGDP60) to capture convergence effects. The standard neoclassical growth literature claims that

[24] An interesting paper by Gallup, Sachs & Mellinger (1999) in Rostowski & Stacescu (2006) present two constant returns models in which transport costs affect not only levels of GDP per capita, but also their growth rates.

[25] The 'common pool' resource problem.

countries with lesser initial conditions of technology and income should grow faster than countries with somewhat better initial conditions, due to the assumption of diminishing returns in investment in technology. However, it has been suggested that there might be no convergence in samples with countries having very diverse initial conditions. Infact, Romer (1987) and Rebelo (1991) show that there is no correlation between initial per capita GDP and subsequent GDP growth. Nonetheless, we use initial per capita GDP in 1960 to control for possible convergence in our growth model.

■ A measure of ethnic fractionalization (ETHNIC) to control for rent seeking or the negative effects of ethnic diversity on economic policy making. Easterly & Levine (1999) have argued that SSA's disappointing economic performance since 1960 is to be blamed on poor policy choices engendered by highly fractionalized ethnic societies.

■ The growth rate of population during 1960-2000 (GPO) to control for the effect of demographic factors on growth. We follow Kormendi & Mequire (1985) and Grier & Tullock (1989) in Grier (1999:321) in suggesting a possible correlation between labour force growth (proxied by population growth) and income growth. We thus control for potential causation running from population growth to GDP growth and the two are expected to be negatively correlated.

■ The growth rate of inflation during 1960-2000 (INFL) to capture the negative effects of price instability and rent seeking on growth. Hayek (1944) and Friedman (1977) in Grier (1999:322) both claim that inflation uncertainty increases price variability, thus harming economic growth.

■ The average share of real investment[26] in GDP purchasing power parity during 1960-2000 (INV) to account for the contribution of physical capital accumulation in per capita GDP growth. The standard neoclassical growth literature suggests that investment in physical capital is good for growth during transitional dynamics, although this might not be the case at steady states. The expected sign on INV in the regressions is thus imprecise.

Finally, it is appropriate to indicate the *à priori* classification of these variables into the various HT categories. The HT model requires classification of variables into the following four categories, namely, time-variant exogenous variables, time-invariant exogenous variables, time-variant endogenous variables and time-invariant endogenous variables. However, the latter category need not be included for the model to be correctly specified.

[26] The variable includes both private and public investment.

Based on economic theory, we regroup our variables into the following three HT categories viz.

■ *Time Variant Exogenous Variables:* The black market exchange rate premium during 1960-2000 (BMP), and the interactions of colonial origin with black market premiums, BMPBRI, BMPFRE and BMPOTH.

■ *Time Variant Endogenous Variables:* Average years of schooling (AYS15), Openness (OPEN), Investment (INV), Inflation (INFL), and Population growth (GPO). Accordingly, we also include the following interaction terms, AYSBRI, AYSFRE, AYSOTH and OPENBRI, OPENFRE, OPENOTH for schooling and openness variables respectively.

■ *Time Invariant Exogenous Variables:* British colonial origin countries (BCORG), French colonial origin countries (FCORG), other colonial origin countries (OCORG), duration of colonial rule (DUREE), dummy for landlockedness (LANDLOCK), dummy for natural resource endowment (DNRES), Ethnic fractionalisation (ETHNIC), and the natural logarithm of initial real per capita income (LOGPCGDP60).

Figure 1 in the appendix provides summary descriptive statistics for each variable that we use in the regressions. Panel A of figure 1 describes statistics for the full SSA sample, while panel B compares the means of variables by colonial origins. Most of our data comes from The Africa Research Program dataset, and Global Development Finance and World Development Indicators. Appendix B provides a full list of variable definitions and sources.

Panel B of figure 1 suggests that there are no marked differences in demographic characteristics (captured here by population growth), in inflation variability, in government consumption, in natural resource endowments and in ethnic diversity between former British and former French SSA colonies[27]. Panel B also suggests that during 1960-2000, former British and former French SSA colonies differed significantly in the terms of the following - initial real per capita GDP in 1960, growth record in per capita GDP, human capital endowments, trade openness, landlockedness, investment share in GDP PPP, and black market exchange premium rates. It is also striking to note that, in comparism with French colonial origin, British and Other colonial origins witnessed significantly longer durations of colonisation.

[27] Notwithstanding, we observe a very striking difference in inflation and ethnic diversity between former French SSA countries and other colonial origin countries.

3 Results

This section presents results from the two stage estimation strategy followed by checks for their robustness. A discussion of the results concludes the section.

3.1 Results using GLS estimator

Figure 2 in the appendix reports results of 15 panel estimations of growth on colonial origin sequentially controlling for each of the transmission channels (models 2 - 11), then controlling for all the transmission channels together (models 12 & 13), thereafter controlling for the duration of colonisation (model 14) and finally controlling for other determinants of growth (model 15).

The results in model 1 of figure 2 suggests that colonial origins does matter for economic growth in SSA during 1960-2000 and British former colonies have grown about 1.1% per year, faster than French former colonies. The introduction of the black market exchange premium in model 2 does not alter the economic and statistical significance of the British colonial origin dummy, and the coefficient on black market premium is statistically significant as well.

Controlling for differences in market distortion across colonial origins in model 3 instead increases the magnitude of British colonial origin dummy (which remains significant at 5%), and the British colonial origin market distortion interaction term (BMPBRI) is equally significant (at 10%). However, the magnitude of BMPBRI is -0.007 which is economically insignificant. This suggests that British former colonies have not had their superior economic performance through the market distortion channel.

The results in model 4 where trade openness enters alongside colonial origin dummies in the regression show a reduction in the economic and statistical significance of British colonial origin dummy. The results also suggests that openness is statistically but not economically important for growth in SSA. Controlling for differences in openness across colonial origins in model 5 completely obliterates the significance on the British colonial origin dummy, although the British colonial origin openness interaction term (OPENBRI) is equally insignificant. The magnitude of OPENBRI is 0.008 which is economically insignificant. This suggests that British former colonies have not had their superior economic performance mainly through the trade openness channel.

The results in model 6 where average schooling years enter alongside colonial origin dummies in the regression completely obliterates the statistical significance of British

colonial origin dummy. The results also suggests that the contribution of human capital growth to per capita GDP growth during 1960-2000 has been negative. Controlling for differences in education growth across colonial origins in model 7 slightly reduces the magnitude of British colonial origin dummy (which remains insignificant), and the British colonial origin education interaction term (AYSBRI) is equally insignificant. Although the results are statistically insignificant, they nevertheless suggest that an additional schooling year reduces per capita GDP growth by 0.04%, 0.1% and 0.2% annually in British, French and Other former colonies respectively. This tentative result only enables us infer that the negative effects of human capital growth have been less detrimental in British former colonies as opposed to French (or Other) former colonies but it does not enable us validate the human capital transmission channel as the likely explanation for the superior economic performance of British former colonies.

The results in model 8 where landlockedness enters alongside colonial origin dummies in the regression leaves both the magnitude and statistical significance on British colonial origin dummy unchanged. However, controlling for differences in landlockedness across colonial origins in model 9 completely obliterates the significance on the British colonial origin dummy, although the British colonial origin landlockedness interaction term (LANDBRI) is equally insignificant. The magnitude of LANDBRI is 0.45 which is economically significant. This suggests that landlockedness might have been less of a handicap to growth in British former colonies as opposed to French former colonies but the results does not enable us validate the geography channel as likely explanation for the superior economic performance of British former colonies.

The results in model 10 where natural resources enters alongside colonial origin dummies in the regression leaves both the magnitude and statistical significance on British colonial origin dummy unchanged. Furthermore, controlling for differences in natural resources across colonial origins in model 11 still leaves the magnitude and statistical significance on British colonial origin dummy unchanged, and the British colonial origin natural resource interaction term (NRESBRI) is insignificant. Although the magnitude of NRESBRI (0.55) is large, these results suggest that the presence of natural resources or selection bias, is not the main explanation for the superior economic performance of British former colonies.

The results in model 12 where all the channels simultaneously enter the regression alongside colonial origin dummies, show that market distortion is the lone statistically significant channel. Simultaneously controlling for both the individual channels and their

differences across colonial origins in model 13, reveals three possible mechanisms of transmission between colonial origin and growth, namely, education, geography and natural resources.

The first transmission channel that emerges from the results in model 13 is education. The results show that an additional year of schooling in British former colonies enhances per capita GDP growth by 0.15% annually, while reducing growth by 0.86% and 3.44% annually in French and Other former colonies respectively. It can be observed that all three education interaction terms are statistically significant.

The second possible transmission channel is geography (captured by landlockedness). The results in model 13 show that landlockedness enhances per capita GDP growth by 5.9% and 0.6% annually in Other former colonies and British former colonies respectively, while reducing growth by 0.9% annually in French former colonies. It can also be observed that only the Other colonial origin landlockedness interaction term is statistically significant. The implication of these results is that, geography, as captured by landlockedness, has worked for good to British and Other colonial origins whilst being detrimental to growth in French former colonies.

The third possible transmission channel from model 13 is natural resource or selection bias. The results show that the presence of natural resources enhances per capita GDP growth by 2.6% and 1.6% annually in British and French former colonies respectively, while reducing growth by 0.3% annually in Other former colonies. However, none of the landlockedness interaction terms is statistically significant.

Controlling for the duration of colonial rule in model 14 does not significantly alter this result. However, controlling for the other important determinants of growth in model 15 completely wipes out the statistical significance on the education and geography interaction channels.

The findings from these different model specifications give us an idea of the possible channels through which British former colonies might have gained their superior economic performance, namely, education, geography and natural resources. However, this evidence is inconclusive and requires further investigation using alternative techniques and or measurement.

3.2 Results using Alternative Technique - The HT Estimator

Figure 3 in the appendix provides results of four model specifications of the HT estimation of growth on colonial origins. In model 1 where colonial origin dummies and the trans-

mission channels alone explain growth, the results show that British former colonies have grown about 2.8% per year, faster than French former colonies. Two channels, namely, market distortion and education, emerge statistically significant in model 1, although only the latter is economically important.

The results in model 2, which includes, in addition to all the variables in model 1, the interaction terms for the different transmission mechanisms, show that education is the likely transmission channel between colonial origins and growth. As in stage one above, controlling for the duration of colonisation in this stage (model 3) does not significantly alter our result.

However, after controlling for the standard determinants of growth in model 4, education and geography emerge as the likely transmission mechanisms between colonial origin and growth. In particular, the results in model 4 suggests that the negative contribution of education to growth was less severe in British former colonies (an additional schooling year reduces growth only by 0.6% annually) as opposed to French and Other former colonies (where an additional schooling year reduces growth by 5.6% and 6.5% annually). The results in model 4 also suggests that geography (or landlockedness) was less of an impediment to growth in British former colonies (reducing growth by only 1.9% annually) as opposed to French and Other former colonies (where it reduces growth by 10.4% and 12.5% annually).

As in stage one estimations using the RE model, the HT estimation results just presented are also Pritchett - consistent, confirming the negative contribution of human capital growth to per capita GDP growth in SSA. The plausible implication of these results is that education and geography were less of an impediment to per capita GDP growth only for British former colonies, while for French and Other colonial origins, they were real growth disasters. This probably explains the superior economic performance of British former colonies over their French counterparts.

Similarly, as in the RE model mentioned above, excluding Botswana from the sample does not significantly alter our results, proving that the results are robust to the exclusion of outliers[28].

3.3 Robustness Checks

We use alternative proxies to check for robustness of the human capital transmission channel, namely, secondary enrolment rates during 1960-2000 (SEC) and average life

[28] We have not reported these results for space reasons but they are available on request.

expectancy during 1960-2000[29] (LIFE). Figure 4 in the appendix provides results of four model specifications of the HT estimation following the same strategy employed in stage two above with the only difference that we are now using secondary enrolment rates to proxy for the human capital channel.

The results in figure 4 basically uphold the human capital transmission channel as the likely explanation of the superior economic performance of British former colonies over their French counterparts in SSA. Figure 4 results also confirm the negative contribution of human capital growth to per capita GDP growth in SSA. Furthermore, after controlling for the important determinants of growth in model 4, landlockedness and natural resources emerge as important channels economically although statistically they are insignificant.

It is worth noting that only one of the five channels explored has emerged after subjection to alternative techniques and to alternative proxies, namely, the human capital channel. We do not find statistical evidence in support of the market distortion, trade openness, geography and natural resources channels. However, some channels that are statistically insignificant, notably, geography and natural resources, seem to be economically as important as those that are statistically significant.

In conclusion, it is worth emphasizing that all three human capital variables employed in our regressions enter with a negative and statistically significant sign, in spite of the estimation technique used. As surprising as these findings might be, they are not entirely new to the empirical growth literature. Indeed, several authors that have used the changes in the stock of education (instead of just the initial values of education at the beginning of the regression period) have also found similar results[30].

Pritchett (2001), for instance, finds a strong negative and statistically significant coefficient on schooling growth in the growth regressions and his results are robust to the choice of sample, estimation technique, the presence of outliers and to alternative measures of education. As Pritchett (2001:20) argues, SSA, contrary to intuition, did accumulate a great deal of educational capital over the first three decades following 1960. However, this increased education does not appear to have paid off in aggregate growth due to rent-seeking and talent diversion caused by excessive and ineffective government interventions in the economy.

Easterly (2002), Hall & Jones (1999), Murphy et al (1991), and North (1990) have

[29]It is important to note that life expectancy is not a purely human capital variable and might well be capturing instead the disease environment that affects growth, as Acemoglu & Johnson (2005) have argued.

[30]Notably, Pritchett (2001), Benhabib & Spiegel (1994), Spiegel (1994), and Lau et al (1991) & Jovanovic et al (1992) in Pritchett (2001).

also argued that whenever the main profit opportunity in an economy is to get around government rules, nothing good is going to happen in the real economy and the results are talent diversion as individuals who would elsewhile be productively engaged as engineers constructing bridges, will instead lobby to become parliamentarians in order to have preferential access to foreign exchange or import licences.

That said, it remains to justify why the rent-seeking effects of educational capital should be less detrimental to growth in British than in French (or Other) former SSA colonies. We leave the exploration of that answer for subsequent research.

4 Comparative Review of Prior Literature

The latest work that is closest to ours in the literature is an article by Klerman et al (2008). They investigate the influence of colonial and legal origins on growth during 1960-2003 using a sample of 49 former colonies around the world. Their results unambiguously show that colonial origins matter for growth more than legal origin, and British former colonies have grown faster than French former colonies.

An important similarity between our results and those of Klerman et al, is that colonial origin matters because of differences in educational policies. It is important to mention that although we share this same result, we do not use the same measures of human capital as Klerman et al. We use three different measures, namely, the average years of schooling in the population aged 15 and above, secondary enrolment rates and average life expectancy during the entire period of study (1960-2000), while Klerman et al use only the initial values of primary enrolment rates and life expectancy in 1960 to control for the legacy of human capital endowment.

This paper is also similar to the work of Rostowski & Stacescu (2006) which explores the empirical relationship between legal and colonial origin on growth. Like Klerman et al (2008), Rostowski & Stacescu also find that colonial origin matters more than legal origin and education is the likely channel through which colonial origin affects growth. In the context of this paper, the main problem with the Rostowski & Stacescu paper, as with the Klerman et al paper, is that they do not probe into the different mechanisms through which colonial origin affects growth and their analysis on geography remains open. For instance, Rostowski & Stacescu conclude their paper with this remark "examining the channels through which colonial origin could affect growth is therefore the first priority for future research".

The results of this paper are also consistent with prior work by Grier (1999) and

Bertocchi & Canova (2002), who find that former British colonies have better economic performance than former French colonies. Grier (1999) focuses part of his results on the African sample and finds that French ex-colonies performed 1.38 percentage points worse on average than their British counterparts, and this growth differential is attributable to differences in educational policies at independence. Although this result concords with ours, Grier uses different proxies for human capital, namely, the percentage of the population attending primary and secondary school at independence[31].

Summarily, our paper goes beyond the three previous papers by simultaneously investigating a range of feasible transmission channels through which colonial origin might have affected growth.

5 Conclusion

We sought to investigate whether colonial origin really matters for economic growth in SSA during 1960-2000 and if it does, what its likely transmission mechanisms are. Our results show that colonial origin matters for growth in SSA and its likely transmission mechanism is human capital. In particular, our results suggests that British former colonies have acquired their superior economic performance over their French counterparts mainly because the negative effects of human capital growth on per capita GDP growth has been comparatively less severe in British former colonies. In other words, the legacy of British colonial education in SSA has been more beneficial to growth during 1960-2000 than the legacy of French colonial education.

We do not find statistical evidence in support of the market distortion, trade openness, geography and natural resources channels. However, some channels that are statistically insignificant, notably, geography and natural resources, seem to be economically as important as the one that is statistically significant.

The empirical literature has recently emphasized the specific colonial policy of education as the likely transmission mechanism between colonial origin and growth but none of the previous studies have systematically explored a range of feasible channels simultaneously, to the best of our knowledge. The contribution of this study thus, has been in simultaneously investigating several transmission mechanisms through which colonial origin might matter for growth in SSA. This approach has enabled us introduce some nuance into the colonial origins - growth debate.

[31] Naturally, these gross figures fail to account for differences in the actual school-going age population across countries.

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APPENDIX A: SAMPLE OF SSA FORMER COLONIES (38 COUNTRIES)

I. Former British SSA Colonies (16 COUNTRIES)

Botswana, Gambia, Ghana, Kenya, Lesotho, Malawi, Mauritius, Namibia, Nigeria, Sierra Leone, Sudan, Swaziland, Tanzania, Uganda, Zambia, and Zimbabwe.

II. Former French SSA Colonies (15 COUNTRIES)

Benin, Burkina Faso, Cameroon, Central Africa Republic, Chad, Congo Rep, Cote D'Ivoire, Gabon, Guinea, Madagascar, Mali, Mauritania, Niger, Senegal, Togo.

III. Former Portuguese, Belgian, Italian or Spanish SSA Colonies (7 COUNTRIES)

Angola, Burundi, Congo Dem, Equatorial Guinea, Guinea-Bissau, Mozambique, Somalia.

APPENDIX B: VARIABLE DEFINITION AND SOURCES

BCORG: Former British Colony dummy variable taking the value of 1 for countries that acquired their independence from Britain and 0 otherwise.

FCORG: Former French Colony dummy variable taking the value of 1 for countries that acquired independence from France and 0 otherwise.

OCORG: Other non-British and non-French former colony dummy taking the value of 1 for countries that acquired independence from any other European power besides Britain and France, and zero otherwise.

GROW: Five-year averages of the natural logarithm of per capita GDP growth, 1960-2000 (Africa Research Program datasets)

DUREE: The duration of colonial rule, obtained by subtracting the respective country independence year from the year of colonisation. Source of colonisation dates is from Wikipedia (http://en.wikipedia.org/wiki).

LOGPCGDP60: The natural logarithm of real per capita gross domestic product in 1960 (Penn World Table, Mark 5.6)

GPO: Five-year averages of population growth, 1960-2000 (Global Development Finance & World Development Indicators-GDF&WDI)

ETHNIC: Ethno-linguistic fractionalization (William Easterly & Ross Levine, Africa's Growth Tragedy: Policies & Ethnic Division, 112 Q.J. Econ. 1203 (1997).

AYS15: Five year averages of the average schooling years of population aged 15 and above, 1960-2000. (Barro & Lee Education datasets)

INV: Five year averages of the share of real investment in GDP PPP, 1960-2000 (Africa

Research Program datasets)

BMP: Five year averages of the black market exchange rate premium, 1960-2000. (GDF & WDI)

EXP: Five year averages of the export share of GDP during 1960-2000 (GDF&WDI)

OPEN: Five year averages of the combined share of exports and imports in GDP during 1960-2000 (Africa Research Program datasets).

SEC: Five year averages of secondary enrolment rates during 1960-2000. (GDF & WDI).

INFL: Five-year averages of the annual % change in consumers prices, 1960-2000 (GDF & WDI)

GCONS: Five year averages of the share of government consumption in GDP, 1960-2000 (Africa Research Program datasets)

LIFE: Five year averages of the average life expectancy during 1960-2000 (Africa Research Program datasets).

DNRES: A dummy variable taking the value of 1 for natural resource rich (oil, cocoa & diamonds) countries, and zero otherwise. Countries includes are Gabon, Equatoria Guinea, Ghana, Ivory Coast, Angola, DRC, Nigeria and Botswana.

LANDLOCK: A dummy variable taking the value of 1 for landlocked countries and zero otherwise(Africa Research Program datasets).

Figure 1: Summary Descriptive Statistics

PANEL A - DESCRIPTIVE STATISTICS FOR FULL SAMPLE OF 38 FORMER SSA COLONIES						
Variable	Obs.	Mean	Std. Dev.	Min	Max	
Per Capita GDP Growth (log), 1960-2000	250	0.388	3.788	-12.321	12.913	
Per Capita real GDP in 1960 (log)	296	7.065	0.603	5.948	8.095	
Population Growth, 1960-2000	342	2.554	0.925	-4.087	9.313	
Ethno-linguistic Fractionalisation	306	65.147	24.208	0	93	
Inflation Growth Rate, 1960-2000	239	35.822	172.355	-3.009	2087.952	
Black Market Premium, 1960-2000	258	59.248	173.817	-26.017	1832.598	
Average Schooling Years/Pop above 15, 1960-2000	192	2.471	1.495	0.26	6.28	
Openness to Trade, 1960-2000	282	76.061	45.453	3.842	272.789	
Export share in GDP, 1960-2000	266	28.07	17.243	4.637	83.838	
Investment share in GDP, 1960-2000	296	10.856	9.047	0.958	49.123	
Secondary enrolment rates, 1960-2000	281	15.02	14.708	1	75.974	
Average life expectancy, 1960-2000	281	46.064	6.678	31.815	70.679	
Government Consumption, 1960-2000	261	22.898	13.466	2.617	69.529	
Dummy Natural Resource Rich Countries	304	0.263	0.441	0	1	
Dummy Landlockedness	304	0.368	0.483	0	1	
Duration of Colonisation (in years)	304	70.263	14.762	55	111	

PANEL B - MEANS BY COLONIAL ORIGIN			
	French Former	British Former	Other Former
Variable	SSA Colonies	SSA Colonies	SSA Colonies
Per Capita GDP Growth(Log), 1960-2000	0.03	1.07**	-0.21
Per Capita real GDP in 1960	1488.82	1265.85**	1535.7
Black Market Premium, 1960-2000	15.98	73.91***	148.752***
Government Consumption, 1960-2000	22.27	21	29.21***
Openness to Trade, 1960-2000	66.2	90.54***	66.31
Export share in GDP, 1960-2000	26.66	31.96**	21.83*
Average Schooling Years/Pop above 15, 1960-2000	1.83	3.06***	1.26**
Secondary enrolment rates, 1960-2000	12.91	19.56***	8.59**
Average life expectancy, 1960-2000	44.92	48.64***	42.31**
Dummy Landlockedness	0.33	0.44*	0.27
Dummy natural resources	0.2	0.25	0.43**
Investment share in GDP, 1960-2000	8.67	13.50***	9.55
Population Growth, 1960-2000	2.58	2.64	2.30*
Ethno-linguistic Fractionalisation	66.27	69.71	49***
Inflation Growth Rate, 1960-2000	13.84	15.05	114.69***
Duration of Colonisation (in years)	59.27	81.44***	68.28***

Notes: Asterisks indicate results of t-tests. The null hypothesis is that the mean is the same as the mean for former French SSA colonies.

* Significant at 10%; ** Significant at 5%; *** Significant at 1%.

Figure 2: Results using GLS Estimator

Dependent Variable: Per Capita GDP Growth															
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14	Model 15
BCORG	1.077**	1.177**	1.442**	0.858*	1.000	1.125	0.983	1.101**	0.500	1.057**	1.171**	1.261	0.032	0.006	1.048
	(0.504)	(0.551)	(0.564)	(0.517)	(0.965)	(0.716)	(1.292)	(0.509)	(0.662)	(0.505)	(0.525)	(0.884)	(3.992)	(4.007)	(8.129)
OCORG	-0.654	0.443	0.378	-0.529	-0.886	-1.063	-0.985	-0.653	-1.133	-0.724	-0.425	0.315	-0.342	-1.419	-9.988
	(0.752)	(0.821)	(0.856)	(0.763)	(1.179)	(0.974)	(2.026)	(0.754)	(0.974)	(0.766)	(0.893)	(0.973)	(4.817)	(5.087)	(8.433)
BMP		-0.004**	0.000									-0.004**	-0.010	-0.010	-0.014
		(0.002)	(0.003)									(0.002)	(0.014)	(0.014)	(0.018)
BMP-BRI			-0.007*										0.004	0.004	-0.001
			(0.004)										(0.014)	(0.014)	(0.021)
BMP-OTH			-0.004										0.009	0.009	0.017
			(0.004)										(0.014)	(0.014)	(0.017)
OPEN				0.009**	0.009							0.002	0.019	0.021	-0.049
				(0.005)	(0.009)							(0.007)	(0.043)	(0.043)	(0.077)
OPEN-BRI					-0.001								-0.024	-0.027	0.034
					(0.011)								(0.043)	(0.044)	(0.079)
OPEN-OTH					0.005								0.025	0.034	0.184
					(0.013)								(0.056)	(0.058)	(0.151)
AYS15						-0.068	-0.105					-0.224	-0.856*	-0.860*	-1.097
						(0.267)	(0.549)					(0.311)	(0.489)	(0.494)	(0.871)
AYSBRI							0.064						1.009*	0.960	0.940
							(0.629)						(0.608)	(0.627)	(1.036)
AYSOTH							-0.091						-3.441**	-3.682**	-5.172
							(1.285)						(1.387)	(1.501)	(4.077)
LANDLOCK								-0.213	-1.165			-0.144	-0.945	-0.917	-4.381
								(0.483)	(0.731)			(0.625)	(2.285)	(2.305)	(3.687)
LANDBRI									1.612				1.545	1.366	3.489
									(1.032)				(2.417)	(2.438)	(4.067)
LANDOTH									1.458				6.908*	7.944**	9.222
									(1.510)				(3.735)	(4.173)	(9.061)
DNRES										0.658	1.108	1.303	1.653	1.760	-0.341
										(0.646)	(1.121)	(0.876)	(2.591)	(2.627)	(4.498)
NRESBRI											-0.549		0.946	0.858	0.674
											(1.466)		(2.756)	(2.787)	(4.424)
NRESOTH											-1.127		-1.959	-1.938	6.871
											(1.803)		(2.760)	(2.769)	(8.674)
DUREE														0.022	-0.175
														(0.039)	(0.133)
INV															0.115**
															(0.054)
GPO															-0.226
															(1.061)
INFL															-0.009
															(0.019)
ETHNIC															-0.079
															(0.074)
LOGPCGDP60															1.230
															(1.691)
CONSTANT	0.028	0.028	-0.065	-0.038	-0.579	0.095	0.159	0.098	0.409	-0.104	-0.195	0.276	0.566	-0.812	13.812
	(0.348)	(0.354)	(0.374)	(0.367)	(0.715)	(0.564)	(0.885)	(0.383)	(0.426)	(0.341)	(0.342)	(0.845)	(3.769)	(4.726)	(17.032)
No of Obs.	250	213	213	233	233	160	160	250	250	250	250	137	137	137	76
R-Squared	0.03	0.07	0.07	0.03	0.04	0.04	0.04	0.03	0.04	0.03	0.04	0.1	0.19	0.19	0.39
Standard Errors are presented in parentheses. 1% level of significance, 5% by ** and 10% by *. The omitted category is French Colonial Origin (FCORG).															

Figure 3: Results using HT Estimator

Dependent Variable: Per Capita GDP Growth				
	Model 1	Model 2	Model 3	Model 4
Time Variant Exogenous Variables				
BMP	-0.004**	-0.018	-0.017	-0.071
	(0.001)	(0.027)	(0.027)	(0.071)
BMPBRI		0.013	0.012	0.056
		(0.027)	(0.027)	(0.072)
BMPOTH		0.017	0.016	0.074
		(0.027)	(0.027)	(0.071)
Time Variant Endogenous Variables				
OPEN	-0.008	0.028	0.031	-0.061
	(0.009)	(0.032)	(0.032)	(0.082)
OPENBRI		-0.033	-0.037	0.029
		(0.034)	(0.034)	(0.087)
OPENOTH		0.011	0.014	0.192
		(0.084)	(0.087)	(0.169)
AYS15	-1.353***	-3.034***	-2.935***	-5.582***
	(0.376)	(0.829)	(0.829)	(1.978)
AYSBRI		2.299**	2.127**	4.936**
		(0.955)	(0.961)	(2.200)
AYSOTH		-1.113	-1.363	-1.079
		(2.724)	(2.817)	(4.485)
GPO				-0.563
				(1.535)
INV				0.173*
				(0.104)
INFL				0.006
				(0.022)
Time Invariant Exogenous Variables				
BCORG	2.762**	-2.316	-1.726	-9.088
	(1.342)	(3.924)	(3.746)	(12.485)
OCORG	-0.437	-4.769	-5.087	-20.453
	(1.859)	(6.310)	(6.989)	(15.930)
LANDLOCK	-0.804	-4.143	-3.776	-10.443*
	(1.161)	(2.727)	(2.664)	(5.736)
LANDBRI		4.838	4.301	8.544
		(3.162)	(3.194)	(6.792)
LANDOTH		9.729	10.139	-2.151
		(7.031)	(7.596)	(28.171)
DNRES	1.664	1.945	2.193	2.787
	(1.485)	(3.474)	(3.436)	(7.955)
NRESBRI		0.692	0.473	-4.685
		(4.073)	(4.021)	(12.924)
NRESOTH		-2.305	-2.462	21.1
		(5.963)	(5.895)	(18.270)
DUREE			0.019	-0.228
			(0.082)	(0.288)
ETHNIC				-0.254
				(0.235)
LOGPCGDP60				-2.833
				(3.676)
CONSTANT	3.356	5.386*	3.714	72.143
	(1.518)	(3.178)	(6.176)	(47.566)
No of Obs.	**137**	**137**	**137**	**76**
No Groups	**25**	**25**	**25**	**21**

Standard Errors are presented in parentheses. 1% level of significance, 5% by ** and 10% by *.
The omitted category is French Colonial Origin (FCORG)

Figure 4: Robustness Checks using Alternative Proxy for Human Capital

Dependent Variable: Per Capita GDP Growth				
	Model 1	Model 2	Model 3	Model 4
Time Variant Exogenous Variables				
BMP	-0.003**	-0.004	-0.003	-0.000
	(0.001)	(0.007)	(0.007)	(0.013)
BMPBRI		-0.001	-0.002	-0.024
		(0.007)	(0.007)	(0.016)
BMPOTH		0.002	0.001	0.003
		(0.007)	(0.007)	(0.014)
Time Variant Endogenous Variables				
OPEN	-0.012	-0.017	-0.015	0.039
	(0.009)	(0.018)	(0.017)	(0.048)
OPENBRI		0.008	0.005	-0.066
		(0.021)	(0.021)	(0.051)
OPENOTH		0.033	0.038	0.031
		(0.096)	(0.097)	(0.117)
SEC	-0.113***	-0.099**	-0.098**	-0.352***
	(0.027)	(0.039)	(0.039)	(0.102)
SECBRI		-0.011	-0.018	0.269**
		(0.057)	(0.057)	(0.124)
SECOTH		-0.178	-0.190	-0.073
		(0.234)	(0.236)	(0.273)
GPO				-0.085
				(1.243)
INV				0.116
				(0.117)
INFL				0.009
				(0.023)
Time Invariant Exogenous Variables				
BCORG	1.963**	-0.333	-0.066	1.912
	(0.894)	(2.598)	(2.409)	(6.831)
OCORG	-0.369	-2.751	-3.278	-9.556
	(1.257)	(6.239)	(6.548)	(12.410)
LANDLOCK	1.417	-3.023*	-2.856*	-3.493
	(0.868)	(1.606)	(1.601)	(2.805)
LANDBRI		3.104	2.777	2.586
		(2.015)	(2.153)	(3.739)
LANDOTH		2.488	2.767	7.533
		(3.702)	(3.874)	(14.243)
DNRES	1.173	-0.399	-0.252	1.706
	(0.948)	(1.618)	(1.633)	(3.462)
NRESBRI		2.901	2.841	1.399
		(2.138)	(2.114)	(5.425)
NRESOTH		2.629	2.756	3.053
		(3.475)	(3.488)	(6.953)
DUREE			0.013	-0.007
			(0.055)	(0.185)
ETHNIC				-0.012
				(0.071)
LOGPCGDP60				-2.414
				(2.989)
CONSTANT	2.569**	3.572*	2.522	20.397
	(1.105)	(1.991)	(4.151)	(26.767)
No of Obs.	193	193	193	114
No Groups	33	33	33	28

Standard Errors are presented in parentheses. 1% level of significance, 5% by ** and 10% by *. The omitted category is French Colonial Origin (FCORG)
N.B. Results in Model 3 are robust to the exclusion of Botswana.