The blessings of extractive institutions

Colonial revenue-raising and modern-day institutions in British colonies

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Abstract

The impact of good institutions has been found to be of utmost importance to a wide range of public goods and human wellbeing. Nevertheless, the question of what creates institutional quality is still a key puzzle in political science. Recently, much attention has been devoted to tracing the roots of variation in modern-day institutional quality back to historical circumstances. In one of the most cited hypotheses regarding institution building, Acemoglu, Johnson and Robinson (2001) attribute poor institutional quality to the colonial era and the creation of so-called 'extractive institutions'. These, the authors claim, were set up by European colonizers in areas unsuitable for large-scale settlement, and were designed to maximize revenue from the colony to the metropolitan power, rather than building institutions set to benefit the population and secure their property rights. This argument clashes with claims put forth within the field of fiscal sociology, which argues that revenue-raising, mainly in the form of taxation, improves states' bureaucratic capacity, while forcing rulers to make bargains with the citizenry over the revenues collected. This is said to result in improved institutional quality. This study presents empirical evidence that starkly contradicts the extractive institutions-hypothesis, and supports the notion that increased efforts in raising revenue can be linked to better institutions. Using colonial fiscal records from a sample of 29 British colonies, results from cross-country regression analyses show that colonial revenue extraction during the early 20^{th} century, measured as income-adjusted revenue level, can be linked with higher institutional quality today. This effect is substantial and robust to several specifications of both revenue-level and institutional quality, including measures of government effectiveness, rule of law, and corruption. The results hold under control for a range of relevant control variables, including widely used precolonial and geographic factors.

Introduction

Over the last few decades, the increasingly influential New Institutional Economics literature has identified institutions as an essential component in spurring development, primarily conceived in terms of economic growth (Shirley 2004). The same claim has been expanded as valid for a wide range of public goods by scholars dealing with good governance, or quality of government (see Holmberg, Rothstein, and Nasiritousi 2009). Empirically, it is well established that the places in the world with the highest level of socioeconomic development also tends to be the places with the highest level of institutional quality, often measured in terms of absence of corruption or an effective government. The lion's share of these are states located in Western Europe and North America, polities that already a century ago tended to display a comparatively high level of wealth and institutional quality.

This suggests that institutional equilibria, while possible to change (as demonstrated in East Asian states such as Japan, South Korea, and Taiwan), generally tend to be path dependent, and stable over time. The fact that 'good' institutions in today's world still remains the exception rather than the rule has led to a large mass of research attempting to find historical traces of what happened in the success stories on the top right corner of the map (Mann 1993; Ertman 1997; Rothstein 2009). One factor uniting the vast majority of states with a lower level of institutional quality is that they until relatively recently in effect were governed as colonies, and, to varying degrees, have inherited essential principles and institutions of governance from their old masters. Tracing institutional development back to colonialism is likely to offer useful insights into the birth and subsequent life of the developmental state. As Conrad and Stange (2011:53) note,

> the longevity of political structures and practices rooted in colonial times strongly suggests that there is a path dependency inherent in colonial governance. In order to understand present-day governance in formerly colonized countries it is therefore indispensable to take into account their colonial pasts.

This study will follow suit by taking the historical approach through attributing variation in current institutional quality to differences in the level of revenue that colonies, specifically those under British rule, collected during the early 20th century. While previous studies (most notably Acemoglu, Johnson, and Robinson 2001) have identified 'extractive institutions' set up during the colonial era as a critical impediment to subsequent institutional development, I argue that this argument relies on an overly generalized, and bleak, notion of domestic revenue extraction, and one which finds little support in empirical data. Rather, as will be demonstrated below, a high level of revenue collection during the early 20th century is significantly and positively linked with present-day government effectiveness.

The extractive institutions-thesis revisited

In their highly influential study, Acemoglu et al (2001) connote the notion of 'extractive institutions' to a predatory and destructive colonial system of rule, carrying few prospects of creating a governable and prosperous society. Their argument begins with the mortality rates of early modern European settlers and the claim that in places where these settlers found environmental preconditions suitable for long-term settlement today are well-functioning and prosperous states, while more dangerous settlements were used merely for the economic benefit of the metropolis. In this latter type of setting, the colonizers developed institutions designed to facilitate revenue extraction, while little effort was devoted to the development of any deeper or wider state building. Today, the bulk of this group of ex-colonies belong to the most corrupt and poverty-ridden states of the world.

Despite, or perhaps because of, the originality of this narrative, and the seemingly robust correlation between the authors' settler mortality index and modern-day institutional quality, the study has been subject of a fair deal of criticism. Not only does this extend to questions regarding the reliability of the measure (Albouy 2012), but the limited empirical scope of the sample has come under question. Fails and Kriekhaus 2010 note that excluding the 'neo-Europes' of Australia, Canada, and New Zeeland, and/or the city states of Singapore and Hong Kong, renders the strength of the settler mortality index, and Acemoglu et al's argument, largely dissipated. Finally, and most crucial, Frankema (2010) empirically dispels the paper's very empirical foundation by noting that, for at least the British colonies (which make up roughly half of the sample), the more sparsely settled colonies in fact imposed a lower level of fiscal extraction, relative to the wealth of their respective populations, compared to the settler colonies.

Rather than writing off the extractive institutions-hypothesis altogether, I posit that these findings call for a theoretically more nuanced notion of 'extraction', and a revisit of its relationship to state building. While there is no shortage of testimony to how European colonizers ravaged both the land and societies of those who inhabited them in their quest for riches, history has also taught us about the very potent agent of state building that has been the very same quest for extracting revenues. Through the works of Schumpeter (1919), and later Bates and Lien (1985), Campbell (1993), Olson (1993), Tilly (1992), Mann (1993), Levi (1989) amongst others, historic and political research has laid out a convincing narrative of state- and nation building, through the means of revenue extraction in general, and taxation in particular. A main argument inherent to the field, often referred to as 'fiscal sociology' can be summarized as such: Increased taxation means that rulers need to strike bargains with the prospective and existing revenue base over the extent and means of revenue extraction. This is considered to have been a significant contribution to spurring popular mobilization and accountability. Alongside, a strong and effective state bureaucracy is said to have grown out of the need to collect, administrate, and spend such revenue. Generally, this trend was primarily driven by the increased demands of maintaining a standing army, followed by ambitions of providing a wider range of public services. Both of these outcomes – accountability and openness, and a strong and effective government apparatus – are considered essential parts in the grander concept of institutional quality.

On a theoretical level, Olson's (1993) model of the stationary bandit can further the understanding of the benefits of a regularized system for revenue collection: Under an anarchic system, the population is plagued by theft from roving bandits that impairs incentives for production and investment, and thus the bandits' own bounty. Thus, in order to maximize earnings, it is rational for the strongest bandit to settle down, become 'stationary', and provide law and order and public goods for the productive sections of society. In other words, the bandit founds a government. This 'stationary banditocracy' can subsequently, provided certain conditions are right, pave the way for a more mature state system, characterized by robust rights of property and individual liberty.

This positive notion of extractive institutions will form the main hypothesis of the remainder of this study; if revenue raising can be a factor in how nascent states evolve and prosper, and if their effects are path-dependent, we should, opposite to Acemoglu et al's (2001) underlying argument, expect to see a positive relationship between colonial revenue extraction and modern-day institutional quality.

The empirical basis of this underlying argument is originally gathered from the study of the countries of early-modern Europe, shortly before these states themselves embarked on their colonializing missions across the globe. While a number of recent studies have turned their eyes toward states currently undergoing – very broadly stated - similar development processes, and looked at the link between current efforts of revenue collection and the quality of institutional features such as government quality (Pritchard and Leonard 2010; Baskaran and Bigsten 2013), democracy (Ross 2004), and more specific features of the liberal state (Mahon 2005), little quantitative research has been carried out accounting for path-dependency by linking past levels of taxation and today's institutional landscape. This forms a rather crucial gap in the literature, as the research on early modern Europe, especially England and later Britain, describes the dual process of taxation and state building as one that evolved over generations, and stabilized over time – the very type of path dependent, historical institutionalist development that Acemoglu et al (2001) has been prominent in furthering within social science over the last few decades.

Taking a closer look at the British Empire is particularly interesting in this regard. The metropolitan power's observed tax-institution relationship indicate that a British colonial heritage may have created an institutional framework where the tax effects are particularly visible. The British mode of colonization was, as Lange, Mahoney and vom Hau (2006) denotes it, 'liberal' in character, and thus likely receptive to recreating the domestic state building development. This can be contrasted with, for example, the Spanish colonies, which operated through a mercantilist mode of governance that, according to the authors tended to reproduce patrimonial institutions without the capacity, or motivation, of providing and upholding rule of law, free markets or public goods (Lange et al 2006: 1420). Having recently succeeded with developing a tax state at home, a process that took centuries, Guyer (1992: 42) notes, the British colonizers

> tried to duplicate the English sequence over a period of a few decades: to establish central government and taxation systems on authoritarian bases, to promote the market using these mechanisms fairly ruthlessly in some places, and finally – by the last decade – to allow limited systems of representation and expansion of the salaried civil service.

Furthermore, the fact that the British prided themselves in the art of bookkeeping leaves us with relatively high quality accounts of the fiscal affairs during the colonial era.

While the specifics of how extraction efforts were undertaken, and the extent to which it succeeded, varied across the different colonies, their extractive efforts were of paramount essence to London, and thus their envoys on the ground, in all corners of the empire. Jones (2013) shows how governors' salaries were closely tied to the amount of revenue they were able to extract (see also Berman 1984: 181). Such aggressive focus on relatively short-term revenue-maximization can be paralleled with the strategies of Olsonian stationary bandits, such as the Habsburgs in Spain or the late Bourbons prior to the French revolution (Olson 1993: 570). In spite of this hunger for revenue, the individual colonies were in reality far from cash-cows for the metropolitan government, generally had to be self-sufficient in terms of funding, and were early on run on budgets relatively similar to independent states (Adebayo, 1995; Berman 1984: 178; Gardner, 2012).

To the colonial rulers, taxation also served secondary purposes beyond pure book-balancing concerns. A colonial memorandum from 1929 attests to the centrality of the revenue administration for the quality of the bureaucratic framework: "a well thought out efficient and honestly managed revenue system, is the absolute foundation of any form of orderly Government" (in Burton 2008: 80). This is a notion similar to the one tested and showed in modern-day Africa by Pritchard and Leonard (2010), who find modest evidence of a spillover effect from the quality of the tax administration to other sectors of the bureaucracy. Burton (2008), focusing on colonial Tanganyika, continues to state that "tax was above all political: dependent upon, and simultaneously reinforcing, colonial authority" (2008: 75). These more indirect goals of taxing colonial subjects were particularly evident in the policies introduced by lord Lugard, famed governor of Hong Kong and Nigeria, and one of the most influential architects of British colonialism during the interwar era. Taxation was seen as an instrument that could monetize the economy and bring in subjects under its administrative rule, "transforming the primitive and barbaric into good, industrious and governable colonial subjects" (Bush and Maltby 2004: 7).

Colonial subjects themselves, unsurprisingly, did not merely adhere to the plans of their rulers. Evidence from turn-of-the-century Uganda shows how the advent of monetized tax collection, often fraught with corruption and involving extortionary practices, led to a new type of resistance from peasants, who in the process of coping with the tax burden "were learning to challenge the system by operating within it, as well as through resistance and rebellion" (Tuck 2006, 242). Replies to outright rebellion were met with an increasing professionalization of tax collection, and negotiations between the British and the indigenous elite in charge of tax collection over increased rates led to the introduction of salaries for low-level administrators (Tuck 2006). The coercive aspects of revenue collection were prevalent, especially in the less developed colonies of sub-Saharan Africa. The need for such coercion also led to the establishment of institutions promoting and enforcing law and order. Evidence from Nyasaland (modern-day Malawi) (Deflem 1994) and Southern Nigeria (Killingray 1986: 412, n. 6) shows that tax collection was the main impetus for establishing a colonial police force, a factor Lange (2004: 909) uses as a proxy for the size of the legal-administrative apparatus, and in extension modern-day institutional strength in ex-colonies.

Still, even in this rather extractive context, there is evidence of bargaining and the construction of a social contract between ruler and ruled. In Bechuanaland (modern-day Botswana), taxation became a main prism through which native-metropolitan bargaining took place, partly mediated by the native administration (Makgala 2004). Baker (1975) shows that, while native chiefs intermittently carried out collection of taxes, the taxpayers considered the burden as stemming from the colonial overlords. During the prelude to independence reactions to taxation, even in the least developed parts of the empire such as Western Africa, spurred consciousness and resistance from subjects. As an example, the first meeting of the National Congress of British West Africa in 1920 had as its top priority that taxation should bring increased representation and domestic control over public finances, a demand clearly echoing those made in Europe and the United States during the previous centuries (Bush and Maltby 2004).

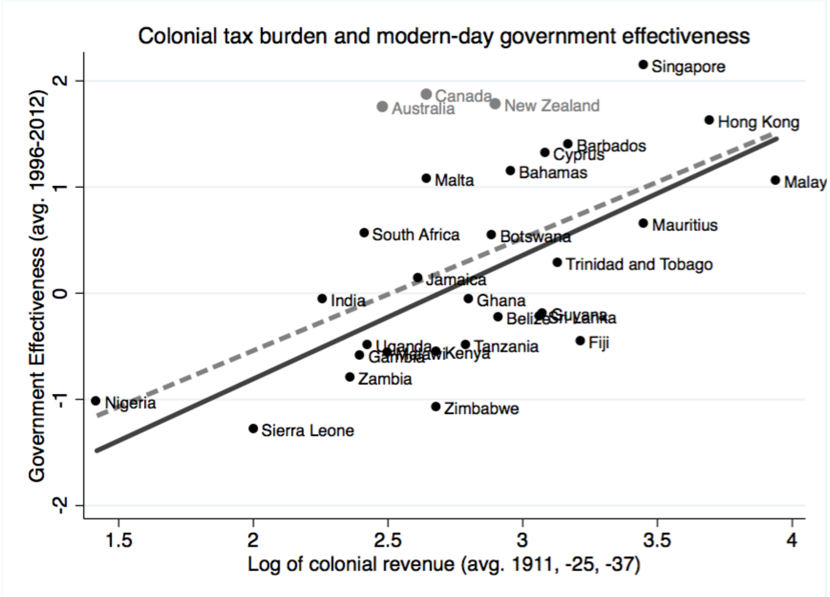
There are some examples of research explicitly tying colonial taxation to modern-day state capacity and institutional quality. Bräutigam (2008b) accredits the relatively successful state building of Mauritius to profitable conditions at independence, which in turn she links to taxes, mainly on sugar. As a response to the tax demands posed on this, for the colony, highly important export good, the sugar producers united in order to form a Chamber of Agriculture, which not only negotiated with the government on tax issues, but also oversaw research of improvements in sugar production. By the transition to independence, this tradition of collective action bargaining, dating back to the late 19th century, proved to be a fertile soil for state building efforts to come. Through

> the extended experience of an elected legislature, and a long tradition of training and hiring Mauritians in a range of government roles, meant that the government was relatively well prepared to manage the demands of development at independence. (Bräutigam 2008b: 146)

Furthermore, Berger (2009) demonstrates how colonial taxation matters for local government effectiveness in today's Nigeria. Looking at otherwise similar districts, divided only by a now obsolete colonial boundary, he finds that in the areas north of the old border, where local direct taxation was instated in the beginning of the 20th century, satisfaction with government services today are significantly higher compared to the 'taxless' areas just south of the border. Additionally, Berger's analysis dispels several alternate explanations commonplace elsewhere in the literature, such as wealth, political instability, and the influence of traditional elites.

Based on the theoretical insights gathered from early-modern Europe, in tandem with the testimonies of the institution-building consequences stemming the efforts in raising colonial revenue, this study will proceed by testing the hypothesis that extractive institutions, measured as higher revenue levels during colonial times can be associated with better institutions today. By using a new dataset (Frankema 2010, see below for a more comprehensive description of the data) that measures the level of revenue collection, adjusted for average income, in the British Empire during the time before World War II, figure 1 plots modern-day government effectiveness, measured as the average score between 1996-2012 for each state in the World Governance Indicator's 'governess effectiveness index' against the logarithm of average colonial revenue in 1911, '25, and '37. The relationship is rather strongly positive, and accounts for an explained variance in government effectiveness of 29 % for the entire sample, and 46 % without the 'neo-Europes' of Australia, Canada, and New Zeeland.

Figure 1. Colonial revenue level and modern-day government effectiveness



Sources: Frankema (2010); Kaufmann et al (2009)
Note: Dashed regression line includes entire sample (N=30), solid black indicates sample without 'neo-Europes' Australia, Canada, and New Zeeland (N=27)

In order to understand whether this relationship, which, prima facie, offers a strong rebuttal to the extractive institutions-hypothesis, truly holds, the positive colonial revenue extraction – current institutional quality-hypothesis will be further tested using statistical analysis.

Sample selection, Data, and Statistical Modeling

Sample of colonies/states

The sample of British colonies is near-exhaustive, with some qualifications. First, it leaves out some minor island states such as Kiribati and Tuvalu. Second, due to the brevity of British involvement in the Middle East, these holdings are excluded. Third, as several of the control variables employed in the models below lack data for Malta, it is also excluded. Fourth, in the subsequent analyses, the models will employ samples both including and excluding the 'neo-Europes', Australia, Canada, and New Zeeland; on the one hand, including these brings the benefit of comparison to other similar studies, on the other, these were by most accounts already highly developed and founded as practically independent states during the interwar era. This leaves us with a relatively modest sample size of twenty-nine for the full sample, and twenty-six without the neo-Europes.[1]

[1] In addition to the criticism of comparing the neo-Europes to the other colonies, Fails and Kriekhaus also make a slightly weaker case for the exclusion of the city states Hong Kong and Singapore. While their arguments are

Although most colonies can be translated into modern-day states, the appendix describes how considerations were made to account for the break-ups, unifications, and border changes for some colonies following independence.

Measuring colonial level of revenue and modern-day institutions

The data on colonial revenue levels comes from Frankema (2010), who uses British colonial tax records from the late 19th century up to World War II in order to estimate the revenue level in the individual colonies. While creating the most commonly used measure of tax levels, in terms of its share of GDP, is not possible to calculate due to lack of reliable data of the size of the economy, Frankema has created a proxy index measuring how many days it would take an unskilled urban worker to pay the average per capita fiscal revenue. Notably, the measure is not affected by the wealth of the colony, as a measure of tax revenue in strict per capita terms inevitably would have done. While indeed a somewhat coarse measure, and considering the fact that many types of public revenue are not necessarily paid by such workers, it is nevertheless likely the most reliable and comparative approximation of the level of taxation in each colony.

This data is available for three points in time during the first half of the 20th century, the period considered the 'heyday of colonialism' (Boone, 1994), centered around 1911, 1925, and 1937.[2] The revenue level variable is calculated as an average of these three years, with minor imputations made for when data is unavailable.[3] This is likely about as early as we can go back in time for such a wide sample of British colonies, as many colonies were little more than trade posts some decades prior, and some did not even exist before the 1920s. Furthermore, the widespread early colonial practice of forced corvée labor as an alternative to taxation of the indigenous population, a factor that could potentially affect net cash revenue

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largely sound, especially as their dependent variable of interest is economic growth, their exclusion seems more arbitrary in a study mainly interested in the causes of institutional quality. First, the colonial population density of these are comparable to several other colonies (in 1925, Hong Kong was the second most densely populated colony after Malta, and Singapore the fourth, following Mauritius). Second, other highly urbanized micro-states such as Monaco and Qatar, while also exceedingly wealthy, have not shown to be as exceptionally well-governed as Hong Kong and Singapore, showing that there is no built-in guarantee of institutional exceptionalism to this type of system. As demonstrated below, colonial population density will be used as a control variable, meaning that the models account for all heavily populated colonies along this vector.

[2] These are allowed to vary +-1 year from the assigned ones.

[3] Botswana, Tanzania, Zambia, and Zimbabwe have missing values for 1911. The imputation was carried out by predicting through regression the 1911 value, based on the colonies' revenue levels in 1925, to which it highly correlates (r^2=.76).

negatively, particularly for the African colonies, was largely phased out in the early 1920s (Iliffe 1995: 198). Limiting the selection to the period before World War II also means that we avoid capturing the effects of more ambitious British grant and aid policies of the final colonial period, which, although emanating in the late 1920's, first began in earnest ten years later (Malmsten 1977).

The types of revenue that are included in Frankema's measure includes not only taxes, such as direct taxes "on income, land, property, inheritances, or harvests" (Frankema 2010: 455), but "all types of direct and indirect taxation, including customs revenue, excises, harbour dues, government licences, stamp duties, and fees of court or office" (Frankema 2010: 475). The non-tax revenue included in the measure still warrant inclusion, as these types of fees still involved a direct interaction between state and individual, as well as required an administrative effort, two of the main mechanisms inherent to the theoretical framework.

Still, from a state building perspective, all sources of revenue are not necessarily equal. Previous studies on the capacity-generating effects of revenue raising has generally considered certain types of taxes as more or less beneficial. Particularly, a fault line has been has been drawn between direct and indirect taxes (primarily the former) on the one hand, and trade taxes on the other. The first type of revenue is considered to be difficult to collect and visible among the people, while the second is gathered with little effort and tends to go unnoticed by the greater population (Lieberman 2002). While this view is both a rather stark generalization, and possibly colored by the tax system-design of Western societies after World War II, it does warrant a closer look within the analysis. In the interest of keeping the tax measure as comparable as possible, it would be unwise to disaggregate the composition of colonial taxation too much, as this could vary due to geographic and economic preconditions between regions. Nevertheless, the analysis below will employ complement the 'simple' total revenue level measure with a second variable, without customs duties, mainly collected from traders at harbors and borders. This stream of revenue was likely the most easily collected considerable source of colonial revenue, the burden of which tended to fall more on traders rather than the denizens of the colonies in question.

As a measure of present-day institutional quality the paper employs indexes widely used for capturing such a concept. Primarily, the analysis will make use of an index of government effectiveness issued annually as part of the World Governance Indicators (see Kaufman et al, 2009). The index, which is widely used in cross-national comparisons, is an composite measure that

> captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. (World Bank, n.d.)

Among the measures used to operationalize the admittedly broad concept of institutional quality, this is arguably the most holistic.[4] The measure is set to be centered around zero and ranges between -2.5 and 2-5.

Despite their reputation as relatively successful cases of subsequent state building (Charron, Dahlström, and Lapuente 2012), the former British colonies display a wide range of government effectiveness today; between the extremes Sierra Leone (at -1.28) and Singapore (at 2.15), we find all but a few of the world's states, and the standard deviation is fairly substantial (0.91). The mean score (.11) is marginally higher than the global mean (0).[5]

To ensure robust results that are not subject to one particular operationalization of institutional quality, the government effectiveness variable is complemented by using the World Bank's Rule of Law Index (averaged for the period 1996-2000), a measure previously used by Nunn and Puga (2012). Second, Transparency International's Corruption Perceptions Index, which annually measures country experts' opinions on the level of corruption in a given country (averaged for the ten years between 2003 and 2012) is used.

Table 1 below presents the states included in the analysis, along with their values on the main variables.

[4] Another potentially suitable measure, the Quality of Government index, which is issued annually by the PRS Group unfortunately does not survey all the states in our sample.
[5] In the subsequent regression models, this variable is rescaled t orange between 0 and 10.

Table 1. Countries included in the analysis

Country Name	**Corresponding Colony**	**Colonial revenue level (days/year)**	**Custom duties, share of fiscal revenue (%)**	**Colonial non-customs revenue level (days/year)**	**Government effectiveness (average 1996-2012)**
Australia	*Australia*	*12*	*51.4*	*5.9*	*1.75*
Bahamas	Bahamas	19.2	84.4	3.6	1.14
Barbados	Barbados	23.8	60.3	9.8	1.40
Belize	British Honduras	18.4	70	5.5	-0.23
Botswana	Bechuanaland	17.9	25.7	13.3	0.54
Canada	*Canada*	*14.1*	*39.6*	*9.4*	*1.87*
Cyprus	Cyprus	21.9	32.9	13.7	1.32
Fiji	Fiji	24.9	64	8.8	-0.45
Gambia	Gambia	11	76	2.8	-0.59
Ghana	Gold Coast	16.5	86.9	2.1	-0.06
Guyana	British Guiana	21.7	62.8	8	-0.19
Hong Kong	Hong Kong	40.3	0	40.3	1.62
India	India	9.6	26.6	7.1	-0.06
Jamaica	Jamaica	13.6	60.5	5.4	0.14
Kenya	Kenya	14.6	40.2	8.4	-0.56
Malawi	Nyasaland	12.2	32.9	7.9	-0.56
Malaysia	Federated Malay States	51.5	46.2	27.5	1.06
Mauritius	Mauritius	31.6	52.5	15.2	0.66
New Zealand	*New Zeeland*	*18.2*	*42.3*	*10.8*	*1.77*
Nigeria	Nigeria	4.1	71.6	1.1	-1.02
Sierra Leone	Sierra Leone	7.4	69.8	2.4	-1.28
Singapore	Straits Settlements	31.5	0	31.5	2.15
South Africa	South Africa	11.2	33.8	7.8	0.57
Sri Lanka	Ceylon	21.4	52.9	9.8	-0.22
Tanzania	Tanganyika	16.3	39.4	9.9	-0.49
Trinidad & Tobago	Trinidad & Tobago	22.9	53.2	10.6	0.28
Uganda	Uganda	11.3	32.7	7.2	-0.49
Zambia	Northern Rhodesia	10.6	25.6	7.8	-0.80
Zimbabwe	Southern Rhodesia	14.6	40.9	8.7	-1.08
Full sample:	Mean (unweighted)	18.8	47.4	10.4	.28
	Standard deviation	10	21.7	8.7	1
W/o neo-Europes	Mean (unweighted)	19.2	47.7	10.6	.11
	Standard deviation	10.5	22.9	9.2	.91

Comments: Italicized state name indicates neo-European colony.
Revenue variables calculated as the average of three years centered around 1911, 1925, and 1937. In reality they are measured between one-year before and one year after these benchmark years.

Control variables

As both revenue raising and institutional quality may be related to a number of external factors, the model will also include a number of control variables to account for possible confounders. First, the underlying structural and socioeconomic characteristics of each colony need to be accounted for. The link between taxation and economic development is generally considered to be positive (North, Wallis and Weingast 2009; Acemoglu 2005), and while there is, to this author's knowledge, no reliable measures of per capita GDP for the interwar years available for this set of states, I employ Maddison's measure from 1950 (in log form), prior to the independence of most of the states in the sample.[6] Another feasible indicator of the ease of revenue collection is population density at the time of the taxation variable. More sparsely populated areas tend to require more effort to survey and tax than more populous and/or urban milieus.

Conversely, Acemoglu et al (2002) and Mahoney, Lange and vom Hau (2006), argue that a high level of precolonial development, measured as population density in 1500, was an impediment to European settlers in establishing enduring institutions. In the main models both population density in 1925 and 1500 will be included.

Other factors that could potentially affect both colonial taxation and subsequent development are geographic in kind (see Easterly and Levine 2003). The models control for average distance to an ice-free coastline for the citizens of each state (Nunn and Puga 2012), a more refined version of the oft-used landlocked variable. Potentially relevant geographic factors such as soil quality, share of state being tropical, and Nunn and Puga's (2012) measure of ruggedness, appear to have a weak relationship to both colonial taxation and modern day institutions, and are left out for the sake of parsimony.

The mode of colonialism itself presents a second set of potentially confounding factors. Feyrer and Sacerdote (2006) find that time spent under colonial rule has affected subsequent economic development positively. Timing could matter both due to the fact that more hospitable areas were colonized at an earlier stage, and that the time spent under colonial rule itself correlates with state consolidation and institutional development. This study will use the logarithm of years spent under British rule until 1925, the middle year for which our revenue variables are measured.[7]

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[6] Belize (British Honduras) has missing data for this variable. Its value is imputed by using the country's level of wealth in 2000, and tracing it back to 1950 using the average 1950-2000 growth rate for the other British colonies in the Caribbean region.

[7] The reason not to include all years under colonial rule up to independence is to avoid concerns of endogeneity – i.e. that states with higher tax capacity could be more empowered and break-free earlier than weaker states.

Lange (2004) argues that the extent of indirect rule – i.e., the amount of responsibilities and powers the colonizers allocated to preexisting traditional and tribal ruling networks – in British colonies is negatively correlated with modern-day governance. The argument is that in colonies where the reach of the metropolitan state was weaker, and the administration relied upon native chiefs for upkeeping order, the institutional structures did not strengthen and develop at the same pace of those colonies with more direct control. Instead, they became fertile soil for clientilism and 'big man rule', often along ethnic and tribal fault lines. Lange's (2004) index measuring the share of court cases that were handled under customary law will function as control for this.

Finally, as a control of Acemoglu et al's (2001) settler mortality index, we encounter the same issue of missing cases as does Lange (2004); since Acemoglu et al (2001) only include 23 of the British colonies in our sample (20 in the non-neo-Europes), we follow Lange's approach and use the logarithm of the share of Europeans in 1955, a variable that should capture the extent of colonial settlement.

Table 2 displays the bivariate relationships between this set of possibly confounding factors and the two colonial revenue extraction-variables. We find that most relationships are along the lines of what the previous body of research would have us predict. Wealth, in terms of GDP/capita, and revenue level are positively related, although only significant for total revenue and when the neo-Europes are left out. Higher colonial population density facilitates revenue raising, although this relationship is quite moderate; the same positive relationship can be observed with regards to how long the colony had been under British rule (although this largely seems to be a neo-Europe-effect). Population density prior to the onset of colonialism has a close to non-existing relationship – a possible exception might be on the total revenue level with the neo-Europes excluded, where the relationship is weakly negative. Being far from a coastline is adversely related to total revenue level, but this relationship is, unsurprisingly, largely limited to when customs duties are included. Having a high share of Europeans is moderately correlated to revenue extraction, although its direction depends on revenue type and the sample. Customary law, or indirect rule, has a decidedly negative relation to revenue extraction. Like most of these control variables, this primarily applies to the full sample, including the neo-Europes.

Table 2. Bivariate correlations between revenue- and control variables

	Full sample		W/o neo-Europes	
	Colonial revenue level	Colonial non-customs revenue level	Colonial revenue level	Colonial non-customs revenue level
GDP/capita 1950 (log)	.27	.15	.41**	.16
Colonial population density (log)	.32*	.27	.30	.30
Precolonial population density (log)	-.07	-.02	-.17	-.03
Avg. distance to coast	-.45**	-.11	-.52***	-.17
Years under British rule <1925 (log)	.28	.08	.32	.08
Customary law	-.66***	-.50***	-.72***	-.52***
Share Europeans 1955 (log)	.13	-20	.27	.25

*Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$*

Statistical models

Tables 3-4 display the main results of the statistical analysis. The dependent variable in both is the average government effectiveness score 1996-2012. In table 3 the revenue measure includes all fiscal revenue, and table 4 only non-customs revenue. Both tables include all colonies with available data, as well as the subset with the neo-Europes excluded.

Apart from the change in revenue variable, the two tables are otherwise identical. In model 1 the independent variable is only regressed on respective revenue variable, while model 2 only includes the complete set of control variables. Model 3 includes the revenue variable, along with the structural control variables (logarithms of population density 1925 and precolonial population density and GDP/capita in 1950, as well as average distance to coast), while model 4 accounts for the factors pertaining to the mode of colonialism (logarithm of years under British colonial rule prior to 1925, customary law, and the logarithm of share of Europeans in 1955). Finally, model 5 runs the regression with all controls included.

Results

Total fiscal revenue (table 3) remains significantly positive on government effectiveness in both subsets, under control for both the structural and colonial batteries of controls, apart (models 3 and 4), and together (model 5). Without controls (model 1), the effect size shows that a doubling in revenue level brings more than one standard deviation in government effectiveness. This varies little depending on whether the neo-Europes are included or not, but, as observed in figure 1 above, the explanatory power, in terms of r^2, increases when they are left out. This confirms the notion that revenue level has its greatest effect in states (or, in this case, colonies) that are still undergoing considerable development. Including the control variables means a slight effect decrease, yet particularly for the non-neo-Europes, this drop-off is marginal.

Table 4 largely tells a similar story; non customs-revenue level remains highly significant in all models, and the explanatory power is higher in the non-neo-Europes. The effect size without controls is smaller, both with and without controls. Under control for rivaling factors, particularly in the full sample, the effect of non-customs-revenue level is, however, generally more significant, compared to total revenue level. The strength of the focal relationship is not greatly affected by which controls we include; the structural battery (model 3) seems to have a smaller disturbing effect than the colonial set (model 4). Interestingly, the inclusion of the full set of controls (model 5) shows a larger effect size that controlling for structure and mode of colonialism separately.[8]

Among the control variables themselves, no single variable retains a consistently significant effect across all the models. Customary law is, similar to Lange's (2004) results, (weakly) significant in a negative direction in the models without revenue level (model 2). When these are included, however, its significance vanishes; this result is an interesting finding in itself, and worth a further investigation. Due to the fact that much of tax collection, as seen above, was under the purview of the native chiefs that formed the basis of indirect rule, primarily in Africa, herein unreported regression models show a negative interaction effect between the two, particularly in the non-neo-European context. This indicates that the institutional premium of revenue raising decreases in a system with indirect rule. These results are, however, slightly below the thresholds for significance, which in turn may be a result of the few degrees of freedom allowed in such a small-sample regression model.

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[8] To check the robustness of the results, the models in tables 3 and 4 were carried out using bootstrap and jackknife estimation techniques, which affected the standard errors only marginally.
Models were also run with substituting dependent variables measuring institutional quality. The first was the average score in Transparency International's Corruptions Perceptions index 2003-2012, and the second World Bank's Rule of Law index 1996-2000 (the latter used by, and gathered from, Nunn and Puga [2012]). The results were very similar to the original models, with some minor deifferences (see figure 2 below).
Diagnostics fail to reveal any severe levels of multicollinearity. Nevertheless, in order to ascertain that the main results of the models are not affected by the collinearity between customary law (highest VIF-value just below 5.5) and the other regressors, supplementary models were carried out by eliminating this variable. Eliminating customary law increased the strength of the focal relationship across the board (see below for a further discussion on the influence of the customary law variable). The same tests reveal that the revenue-variables are not multicollinear to the other regressors, despite its correlations to the other regressors, primarily customary law.

Table 3. Effects of British colonial revenue level on present government effectiveness

	Full sample					W/o 'neo-Europes'				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Colonial revenue level	3.15***		2.50***	1.85*	2.44**	3.48***		2.80***	2.42**	2.74***
	(0.91)		(0.70)	(0.97)	(0.88)	(0.70)		(0.69)	(0.95)	(0.86)
Colonial population density		0.30	0.19		0.20		0.40	0.35		0.33
		(0.27)	(0.21)		(0.24)		(0.29)	(0.22)		(0.24)
GDP/capita 1950		1.00	2.10***		1.38**		0.71	1.51***		1.06*
		(0.66)	(0.38)		(0.59)		(0.72)	(0.49)		(0.60)
Precolonial population density		0.18	0.11		0.20		0.16	0.12		0.19
		(0.22)	(0.19)		(0.19)		(0.23)	(0.18)		(0.19)
Avg. distance to coast		2.15	2.16*		2.55**		2.85	2.08		3.43*
		(1.31)	(1.13)		(1.15)		(2.12)	(1.55)		(1.74)
Years under British rule <1925		0.38		0.78**	0.59		0.39		0.67*	0.62
		(0.40)		(0.37)	(0.35)		(0.43)		(0.36)	(0.36)
Customary law		-0.04*		-0.01	-0.00		-0.04**		-0.01	-0.00
		(0.02)		(0.02)	(0.02)		(0.02)		(0.02)	(0.02)
Share Europeans 1955		0.26		0.49**	0.29		0.17		0.15	0.18
		(0.29)		(0.20)	(0.25)		(0.31)		(0.24)	(0.25)
Constant	-4.28	-3.34	-17.9***	-3.55	-15.1**	-5.77***	-1.18	-14.5***	-5.05	-13.8**
	(2.60)	(4.92)	(3.51)	(3.98)	(6.03)	(2.02)	(5.59)	(4.17)	(3.82)	(6.03)
N	29	29	29	29	29	26	26	26	26	26
R^2	0.31					0.50				
adj. R^2	0.28	0.62	0.69	0.61	0.71	0.48	0.50	0.66	0.57	0.67

Standard errors in parentheses
*Significance levels: * p < 0.10, ** p < 0.05, *** p < 0.01*

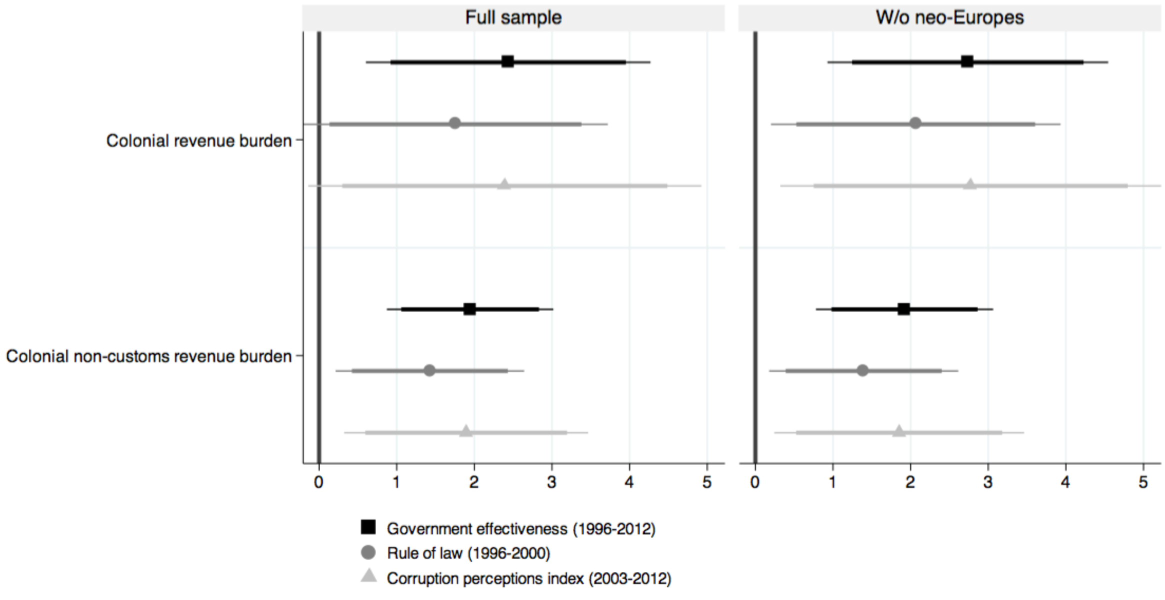
Table 4. Effects of British colonial non-customs revenue level on present government effectiveness

	Full sample					W/o 'neo-Europes'				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Colonial non-customs revenue level	2.14***		1.71***	1.54***	1.95***	2.11***		1.71***	1.64***	1.92***
	(0.61)		(0.39)	(0.50)	(0.51)	(0.51)		(0.39)	(0.49)	(0.54)
Colonial population density		0.30	0.08		-0.07		0.40	0.15		0.01
		(0.27)	(0.20)		(0.23)		(0.29)	(0.22)		(0.25)
GDP/capita 1950		1.00	2.11***		1.84***		0.71	1.64***		1.56**
		(0.66)	(0.35)		(0.56)		(0.72)	(0.47)		(0.61)
Precolonial population density		0.18	0.06		0.11		0.16	0.08		0.11
		(0.22)	(0.17)		(0.17)		(0.23)	(0.18)		(0.18)
Avg. distance to coast		2.15	0.55		0.76		2.85	-0.34		0.55
		(1.31)	(0.99)		(1.09)		(2.12)	(1.40)		(1.78)
Years under British rule <1925		0.38		0.97**	0.74**		0.39		0.85**	0.67*
		(0.40)		(0.35)	(0.32)		(0.43)		(0.34)	(0.35)
Customary law		-0.04*		-0.01	0.01		-0.04**		-0.01	0.00
		(0.02)		(0.02)	(0.02)		(0.02)		(0.02)	(0.02)
Share Europeans 1955		0.26		0.43**	0.02		0.17		0.11	-0.05
		(0.29)		(0.17)	(0.24)		(0.31)		(0.22)	(0.25)
Constant	0.13	-3.34	-14.3***	-2.32	-16.3***	-0.32	-1.18	-10.7***	-2.19	-13.9**
	(1.34)	(4.92)	(2.82)	(2.44)	(5.16)	(1.13)	(5.59)	(3.71)	(2.35)	(5.64)
N	29	29	29	29	29	26	26	26	26	26
R^2	0.31					0.42				
adj. R^2	0.29	0.62	0.74	0.68	0.77	0.39	0.50	0.68	0.64	0.70

Standard errors in parentheses
*Significance levels: * p < 0.10, ** p < 0.05, *** p < 0.01*

In sum, table 3 and 4 appear to confirm a significantly positive relationship between colonial revenue levels and current institutional quality. To illustrate the magnitude of these effects, as well as the robustness of the findings, figure 2 plots the regression coefficients for the revenue variables on government effectiveness, along with the estimates of the alternate dependent variables rule of law and corruption (all ranging between 0 and 10), after the full set of control variables has been accounted for (analogous to model 5 in tables 3 and 4). It shows that this effect is decidedly non-trivial and robust. Total revenue level shows a consistently sizeable effect, a doubling of which ranging between an increase in institutional quality of between slightly below 2 and slightly below 3 points. This effect is consistently significant, although for the full sample, this is limited to the 90 % level of significance for rule of law and corruption. The effect of non-customs revenue is consistently smaller, ranging between 1.5 and 2 points, yet its confidence intervals are as well, and the effect on all three dependent variables are significant at the 95 % level.

Figure 2. Coefficient estimates of colonial revenue on institutional quality



Comments: Regression coefficients for colonial revenue variable's effect on respective DV (scaled between 0 and 10; after inclusion of full set of control variables, model specification equal to model 5 in tables 3 and 4).

Thick line indicate confidence interval at 90 % level of significance; thin line indicate confidence interval at 95 % level of significance.

These findings illustrate two further points: First, the larger estimated effects for total revenue level indicates that this factor indeed can be considered a potent factor for later institution-building, yet the slightly larger confidence intervals signs that its effects are not as certain as for the non-customs-measure. This is in line with aforementioned notions that customs- and trade taxes are more uncertain as causes of institution building. Second, while the differences between the two samples are minuscule, the results above show that excluding the neo-Europes brings significance levels and, for total revenue level, effects up. This too is unsurprising, considering the unique original status of these colonies. While their inclusion is not enough to refute the extraction hypothesis, these results offer further support for treating Australia, Canada, and New Zeeland (as well as the United States, which is not included in this sample) as a unique type of colonial entity.

Conclusion

What is learnt by applying the framework of fiscal sociology on the field of colonial state building? First, judging from the results above, and keeping in mind that any strong causal claims emanating from a study such as this must be made with caution, we can conclude that it cannot be ignored when telling the story of the colonies varying success in transitioning into independent and mature states. The inclusion of the most commonly cited confounding factors, and their failure to dismiss the positive influence of taxation and revenue level on modern-day institutional quality, speaks strongly to this, as does the qualitative historical case-stories presented above. The results in this study clearly shows that 'extractive institutions' can, despite its negative connotation and Acemoglu et al's (2001) assumptions, be seen as a boon for subsequent institutional quality rather than the opposite.

Second, the empirical analysis herein relies of a relatively small sample of colonies/states with one common colonial heritage. It is not certain that its results could automatically be applied to the plethora of, mainly developing, states previously ruled by different colonial masters. While existing research has shown similar linkages elsewhere, such as how taxation under Japanese rule in Korea and Taiwan worked to improve state-capacity in the long run (Di John 2008; Bräutigam 2008a), Lange et al (2006) make a convincing case that Spanish colonies operated in a manner quite distinct from those comprising the British Empire. Thus any generalizations regarding the link between revenue extraction and state building should be made only after considering the larger institutional context, as well as the overall level of development.

Appendix: Linking colonies to modern day states

Translating early 20th-century colonies to modern states means making certain choices. In most cases herein, making such linkages is fairly uncomplicated; islands such as Barbados and Fiji became independent in the same shape as the colonies they had been, while holdings like Ceylon and Nyasaland merely changed names to Sri Lanka and Malawi.

Nevertheless, some colonies merged with others to create new states, and others fell apart after independence. Most notable are the cases of the Federated Malay States, the Straits Settlements, India, and to a lesser extent Tanganyika and the Gold Coast. The Straits Settlements consisted of Singapore – to which it will be translated in the analysis – but also current Malaysian regions Penang, Malacca and Lauban. It may thus have a slightly overrated measure of government effectiveness, as Malaysia's score is comparatively a good deal lower (Singapore's +2.15 is over a standard deviation above Malaysia's + 1.06). Simultaneously, modern-day Malaysia – herein corresponding to the Federated Malay States – not only include the aforementioned Straits Settlement provinces, but notably also parts of North Borneo. As Booth (2007: 248) shows, the regions formerly belonging to the Federated States had a higher level of taxation (per capita) than the unfederated parts; Malaysia's revenue level scores are thus likely somewhat overrated. For both the Straits Settlements and the Federated Malay states, such adjustments would very likely put their heir states in positions which would increase the overall fit of the model, as presented in figure 1 above.

India, which at the time of the fiscal accounts used also included Bangladesh, Myanmar, and Pakistan is left as is in the main analyses here. This is in part due to the population advantage that India has over the three other, admittedly sizeable states. As India's score is the highest of the four, it is nevertheless likely slightly overrated as a representation of the colony at large, and lowering it would put it closer to the regression line in figure 1.

Finally, states such as Ghana and Tanzania, which gained some territory around independence, will be left as is on the basis of population dominance in the 'original' area, where also (in all of the cases above), both the colonial and present capital or main seat of power reside.

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