

The identity of the colonizer and subsequent economic growth

A complexity approach

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Introduction

The study of colonialism is again in fashion (Engerman & Sokoloff, 2005a). Over the last decade, colonization enjoyed a revivification among both scholars and the general public. There are several reasons for this renewed interest. One reason is the social longing for a simpler ordered world. This reason can be labeled as sentimental and sheds a more favorable light on the past than has generally been conventional (Lal, 2004). A quite different reason is the recent proliferation of studies which aim at the understanding of processes and institutions of economic growth (Davis and Huttenback, 1986). In this kind of studies scholars want to take advantage of the natural experiment, offered to them by a small number of European countries, of establishing colonies all over the world. This study aims at the establishment of a broader view on the colonial past of Africa, and its sequent developments, than a purely economic view. For this a complexity approach is needed. This is an approach which is not solely based on one discipline but is trans-disciplinary, and thereby gets a more sophisticated view on today's (economic) performance of African countries. The central thesis addressed is, if differences in progress within Africa can be explained from the legacy of different colonizing countries (French, British). The current study tries to profit from the natural experiment offered to us by the colonial powers of the past, and shed some light on the factors that do matter for the overall development of countries. More confined the factors which matter for latter economic development. The current study starts with a disquisition on the relation between progress and colonization, thereafter continuing with a description of economic models, and an ascription of these economic models to a former colonizing country. The nature of the third section is mainly philosophical. The fourth, fifth, and sixth sections address the empirical question to be answered in this study. This question could be formulated as follows: " does the identity of the colonizing country matters for subsequent progress of a colonized country?"

Colonization literature

The main point in this section circles around two major literature streams, which both try to clarify what constitutes progress. Starting with what was the start of the current debate, continuation leads to clarity of what economic literature says about what leads to the differences seen in progress of African countries.

In 1996 Bertocchi and Canova asked themselves the question whether colonization did matter for progress. By which they defined progress in GDP per capita. In their empirical exploration they found out that colonization had, on average, a negative effect on progress in Africa. Englebert (2000), points at the differences of performance levels within Africa. He also points at a multitude of explanations for these various performances. The central question addressed in this study is how differences in prosperity can be explained from the legacy of different colonizing countries? For an answer on this question the current study is confined to economic literature on colonization. In this, economic, literature differences in geographic patterns across societies have long been recognized as the explanation for differences in overall economic performance. But due to recent opposing evidence, there has been a revival of interest in these geographic patterns among scholars, and the discussion of what constitutes economic performance is open again. Theory, on this point, can be classified into two main streams. One stream focusing on the effects of conditions closely associated with geography. The other stream highlights how differences in performance could be rooted in the indirect effects that factor endowments have on paths of development through their influences on the way institutions evolve (Hall & Jones, 1999; Gallup et al., 1999; Diamond, 1997; Engerman & Sokoloff, 1997; Acemoglu et al., 2001). The thought that there might be a systematic reason why some societies evolve institutions that are favorable to growth generated much excitement (Engerman & Sokoloff, 2002). It even led to the consensus that institutions are important for subsequent growth. Without giving a decisive answer about the direction of this relation. In the remainder of this chapter the main points of the two streams mentioned above, their shortcomings, and their relation to economic growth (GDP) are mapped. For reading ease purposes the literature stream relating to the conditions closely related with geography will be named the geography-stream. The literature stream referring to the indirect effects of factor endowments on the way institutions evolve will be referred to as the legal-stream.

The geography- stream explains disparities in economic prosperity between countries by pointing at the geographic, climatic or ecological differences (Machiavelli, 1519; Montesquieu, 1748; Toynbee, 1934-1961; Marshall, 1890; Huntington, 1945; Myrdal, 1968). Seen on the former spacious definition it is logical that there are many conceptions in this stream. Perhaps the most common is the view that climate has a direct effect on income through its influence on work effort. This idea goes way back and can be ascribed to Machiavelli (1519) or Montesquieu (1748). Ellsworth Huntington (1915, 1945) pursued this idea further, and even did some experiments to show the effect of climate on work effort. Toynbee (1934) and Marshall (1890) emphasized the importance of climate, both on work effort and productivity. Jared Diamond (1997) offered the world a different version of the geography thesis by pointing at the importance of Neolithic revolution and its long lasting effect by determining which societies were the first to develop strong armies and modern technology. With Neolithic revolution the first agricultural revolution is meant. In which, on a wide-scale, human cultures switched from a lifestyle of hunting and gathering to agriculture and settlement. By reasoning Diamond (1997) came to the conclusion that differences in the timing of this Neolithic revolution were due to geographically determined characteristics. A third, and more recent perspective, is from an overall economic perspective. Engerman & Sokoloff (1997) argue that the roots of inequality in economic development lay in the initial factor endowments of the respective colonies. The last perspective added here to this debate is the view of Sachs (2000). In his study he solely focuses on the initial factor endowments. Characteristically he writes: “Certain parts of the world are geographically favored. geographical advantages might include access to key natural resources, access to coastline and sea – navigable rivers, proximity to other successful economies, advantageous conditions for agriculture, advantageous conditions for human health.”. In understanding this, a bit diffuse, debate it is useful to distinguish the simple theories from the more sophisticated. The sophisticated theories acknowledge that the major role of geography is not through its main effect, but through an interaction effect. Geography factors interact with, inter alia; legal- stream factors (Acemoglu et al., 2001).

The legal- stream relates differences in economic performance to the development of institutions (Acemoglu et al., 2001). Societies that provide incentives and opportunities for investment will be richer and wealthier than those who fail to do so (North & Thomas, 1973; Olson, 2000). In essence this view goes back to the philosopher of the modern period John Locke (1632 – 1704), who stressed, in his *Two Treatises of Government*, the importance of property right for productive activities. Stating that the main purpose of government was “the preservation of the property of ... members of the society” (p. 47). Similarly, Adam Smith and Frederick von Hayek, emphasized the importance of property rights for the success of nations. So, the availability of institutions secures economic growth. It is important to mention here that the transition to a capitalist agriculture is related to the power of the capitalist class or so called bourgeoisie. This class rules by means of production and employment of workers (Wright, 2000). How this class is constituted within a certain society goes beyond the boundaries of this study. For now it is enough to see that the legal-stream isn’t an isolated concept, as if it is a point of departure for future developments. More recently economist and historians have stressed the significance of institutions that guarantee property rights. Countries with better institutions and less distorted economic policies will outperform those lacking these characteristics (North & Thomas, 1973). More recently North (1990) identified effective protection of property rights as important for the organization of society, and thereby affects performance of economies as well. By following this logic, several scholars entered in the fierce debate on colonialism and subsequent economic development. Mahoney (2000, 2001) claims the differences in institutions of colonizing countries led to divergence in economic development of colonized countries. A point of criticism on the above can be found in the study of Cordoba (2007). He argues against the idea of some positive relation between institutional development and the development of a country. He does so on the basis of historical evidence, and suggests the contrary in the case colonialism. The conclusion of his study is that institutional development in colonized countries produced severe effects on latter development of these areas. In some cases even leading to a reversal of relative income (Acemoglu et al., 2001).

Bertocchi and Canova (1996) showed the scientific world that there is some relation between the concept of colonization and the concept of growth, specifically GDP per capita. Later studies, which include Engelbert (2000), led to a multitude of explanations for different levels of growth within Africa. For this study interest is in what constitutes economic performance. Two main literature streams for explaining differential levels of economic growth are dealt with. The first stream focusing on the initial factors endowments, the second on the development of institutions. These effects must not be seen in isolation of each other. In other words these are not singular effects, they are mutual reciprocal. This is, amongst others, due to the latitude of these two streams.

To get some more affiliation with the central thesis it will be helpful to deepen our understanding of which variables within the legal-stream are of specific interest. We examine the legal- stream more thoroughly because colonization affects this stream directly. The following paragraph tries to give some more insight on how the legal-stream is affected by colonization. Starting with a disquisition about economic models, it continues with an historical exposition about the French and British Empire. The paragraph will end with an ascription of an economic model to a colonizing country on the basis of characteristics of the implemented policies by each specific country.

Economic models and ascription

The following paragraph gives a complete as needed overview of the available literature on economic models of colonizers, by assuming economic theory of colonialism is built up around two main models. The purpose of this dichotomy for this study is to give some theoretical background on the relation between post-colonial development and colonizer. The first model stems from Eli Heckscher (1935), and is referred to as the mercantilist model. In this model the economy is organized in a way which enables productive activity to obtain national economic self-sufficiency and short term gains through favorable trade balances, and accumulation of precious earth metals. Another characteristic of this model is posed by Ekelund & Tollison (1981), who states that political authorities use the state to establish trade restrictions and support extra-market bodies that provide rent to certain groups and deny privileges to others. In this, mercantilism leads to severe inequality by concentrating resources in the hands of the state elite. The other model is proposed by inter alia Wallerstein (1974), and can be named liberal in its content. The notion liberal is inseparable from the concept of the free market, and so it functions also in the liberal model of colonization. It proposes free trade, and thus not provides a certain state elite with all the advantages of productive activities. In the remainder of this paragraph the discussion will center on the French and the British as colonizers, and an attempt to relate them to both the mercantilist and/or liberal model.

According to Robin Grier (1999) the French Colonial Empire differed greatly from the British in its political and economic treatment of colonies. Prominent historian of the British empire D.K. Fieldhouse characterizes the French approach, in a comparative study, on a rather striking way by pointing toward the French Republican principles of 1789 (Fieldhouse, 1966). Although the *République Française* was officially established, three years later, in 1792. The shadows of this, one and indivisible, republic became already visible in the administrative treatment of colonies. This meant that colonies were an intrinsic part of the republic, and should be assimilated to it. For example not only a single tariff system, but also the application of the metropolitan pattern of local government and laws, representation of colonist in the French assembly, and full cultural assimilation (Fieldhouse, 1966) were part of this approach. On the other hand the British were more decentralized in their colonial approach. After 1765, the British did not automatically impose their own constitution on the vernacular culture, but tried to individualize each country's constitution to its specific needs by identifying different forms of colonial holdings. Eventually an attempt, made in 1839, to centralize power more by seizing total control over four distinct (namely: The constitution, foreign relations, international trade, and public lands) areas was unsuccessful. Adjustments had to be made to not give rise to rebellion and discord in the colonies.

Having seen a glance of the political differences of the colonizing empires, let us return to economic spheres. Did these two colonial empires differ also in their economic approach? Can there be some ascription of mercantilist or liberal model to them? And by which characteristic can this be done? Fieldhouse (1966) asserts the French imposed a strict, mercantilist model on colonial trade. Colonies were forced to import from France, to sell their goods only to France, and to use French ships. In the late 19th century a brief relaxation of these laws occurred when the French attempted to smooth relations with Britain. This attempt failed, and all things reverted back to the mercantilist system. Strict as the French government was, so loosely where the British. As posed earlier decentralization was an important characteristic of the British colonial undertaking. An important reason for this, and preliminary to this, was a policy of free trade to all foreign countries. In this it can be posed the British pursued a liberal model for their economies.

Some scholars highlight the importance not to exaggerate differences between both economic models of former colonizers, as well as their overall approach. Although this exaggeration is inherent to modern social sciences, which live by the grace of bifurcation, the main object of science should lie at presenting things in whole concepts. An almost perfect example is the study of Kiwanuka (2012). In his study he demonstrates that differences between colonizers in indirect and direct rule, native chiefs, and policies of assimilation are more based on what is said about it, than what was practiced. Despite these voices pointing to common characteristics of colonial regimes, the current fashion of stressing differences has prevailed.

In the preceding of this paragraph the literature on economic models of colonizers was discussed. This debate centered itself around the mercantilist and liberal model, as proposed by Heckscher (1935) and Wallerstein (1974). Both the British and French colonial empire were held against the light and were ascribed to a mercantilist or

liberal model. Though this differentiation is very helpful for this current study, it is far to stylized to conclude this partition could be the key to an overall explanation of what determined growth in time. Certainly seen on the multitude of explanations offered by other scholars and historians. The following paragraph will give philosophical insight in both the concept of growth and the concept of causality. This will enhance our comprehension of what really can be concluded in this study.

Views from different disciplines

This section is devoted to thinking. Thinking about the concepts used in this study, but also thinking about reality, claims of truth, and our place as humans in these contexts. It develops itself alongside respectively the concept of growth, a discussion about causality, and slavery as a confounding effect,.

The concept of growth

The central thesis above is a bit strangely worded. Words as prosperity, development, or economic growth could have been used. Instead of that the word progress has been used. What is behind this word? Is the word progress is appropriate, or is growth or development a better description of what happened in colonialism and its aftermath. This linguistic discussion will enhance our understanding of the concept of progress in the context of this study, and hence it will be easier to relate this study two the ‘whole picture’ as seen as the view of the world constituted by science for us today. In this is doesn’t mind whether this whole picture is whole in its most essential way, or this whole picture is constituted out of a plotted and pieced, dappled world.

Let’s start with noticing there is no simple answer to the question of what progress is. Rather, it is a contested concept. There are three main approaches to the concept and project of progress. First, that modernity is progress. This connotation of modernity is advocated by respected philosophers as Jean-François Lyotard (1984) and Jurgen Habermas (1989). A second response is to deny the usefulness of the concept of progress at all. It is too simple, falsely universalistic, and ethnocentric. Rather than a universal ‘one size fits all’, there are potentially infinite numbers of particular ways of thinking about what it is to life the ‘good life’. The third and last position sees progress as a contested project. There are alternative conceptions, but not an infinite number. It can be concluded from the above that the concept of progress is as contested as it is divided. It is the third, and last, concept that will be treated more expansive.

Progress as a contested project. When taking a closer look at this notion we can deduce four different goals of progress from it. These are respectively equality, human rights, human well-being, and economic development. Aware of the fact there are others, the main point will be centered on these four goals. The goal of equality is a view of progress which is seen through the lens of justice (Rawls, 1999). This approach prioritizes justice, equality, and human rights rather than material improvements. Equality may be understood either as an outcome or as an opportunity. Equality of outcomes is the stronger programme, while equality of opportunities addresses processes and procedures which may possibly, lead to greater equality in outcome. The principle of equality is often selectively applied and is made more difficult because it is often complexly entwined with differences. In the human rights-based approach to justice, every individual is regarded as having inviolable rights, the realization of which constitutes a just society (Marshall, 1950). Human well-being challenges a focus solely on economic development and growth, but is equivocal about equality (Sen, 1999). This approach broadens the concept of sheer economic development to human well being and development. Until now, rather social forms of progress are discussed. The last concept that will be adopted for this study is called economic development. Economic development is expected to increase the average income of a person and thereby their standard of living (Stiglitz, 2002). This approach appears to treat economic development as an end in itself, but usually rests on the assumption that economic development will lead to an improved standard of living in broader sense over time. In this economic development is just one of the indicators of progress. In the current study the concept of progress will be strongly related to the latter goal. In this economic development is the locus of this study.

Questions that arise here are: how can we measure progress? Or more specifically how can economic development be measured? International bodies and governments make use of indicators as Gross National Income (GNI), Gross Domestic Product (GDP), or GDP per capita (pc) when focus is on individuals. The main disadvantage of using these indicators is that averages across a country hide the inequalities in accessing living standards between people. Another disadvantage is that there are more important matters, including human rights, than economic development that are overseen by these indicators.

Starting with some linguistic thought, the former paragraph developed itself alongside two questions. The first of what constitutes progress, leading into the debate whether there is progress at all, and ending with the conclusion that progress is a contested concept. With this conclusion in hand, several goals of progress were deduced, leading to the notion that economic development is one of the many indicators of progress. The second question was how to measure economic development. Noting international bodies and governments make use of indicators as GNI, GDP and GDPpc, however the disadvantages of these indicators are severe as they do not take into account the social aspects of progress.

Confounding effect: slavery

The reason for adding this subject into the current study is twofold, firstly because of the enormous overlap of with the subject under study, secondly because we can learn from the ineffable character of man.

Recent studies argue that among former New World colonies a nation's past dependence on slave labor was and is important for its subsequent economic development (Engerman and Sokoloff, 1997, 2002). It is argued that this is due to specialization in plantation agriculture, with its use of slave labor, caused economic inequality, concentrating power in the hands of a small elite, adversely affecting the development of domestic institutions needed for sustained economic development. Nathan Nunn (2007) argues in his study that slave use is negatively correlated to subsequent economic development. Though not treated in this study, a combination of colonization and slavery could be a major explanation for future economic development in a country. The reason for omitting this variable from the empirical part of this study is due to the scope of these two practices. While colonization affects both on national and individual level, slavery affects primarily on individual level. The latter practice has devastating consequences on life of those who were victim, and it would be inappropriate to measure its effects solely within the realm of macro economics since these stretch far beyond it. Worth noting for the conclusion of this study is the inconsistency of man. *Individuum est ineffabile* is a philosophical statement that nicely captures the insurmountable secret of what drives individuals (Hazelrigg, 1989). The inconsistency meant here is the inconsistency of the French colonizers which introduced the revolutionary principle of freedom in their home country, but did not care about the freedom of other people. Without exaggerating, the principle of freedom became the basis of the bourgeois world from the time of the French revolution onwards. The old European clerical and feudal society was destroyed, and egalitarian meritocracy took its place. Performance, not birth, decided a person's value and status. Decades later the notions of freedom and equality became universal, but only when the oppressed themselves took up the same concepts, and fought for liberation (Moltmann, 2001).

Recent studies argue that there is some relation between past dependence on slave labor and subsequent economic development. This is empirically substantiated by Nathan Nunn (2007). Though omitted in this study, slavery in combination with colonization could be a major explanation for a country's further development. The reason for adding this subject to the current study can be sought in the concept of the ineffable character of man. Learning from the inconsistency sketched out with reference to freedom, the conclusion becomes more realistic in the understanding of reality.

Causality discussion

Current scientific literature offers us an overwhelming amount of 'causal' relationship between past events, and historical and contemporary development of countries. For example, North (1981) emphasizes the rise of the Parliament in England in the second half of the seventeenth century and its role in securing property rights; Mokyr (2002) highlights the scientific revolution of the seventeenth century, which is related to the writings of Francis Bacon; Weber (1905) considers the rise of Protestant movements as a key to explain subsequent development. Though all these relations can be viable, they cannot be seen as the ultimate explanation for what determines development at all, because they are limited to some specific space and time. So, in accordance with scientific philosophers they must be seen as thin causal relationships, which only can be seen as a point of view from certain disciplines. By this, the problem of gaining more knowledge of what happened than really happened is avoided (Cartwright, 2007).

Data and Variables

Does the identity of the colonizing country matters for subsequent economic performance? That is the, reformulated, empirical question to be answered in the following sections. To answer this question, data of 34 former African colonies is gathered. These are both British and French colonies. Data stem from The World Bank, and comprise the years 2003 until 2008. Egypt, the Seychelles, Tanzania, Algeria, Reunion, Tunisia, Guinea-Bissau, and Cameroon are omitted from the sample. There are a number of reasons for this; one example as a reason for exclusion is the case of Tanzania, which was occupied by the Germans from 1880 until 1919 and after that is was under the rule of the British till 1961. The results of this study would be blurred if the British period of reign would be taken into account. The remaining, viable, countries are in Appendix B.

GDP per capita has been the most commonly used measure of economic performance and development (Acemoglu et al., 2001), but there is no consensus on the specific measure that should be used. While some suggest the use of exchange rates, others suggest the usage of purchasing power parities (PPP). This study will estimate both models which make use of GDP per capita, and a model using PPP conversion to market exchange rate ratio. A PPP conversion factor is the number of units of a country's currency required to buy the same amount of goods and services in the domestic market as a U.S. dollar would buy in the United States. The ratio of PPP conversion factor to market exchange rate is the result obtained by dividing the PPP conversion factor by the market exchange rate. The ratio, also referred to as the national price level, makes it possible to compare the cost of the bundle of goods that make up gross domestic product (GDP) across countries. It tells how many dollars are needed to buy a dollar's worth of goods in the country as compared to the United States ([The World Bank](#)).

The dependent variables used in this study are GDP per capita and PPP. The independent variables stem from economic literature. Including factors from both legal and the geographical- stream. The following is a brief description of the variables.

- (-) GDP per capita: GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products ([the World Bank](#)).
- (-) Purchasing Power Parity: A purchasing power parity conversion factor is the number of units of a country's currency required to buy the same amount of goods and services in the domestic market as a U.S. dollar would buy in the United States ([The World Bank](#)).
- (1) Identity Colonizer: A series of dummy variables representing the identity of colonizing country. Either Britain (1), or France (0). The broader meaning of this is that a 1 implies a liberal model affects GDP or PPP, a 0 means the mercantilist model affects GDP or PPP.
- (2) Population growth: As shown in the studies of Grier and Tullock (1989), labour force and income grow proportionately. While population growth is clearly not equivalent to labor force growth, it is a good proxy and should also have a proportionate effect on income. Population growth is measured annually and in percentages. ([return to in conclusion](#))
- (3) Inflation: Friedman (1977) claims that inflation uncertainty increases the variability of prices, which hampers economic growth and efficiency. Levi and Makin (1980) show that variability of inflation is negatively correlated with economic growth. So, the expectation is that the variability of inflation will be negatively correlated to with GDP per capita. Inflation is measured annually in percentages. ([return to in conclusion](#))
- (4) Government Consumption: the effect of government spending on GDP is ambiguous. While governments spending on investment projects such as infrastructure and education may be conducive to economic growth, government consumption is likely to be negatively related to GDP growth.
- (5) Duration of the Colonial Period: The variable TIME will be created, and will measure the duration of the colonial period by subtracting the date of colonization from the date of independence. In literature, there is no consensus about the sign of the TIME coefficient. It is possible that a longer colonization period would hamper subsequent economic growth. Another possibility is that a longer period of colonization is on average better than a shorter period because it allows the colonizing country to establish more and better institutions. ([return to in conclusion](#))

The empirical model that follows from the preceding looks as follows:

Before estimation of the models, the data of the 26 remaining were cleaned for missing values. This resulted in the removal of Nigeria from the sample. Since no data were available on Government Consumption for this country. Another notable modification is the deleting of the years 2003-2006 of Sierra Leone, this also is due to missing data. 131 observations were remaining after all modifications had been made.

Empirical tests and results

For model estimation the ordinary least squares method is used. In continuation of this paragraph several models will be estimated using this method. First, two models based on GDP are estimated, after that one model based on a PPP measure will be estimated.

Models based on GDPpc

GDPpc model

In the first model problems occur with the significance level of both the dummy Variable IdentityCountry and government consumption. The overall explanatory power of the model is about 0.52, but the variable of interest for this study is not even individually significant at a 0.18 level. The variable Government consumption is statistically highly insignificant. As can be seen in Appendix C, this is not due to collinearity.

GDPpc Growth (annual %)

The second estimation exchanges GDP per capita for GDP growth in annual percentages. The explanatory power of this model is slight better than the first model. However, problems arise with the individual significance of several beta's (see appendix D). The most pleasant development is that the dummy variable becomes less insignificant. Unpleasant are the individual significance levels of inflation, government consumption and TIME, these are highly insignificant.

Logarithmic model with GDPpc

The use of logarithmic transformation is useful for interpreting the coefficients of the estimation in terms of percentages. It is also valuable for removal of heteroskedasticity problems. The outcomes of this model are very delightful, since for the first time our variable of interest becomes individually significant at a 0.05 level. Another gain is the improvement of the explanatory power of the model to near 0.57. The reason for these improvements can be sought in the behavior of the error terms in the ordinary linear regression model in relation to the dependent variable.

Models based on PPP

PPP conversion to market exchange rate ratio

Using PPP instead of GDPpc leads to improvement for the explanatory power of the model, which rises to the level of almost 0.64. A drawback is the highly insignificance of both the inflation and TIME variables in this model.

PPP Logarithmic model

As said before, the use of logarithmic transformation is useful for interpreting the coefficients of the estimation in terms of percentages. As in the estimation of the former logarithmic model the explanatory power improves. The inflation and country variables stay highly insignificant.

Model with interaction term

In line with the thought that in the beginning the French did develop more and extensive institutions than the British did, it is reasonable to assume that a joint effect of the variable IdentityCountry and TIME would improve the model. With time passing by, the French system did not improve themselves significantly, while the British started to understand and identify their colonial holding better and better. Leading to better outcomes for both the British Empire of that time, as for the former colonies today. The following model was estimated, interest is in the coefficient, and significance level of the last beta.

Proceeding with the best model so far (the model based on logarithmic transformation of GDPpc), leads to results that are rather disappointing. The model does not improve, and the interaction term is highly insignificant. This implies that there is no interaction effect between the duration of the colonization and the identity of the colonizer.

Conclusion

The study of colonialism is again in fashion. There are several reasons for this renewed interest. The first reason could be the social longing for a simpler ordered world. A quite different reason comes from the recent proliferation of studies which aim to take advantage of the natural experiment offered to them, and by this understand processes and institutions of economic growth. This study aims at a broader understanding of the colonial past than is conventional, by using a complexity theory approach. By addressing the question whether the differences in progress within Africa can be explained from the legacy of the French and British as colonizers. In 1996 Bertocchi and Canova asked themselves the question whether colonization did matter for progress. By which they defined progress in GDP per capita. They found out that colonization had, on average, a negative effect on progress in Africa. In economic literature differences in geographic patterns across societies have long been recognized as the explanation for differences in overall economic performance. Due to recent opposing evidence, there has been a revival of interest in these geographic patterns among scholars. Theory offers two main explanations for differences in economic performance. One stream focusing on the effects of conditions closely associated with geography. The other stream highlights how differences in performance could be rooted in the indirect effects that factor endowments have on paths of development through their influences on the way institutions evolve. These streams were referred to as the geography-stream and the legal-stream. The current study tries to explain differences in progress, from the difference of colonizing country, more specifically from the difference in economic model used by the colonizers. It could be concluded that this lies mainly within the realm of the legal stream. Two models were proposed. The mercantilist model, in this model the economy is organized in a way which enables productive activity to obtain national economic self-sufficiency and short term gains through favorable trade balances and accumulation of precious earth metals. Another characteristic of this model is that political authorities use the state to establish trade restrictions, and support extra-market bodies that provide rent to certain groups and deny privileges to others. This model leads to severe inequality. The liberal model is proposed. The notion liberal is inseparable from the concept of free markets. And so it functions in the liberal model of colonization. It proposes free trade, and thus not provides a certain state elite with all the advantages of productive activities. The models assigned to the British and the French were respectively the liberal and the mercantilist model.

Returning to the question to be answered in this study, data of 34 former British and French African colonies was gathered. Both GDP per capita and purchasing power parity conversion to market exchange rate ratio were used as dependent variable. A dummy variable of the identity of colonizing country, population growth in percentages, inflation, government consumption, and the duration of colonization were used as independent variables. Several models were estimated, in the logarithmic model making use of GDP per capita both the dummy variable of the identity of the colonizer, and the duration variable were both highly significant. An additional estimation of this model including an interaction term of duration and the identity of the colonizer did increase the explanatory power of the model slightly, but the individual significance levels went down, or weren't present anymore.

The conclusion of this study is twofold. On the one hand the empirical results show acceptable levels of significance in multiple models. This, indicating that there is both a duration effect, and an effect of the identity of the colonizing country. However, there is no evidence that a longer colonization period in combination with the identity of the colonizer has a significant effect on GDP. Otherwise said, there is no interaction between duration of the colonial period and the identity of the colonizer, and with that, no effect on growth. This also means that there is no institutional effect, meaning that the longer colonization period did not improve institutional development. A third conclusion is that there is no significant difference between a liberal and a mercantilist approach over time. On the other hand, the current study may give rise to some nuances. The concept of growth is a contested concept. There is not just one answer to what progress is, and what it means. After taking a closer look at progress, it can be concluded that four different goals can be deduced. One of them is economic development. From these simple notions it also can be concluded that economic development, and especially GDP growth, is just one way of talking about progress, and it does not necessarily overlap with progress. Another nuance that came forth from the concept of progress is how to measure it. International institutions and governments make use of indicators as GDP, however the disadvantages are severe, because these indicators hide inequalities in living standards. The former still leaves the question open whether progress can be measured in the realm of economics solely. Or, is it realistic and truthful to measure progress in the realm of economics? A second nuance from this study is about the ultimate viability of causal relationships. In an attempt to circumvent unrealistic conclusion the current conclusion must be seen as a thin causal relationships. Meaning that it only describes, to some extent, a certain space and time. The third nuance made, is about a subject which has enormous overlap with colonization. Slavery. Though omitted in this study, there is a learning point in this practice. It is a point of learning about the inconsistency of man. It is about colonizers who introduced the revolutionary principle of freedom, and took away the freedom of others. The ending conclusion of this study is therefore, that, though the empirical model appears to be reliable, and thereby there is a duration and an identity effect. It is a far foregone conclusion, since there are reasonable uncertainties about what is named progress, and what is named causality. More important, there are reasonable uncertainties about the consistency of the behavior of man. After all this may lead to the conclusion that *individuum est ineffabile*, and mapping his behavior is just movement within a realm. Future research could benefit from the use of panel data. A panel data set contains repeated observations over the same units, collected over a number of periods. Although panel data are typically collected at the micro-economic level, it has become increasingly common to pool individual time series of a number of countries and analyze them simultaneously. This allows economist to specify and estimate more complicated and more realistic models than single cross-section or single time series would do.

Appendix A

- Acemoglu, Daron, Johnson, Simon, Robinson, James A., 2001. The colonial origins of comparative development. *American Economic Review* 91 (5), 1369–1401.
- Bertocchi, G., And Canova, F., 1996. "Did Colonization Matter for Growth? An Empirical Exploration into the Historical Causes of Africa's Underdevelopment," CEPR Discussion Papers 1444, C.E.P.R. Discussion Papers.
- Cartwright, N., 1999. *The Dappled World*. Cambridge: Cambridge University Press.
- Cartwright, N., 2007. *Hunting Causes and Using Them*. Cambridge: Cambridge University Press.
- Cordoba, J.C., 2007. On the Colonial Origins of the Industrial Revolution. Munich Personal RePEc Archive. August 10.
- Davis, L. E. and R. A. Huttenback. 1986. *Mammon and the Pursuit of Empire: The Political Economy of British Imperialism, 1860-1912*. New York
- Diamond, J., 1997. *Guns, Germs, and Steel: The Fate of Human Societies*. New York: Norton.
- Ekelund, R. B., and R. D. Tollison. 1981. *Mercantilism as a Rent-Seeking Society: Economic Regulation in Historical Perspective*. College Station: Texas A&M University Press.
- Engerman, S. L., and K. L. Sokoloff, 2005a. "Colonialism, Inequality, and Long-Run Paths of Development," Working Paper 11057, National Bureau of Economic Research.
- Engerman, S. L., and K. L. Sokoloff, 2005b. "The evolution of suffrage institutions in the Americas," *Journal of Economic History*, 65, 891–921.
- Engerman, S. L., and K. L. Sokoloff. 1997. "Factor Endowments, Institutions, and Differential Paths of Growth among New World Economies: A View from Economic Historians of the United States." In *How Latin America Fell Behind*, edited by Stephen Haber, 260–304. Stanford University Press.
- Engerman, S. L., and K. L. Sokoloff. 2001. "The Evolution of Suffrage Institutions in the New World." Working Paper 8512. Cambridge, Mass.: National Bureau of Economic Research.
- Ferenczi, Imre, and Walter F. Willcox. 1929. *International Migrations*. New York: National Bureau of Economic Research.
- Engerman, S. L., and K. L. Sokoloff. 2002. "Factor Endowments, Inequality, and Paths of Development among New World Economies." *Economia* 3:41–88
- Englebert, P. 2000. Solving the Mystery of the Africa Dummy, *World Development*, Vol.28, No.10, pp. 1821–1835.
- Fieldhouse, D. K. 1966. *The Colonial Empires: A Comparative Survey from the Eighteenth Century*. London: Weidenfeld and Nicolson.
- Friedman, M. 1977. "Inflation and unemployment," Nobel lecture, *Journal of Political Economy* 85(3), 451–472.
- Gallup, J. L., Sachs, Jeffrey, Mellinger, Andrew, 1999. Geography and economic development. *International Regional Science Review* 22 (2), 179–232.
- Grier, K.B. and G. Tullock (1989). An Empirical Analysis of Cross-National Economic Growth, 1951-80, *Journal of Monetary Economics*. 24: 259-276
- Grier, R. M. 1999. "Colonial Legacies and Economic Growth." *Public Choice* 98: 317–35.
- Habermas, J., 1989. *The Structural Transformation of the Public Sphere*. Cambridge: Polity
- Hall, R. E., Jones, C. I., 1999. Why do some countries produce so much more output per worker than others? *Quarterly Journal of Economics* 114 (1), 83–116
- Hazelrigg, L.E., 1989. *Social Science and the Challenge of Relativism*. Florida: University Press of Florida
- Heckscher, E. F. 1935. *Mercantilism*. 2 vols. London: George Allen & Unwin.
- Huntington, E. 1945 *Mainsprings of Civilization*, J. Wiley and Sons, New York.
- Kiwanuka, M.S., 1970. Colonial Policies and Administrations in Africa: The Myths of the Contrasts. *African Historical Studies*, Vol. 3, No. 2 (1970), pp. 295-315
- Lal, D., 2004. In *Praise of Empires: Globalization and Order*. New York.
- Levi, M. D. and Makin, J. H. (1980) "Inflation Uncertainty and the Phillips Curve: Some Empirical Evidence", *American Economic Review* 70 (5), 1022–27.
- Locke, J., 1905 *Two Treatises of Government*, Hackett, Indianapolis.
- Lyotard, J.F., 1984. *The Postmodern Condition*. Minneapolis: University of Minneapolis.
- Machiavelli, N., 1519 *Discourses on Livy*, Oxford University Press, New York.

- Mahoney, J., 2000. "Path Dependence in Historical Sociology." *Theory and Society* 29:507–48.
- Mahoney, J., 2001. *The Legacies of Liberalism: Path Dependence and Political Regimes in Central America*. Baltimore: Johns Hopkins University Press
- Marshall, A., 1890 *Principles of Economics*, Macmillan, London.
- Marshall, T.H., 1950. *Citizenship and Social Class*. Cambridge: Cambridge University Press.
- Mokyr, J. 2002. *The gifts of athena. Historical origins of the knowledge Economy*. Princeton/Oxford.
- Moltmann, J., 2001. *The Spirit of Life*. Minneapolis: Fortress Press.
- Montesquieu, C. 1748 *The Spirit of the Laws*, Cambridge University Press, New York NY.
- Myrdal, G., 1968. *Asian Drama; An Inquiry into the Poverty of Nations*, 3 Volumes, Twentieth Century Fund, New York
- Nordhaus, W.D., and Tobin, J. 1972. *Is Growth Obsolete?*, Columbia University Press, New York.
- North, D. C. and Robert P. T., 1973. *The Rise of the Western World: A New Economic History*, Cambridge University Press, Cambridge UK.
- North, D. C., 1990. *Institutions, Institutional change, and Economic Performance*, Cambridge University Press, New York.
- North, D.C., 1981. *Structure and change in economic history*. New York: W.W. Norton.
- Nunn, N., *Historical Legacies: A Model Linking Africa's Past to its Current Underdevelopment*," *Journal of Development Economics*, Vol. 83, No. 1, May 2007, pp. 157-175.
- Olson, M., 2000. *Power and Prosperity : Outgrowing Communist and Capitalist Dictatorships*, Basic Books, New York.
- Rawls, J., 1999. *A Theory of Justice*. 2nd ed. Oxford: Oxford University Press.
- Sachs, J. D., 2000. "Notes on a New Sociology of Economic Development" in Lawrence E. Harrison and Samuel P. Huntington eds. *Culture Matters: How Values Shape Human Progress*, Basic Books, New York.
- Sen, S., 1999. *Development as Freedom*. Oxford: Oxford University Press.
- Stiglitz, J. 2002. *Globalization and its Discontents*. London: Allen Lane
- Taylor, C., 1975. *Hegel*. Cambridge: Cambridge University Press.
- The World Bank, 2012. *World Data Bank*. [online] Available at:<<http://databank.worldbank.org/ddp/home.do#ranking>> [Accessed 2 June 2012].
- Toynbee, A. J., (1934-1961) *A Study of History*, 12 Volumes, Oxford University Press, Oxford.
- Wallerstein, I., 1974. "The Rise and Future Demise of the World Capitalist System: Concepts for Comparative Analysis." *Comparative Studies in Society and History* 16:387–415.
- Weber, M., 1905 *The Protestant Ethic and the Spirit of Capitalism*. Routledge:London.
- Welker, M., 1994. *God the Spirit*. Minneapolis: Fortress Press
- Wright, E.O., 2000. "Working-Class Power, Capitalist-Class Interests and Class Compromise." *American Journal of Sociology*, January, 105(4):957-1002.

Appendix B

List of remaining countries in the sample					
Country:	Independence Date:	Colonization Date:	Duration:	Identity of Colonizer:	Average GDP:
Botswana	1966	1885	81	British	5757,594337
Gambia	1965	1765	200	British	346,6539264
Ghana	1957	1874	83	British	752,6246773
Kenya	1963	1885	78	British	592,0833205
Lesotho	1966	1867	99	British	3907,324087
Malawi	1964	1891	73	British	1406,612188
Mauritius	1968	1715	253	British	5631,930665
Sier. Leone	1961	1787	174	British	303,6919
Swaziland	1968	1902	66	British	2245,808547
Uganda	1962	1885	77	British	340,7513696
Zambia	1964	1891	73	British	760,4914081
Zimbabwe	1981	1890	91	British	432,0525695
Benin	1960	1909	51	French	535,1084462
C.A.R.	1960	1880	80	French	364,5001797
Chad	1960	1900	60	French	517,6033399
Congo	1960	1897	63	French	1925,158172
Gabon	1960	1839	121	French	6873,068355
Iv. Coast	1960	1843	117	French	968,4258159
Madagascar	1960	1885	75	French	337,4861607
Mali	1959	1898	61	French	447,0289291
Mauritania	1960	1903	57	French	610,1432301
Niger	1960	1861	99	French	243,5901956
Senegal	1959	1758	201	French	5175,722353
Togo	1960	1914	46	French	373,6833416
Bur. Faso	1960	1895	65	French	405,6834565
Average British GDP:			1873,1349163		
Average French GDP:			1444,4001519		

Appendix C

GDP models correlations

	Correlations							
	GDPpc	GDPGrowth	LogGDP	IdentityColonizer	Pop. Growth	Inflation	Government Cons.	TIME
GDPpc	1	-,063	,918**	,091	-,413**	-,049	-,106	,341**
GDPGrowth	-,063	1	-,062	-,075	,501**	-,099	,101	-,103
LogGDP	,918**	-,062	1	,09	-,482**	-,06	-,043	,312**
IdentityColonizer	,091	-,075	,09	1	-,387**	,096	,106	,186*
Pop. Growth	-,413**	,501**	-,482**	-,387**	1	-,270**	,190*	-,231**
Inflation	-,049	-,099	-,06	,096	-,270**	1	-,044	-,013
GovernmentCons.	-,106	,101	-,043	,106	,190*	-,044	1	-,106
TIME	,341**	-,103	,312**	,186*	-,231**	-,013	-,106	1

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

PPP models correlations

	Correlations						
	PPP	LogPPP	IdentityColonizer	Pop. Growth	Inflation	Government Cons.	TIME
PPP	1	,983**	-,016	-,406**	-,023	,342**	,041
LogPPP	,983**	1	-,067	-,453**	-,081	,279**	,021
IdentityColonizer	-,016	-,067	1	-,387**	,096	,106	,186*
Pop. Growth	-,406**	-,453**	-,387**	1	-,270**	,190*	-,231**
Inflation	-,023	-,081	,096	-,270**	1	-,044	-,013
GovernmentCons.	,342**	,279**	,106	,190*	-,044	1	-,106
TIME	,041	,021	,186*	-,231**	-,013	-,106	1

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Appendix D

	Model Results					
	GDPpc	GDP Growth	Ln (GDPpc)	PPP	Ln (PPP)	Ln (GDPpc)
Constant	2842,83***	-2,675*	7,734***	,660***	-,297***	7,672***
Identity Colonizer	-454,342	1,359*	-,325**	-,063**	-,155***	-,226
Population Growth	-956,012***	2,922***	-,616***	-,082***	-,194***	,005*
Inflation	-,144*	9,025E-5	-8,971E-5 **	0	0	-,614***
Government Cons.	1,951E-11	-9,374E-14	9,13E-14	4,904E-14***	9,388E-14***	-8,988E-5**
TIME	9,925***	7,378E-6	,004***	-4,366E-5	0	8,596E-14
identityColon.*TIME	-	-	-	-	-	-,001
R	,516	,519	,576	,634	,659	,577
Adj. R	,237	,241	,305	,377	,411	,3
Significant at 0,10	*					
Significant at 0,05	**					
Significant at 0,01	***					