Differential Impact on Economic Development: An Analysis of Colonial Legacy on Sub-Saharan Africa

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Abstract

There is substantial literature in development economics suggesting that a nation's colonial history plays an integral part in pre-determining who is rich, and who is poor. Previous studies suggest that among former African colonies, British and French colonies experienced marginally faster growth rates than Portuguese, Belgian, or Italian ones. This provides insight to suggest that differentiation in economic growth could be explained by a nation's colonial history. This study attempts to understand the differential impacts of British and French colonialism on the economic growth in sub-Saharan Africa. By investigating the different approaches to colonizing, is it possible that one of these previous imperial powers better equipped their colonies with institutions conducive for economic growth after independence?

Keywords: Development economics, colonial history, sub-Saharan Africa

Introduction

Why are some countries wealthier than others? There are numerous ways to address this question; however, there is substantial literature in development economics that suggests a nation's colonial history plays an integral part in pre-determining who is rich, and who is poor. Much of the literature surrounding this notion refers to the work of Acemoglu, Johnson, and Robinson who theorized that colonies established as "settler colonies" tended to inherit institutions conducive to economic growth, and vice versa for "extractive states" (Acemoglu, Johnson, & Robinson, 2001, pp. 1370, 1374). When these colonies achieved independence, much of the legal systems, styles of governance, and institutions were either inherited or modeled after those of their colonial ruler. Furthermore, who you were colonized by also impacted what was inherited after independence. Previous studies suggest that among former African colonies, British or French colonies experienced marginally faster growth rates than Portuguese, Belgian, or Italian colonies (Bertocchi & Canova, 2002). This provides insight to suggest that differentiation in economic growth could be explained by a nation's colonial history.

This study attempted to understand the differential impacts of British and French colonialism on the economic growth in sub-Saharan Africa (SSA). This was implemented by examining a country's gross domestic product and Human Development Index. The countries of interest for this study pertained only those that achieved independence from British or French rule.

One key device that was inherited by colonies from their rulers were institutions. Institutions are broadly defined as humanly devised constraints that dictate the political, social, and economic interactions that take place in society (North, 1991). These can be both formal institutions such as constitutions and laws, and informal institutions like customs and traditions (Kaufmann, Hooghiemstra, & Feeney, 2018). Studies investigating the relationship between a nation's institutions and economic growth stress the importance of institutional quality over other determinants of economic growth (Rodrik, Subramanian, & Trebbi, 2004). Once institutions are controlled for in a model, the effects of other predictors are minimal such that institutional quality trumps the overall effects of other indicators (Osman, Alexiou, & Persefoni, 2012). Institutions serve as a major source of economic growth. Thus, by analyzing former British and French colonies' institutional quality, is it possible that one of these imperial powers better equipped their colonies with institutions conducive economic growth after independence?

Sample

The sample for this paper included 34 SSA countries, as defined by the World Bank, colonized or occupied by the British or French empires following the ratification of the Treaty of Versailles on June 28, 1919. South Sudan, Djibouti, and Somalia were omitted from the sample due to missing data relevant. Missing data arose from matters such as conflict, lack of data collection infrastructure, and diplomatic recognition.

Response Variable

Log Gross Domestic Product (GDP) per capita (constant 2010 US$)

GDP per capita is defined as the ratio of a country's GDP and its midyear population. GDP is the total value of a nation's goods and services produced in a specific time period in constant 2010 U.S. dollars. Utilizing data in constant 2010 U.S. dollars accounts for the effects of inflation on GDP per capita over time. This study used log GDP per capita data from 2000 – 2017 (excluding 2001) due to missing data for the Human Development Index. The source of this variable was the World Bank national accounts data, and the Organization for Economic

Cooperation and Development (OECD) National Accounts data files. Calculations to obtain the log GDP per capita were done by the author.

Human Development Index (HDI)

The HDI is a composite statistic used to capture a nation's overall economic and social development using four indicators: life expectancy, expected years of schooling, mean years of schooling, and gross national income per capita (United Nations Development Programme, 2019). Comprehensive data for the countries in the sample were not available until 2000. Consequently, this study used the HDI of the sample countries every year from 2000 – 2017 (excluding 2001). This data comes from the Human Development Reports published by the United Nations Development Programme.

Explanatory Variables

Colonial History Variables

Colonial Origin. The differences in which the British and French approached governing (common versus civil law respectively) and exercising power (indirect versus direct rule) over their colonies indicate that colonial origin may impact the growth rates of former colonies. Previous studies suggest that countries whose legal systems were based on common law experienced higher growth rates than those based on civil law (Mahoney, 2001). Furthermore, indirect rule enabled British colonies to gradually assume self-governance under the supervision of British representatives (Crowder, 1964). The British believed this level of political participation would lessen the chance of political unrest and lead to political stability post-independence (Kamalu, 2019). The evidence suggests that former British colonies will exhibit marginally better growth rates than their French counterparts (Agbor, Fedderke, & Viegi, 2010). This led to the hypothesis that former British colonies will exhibit higher levels of GDP per capita and HDI compared to former French colonies.

A dummy variable was used to differentiate between former British and French colonies, with 1 representing nations previously colonized by the British and 0 for nations previously colonized by the French. Colonial origin was obtained from the Issue Correlates of War Colonial History Data Set which identifies the relationships between former colonizers and their former colonies (Hensel, 2018).

Duration of Colonial Rule. The number of years in which the British and French ruled over their colonies varied across Africa. For example, World War I reparations stipulated Germany to

grant its African colonies to Britain, Belgium, and France. This meant some colonies were under colonial rule for less time than those colonized in the 19th century. Variation in the duration of colonial rule might suggest that some institutions were affected by other colonial powers as a result of the change in governmental structure and organization. It was hypothesized that colonies with longer and fewer colonial rulers should have sturdier institutions and better growth. This variable was calculated by subtracting the year in which a nation became recognized as a British of French colony from the year it gained independence.

It is important to note that the method in which independence was achieved and the events that transpired immediately after gaining independence for the countries of interest were not directly accounted for in the models. However, these would undoubtedly have some effect on economic performance.

Institutional Quality Variables

There has been a shift in research from determining whether institutions matter for economic growth, to which ones specifically are the most important for it. In the context of SSA, the literature suggests that institutions pertaining to government stability and socioeconomic conditions have significantly positive impacts on economic growth (Osman, Alexiou, & Persefoni, 2012). Rodrik (2000) highlights five key institutions that are crucial for conducive economic growth: property rights, regulatory institutions, institutions for macroeconomic stabilization, institutions for social insurance, and institutions for conflict management (Rodrik, 2000). It is speculated that although economic institutions have a more dominant effect on economic growth, oftentimes political institutions serve as determinants of the efficiency of economic institutions, thus having indirect effects on growth (Kefi & Hadhek, 2012).

To address the multiple dimensions of institutions in a country, the models fitted in this study included the six indices from the Worldwide Governance Indicators. These attempt to measure the quality, effectiveness, and reputation of governments throughout the world and the data used to calculate these is extrapolated from a variety of sources (Kaufmann & Kraay, 2018). Each index is calculated independently of one another. The methodology behind the calculations for each of these indices is as follows:

1. The data from the individual sources is assigned to the relevant index
2. The data is then rescaled for each variable.

3. An Unobserved Components Model is used to construct a weighted average for each variable to standardise their units of measure which range from -2.5 to 2.5 with higher values associated with better governance (Kaufmann, Kraay, & Mastruzzi, 2011).

Parallel to the previous literature relating institutional quality to economic growth, it is expected that countries with higher levels of the aforementioned indices will exude higher levels of economic growth.

Control Variables

The models used in this study incorporate two control variables to remove their respective effects on the response variables, namely population growth and foreign direct investment (FDI). The data for population growth and FDI were taken from the World Bank.

Discussion of Results

Table 1 provides the summary of descriptive statistics of the variables included in each of the regression models. When comparing former British colonies with former French colonies, it is evident that on average, former British colonies have higher log GDP per capita. However, the caveat is that the variation in levels of log GDP per capita is more varied than among former French colonies. This analysis is drawn from Table 2 and Table 3. These tables provide descriptive statistics based on colonial origin. From observing the raw data, it is evident that some former British colonies, such as Mauritius and Botswana, have considerably higher levels of log GDP per capita than most other former British colonies. The data also indicates that former British colonies exhibit higher levels of the HDI.

Table 1. Descriptive Statistics for Former British and French Sub-Saharan African Countries

Statistic	N	Mean	St. Dev.	Min	Max
Log GDP per Capita (2010 Constant)	578	3.11	0.43	2.48	4.15
HDI	573	0.49	0.11	0.25	0.80
Voice and Accountability	578	-0.46	0.66	-1.83	0.98
Political Stability and Absence of Violence	578	-0.43	0.86	-2.70	1.28
Government Effectiveness	578	-0.66	0.60	-1.85	1.05
Regulatory Quality	578	-0.54	0.56	-2.24	1.13
Rule of Law	578	-0.59	0.61	-1.85	1.08
Control of Corruption	578	-0.58	0.57	-1.54	1.22
Colonial Duration	578	76.26	31.64	38	166
FDI (in millions)	578	682.96	1,296.24	-675.55	9,885.00
Population Growth	578	2.35	0.95	-2.63	4.63

Table 2. Descriptive Statistics for Former British Colonies

Statistic	N	Mean	St. Dev.	Min	Max
Log GDP per Capita (2010 Constant)	306	3.24	0.46	2.48	4.15
HDI	304	0.53	0.11	0.28	0.80
Voice and Accountability	306	-0.29	0.73	-1.83	0.98
Political Stability and Absence of Violence	306	-0.26	0.92	-2.67	1.28
Government Effectiveness	306	-0.41	0.63	-1.55	1.05
Regulatory Quality	306	-0.39	0.66	-2.24	1.13
Rule of Law	306	-0.36	0.66	-1.85	1.08
Control of Corruption	306	-0.39	0.66	-1.54	1.22
Colonial Duration	306	87.83	35.04	42	166
FDI (in millions)	306	979.10	1,655.04	-60.19	9,885.00
Population Growth	306	1.99	1.06	-2.63	4.63

Table 3. Descriptive Statistics for Former French Colonies

Statistic	N	Mean	St. Dev.	Min	Max
Log GDP per Capita (2010 Constant)	272	2.98	0.35	2.51	4.01
HDI	269	0.45	0.09	0.25	0.70
Voice and Accountability	272	-0.64	0.52	-1.47	0.42
Political Stability and Absence of Violence	272	-0.63	0.74	-2.70	0.82
Government Effectiveness	272	-0.94	0.40	-1.85	0.05
Regulatory Quality	272	-0.70	0.35	-1.48	0.34
Rule of Law	272	-0.85	0.42	-1.82	0.07
Control of Corruption	272	-0.80	0.36	-1.52	0.18
Colonial Duration	272	63.25	20.70	38	132
FDI (in millions)	272	349.80	533.10	-675.55	4,406.04
Population Growth	272	2.76	0.58	0.26	3.91

Although each index is calculated independently and draws from separate data sources, what the institutional quality variables measure are related. Based on the correlation matrix in Table 6, some are highly correlated. This highlights the presence of multicollinearity in one of the models fitted, as it includes all the explanatory variables. This results in imprecise estimates of the effects of explanatory variables on both log GDP per capita and HDI. Furthermore, it negatively impacts the model's ability to make accurate inferences. To address this issue, the Limited Variables Model was constructed which removes some institutional quality variables that were highly correlated. Population growth and FDI are not included in the correlation matrix for organizational purposes. Neither were highly correlated with the other explanatory variables.

The remaining discussion pertains to the regression output for this study. In total, six regressions were run: three utilising log GDP per capita (constant 2010) as the response variables and three utilising HDI. Each model included the same explanatory variables, and the results were based upon OLS regression. These models included time fixed effects to control for aggregate trends that occur over the time period of the study. Excluding the Colonial History

Regression Models, each regression model includes control variables for population growth and FDI.

Table 4. Log GDP per Capita (2010 Constant) Regression

	Response variable: Log Gross Domestic Product per Capita (Constant 2010)		
	Colonial History Model	Institutional Quality Model	Limited Variables Model
Voice and Accountability		-0.384***	-0.323***
		(0.036)	(0.037)
Political Stability and Absence of Violence		0.112***	0.138***
		(0.024)	(0.023)
Government Effectiveness		0.471***	
		(0.054)	
Regulatory Quality		-0.037	0.183***
		(0.051)	(0.044)
Rule of Law		0.023	
		(0.068)	
Control of Corruption		0.111**	0.267***
		(0.052)	(0.051)
Colonial Ruler Dummy Variable	0.140***	-0.185***	-0.092***
	(0.035)	(0.031)	(0.030)
Colonial Duration	0.005***	0.004***	0.003***
	(0.001)	(0.0005)	(0.001)
Observations	578	578	578
R^2	0.205	0.598	0.537
Adjusted R^2	0.180	0.579	0.517
Note:			*p < 0.1; **p < 0.05; ***p < 0.01
			Standard error in parentheses

Table 5. HDI Regression

	Response Variable: HDI		
	Colonial History Model	Institutional Quality Model	Limited Variables Model

Voice and Accountability		-0.072***	-0.054***
		(0.008)	(0.009)
Political Stability and Absence of Violence		0.041***	0.050***
		(0.005)	(0.005)
Government Effectiveness		0.124***	
		(0.012)	
Regulatory Quality		-0.0003	0.063***
		(0.011)	(0.010)
Rule of Law		0.017	
		(0.015)	
Control of Corruption		-0.029**	0.015
		(0.012)	(0.012)
Colonial Ruler Dummy Variable	0.054***	-0.018***	0.008
	(0.008)	(0.007)	(0.007)
Colonial Duration	0.001***	0.001***	0.001***
	(0.0001)	(0.0001)	(0.0001)
Observations	573	573	573
R^2	0.370	0.698	0.629
Adjusted R^2	0.349	0.683	0.613

Note: $^*p < 0.1; ^{**}p < 0.05; ^{***}p < 0.01$
Standard error in parentheses

Colonial History Regression Models

Colonial History Variables. The first two models include the colonial origin dummy variable and duration of colonial rule as explanatory variables. This was to test the significance of the colonial history variables in relation to both the log GDP per capita and the HDI. The results from the model in which log GDP per capita is the response variable suggest that former British colonies exhibit higher levels of log GDP per capita when compared to former French colonies in our sample. Additionally, the results indicate that colonies which experienced longer periods of colonial rule had higher log GDP per capita as well. The effects of colonial duration could be due to fewer changes in colonial ruler. Both variables have statistically significant

effects on log GDP per capita and match the hypotheses set forth previously in this paper and results obtained in previous literature.

With regards to the second response variable, the model yields a similar outcome. The results suggest that the HDI was 0.054 higher among countries that were previously colonized by the British compared to those colonized by the French. Similarly, the duration of colonial rule appears to have a positive impact on the HDI. Both variables have high levels of statistical significance with respect to their impact on the HDI and conform to the hypotheses proposed.

Institutional Quality Regression Models

The second set of regression models accounted for both colonial origin variables and institutional quality variables.

Colonial History Variables. Based on the results from the regression output, once the institutional quality variables are accounted for, the coefficient associated with the colonial ruler dummy variable changes. This signifies nations colonized by the British have lower levels of log GDP per capita when compared to those colonized by the French. This variable remains statistically significant. Colonial duration continues to have a positive, statistically significant impact on the country's log GDP per capita. These same effects are captured by the model in which the HDI is the response variable with both also being statistically significant.

Institutional Quality Variables. Of the six institutional quality variables included in the model, only "Voice and Accountability", "Political Stability and Absence of Violence", "Government Effectiveness", and "Control of Corruption" are statistically significant. It was hypothesized that all the variables measuring institutional quality would be positive; however, "Voice and Accountability" has a negative coefficient. This outcome seems counterintuitive and contradicts the literature. Rodrik (2000) states that institutions for social insurance are conducive to economic growth. Based on the results, countries with better institutions for social insurance exhibit lower log GDP per capita which is not in line with the theory.

There is a similar result when running the model with respect to the HDI. The model shows that of the six institutional quality variables, the same four are statistically significant. However, the sign of the "Control of Corruption" changes from positive to negative. The results indicate that improving the institutions associated with social insurance, conflict management, and effective and honest governance could boost economic performance. Again, contrary to the

theory and previous literature, the results show that higher levels "Voice and Accountability" and "Control of Corruption" translate to lower levels of the HDI.

Limited Variables Models

Although each institutional quality variable is individually calculated, due to the nature of what each index measures, there is a potential for high correlation among variables as seen in Table 6. Upon further analysis, "Rule of Law" and "Government Effectiveness" were removed for the final regression model to see how this affected the regression output. Numbers in red indicate high levels of correlation between corresponding two variables.

Table 6. Correlation Matrix

	Voice and Accountability	Political Stability …	Government Effectiveness	Regulatory Quality	Rule of Law	Control of Corruption	Colonial Duration	Ruler Dummy
Voice and Accountability	1.00							
Political Stability and Absence of Violence	0.66	1.00						
Government Effectiveness	0.77	0.67	1.00					
Regulatory Quality	0.78	0.62	0.86	1.00				
Rule of Law	0.84	0.78	0.90	0.87	1.00			
Control of Corruption	0.78	0.74	0.86	0.80	0.89	1.00		
Colonial Duration	0.44	0.39	0.36	0.27	0.40	0.44	1.00	
Ruler Dummy	0.26	0.21	0.45	0.27	0.40	0.35	0.39	1.00

Colonial History Variables. The results of removing the specified institutional quality variables had no impact on the significance levels, or the signs of the coefficients for the variables accounting for colonial ruler and colonial duration with respect to log GDP per capita. Colonies previously colonized by the French exhibit higher levels of log GDP per capita and colonies with longer periods of colonization had higher levels of log GDP per capita as well.

However, once these two institutional quality variables are removed from the model, both the colonial origin variables lose their statistical significance with respect to the HDI.

Institutional Quality Variables. "Government Effectiveness" and "Rule of Law" were removed from the model due to relatively high correlation predominantly with "Regulatory Quality". This is not abstract considering what these variables measure. Once these two explanatory variables were removed, "Regulatory Quality" becomes statistically significant with respect to log GDP per capita at the 0.01 significance level. With respect to the HDI, by excluding these two variables, "Control of Corruption" loses statistical significance. The results also suggest that in the absence of these variables, the explanatory power of "Regulatory Quality" with regards to the HDI becomes statistically significant at 0.01 level.

Conclusion

The aim of the paper sought to explore the differential impacts of colonization on former British and French SSA colonies. This was done by examining the effects of both colonial history and institutional quality variables while controlling for country-specific statistics. Furthermore, it aimed to provide additional insight as to which institutions matter most for economic growth. The results obtained suggest that colonial origin and duration of colonial rule have statistically significant impacts on the log GDP per capita and the HDI of former British and French colonies in SSA. However, the model including these two variables only explain roughly 21% and 37% of the variability of log GDP per capita and the HDI respectively.

Once institutional quality is accounted for, this coverage increases significantly, namely to about sixty percent for log GDP per capita and seventy percent for the HDI. This result is consistent with previous literature and development theory. Even once "Government Effectiveness" and "Rule of Law" are removed from the model, both models explain over 50% of the variability in the response variables. Additionally, the results show that when institutional quality is considered, former French colonies perform better than their British counterparts. Although these findings confirm some of the results proposed in previous studies, further research is needed to check the robustness of these results, possibly by using more extensive explanatory variables to account for the quality of institutions. It is important to note that many countries in SSA are relatively young nations. Therefore, future research should continue to explore the relationship between economic growth and colonial origin to better understand its impact and legacy on SSA.

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