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An empirical investigation into the process of early institutional development in ex-colonies

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This paper examines the proposals regarding historic institutional development as presented in the 2001 paper "The Colonial origins of Comparative Development", co-authored by Acemoglu, Robinson and Johnson (AJR). I find that several of the relationships proposed by AJR hold in an expanded and updated dataset, and are robust to various empirical checks. However, I also find that some key elements of the colonization process have been overlooked in the existing literature. Particularly, I note the role of Britain as a colonizer, as well the effects that timing had on institutional outcomes. I also argue that certain other factors that are difficult to operationalize should not be abandoned from the analysis.

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INTRODUCTION – THE AIMS OF THE PAPER

The goal of this paper is to provide a better understanding of the historic development of political institutions, and the ramifications that this process has on contemporary economic outcomes. This intention is largely motivated by the ideas proposed by Acemoglu, Robinson and Johnson (2001) in their paper *The Colonial Origins of Comparative Development: An Empirical Investigation.*[1] Within the paper, Acemoglu, Robinson and Johnson (AJR) argue that the nature of countries' colonial experiences roughly 500 years ago set each country on a relatively deterministic path of institutional development, and that this path of institutional evolution explains in large part the subsequent economic developments of the country leading to the present day.

This theory can usefully be separated into two constituent parts – a theory of institutional development, and a theory of the economic consequences of political institutions. AJR do not separate their analysis in this fashion, and rather consider both parts of the theory together within a broader strategy of identifying the effect of political institutions on economic development. They do so in order to succinctly motivate the estimation of their model using an Instrumental Variables technique, which corrects for the potential endogeneity of political institutions.

In order to better understand the underlying mechanics that drive early settlement and the subsequent institutional development, however, I first consider the evolution of colonial and political institutions as an independent research question, which allows a more thorough exposition. Particularly, I allow for the effects of various factors which are not considered by Acemoglu, Robinson and Johnson (2001:1374), who focus primarily on the role of setter mortality in determining the evolution of political institutions. Importantly, AJR do not insist that settler mortality is the *only* determinant of institutional development. Rather, they correctly stress that as a proposed instrument for institutions, mortality rates of settlers need only be correlated with institutions in order to meet the relevance criterion (AJR, 2001:1371; Wooldridge, 2012:492).

Given that the second part of the theory and this paper is in estimating the effects of political institutions on economic development, searching for other significant determinants of colonial settlement and institutional formation runs parallel with the pursuit of an identification strategy to solve for institutional endogeneity: such factors -if they can be operationalized - may be suited as instruments for institutions provided they is excludable from the second stage. Perhaps more importantly, even if they turn out to be invalid instruments, the discovery of variables that explain the origin of political institutions is interesting in its own right as they help answer the question: *what historic influences explain the early and contemporary evolution of institutions?*

[1] This specific paper is henceforth referred to as either AJR (2001), or simply AJR.

The layout of the paper is as follows: Section 1 begins with a review of the literature on the subject and the shortfalls therein which introduce this paper. Section 2 presents the idea of the significance of a British colonial legacy in creating useful political institutions. Section 3 details the data and methodological considerations relevant to the empirics. Section 4 begins the empirical analysis by assessing the first part of AJR's theory – the early development of political institutions. I refer to this half of the theory as the 'first-stage,' because it represents the first-stage of AJR's instrumentation approach and is also chronologically first. Section 5 turns to the 'second-stage' of the theory, and assesses the link between political institutions and economic development. Section 6 then introduces some remarks in defence of alternative theories, and section 7 finally concludes with a summary of the paper's findings and their implications. Appendix 1 contains general graphs and figures referenced through the paper, whereas Appendix 2 contains details on variables and their construction, as well as the sample under consideration.

1. LITERATURE REVIEW

A primary view within the literature is that the development path of political institutions within a country is paramount in explaining economic outcomes. Authors on the subject offer various theoretical arguments that explain early and subsequent institutional development. First of course is the AJR view that settler mortality determined European colonization – Europeans simply preferred to settle somewhere with lower mortality. Where Europeans settled in greater numbers, the territory gained a greater chance of inheriting the inclusive political institutions that characterize typical West-European countries (AJR, 2001). A second idea, developed by von Hayek (1960) and reasserted by La Porta et al. (1998), is that the identity of the colonizer is relevant to institutional development. In particular, British common law is seen as being substantially more conducive to the protection of property rights and markets (La Porta et al., 1998) than other legal systems. Under this view, exposure to a British presence is imperative to the development of useful legal institutions and the protection of property rights.

Another set of ideas relating to the development of intuitions revolve around the disease climate within a country. Disease is posited to have an effect on early institutions in three ways, by either: 1) encouraging settlement in 'healthier' areas (Auer, 2007; AJR, 2001), 2) spreading from colonizer to substantially harm the indigenous population (Diamond, 1997; Easterly & Levine, 2013), or 3) discouraging settlement in 'risky' areas leading to a particular kind of extractive regime(AJR, 2001). Some authors within the institutions camp maintain that geography and disease are only significant for economic outcomes through their ability in determining institutional developments (AJR, 2001; Easterly & Levine, 2013).

Contending the idea that institutional developments are dominant in explaining economic developments, certain scholars maintain that geographic features have an independent and equally significant effect on economic growth. For example, Jared Diamond (1997) argues that the availability of arable lands, cultivatable plant species and animal species capable of being domesticated gave certain regions a key advantage in early

development roughly 500 years ago (Diamond, 1997). The focus of Diamond's hypothesis is not placed on the development of institutions, but rather explains divergent paths of economic development as a result of different rates of technological development, which depend on the favourability of the geographic endowment.

A different line of argument based also on geography, and most notably supported by Jeffrey Sachs and co-authors (Bloom & Sachs, 1998; Sachs, 2003), contends that geography is directly relevant to economic development through its impact on the disease environment. While good institutions may still be important, disease has a crippling effect on economic performance that is independent of its effect on political institutions (Sachs, 2003). AJR (2001:1380) maintain that indigenous peoples are generally immune to indigenous diseases, and as such the effect of disease is only in deterring colonizers from settling, and therefore eroding the possibility of positive institutional development. Sachs (2003:39) contests this, arguing that a territory's disease environment is significant in deterring foreign investment, and increasing the costs of international trade within the country. Being endowed with a climate that is conducive to disease (and also being farther inland) critically hampers a country's trade prospects, and this effect is somewhat devastating regardless of the settler population and even the level of political inclusiveness. Sachs and colleagues do not try and refute that geography is relevant to the incidence or persistence of colonization and the subsequent effects on political institutions, but assert that geography and disease are still independently significant in determining economic prosperity regardless of institutional effects.

SHORTFALLS WITHIN THE LITERATURE

Given that the legacy of colonization is significant (for many authors) in explaining contemporary institutions, a thorough exposition of colonization and its determinants is therefore indispensible in understanding the lay of the land today. Within the literature, however, it is important to note that some elements that affect the colonist's settlement decision and that may well be relevant historically are overlooked by scholars whose only interest is in discovering a valid instrument. The reason is that such authors will immediately reject those variables that are not excludable in the second stage, as they will be invalid instruments (Wooldridge, 2013:506). For instance, a measure of the perceived value of a territory to the potential colonist seems invaluable in explaining their colonizing decisions. However, valuable territories may have consequences for economic development, and therefore are not excludable.

It is perhaps because of this inconvenience that AJR, who are interested in instrumenting with settler mortality, pay less attention to other potential determinants of colonization that may also be relevant. For instance, they stress that Northern America and Australia were chosen as British colonies due to *only* their endurable climates: "Hopes of settling in West [and Southwest] Africa were dashes by very high mortality….the final decision was to send convicts [previously intended for the United States] to Australia" (AJR, 2001:1374). Unfortunately, such analysis forgoes the 'benefits' side of a cost-benefit analysis to the potential colonist. Even if mortality was the primary consideration in these two cases, various other examples go poorly by such limited analysis. For example, Egypt and India are two hot and moderately deadly climates[2]

[2] Both have mortality rates near the mean according to AJR's measure of mortality.

according to AJR, yet they experienced an unprecedentedly early and durable British presence given their mortality levels.

Furthermore, it is well known and seemingly obvious that the British Empire (like any other) colonized with the intention of securing geostrategic positions on the world map. Territories such as Egypt, India, South Africa, and those African states intended to pave the way for Cecil John Rhodes' infamous 'Cape To Cairo' railroad (Rotberg, 1988; 309) were chosen for their capacity to secure essential and profitable sea and land trade routes. Who ended up winning such territories naturally depended on the relative levels of technology and power between countries at the time. However, what is clear is that the interest, presence and endurance of a particular colonizing power within a territory depends on strategic consideration, and cannot depend exclusively on the mortality rate faced at the time.

Apart from having a strategic position, colonizers might take interest in a certain territory or colony through a basic analysis of the natural resource wealth within. Reported instances of resource endowments of any form should naturally attract settlement attempts. Although Acemoglu and Robinson agree with others that natural resource wealth makes extractive regimes easier to sustain (Acemoglu & Robinson, 2006, 2012; Collier & Hoeffler, 2004), they do not posit that this might cause colonizers to select such a territory. For instance, in their chapter explaining the success of Botswana, AR (2012, Chapter 14) overlook the important fact that substantial diamond reserves were only discovered a year after independence in 1967 (Tsodilo Resources, 2014), during a global wave of permanent decolonization. This fact has been argued as crucial to Botswana's success, as colonists took little interest in setting up their own institutions – extractive or otherwise (Clark, 2005).

In fact, the earliest theories of national prosperity, as proposed by influential intellects such as Thomas Mun (1571 – 1641) and Thomas Hobbes (1588 - 1651), centred on the accumulation of gold through trade and expansion (Heilbroner, 2000: 41). Their ideas can be termed early Mercantilism, and suggested that adventurers such as Columbus, Hernando Cortez and Francis Drake, are necessary for the patriotic expansion and development of their relevant nations and Empires(Heilbroner, 2000:29). AJR (2001:14, 16, 22) repeatedly stress that extractive institutions were quickly established and entrenched in Latin America, as the Spanish sought to exploit all the gold and silver they had reason to believe existed. It is therefore slightly myopic to focus on the settler mortality faced in such as territory as the only determinant of the European population size, when the presence and perception of gold and silver reserves are clearly substantial factors.

Most of the debate sparked by AJR's 2001 and subsequent papers is distributed between supporters of the 'institutions only' view (AJR, Easterly and Levine) as opposed to those arguing in favour of geography's independent effect (Sachs et al.), with more 'alternative' views (La Porta, Glaeser) being marginalized. Furthermore, a focus on instrumentation has plausibly led attention away from certain variables with meaningful effects on historic developments due to their non-excludability, as argued previously. This paper attempts to address these issues by re-introducing the 'alternative' theories to the debate, and by deliberately focusing on the determination of institutions (the first-stage regression) independently such that non-excludable variables are still of interest.

Finally, given that several of the theories previously explained (AJR, La Porta, Easterly & Levine, Diamond) revolve around exposure to a European influence, a last feature introduced to the analysis is a measure of the length of a given foreign presence. These effects are mostly implicit in the existing literature, and to my knowledge explicitly adding them to the analysis is therefore a novel approach. I incorporate three time measures – the date of first colonization, the date of independence, and the duration of colonization (being the difference between the two). I also consider interacting the identity of the colonizer with the duration time, to test the premise that exposure to a particular colonizer is the source of institutional development. [3]

2. BRITAIN, COMMON LAW AND INSTITUTIONAL DEVELOPMENT

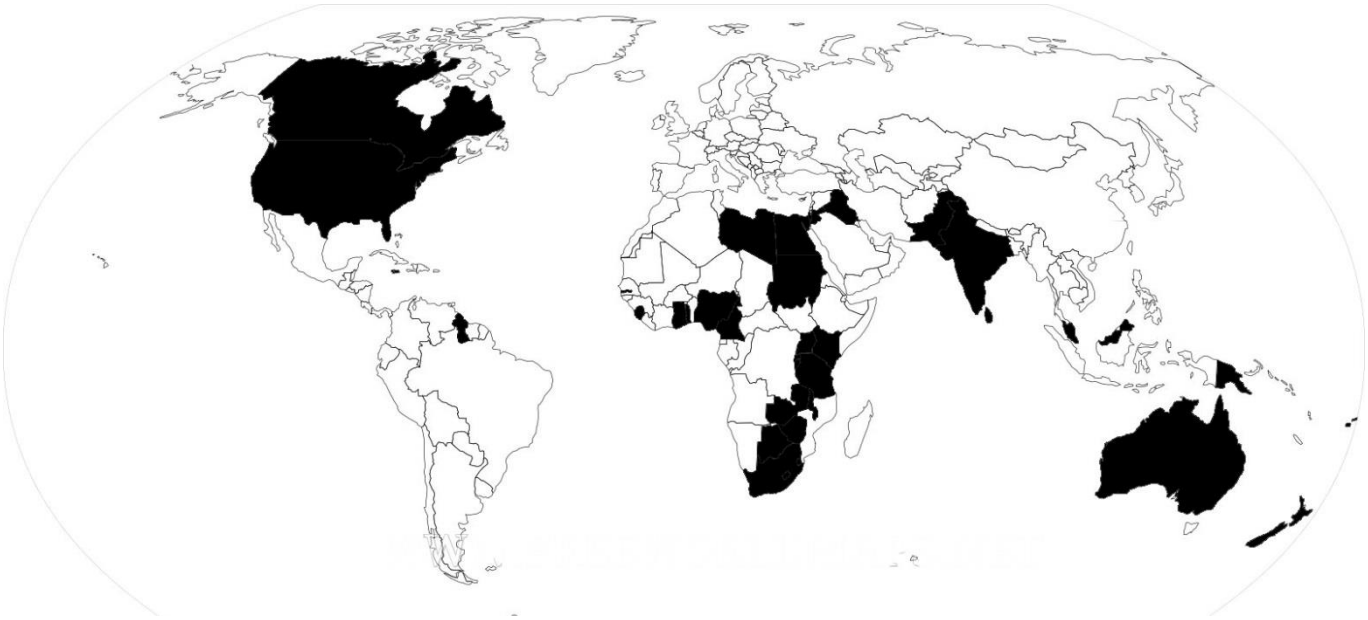
One of the 'alternative' views that has arguably been marginalized, and that I reintroduce, is that the identity of the colonizer is important to outcomes. In the vein of Von Hayek and La Porta, it could be argued that legal institutions make the difference by affecting the investment climate. In particular, La Porta et al.(1998) argue that British common law is superior in protecting investors' property rights, whereas countries under civil law (especially French-civil-law) create an environment that is less conducive to domestic investment. These countries invest less over time, and therefore fail to accumulate capital at similar rates to common-law countries, which explains the divergent paths of consumption and development. Although the link between institutions and economic growth is the same as under AJR – both believe property rights are essential to foster investment – there is a critical difference. While La Porta et al. believe it is the identity of the colonizer that matters, AJR maintain that the ability of the colonizer to settle is the determining factor, and that this is highly correlated with settler mortality.

A preliminary piece of evidence in favour of the idea that *identity* determines institutions is evident through a simple comparison of world maps. Figure 1 represents the countries within my data that have been coded as ex-British colonies[4], whereas Figure 2 measures political freedom and is taken from the Freedom in the World report publish by the Freedom House (Freedom House, 2013).

[3] The time and identity data are collected from the CIA World Factbook (2014) and Ertan, Putterman & Fiszbein (2012); the exact rules of collection are available for reference in Appendix 2.

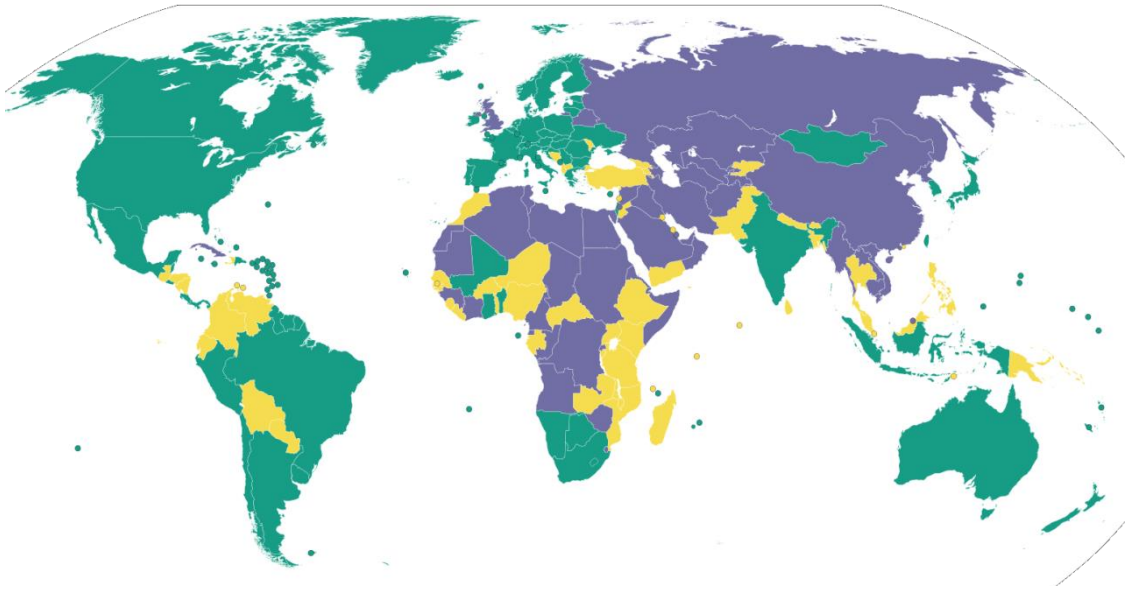
[4] Details of the data collection methodology are available in Appendix 2.

Figure 1: The Colonies of Britain



The countries in black from figure one are noticibly correlated with projections of the level of democracy, for instance under the Freedom House (2013) categotization:

Figure 2: Democracy measured by the Freedom House



Green – Free
Yellow – Partially Free
Purple – Not Free

A comparison of the above reveals that in almost all countries colonized by Britain, the Freedom House categorization classifies these countries as either 'partial' or 'complele' democracies (yellow or green respectively) – and most often the latter.

Seeing as settler mortality should be considerably consistent within particular regions, it is noticible how certain ex-British colonies stand out in stark comparison to regional trends. For instance, in Sub-Saharan Africa, the countries paving the way from South Africa to Ethiopia that were colonized by Britain, are distinctly more democratic than the region in a pattern that mirrors the path of British colonialization (excluding Zimbabwe). Other countries such as Afghanistan and India, or Ghana, are also distincly more democratic than their regional neighbors and are the only ex-British colonies in the region. A natural induction from this observation is that the British legacy within these territories helped to shape their institutional development for the better, regardless of the level of settler mortality implied by the region.

Notable exceptions to this broad rule are the Latin American and European regions. However, Europe is excluded from AJR and my analysis as it was not settled during the colonial era, and does not fit into the theory of the colonial origins of development. Furthermore, Europe obviously has a high level of European and British permeation, and this result is therefore compatible with theory as one can argue that the region developed as a result of either British or at least European exposure. Latin America is slightly more threatening to a theory of *British* development, as it was primarily colonized by non-British Europeans and yet appears to have reasonably respectable institutions. Particularly, several of the 19 ex-colonies I observe in the Latin American region appear to be democratic, yet none were colonized by Britain and 15 were colonized by Spain[5].

One response to this potential criticism of British superiority is that Latin American democracies are generally poorly consolidated; many of them are better described as semi-democracies. Moreover, many of them only recently experienced movements towards democratic system. For instance, it was only in 1999 that Brazil, Peru and Suriname improved enough to be classfied as free by the Freedom House. It could also be argued that globalization and the expansion of trade and techology have only recently begun to open these countries to more substantial European and *British* influence. As such, the subsantial headstarts of various countries and regions are therefore still the result of the colonial legacies of various superior colonizers from many years previous.

Furthermore, the common-law argument only pertains directly to the protection of property rights, whreas the Freedom House measure is probably the most broad and substantive measure of rights and liberties available (Halperin et al., 2004:30). Therefore, one should expect an imperfect correlation between the protection of property rights and the level of freedom as measured by the Freedom House, which might explain why certain countries are coded as free and yet do not exhibit the significant protection of property rights and subsequent growth that is of interest. A third map detailing the level of GDP per capita (PPP adjusted) also reveals that the pattern continues from institutions to economic outcomes, and is available for reference as Figure A in the first appendix.

[5] See the Appendix for a table capturing the regional trends of colonization.

The purpose of the above section has been to introduce the identity of the colonizer, particularly as being British, as a critical determinant of political (and later, economic) outcomes. This idea is henceforth referred to as the 'British superiority' hypothesis. Later in section 4 of the paper, I begin a step by step examination of the development of institutions, and at each step I consider including a 'British Colony' dummy variable within the model to measure the distint effect that a British legacy might have, in light of the above discussion. Before moving into the empirics however, important changes to the data are worth detailing.

3. CHANGES TO THE DATA AND METHODOLOGY

Before presenting results, an important note is necessary regarding data construction, being an alteration to AJR (2001)'s latitude variable. To measure countries' latitude, AJR follow the literature by measuring latitude as the absolute value of the capital city's latitudinal distance from the equator (in terms of degrees) and then scaling to get a value between 0 and 1 (AJR, 2001: 1379). The problem with such a measure is that the geographic distribution of capital cities and countries is concentrated within a smaller band than this measure captures. For instance, most political maps only span from around 60 degrees south of the equator to roughly 80 degrees north of it, the reason being that so few countries exist at extreme latitudes. In fact, within a sample of 163 countries, only 4 countries – Finland, Iceland, Norway, and Sweden, are recorded as being further than 60 degrees from the equator. Therefore, approximately a third of such a measure of latitude is purely 'white noise', deflating the coefficients on latitude as a regressor. Figure B of the first appendix shows a histogram of the distribution of latitude and reveals the skewed distribution of countries within such a measure. The second panel reveals that the problem is substantially worsened when only the ex-colony sample is considered, an issue which is not addresses in AJR.

A second issue with such a measure is that countries that are geographically very similar in latitude may be coded with relatively different latitudes depending on their capital cities, or, conversely, countries that are quite different in latitude might be coded as very similar. For instance, countries such as India, Thailand and Vietnam will appear to have different latitudes when they do not, whereas Chile and Argentina will both appear to have similar latitudes to South Africa when neither of them does. If latitude does have a causal impact on instructions, then, we would again expect such a measure to under-estimate the effect of latitude. The reason is that falsely observed differences in latitude are being correlated with a lack of resulting effect, whereas falsely observed similarities in latitude are being correlated with an effect that then goes unexplained[6].

One solution might be to take a more accurate account of the shape of the territory or consider the population dispersion of indigenous and colonizing peoples. Without such data, however, I prefer a more

[6] Put technically, measurement error in the variable will create attenuation bias in the results.

simplistic solution to the problem, which is to take the absolute value as provided by AJR and split it into a few distinct groups of equal size. Statistics programs such as Stata can perform these operations automatically – I choose to create 5 equally sized groups. This solves the distributional problem as the groups are necessarily equally populated, and hopefully mitigates the second problem although this is difficult to establish. The result is an evenly distributed latitude variable across the sample.

Following the collection of additional colonization data, my dataset facilites several new countries with colonial histories that were not previously considered by AJR. A list of the new countries as well as those in the original AJR paper is available for reference in Appendix 2. Unfortunatelly, however, many of the neccesary specifications require the use of AJR's (2001) original settler mortality vairable, which inevitably limits the sample to the non-missing values they provide. Given this issue, a worry is that there is no way to gauge whether or not sample or measurement error bias is introduced by AJR's variable without a comparable measure of early settler mortality. The only substantial effort I know of to update or revise AJR's mortality data was made by Albouy (2008); within this paper the coverage and accuracy of settler mortality data is not improved.

Alternative measures do exist for the dependent variable - contemporary institutions. Many of the institutional measures employed are here extended forward in time compared to AJR's in order to capture recent developments; they are also measured over a longer period where possible to produce more accurate country averages. Similar to AJR (2001), I run each regression a second time while excluding the *'Neo-Europes'* as a robustness check against the objection that outliers (New Zealand, Australia, Canda and the United States) are driving the results. Unlike AJR, I also run the full set of controls for each specification. The rationale behind this is that finding an insignificant coefficient within one specification does not warrant a rejection of the given regressor. There is a reasonable chance that the peculiarities of that particular specification led to a form of correlation (multicollinearity or bias) which removed some of the effect of the given variable. AJR's method of selectively trying different combinations runs the risk of rejecting a relevant regressor and is cause for concern[7]. I follow the logic that lower coefficients throughout the results due to multicollinearity are a lesser evil than introducing bias through under or miss-specification.

[7] Such a selective process is also dangerous in that it might lead one to conclude that an irrelevant variable is actual relevant, due to omitted variable bias or misspecification. For instance, when estimating A, it might be true that either B or C only has an effect on A when B and C are controlled for together. In such a scenario, by selectively regressing A on B, and then A on C, you might falsely reject B or C. A regression of A on D would then be biased due to an omitted variable. Even worse, if B and C only have an effect when they co-occur, it may be necessary to interact the two to reveal such a relationship. In this scenario, regressing A on B, A on C, as *well* as a regression of A on B *and* C, might lead you to erroneously reject B and C. Therefore, it is prudent to include more controls rather than less, as well as to consider different specifications.

4. EMPIRICAL ANALYSIS – ASSESSING THE FIRST STAGE REGRESSION

The above sections serve to introduce my interests and strategy in the empirical testing of the first-stage relationship presented in AJR (2001), between institutions and various historic factors specific to colonization. From the literature review, settler mortality, latitude, and colonial identity are considered the most important factors in determining the type of colonization, which subsequently affects later outcomes such as the size of the European population and the eventual level of political inclusion. As mentioned, several factors such as resource endowment and strategic elements are also likely to have an effect on institutions but unfortunately may also directly affect economic outcomes. Because these variables cannot be used as instruments as they belong in the structural equation (Wooldridge, 2013: 503), they have received less attention than is perhaps warranted. Re-introducing such variables to the first-stage regression is therefore an element of the analysis. Finally, given that second two introduced British colonial identity as an important contributor, I therefore include a 'British colony' dummy in most specifications.

Table one begins by examining the sensitivity of AJR's findings with respect to a change in the measure of institutions, and the results are reported below:

Table 1: OLS regression of contemporary institutions on potential determinants (various measures used)

	Protection Against Expropriation 1985-1995	Quality Of Government 1985-2011		Freedom House & Polity Index 1985-1995		Property Rights 1995-2011		Economic Freedom Index 2002-2011	
Settler Mortality	- 0.41**	- 0.65***	- 0.44***	-0.08	-0.02	- 0.47**	-0.33	- 0.24**	-0.16
	(0.17)	(0.17)	(0.16)	(0.22)	(0.23)	(0.20)	(0.21)	(0.09)	(0.10)
Latitude	0.16	0.34**	0.20	0.27	0.22	0.43**	0.32	0.15	0.09
	(0.16)	(0.16)	(0.15)	(0.26)	(0.22)	(0.19)	(0.19)	(0.09)	(0.09)
Asia Dummy	0.20	0.06	0.47	- 3.08***	- 2.96***	- 1.02*	-0.75	- 0.56*	-0.41
	(0.50)	(0.49)	(0.45)	(0.64)	(0.67)	(0.59)	(0.59)	(0.29)	(0.29)
Africa Dummy	-0.38	-0.20	-0.18	- 3.67***	- 3.65***	-0.59	-0.56	- 0.41*	- 0.40*
	(.42)	(0.39)	(0.46)	(0.51)	(0.53)	(0.48)	(0.46)	(0.23)	(0.23)
British Colony	0.45	0.82**	0.43	1.23***	1.13**	1.36***	1.12***	0.41**	0.23
	(0.34)	(0.33)	(0.31)	(0.44)	(0.47)	(0.41)	(0.41)	(0.20)	(0.20)
R^2	0.32	0.54	0.35	0.63	0.56	0.46	0.29	0.41	0.24
Obs	65	63	59	72	68	72	68	71	67

*Notes: All regressions within this paper are calculated with an intercept. Every table reports coefficients as well as standard deviations in parenthesis. Asterix's refer to the most commonly used significance levels, being the 1, 5 and 10 percent levels. These level are denoted within the tables by ***, **, or * respectively. Average Protection Against Exproriation Risk 1985-1995 is taken from AJR (2001). The Quality of Government, Freedom House and Polity, Property Rights and Economic Freedom measures are all taken from Teorell, J. et al. (2013), The Quality of Government Dataset 2013, Standard Version. This dataset is an agglomentaion of various sources however, and should not be the final citation. See Appenix 2 for further details.*

A first observation is that the relationship between settler mortality and modern institutions is somewhat robust to the choice of the dependent variable. Although it drops off under the Freedom House and Polity measure, the Freedom House variable is already known to be a very broad measure of democracy (Halperin et al., 2004:30) , and has been criticized for 'over-loading' the concept of democracy (Schneider and Schmitter, 2004). Specific to this context, many of the freedoms it encompasses, such as religious or personal freedoms, are outside of theoretical case that links settler mortality to European settlement and protection of private interests. By comparison it is thus no surprise that the relationship remains significant when a measure of contemporary property rights is used as the dependent variable.

Perhaps the most striking result within Table 1 is that the presence of a British colonizer as opposed to any other type is significant in various specifications. Particularly, it is significant at the 5% level and beyond in 6 of the 8 new specifications. Furthermore, it appears to be less sensitive to broader measures of political outcomes than settler mortality, although equally sensitive to the exclusion of the *Neo-Europes*. Given that the argument runs that British legal systems further the political protection of private property rights, it is particularly notable that the coefficient of *British Colony* remains significant at beyond the 1% level when predicting contemporary property rights - even when the 'rich four' are excluded. This is a preliminary piece of evidence in support of the British superiority hypothesis introduced earlier.

Latitude is at times significant, but this result always drops away when the *Neo-Europes* are excluded. This is despite the reformulation of its measure as discussed previously. However, a last defence for latitude could be that the channels through which latitude affects institutions are all included in the model. For instance, if latitude attracts helpful British colonizers or reduces the harmfulness of the disease environment, these effects will have little variation and explanatory once both *British Colony* and *Settler Mortality* have been partialled out. Importantly, this result can therefore still be consistent with a view that says that latitude matters in its role in determining institutional outcomes (Easterly & Levine, 2002). Furthermore, this result in and of itself is not evidence against the view that latitude and geographic factors have a direct effect on *economic* development that is not through institutions (Bloom & Sachs, 1998; Sachs, 2003).

Tables 2, 3 and 4 aim to trace the process of colonization and institutional developments according to a handful of key variables of interest. The purpose is to flesh out exactly what determines the presence of a colonizer, their duration within the colony, and the eventual establishment of certain political institutions. Table 2 begins by considering the determinants of colonial presence.

Table 2: OLS Regressions - Estimating colonial presence

	Date Colonized			Years Occupied			Date Of Independence		
					Neo-Europes Excluded	Neo-Europes Excluded		Neo-Europes Excluded	Neo-Europes Excluded
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Settler Mortality	32.20**	41.93***	18.42	4.57	0.45	-0.45	6.13	0.81	-0.45
	(15.50)	(15.52)	(17.22)	(4.19)	(4.05)	(3.50)	(3.63)	(3.36)	(3.50)
Latitude	-5.52	-7.70	-21.65	-4.07	-1.52	-4.67			-4.67
	(21.42)	(17.03)	(17.93)	(4.38)	(4.21)	(3.80)			(3.80)
Landlocked	101.70	88.47*	123.14**	-7.92	-6.34	-2.26	-2.34	-0.91	-2.26
	(66.50)	(46.46)	(53.09)	(12.25)	(11.08)	(9.48)	(11.25)	(9.46)	(9.48)
Colonization Year				- 0.68***	- 0.67***	- 0.81***	0.20***	0.20***	0.19***
				(0.03)	(0.03)	(0.04)	(0.04)	(0.04)	-0.04
British Colony		84.72**	168.61***	31.7***	37.45***	23.90**	15.80	22.82**	23.90**
		(36.78)	(41.94)	(9.81)	(9.05)	(9.50)	(11.12)	(9.50)	(9.50)
French Colony			257.16***			4.33	-3.04	0.29	4.33
			(53.91)			(10.46)	(11.83)	(9.97)	(10.46)
Spanish Colony						- 67.27***	- 61.34***	- 66.2***	- 67.26***
						(13.67)	(16.14)	(13.70)	(13.67)
						(13.67)	(16.14)	(13.70)	(13.67)
R^2	0.13	0.20	0.49	0.90	0.92	0.94	0.76	0.83	0.83
Observations	75	73	50	73	69	69	73	69	69

Notes: All variables pertaining to dates are taken in relative terms. For instance, date colonized ranges from 0-475, corresponding to how many years after the first country the given country was colonized. Independence is measured in a similar fashion, and years occupied is simply taken as the difference the independence and colonization dates. Data on colonization taken from the CIA World Factbook (2014) and Ertan et al. (2012). See Appendix 2 for details.

There are three dependant variables in the above table: date colonized, years occupied and the date of independence. The date colonized variable is measured in years, beginning at zero corresponding to the first colonization on record (Cape Verde by Portugal in 1462) and increasing to a maximum of 474 years when Italy colonized Ethiopia in 1936. I consider that the time of colonization might hypothetically be effected by the following variables: settler mortality, latitude, whether or not the country is landlocked, whether or not the colonist was British, the level of mineral endowment, the prevalence of ports. The arguments for these run as follows:

Lower settler mortality is proposed to attract settlers (AJR), and should therefore lead to earlier settlement and colonization. Latitude might have an effect independent of this, as colonizers settling out from Europe would have to travel further and across different unchartered seas to reach greater latitudes. Latitude could also have an effect on the disease environment, but would probably be captured through the mortality channel. Secondly, latitude could affect the productivity of crops and livestock – if any such activities are expected to yield surplus value (beyond survival needs), this might create an effect of latitude on the desire to colonize, and could thus plausibly create earlier settlement dates independent of mortality. This logic highlights the 'benefits-side' type of analysis that was mentioned previously.

Another variable on the 'benefits side' of the colonists' decision is the mineral wealth perceived to exist within the given potential colony. Without data on early perceptions (which would be invaluable to such a discussion), I have to rely on a proxy for early perceptions of mineral wealth. Presuming that some of the information presented to potential colonizers regarding the wealth of a potential colony is correct, and that mineral wealth tends to persist within countries, I attempt proxying for the perceived stock of mineral wealth with the level of mineral exports today, measured as a share of total manufacture exports.

I make a similar attempt to proxy for the geostrategic importance of the country, by including a measure of the quality and availability of contemporary ports. The idea is that the countries that are most strategically desirable (from a sea-trade perspective) will be so almost indefinitely. Providing that a geostrategic location always creates reason to build and sustain good ports within such a country, it is plausible that the desirability of a country in terms of its strategic importance to a potential colonist will be correlated with the level of ports in the future. I therefore substitute the measure of contemporary ports to try and capture the strategic desirability of the country in the eyes of the colonist. Finally, the dummy variable that represents landlocked countries is also rationalized as a strategic factor by such an argument, as a potential for sea-trade requires a coastal region. However, this relation might be lessened by the rail-road strategies at play, as well as the fact that the borders of the colonies were flexible for much of the time that colonists might have been strategizing.

The results from the first part of Table 2 indicate that only mortality, latitude, and having a British colonizer are robustly significant predictors of the year of colonization (being landlocked also has a substantial economic effect, although this is not precisely estimated). In no specifications were the proxies for resource wealth and geostrategic importance significant, and I therefore omit them from the table.[8] This means that either the proxy used was weak (likely), or alternatively colonists did not use considerations of mineral wealth in a way that affected outcomes (less likely). It seeks most plausible that the proxy is weak due to low correlation – natural resource reserves today are substantially different in volume as well as in type to those observed and desired by colonists in the past. The same might be said of the 'ports' variable – the link between past strategic significance and current port quality was hopeful to begin with.

In terms of the date first colonized the results are mostly intuitive. In countries where settlers faced higher mortality rates they usually took longer to establish a foothold. Countries that are landlocked and therefore not directly accesible by sea are predicted to be colonized roughly a hundred years later than those countries that are not, although the standard deviation of the coefficient is relatively high. The latitude of a country seems to have no precise effect on its date of colonization. Importantly, countries colonized by British and French forces are predicted to be colonzation around 200 years later than the base group, which includes all the other colonizers such as Spain (which colonized the Latin America's particularly early).

[8] The full tables with all coefficients are available in Appendix 3.

Given that the sample considered involves countries that were all colonized at some point, and that there is a degree of randomality in the distribution of indepence, the highly significant coefficient on date of colonization when predicting the duration of the colony was not guaranteed. Rather, it probably correctly represents a strong link between early colonizaiton and the potentional for the colony to endure for many years. The coefficient on colonization year in column (4) implies that a one-year increase in the colonization date reduces the predicted duration of the colony by two-thirds of a year. Interestingly, under this specification settler mortality is predicted to have no effect on the length of the colony. Seeing as settler mortality was significant previously in predicting the colonization date, it is plausible that it's effect is being (correctly) partialled out by the inclusion of the colonization date in the regression[9]. In other words, settler mortality effects duration mostly through encouraging early settlement.

Although it was already shown that British colonies tended to begin later, it is interesting to note that when the colonization date is controlled for, British colonies tended to last longer than others, such as Spanish colonies which seem prone to falling apart. Column (6) shows that relative to the baseline, and controlling for the year colonized (and other effects), Spanish colonies are predicted to end 80 years (67+23) sooner than British ones. This pattern is releaved again in columns (7) to (10) which estimates the same phenomena with independence date as the dependent variable. Unsuprisingly, this rearrangement of the variables makes little difference and the important results are the same: Although British colonies typically started later than others, they also tended to survive longer (particularly longer than Spanish ones) once the colonization date is controlled for. This result is revealed nicely in Tables C and D of Appendix 1, which show the dates of independence and colonizaiton according to the identity of the colonizer.

The next table attempts to link the established patterns of colonization to the creation of a European population and the results for the development of political institutions.

[9] Omitting the colonization date from the regression confirms this as the mortality variable becomes very significant again. I do not report this but the code necessary to perform this check is available at request.

Table 3: OLS Regressions - The path of early institutions

	Date Colonized			European Population 1900†				Executive Constraint at Independence		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Settler Mortality	32.20**	41.23**	45.34**	- 8.79***	-9.09	- 7.37***	-0.13	- 0.68***	- 0.67***	-0.31
	(15.50)	(20.40)	(19.96)	(2.26)	(2.84)	(2.33)	(1.53)	(0.24)	(0.24)	(0.22)
Latitude	5.52	5.52	2.07	8.56***	10.65	8.57***	3.83**	-0.07	-0.07	-0.24
	(21.42)	(21.40)	(21.13)	(2.49)	(2.98)	(2.46)	(1.55)	(0.26)	(0.26)	(0.23)
Landlocked	101.70	101.70	110.08*	-0.41	-0.39	2.60	1.616	-0.34	-0.34	-0.01
	(66.50)	(66.50)	(65.07)	(6.23)	(8.90)	(7.74)	(4.55)	(0 .71)	(0.71)	(0.61)
Colonization Year						- 3.30**	- 6.30***	- 0.63**		
						(1.65)	(1.01)	(0.30)		
Independence Year								2.83***	2.20***	1.30***
								(0.69)	(0.49)	(0.47)
Duration of Colonizer									0.63**	0.48*
									(0.23)	(0.26)
British Colony			104.69**							2.59***
			(48.77)							(0.55)
R^2	0.13	0.14	0.22	0.44	0.52	0.47	0.52	0.3	0.3	0.49
Observations	74	51	50	67	47	66	62	70	70	69

Notes: European Population is a percentage share of the population of European descent, as taken from AJR (2001). Executive Constraint at Independence also Taken from AJR (2001). See Appendix 2 for further details.

† Columns (4) to (7) where the dependant variable is European Population 1900 are regressed for the sub-sample of countries that were colonized before 1900. Column 7 excludes the Neo-Europes.

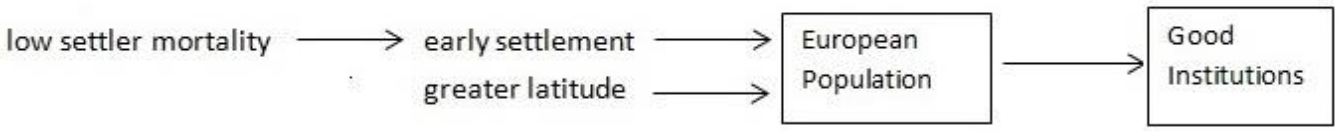
Recall AJR's linear model of institutional development: Low mortality -> early/more substantial colonial settlement -> establishment of a European population-> higher later-day levels of sophistication and inclusiveness in political institutions. The layout of the above table is chosen to capture the flow from one stage to the next. In each of the three stages, I build a model to predict the given y, and carry the most relevant variables forward to see if they have independent effects later in the process.

Columns (1) to (3) repeat the previous analysis for quick reference. The proxies for wealth and geostrategic importance were introduced to a few of the specifications (which explain the fluctuation number of observations) but were always insignificant and are henceforth dropped from the analysis. Columns (4) and (5) turn to the next step of the process, and examine the variables associated with having a higher European population within the colony in 1900. In both specifications, settler mortality and latitude both have independent and significant effects on the size of the European population in 1900, and this result is robust to the exclusion of the Neo-Europes in column (7). This result is interesting as it was previously found that latitude only seemed to effect the duration of the colony through its effect on settler mortality. The date of colonization also plays a significant role again – colonies that are started earlier tend to have a bigger share of Europeans in 1900.

The final three columns introduce a measure of political institutions – constraint on the executive at the time of independence- and regress it on the causal variables that have been built up so far. Settler mortality remains significant, whereas the significance of latitude falls away. The usefulness of the existing layout now

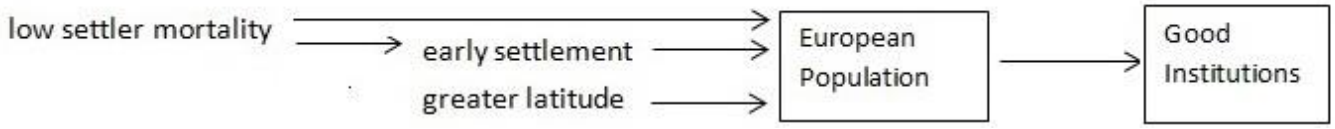
becomes apparent, as we are able to diagnose through which channels different variables are acting, by carrying them forward at each step and observing when they are and are not significant. Latitude, for instance, was not important in determining the beginning or duration of a colony. However, it became significant in determining the European population, even when timing factors and settler mortality were controlled for. The same approach can be applied to examine settler mortality. Mortality of settlers was significant in determining the onset of colonization, but not the duration of the colony. When the timing of colonization is taken into account settler mortality appears to lose its effect on the European population, whereas latitude remains important.

Based on the evidence thus far, a representation of the possible causal relationships being observed might appear as follows:



Although perhaps over-simplified, the above reveals the premises of AJR and other authors, which is that although there is a 'web' of causality between variables, latitude and settler mortality seem to be early enough links in the chain of historic events that they might be considered ultimate causes.

Seeing as AJR's paper is primarily concerned with the link between settler mortality and institutions, the final three columns of table 3 are included to check which channels settler mortality is acting through. In these specifications, settler mortality, latitude and timing factors are combined to predict the institutional quality at independence. This is a way to measure the degree to which settler mortality acts through timing as opposed to through creating a European population. The results show that settler mortality is acting through a channel apart from through timing. If this channel is European population, lower settler mortality creates higher European populations, even when the arrival time of the colonizer is controlled for:



Regardless of the finer details, the overwhelming implication is that the collective effects of lower settler mortality and greater latitude should act to create better institutions by creating a European population in the territory. The final table of this section examines how robust the above prediction is to controls for the identity of the colonizer.

Table 4: OLS Regressions - The development of later institutions

	Constraint at Independence (AJR)				Property Rights 1995 - 2011				
				Neo-Europes Excluded		Neo-Europes Excluded		Neo-Europes Excluded	Neo-Europes Excluded
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
European Settlers							0.04***	0.04**	0.04**
							(0.01)	(0.02)	(0.02)
Settler Mortality	-0.21	-0.22	-0.21	-0.03	- 0.48**	-0.26	-0.27	-0.25	- 0.26
	(0.23)	(0.23)	(0.23)	(0.24)	(0.18)	(0.19)	(0.18)	(0.19)	(0.19)
Latitude	-0.29	-0.26	-0.20	-0.36	0.56***	0.42**	0.12	0.14	0.18
	(0.24)	(0.24)	(0.24)	(0.26)	(0.20)	(0.20)	(0.20)	(0.21)	(0.22)
British Colony	2.98***	2.05***	1.19	0.67	0.43	-0.22	0.32	0.23	-0.23
	(0.53)	(0.66)	(0.86)	(0.89)	(0.68)	(0.68)	(0.62)	(0.70)	(0.81)
French Colony		-0.73	-0.96	-0.97	-0.36	-0.41	0.10	0.07	-0.10
		(0.71)	(0.69)	(0.69)	(0.57)	(0.54)	(0.52)	(0.56)	(0.60)
Spanish Colony		- 2.0**	- 1.42**	- 1.25*	0.11	0.29	-0.29	(0.59)	0.24
		(0.81)	(0.70)	(0.70)	(0.58)	(0.55)	(0.52)	(0.59)	(0.75)
British*Years			0.61*	0.78**	0.40	0.65**	0.49*	0.53*	0.91**
			(0.36)	(0.37)	(0.28)	(0.27)	(0.25)	(0.28)	(0.44)
R^2	0.37	0.43	0.44	0.40	0.45	0.32	0.57	0.36	0.37
Observations	70	70	70	66	73	69	71	67	67

Notes: Constraint on executive in at Independence is on a scale of 1-7, taken from AJR (2001). Property Rights are on a scale of 1-10 and are taken from Teorell, J. et al. (2013), The Quality of Government Dataset 2013, Standard Version. See Appendix 2 for further details.

(Note that I exclude mortality measures from any regression that includes the European Settlement variable on the right hand side, due to multicollinearity concerns.[10])

Columns (1) through (4) reintroduce constraint at independence as the dependent variable. Given the previous analysis, it is expected that settler mortality and latitude will have effects on such a variable. Furthermore, this effect should fall away when the size of the European population is controlled for, for reasons previous explained. Unfortunately, because the earliest measure available for the size of the European population is from 1900, it cannot be used as a regressor that predicts constraint at independence. The reason is that several countries were independent before 1890, and some were only colonized after 1990. These countries will interfere with the results. For instance, a country only colonized after 1900 might still have a very positive colonial experience with a thriving European population, yet be coded a zero for the size of the European population. Countries independent before 1900 are also slightly problematic, as the European population might fluctuate after independence, possibly even as a result of the type of institutions created at independence. Adjusting the sample appropriately unfortunately reduces observations beyond suitable levels. [11]

10 A simple regression of European Settlements in 1900 and the Mortality variable yields a significance level beyond the 1% with an R2 of 0.4, indicating that including both on the right hand side will cause multicollinearity. Running the regression for Table 2 part B with both on the right hand side lowers all of the coefficients, as expected, but the relative importance of each variable does not change.

11 When reducing the sample to those countries colonized at least ten years before 1900, and becoming independent after 1900, the sample size drops to around 35 and the variance of estimators increase unsatisfactory.

Surprisingly, when the identities of the three biggest colonizers (Britain, Spain and France) are controlled for, both the latitude and settler mortality variables lose their effects, and the R^2 remains reasonably high. Given previous suspicions that a British presence is most important for institutions, I try interact the duration of colonization with the British dummy variable. This was based on the theoretical idea that while the duration of the colonizer was shown to be some help for later institutions, the effect might be far greater when the colonizer is British. The results are remarkably consistent – in every specification, a British presence is significantly better than the alternatives. The interaction term is also significant where introduced, indicating that it is not only helpful to have Britons, but that the longer they stay the better your chances of having desirables political institutions at independence. Conversely, Spanish institutions are notably harmful to the institutions that emerge at independence. All of the above results are robust to the exclusion of the Neo-Europes in column (4).

The right-hand side regresses the same controls on contemporary institutions, using the Property Rights index as a measure of the dependent variable. Columns (5) and (6) show that settler mortality and latitude have their usual effect, although their significance levels fall somewhat when the Neo-Europes are excluded in column (6). Interestingly, the interaction term between British and Years colonized becomes more significant when the Neo-Europes are dropped. This might be because the rich four were actually colonized for unusually short periods of time – Australia, New Zealand and the United States were on average colonized for half as long as the typical country. Their conditions were unique in that they had high levels of European citizenship from very early on, culminating in earlier revolution from the British Empire. For other countries, far more time was needed beforehand to amass enough European citizens and acquire the gradual assimilation of political ideas and norms necessary to acquire good institutions by the time of independence.

Because the dependent variable is contemporary, we can now include the size of the European population in 1900 in the set of controls – the results are pleasing. Within columns (7) to (9), settler mortality and latitude effects are rendered insignificant by the inclusion of European Settlers in 1900, indicating that they are acting through the channels expected. Furthermore, the interaction term is slightly significant in all three specifications, indicating that being exposed to a British presence can help institutional formation above and beyond the effect that the size of the European population has directly. Theoretically, the assimilation of ideas, norms or values, or the persistence of physical and organizational institutions, might explain how being exposed to British people for extended periods can assist in institutional development regardless of the number of British citizens within the territory at a given time. Similar to before, this effect actually increases when the Neo-Europes are excluded as in column (9).

5. THE SECOND STAGE REGRESSION

Section 4 above provided various insights into the colonization process. Most importantly, it was revealed that the process of colonization and institutional developed proposed by AJR was borne out of a more rigid examination. The following section moves on to examine the second-stage relationship between institutions and economic outcomes. Importantly, institutions are now on the right-hand side of the model, and are being instrumented with settler mortality to account for their endogeneity (endogeneity is likely to arise through feedback from the dependent variable[12], as well as potentially through omitted variable bias).

Table 5 begins by examining whether 'British Superiority' has an effect on economic development once institutions have been controlled for. I update the dependent variable from AJR's 1995 measure to capture the log of GDP per capita from 2011 (also PPP adjusted) as a partial robustness check. I also test the

Table 5: IV regression of Log GDP per capita 2011 instrumenting with settler mortality

	AJR	Base Sample	AJR without Neo-Europes	Base Sample without Neo-Europes	AJR without Africa	Base Sample without Africa	AJR with Continent Dummies	Base Sample with Continent Dummies
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Protection Against Expropriation	1.18***	1.17***	1.52***	1.5***	0.56***	0.63***	1.00***	1.05***
	(0.27)	(0.26)	(0.48)	(0.47)	(0.13)	(0.16)	(0.32)	(0.36)
Latitude	-0.03	0.01	0.12	0.16	-0.05	-0.01	-0.06	-0.05
	(0.18)	(0.17)	(0.21)	(0.20)	(0.10)	(0.11)	(0.15)	(0.16)
Asia Dummy							-0.62	- 0.83*
							(0.42)	(0.45)
Africa Dummy							-0.66	-0.53
							(0.44)	(0.47)
British Colony	- 0.68*	- 0.64*	-0.41	-0.38	-0.19	-0.26	-0.42	-0.43
	(0.38)	(0.37)	(0.44)	(0.44)	(0.32)	(0.37)	(0.37)	(0.40)
R^2	0.07	0.08			0.65	0.57	0.38	0.30
Obs	60	62	56	58	33	34	60	62

Notes:Average Protection Against Expropriation Risk 1985-1995 taken from AJR (2001). Log GDP per capita 2011 taken from the World Bank Development Indicatiors (2014). See Appendix 2 for details.

robustness of the results to various different sub-samples, in a similar fashion to AJR's approach in their Table 4. Columns noted with 'AJR' refer to regressions run on the AJR sample, whereas columns notes with 'Base Sample' refer to the regressions run with all colonized countries in the current dataset.

[12] Interestingly, Acemoglu et al(2008) later examine the link between income and democracy, and argue that there is actually no effect of income on democracy, once country-fixed effect are appropriately included in the model. This would support their view that it is the colonial legacy that matters.

Recalling that both AJR and La Porta et al. (1998) maintain that being a British colony is only beneficial insofar as it improve your likelihood of having private property rights, the above table gives credence to these views. Being a British colony is not predicted to improve economic outcomes, and in fact has a consistently negative (although insignificant) coefficient. On the other hand, having good institutions[13] is critical to economic outcomes: on average, a one point increase in the index of expropriation protection increases the predicted log of GDP per capita by about one point, indicating a doubling of the *level* of GDP per capita. Specifically, given a country like the Bahamas, with an average expropriate risk score of 7.5, as opposed to, say, Haiti, with a score of 3.7, the model in column (2) for instance predicts that GDP per capita in the Bahamas should be 3.8 * 1.17 = 4.4 log points higher than Haiti. In reality, these countries are only 3.3 log points apart in the data (the Bahamas were roughly 26 times richer than Haiti in 2011), meaning that the model is slightly over-predicting the differences in GDP per capita.

Table 5 also reveals the problem brought up earlier, that the sample cannot be expanded so long settler mortality is within the model as it has such restricting observations. Despite the inclusion of 24 new countries to the dataset of ex-colonies, the number of observations creeps up by as little as two each time the model is run on the expanded sample. As mentioned previously, it is difficult to know with certainly that bias is not intruded through the particular sample this variable is taken over, or through measurement error, without expanding the variable and also trying a different measure of mortality.

As before, although comparable measures do not exist for settler mortality, they do for contemporary institutions. Table 6 therefore investigates the robustness of the second-stage regression to alternative specifications of the measure of institutions as the independent variable of interest. Additionally, I control for sample-selection bias by rerunning each specification over different sub-samples.

[13] In this case institutions are measured as the average protection against expropriation 1985-1995 index as in AJR.

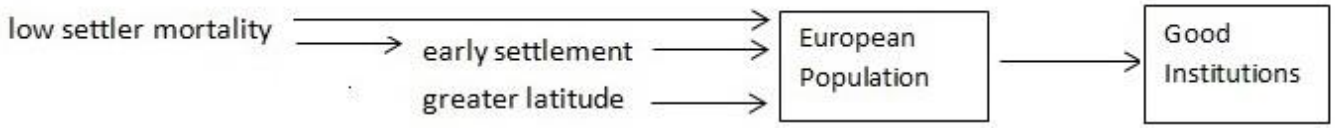
Table 6: IV regression of Log GDP per capita 2011 instrumenting different institution measures with settler mortality

	Base Sample	Base Sample without Neo-Europes	Base Sample without Africa	Base Sample with Continent Dummies	Base Sample	Base Sample without Neo-Europes	Base Sample without Africa	Base Sample with Continent Dummies	Base Sample	Base Sample without Neo-Europes	Base Sample without Africa	Base Sample with Continent Dummies
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Protection Against Expropriation 1985-1995				Property Rights 1995-2011				Quality Of Government 1985-2011			
Institutions	1.17***	1.5***	0.63***	1.05***	1.06***	1.33***	0.46***	0.86	0.87***	1.08***	0.50***	0.70***
	(0.26)	(0.47)	(0.16)	(0.36)	(0.03)	(0.04)	(0.01)	(0.30)	(0.16)	(0.24)	(0.12)	(0.18)
Latitude	0.01	0.16	-0.01	-0.05	-0.34	-0.34	-0.16	-0.24	-0.20	-0.15	-0.11	-0.21
	(0.17)	(0.20)	(0.11)	(0.16)	(0.25)	(0.32)	(0.10)	(0.22)	(0.16)	(0.18)	(0.11)	(0.14)
Asia Dummy				- 0.83*				0.21				- 0.85**
				(0.45)				(0.53)				(0.33)
Africa Dummy				-0.53				-0.39				- 0.79**
				(0.47)				(0.49)				(0.30)
British Colony	- 0.64*	-0.38	-0.26	-0.43	- 1.27**	- 1.27*	-0.41	-0.98	- 0.67**	-0.50	-0.34	-0.36
	(0.37)	(0.44)	(0.37)	(0.40)	(0.51)	(0.28)	(0.31)	(0.56)	(0.30)	(0.32)	(0.35)	(0.28)
R^2	0.08	-	0.57	0.30	-	-	0.74	0.29	0.39	0.13	0.63	0.61
Obs	62	58	34	62	71	67	36	71	62	58	34	62

Notes: The endogenous explanatory variable, institutions, is instrumented with settler mortality. The measure of institutions changes within the table: columns (1) to (4) use Average Protection Against Expropriation Risk 1985-1995, taken from AJR (2001). In columns (5) to (8) it is an index of Property Rights, which is scaled to range between 1 and 10. In columns (9) to (12) the variable use is Quality of Government, an index also scaled to be between 1 and 10. Both Property Rights and Quality of Government are taken from Teorell, J. et al. (2013), The Quality of Government Dataset 2013, Standard Version. See Appendix 2 for further details.

The results within Table 6 are pleasing for two reasons. Firstly, they follow the same trends as in Table 5, indicating that the coefficients within Table 5 were not resulting from a peculiarity within the average expropriation risk variable. Secondly, they confirm the findings within Table 5 and AJR: institutions are substantial predictors of economic development, and once they are controlled for the latitude of the country and a British colonial legacy do not have independent effects on economic outcomes. One point of difference from AJR is that the continent dummies are practically large in all specifications, and statistically significant in half of them. Sachs (2003) argues that being African or Asian may well have a negative impact on the economy, as their climates are conducive to disease. This is supported by the practically large and moderately significant coefficients reported in Table 6. Interestingly, they are most significant when the broadest measure of institutions (QOG) is controlled for.

Before introducing the final table of the paper, a summary of certain previous findings is necessary. From Table 3, we know that European populations in 1900 tended to be significantly larger in countries at greater latitudes, even when the colonization date and the level of settler mortality was controlled for. Table 4 showed that when the European population was controlled for, the effect of latitude fell away. This analysis led to a causal diagram of the following basic structure:



A useful insight from this analysis is that, seeing as latitude is hypothesised to have no independent effect on economic outcomes (AJR), which was also confirmed in Tables 5 and 6, it may well be excludable from the structural equation. Furthermore, seeing as it is correlated with the size of European Population, it is likely to be correlated with desirable institutions through the mechanism above. These two features make it a valid instrument for institutions in a model predicting the level of GDP per capita (Wooldridge, 2014: 507).

Table 7 adopts this novel approach, and runs the structural equation with latitude as the instrument and institutions again as the instrumented variable. I check the robustness to different measures of institutions, and additionally I consider different samples and the inclusion of continent dummies. I also perform routine post estimation tests for over-identification, and these results are reported in Appendix 3. The bottom panel reports the coefficient on latitude from the first-stage regression, to ensure that it is reasonably correlated with institutions within each specification. The R^2 values for the second-stage were relatively high, but the R^2 from a 2SLS regression is difficult to interpret and is usually relatively meaningless (Wooldridge, 2013: 501). Table 7 rather reports the R^2 from the first-stage regression, to check that latitude is a reasonable predictor of institutions. The R^2 from the second-stage is available for reference in Appendix 1, as Table B.

A useful element of instrumenting with latitude is that I am finally able to exploit the additional countries that were added to the data, as both settler mortality and the average expropriation risk variable can be excluded from several of the specifications. The results are quite interesting. Firstly, institutions remain practically and statistically significant in predicting GDP per capita. However, this significance falls away whenever settler mortality is included as a control (columns 3, 7 and 11). This is probably due to the extremely high correlation between institutions (even when they are predicted by latitude) and settler mortality that was found previously. It is perhaps indicative that the effect of settler mortality is more strongly correlated with institutions than latitude, as there appears to be more multicollinearity in this specification than when institutions and latitude were controlled for together.

Table 7: IV regression of Log GDP per capita 2011 instrumenting different institution measures with latitude

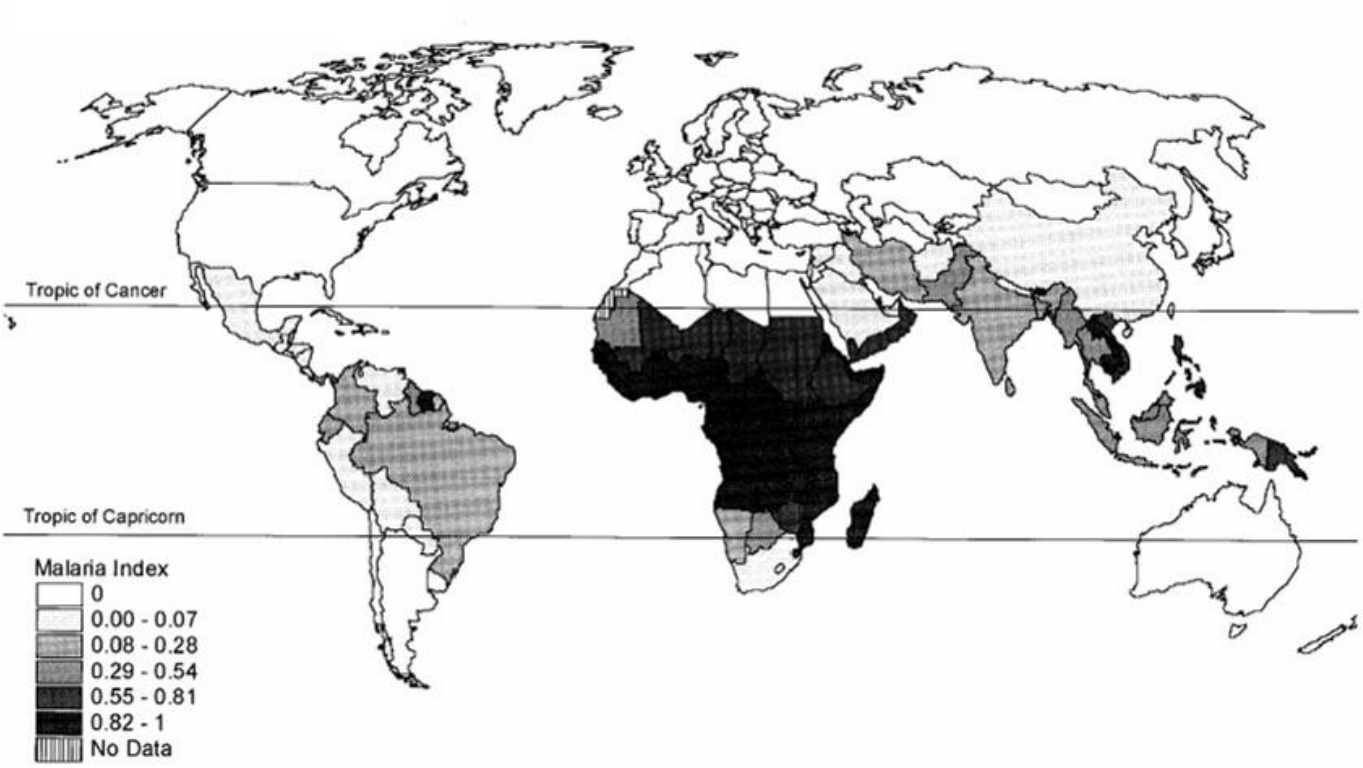
		Continent dummies	Continent dummies and settler mortality		Without Neo-Europes	Continent dummies	Continent dummies and settler mortality	Base Sample	Without Neo-Europes	Continent dummies	Continent dummies and settler mortality
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Protection Against Expropriation 1985-1995			Property Rights 1995-2011				Quality Of Government 1985-2011			
Institutions	1.14***	0.96**	0.71	0.45***	0.51***	0.44***	0.29*	0.45***	0.54**	0.42***	0.16
	(0.36)	(0.39)	(0.49)	(0.10)	(0.17)	(0.10)	(0.17)	(0.13)	(0.25)	(0.13)	(0.22)
Settler Mortality			-0.12				-0.24				-0.34
			(0.28)				(0.16)				(0.21)
Asia Dummy						-0.25	-0.43			- 0.65***	- 0.77***
						(0.25)	(0.29)			(0.23)	(0.27)
Africa Dummy		-0.63	-0.51	- 0.92***	- 0.92***	- 1.02***	- 0.86***	- 0.85***	- 0.81***	- 1.11***	- 0.96***
		(0.43)	(0.32)	(0.18)	(0.19)	(0.22)	(0.21)	(0.24)	(0.29)	(0.25)	(0.23)
Latitude from First-Stage	3.41***	2.71**	1.77	0.73***	0.50***	0.71***	0.48**	0.61***	0.35**	0.61***	0.42**
	(1.36)	(1.39)	(1.38)	(0.19)	(0.19)	(0.19)	(0.21)	(0.16)	(0.15)	(0.17)	(0.17)
R^2	0.083	0.13	0.30	0.22	0.12	0.24	0.38	0.29	0.17	0.29	0.49
Obs	71	71	63	84	80	84	72	72	68	72	63

Notes: Average Protection Against Exproriation Risk ranges from 1-10 and is taken from AJR (2001). The Property Rights index has been scaled to range 1-10, as has the Quality of Government Variable. Both the Property Rights and Quality of Government variable are taken from Teorell, J. et al. (2013), The Quality of Government Dataset 2013, Standard Version. Details can be found in Appendix 2.

Another interestingly feature of the table is that the significance of the Africa and Asia dummy variables as independent causes of economic failure have returned in substantial force in Table 7. For instance, columns (4) through (11) suggest that on average, being African is expected to lower your GDP per capita by close to 100%, whereas being an Asian country is expected to lower GDP per capita by around 50% on average. This could either be the result of the expanded number of observations, or because of the new instrument being used. This result differs from AJR, and might indicate that geographic features are acting to the detriment of Asian and African countries. In fact, a closer analysis of Jeffrey Sachs' arguments reveal that he is primarily concerned with the disease environment in Africa and Asia, and does not necessarily mean to make suppositions about the entire globe. For instance, he writes:

> "Impoverished regions with an unfavourable geography, such as most of sub-Saharan Africa, central Asia, and large parts of the Andean region….have not succeeded in raising living standards." (Sachs, 2003:39).

Sachs correctly points out at several points that Africa has an unusually high burden of detrimental geographic factors, of which the most important result is the prevalence of malaria. Figure 3 is taken from Sachs (1998), and reveals the severity of malaria incidence within Africa:



Sachs makes several reasonably convincing arguments as to why disease and geography may have a significant effect on economic outcomes, independent of the level of political institutions, many of which were discussed in the literature review section. For instance, the inability to attract foreign investment, lower levels of factor mobility and agrarian difficulties might hamper the creation and diffusion of technology, and therefore substantially undermine growth prospects regardless of the level of political institutions. These arguments are somewhat convincing, and have received substantial respect from fellow authors. This begs the question: Why are these effects not borne out in empirical analysis such as in AJR?

6. IN DEFENCE OF GEOGRAPHY

AJR (2001:1387) claim to have discovered evidence against the direct effect of geography and disease on economic development by controlling for latitude in the structural equation and finding an insignificant coefficient. However, the fact that multicollinearity is well known to reduce the preciseness of estimators (Wooldridge, 2013:90) and has been referred to repeatedly within this text. Within an Instrumental Variables context, multicollinearity is an even greater problem. This is due to two facts: firstly, because the endogenous variable is fitted according to the exogenous variables in the reduced equation, it necessary has less variation than the true variable because it only contains the explained sum of squares (Wooldridge, 2013:508). Secondly, the correlation between the fitted values of the endogenous variable and the controls in the structural equation is usually higher than the same correlation when the true endogenous variable is used (Wooldridge, 2013:509).

Using the exact specifications reported by AJR (2001:1386) in their Table 4, it is possible to examine the multicollinearity at play by predicting the endogenous variable and regressing the fitted values on the controls in the structural equation. For example, regressing the fitted values of average expropriation risk as (predicted by settler mortality) against the latitude measure used by AJR produces an R^2 of 0.68, with a p-value of 0.000 attached to the latitude variable. Doing the same for column (8) of their table, which includes the continent dummies and the latitude variable results in an R^2 of 0.90, and each variable has a p-value of 0.000. This R^2 is extremely high, and explains why latitude so often loses its significance.

In fact, referring back through the tables within this paper, it is clear that latitude is very seldom even weakly significant when just continent dummies are included. This is probably because controlling for continents naturally limits the variability of latitude, as latitude is well explained by the sum of (the latitudes) of various continents: Africa and Asia alone explain around 30% of the variance in latitude. The multicollinearity problem is even worse when latitude is paired with settler mortality on the right-hand side, and latitude is almost never found to a significant predictor of anything when settler mortality is also controlled for.

Theoretically, it seems quite obvious that latitude is correlated with mortality – in fact, this is the underlying premise of the very geography hypothesis that AJR are determined to disprove. Sachs (2003) writes:

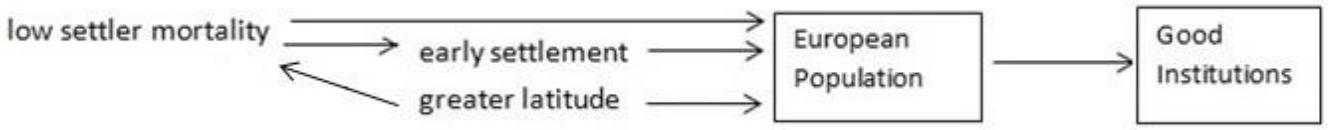
> "Sub-Saharan Africa is the tropical region par excellence, with 93 percent of its land lying between the Tropic of Cancer and the Tropic of Capricorn (Bloom & Sachs, 1998:213)…. The evidence suggests that the burden of infectious disease is vastly higher in the tropics than in the temperate zones, both as a percentage of total disease burden, as measured by total disability-adjusted life years ….we find that hotter climates display systematically lower life expectancies" (Bloom & Sachs, 1998:228).

He goes on to conclude that:

> "….At the root of Africa's long-term growth crisis is Africa's extraordinary geography."

While the jury may still be out regarding the ultimate causes of Africa and other regions' poverty, what is clear is that Sachs and co-authors throughout their paper argue for *a direct effect of latitude on mortality.* In other words, insofar as the burden of a hot and tropical climate falls onto the settlers, which is likely through the transfer of disease and the difficulty in raising crops and livestock, there is good reason to suppose that latitude is correlated with settler mortality.

Diagrammatically, the causal chart from before should therefore be updated as follows:



The problem within the above system is that it would clearly involve a high and complex web of cross-causality, making isolating specific effects particularly difficult. Given the worrying implications of multicollinearity for IV estimation, as well as the fact that theoretical and empirical evidence supports the argument that latitude and settler mortality are highly correlated, substantial doubt is cast on the rejection of latitude as a consequent variable in any regression where settler mortality is also controlled for – the *ceteris paribus* nature of econometric analysis undermines the potential for mortality and latitude to vary independently. Even in the later tables in AJR (2001), where they provide a set of alternative measures of disease and non-favourable geographic factors, they consistently instrument with settler mortality. Because multicollinearity arises between the *fitted* values of the endogenous variable and the control in the structural equation, instrumenting with settler mortality will therefore undermine the explanatory power of latitude in any specification. The fact that settler mortality as given in AJR is more highly correlated with the protection against expropriation variable and other dependent variables might be consistently driving away the effect of latitude whenever they both appear on the right-hand side.

To summarize this section, the high correlation between latitude and mortality has a strong theoretical and empirical case, and is likelihood to result in multicollinearity within model such as AJR's. This problem is not addressed in the AJR paper, and casts some doubt on their rejection of the importance of geographic features. Until an improved approach is devised that is able to disentangle and isolate the effects of geography and settler mortality, it will remain empirically difficult to determine whether or not geography has in independent effect on economic outcomes.

7. CONCLUSION

The approach adopted by Acemoglu, Robertson and Johnson in *The Colonial Origins* was novel and contributed to the body of knowledge by providing a valid instrumentation strategy to control for the endogeneity of political institutions in models of economic development. Within this paper, they also argued that political institutions today are largely determined by pre-determined paths of development, which were decided roughly 500 years during countries' colonization experiences. In an important sense, this theory is therefore deterministic in that it explains the present and much of the future as the result of unchangeable historic events.

Unfortunately, despite the fact that the paper so strongly argued in favour of historic determinism, the juxtaposition of such a theory with a theory of contemporary institutions placed an undue emphasis on potential instruments as the only variables of interest in determining political institutions. As a result, much of the richness and variety in human history and institutional evolution has been overlooked by scrupulous eye of the economist seeking operable and excludable variables. The debate following the AJR paper has largely been a back-and-forth regarding the relevance of certain variables in the final step of the interesting narrative they provided, and the early stages of this narrative have thus been somewhat over-looked. This paper aimed to address this problem by returning to the early development of institutions and colonization and focusing on this process as a research topic in its own right.

Several interesting results were found, and add to the conceptual framework. Particularly, timing considerations were included and found to be significant. Colonies that were settled in earlier times had a greater change of accumulating a European population, which had effects on the level of political inclusion at the time of independence. The duration of the colonizing presence was also relevant, and was revealed to improve the chances of positive institutions at the date of independence, through several possible channels. Additionally, variables were introduced to capture the value of the potential colony to the colonizer. These included a proxy for natural resource wealth as well as a proxy for the geostrategic relevance of the country. Although the specifications in this paper did not find significant results for these proxies, this approach is still important as it highlights the need to consider the 'benefits' side of a colonizers' decision. A convincing explanation of colonization cannot be based solely on the relatively costs of settling in a territory, as this completely forgoes the reasons for actually wanting to settle elsewhere to begin with.

Several of the findings within this paper supported the hypothesis proposed by Acemoglu, Robinson and Johnson. Particularly, the path of early institutional development was expounded and confirmed at various stages, often using new variables as robustness checks. In particular, more substantial colonial settlement (measured in time) led to a greater European share of the population, which subsequently led to superior early institutions. These institutions seemed to persist into the future, creating better political institutions in the present day. The second-stage results from the *Colonial Origins* paper were also confirmed – institutions were predicted to have remarkably similar effects on GDP per capita to the effect found in AJR, even when various alternative specifications were used.

The paper also introduced the use of latitude as a potential instrument, and found that this instrumentation approach produces estimates that were remarkably consistent with previous approaches. Interestingly, the results differed to previous specifications in that Africa and Asia became significant in reducing the predicted level economic prosperity. It was posited that this result reflected the high degree of multicollinearity in models that use both mortality and latitude measures. The concern of multicollinearity was finally used as a defence of geographic determinants, where it was argued that settler mortality may have been undermining the explanatory power of geographic features in the previous as well as in the analysis of AJR.

Future research on this topic should focus more on the early causes of institutional development, especially if they are truly believed to be all-important to current economic development. Particularly, research into the perception of various potential colonies, as well as better coverage and revision of settler mortality estimates, would be useful in more accurately revealing the decisions that determined patterns of colonization. After all, if institutionalists such as AJR truly believe that colonial history explains the largest part of our collective economic successes, the least they could do is provide a framework that explains *why* colonists settled where they did.

APPENDIX 1 – GENERAL FIGURES, TABLES AND GRAPHS

Figure A – GDP per Capita, PPP Adjusted, 2006 (from the World Bank Development Indicators).*

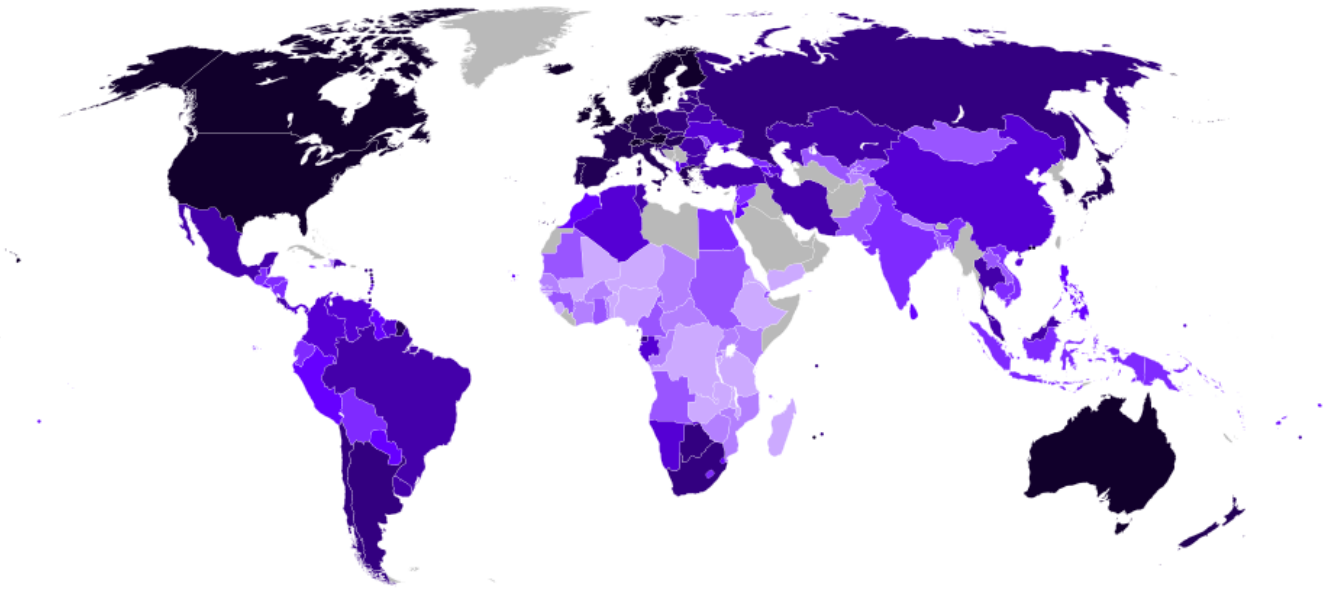
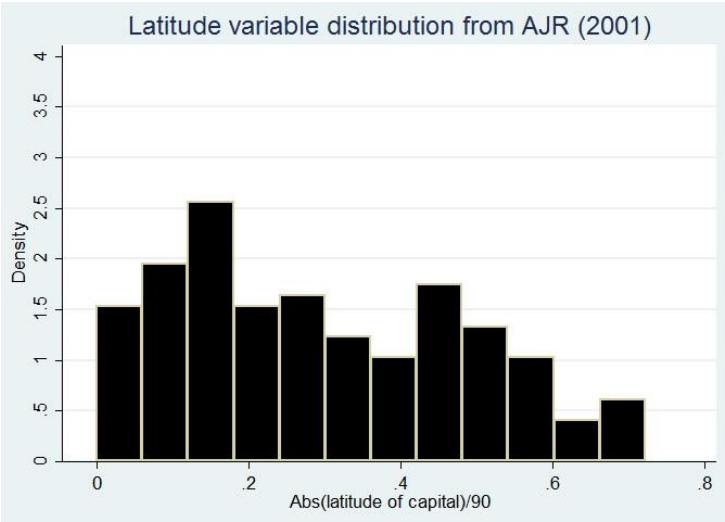


Figure B – Histograms of the Latitude Variable.



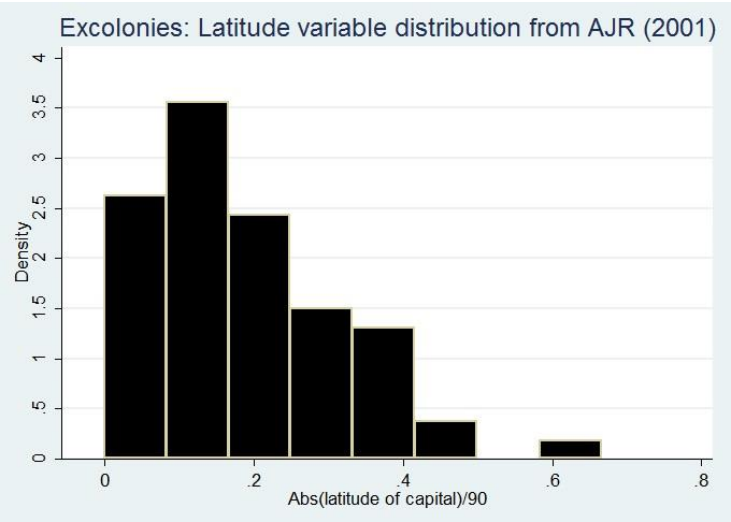


Figure C – All colonization and independence dates by identity

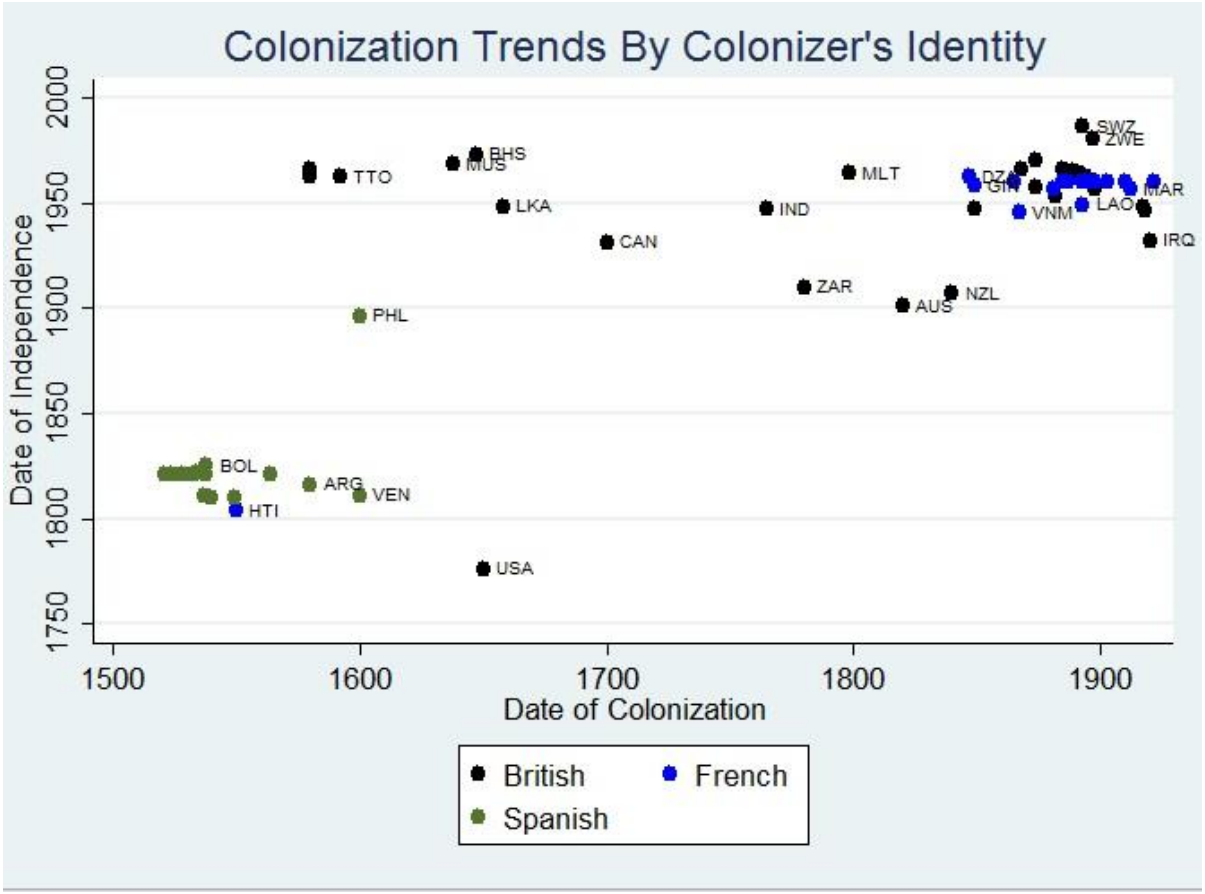


Figure D– later-day colonization and independence dates by identity

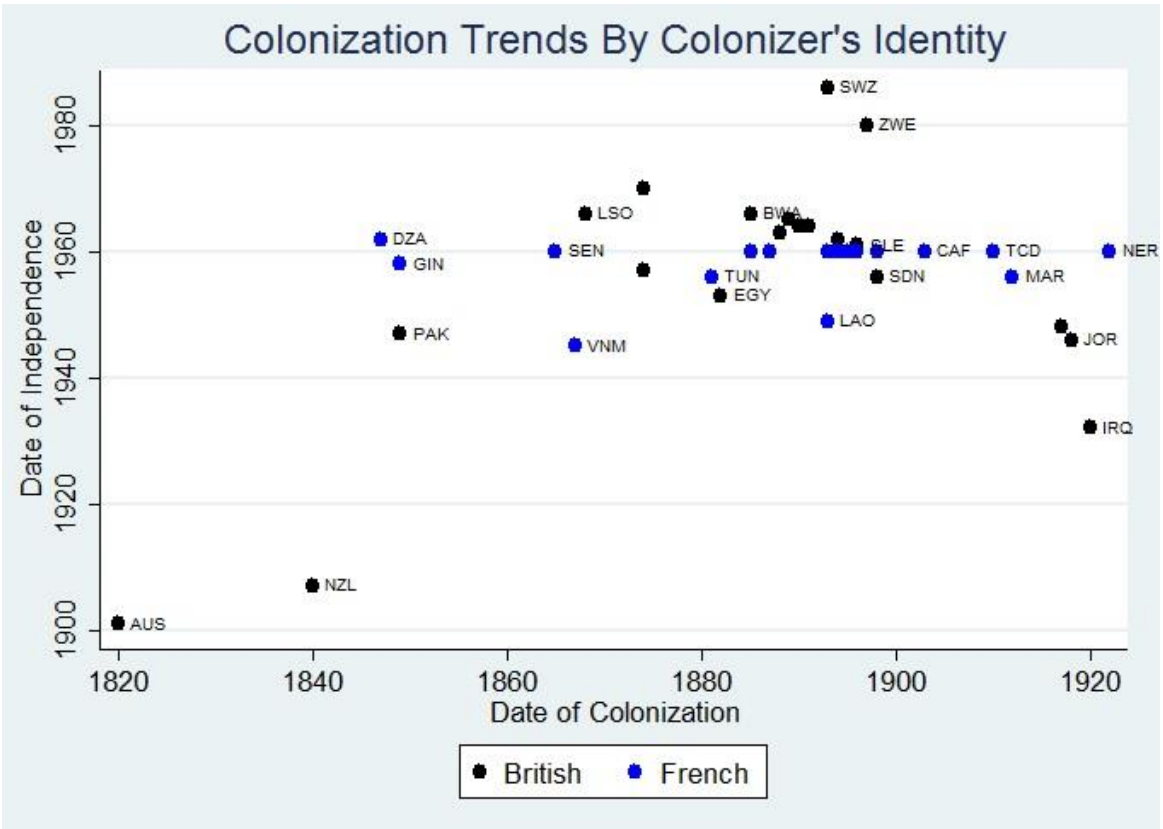


Figure D – World Map Showing Date Colonized

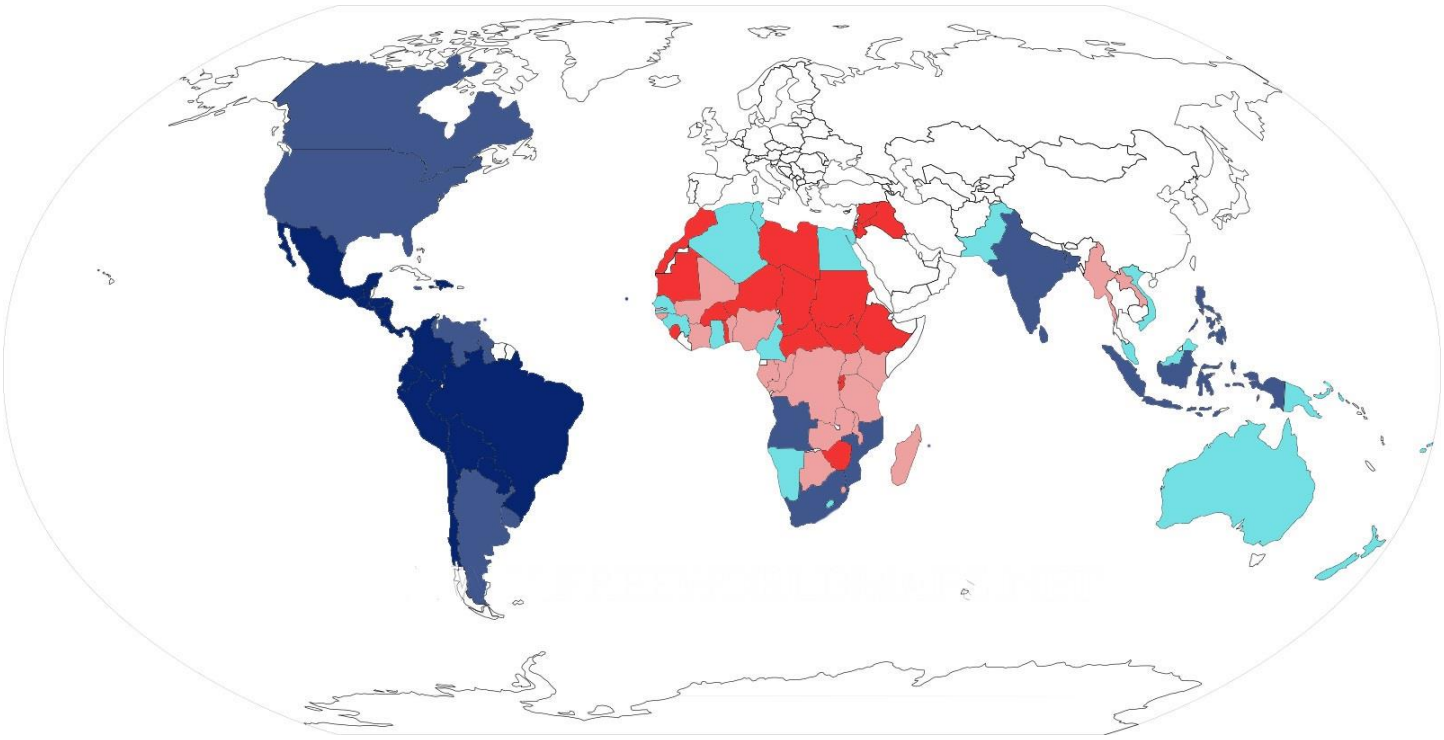


Table B

Table B: R^2 Values from the second-stage regression within each column of Table 7

Column Number	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
R^2	-	0.168	0.58	0.67	0.57	0.68	0.74	0.65	0.56	0.69	0.69
Obs	71	71	63	84	80	84	72	72	68	72	63

Notes: The R2 for column 1 was suppressed by Stata and is therefore not reported

APPENDIX 2 - DATA AND VARIABLES

The Patterns of Colonial Development

The Region of the Country	colonizer .Never	Belgium	Brazil	France	Haiti	Italy	Malaysia	Pakistan	Portugal	South Afr	Spain	UK	Total
1. Eastern Europe and	1	0	0	0	0	0	0	0	0	0	0	0	1
2. Latin America	0	0	1	1	1	0	0	0	1	0	15	0	19
3. North Africa & the	0	0	0	4	0	0	0	0	0	0	0	4	8
4. Sub-Saharan Africa	0	1	0	12	0	1	0	0	4	1	0	14	33
5. Western Europe and	0	0	0	0	0	0	0	0	0	0	0	5	5
7. South-East Asia	0	0	0	2	0	0	1	0	0	0	1	1	5
8. South Asia	1	0	0	0	0	0	0	1	0	0	0	3	5
9. The Pacific	0	0	0	0	0	0	0	0	0	0	0	1	1
10. The Caribbean	0	0	0	0	0	0	0	0	0	0	0	4	4
Total	2	1	1	19	1	1	1	1	5	1	16	32	81

The extent of my sample

Country Name	3-Letter Code	AJR Sample	Year Colonied	Independence Year	Colonized By	Landlocked	Notes
Algeria	DZA	1	1847	1962	France	0	
Angola	AGO	1	1750	1975	Portugal	0	
Argentina	ARG	1	1580	1816	Spain	0	
Australia	AUS	1	1820	1901	UK	0	
Bahamas	BHS	1	1647	1973	UK	0	Data Not Available in Ertan et al. (2012)
Bangladesh	BGD	1	1757	1971	Pakistan	0	
Benin	BEN		1894	1960	France	0	
Bolivia	BOL	1	1538	1825	Spain	1	
Botswana	BWA		1885	1966	UK	1	
Brazil	BRA	1	1533	1822	Portugal	0	
Burkina Faso	BFA	1	1896	1960	France	1	
Burundi	BDI		1903	1962	UN/Belgium	1	
Cameroon	CMR	1	1884	1960	UN/France	0	
Canada	CAN	1	1700	1931	UK	0	
Cape Verde	CPV		1462	1975	Portugal	0	
Central African Republic	CAF		1903	1960	France	1	
Chad	TCD		1910	1960	France	1	
Chile	CHL	1	1540	1810	Spain	0	
Colombia	COL	1	1549	1810	Spain	0	
Congo	COG	1	1885	1960	Belgium	0	
Costa Rica	CRI	1	1564	1821	Spain	0	
Cote d'Ivoire	CIV	1	1893	1960	France	0	
Dominican Republic	DOM	1	1505	1844	Haiti	0	
Ecuador	ECU	1	1534	1822	Spain	0	
Egypt	EGY	1	1882	1953	UK	0	
El Salvador	SLV	1	1528	1821	Spain	0	
Ethiopia	ETH	1	1936	1941	Italy	1	
Fiji	FJI		1874	1970	UK	0	
Gabon	GAB	1	1885	1960	France	0	
Gambia	GMB	1	1889	1965	UK	0	
Ghana	GHA	1	1874	1957	UK	0	
Guatemala	GTM	1	1524	1821	Spain	0	
Guinea	GIN	1	1849	1958	France	0	
Guinea-Bissau	GNB		1886	1974	Portugal	0	
Guyana	GUY	1	1580	1966	UK	0	
Haiti	HTI	1	1550	1804	France	0	
Honduras	HND	1	1524	1821	Spain	0	
Hong Kong	HKG	1	1842		China	0	Not observed in the QOG dataset
India	IND	1	1765	1947	UK	0	
Indonesia	IDN	1	1755	1945		0	
Iraq	IRQ		1920	1932	UK	0	
Israel	ISR		1917	1948	UK	0	
Jamaica	JAM	1	1580	1962	UK	0	
Jordan	JOR		1918	1946	UK	0	
Kenya	KEN	1	1888	1963	UK	0	
Laos	LAO		1893	1949	France	1	
Lesotho	LSO		1868	1966	UK	1	
Libya	LBY		1911	1951	UN	0	
Madagascar	MDG	1	1895	1960	France	0	
Malawi	MWI		1891	1964	UK	1	
Malaysia (1966-)	MYS	1	1874	1957	UK	0	
Mali	MLI	1	1887	1960	France	1	
Malta	MLT	1	1798	1964	UK	0	Data Not Available in Ertan et al. (2012)
Mauritania	MRT		1898	1960	France	0	

Mauritius	MUS		1638	1968	UK	0	
Mexico	MEX	1	1521	1821	Spain	0	
Morocco	MAR	1	1912	1956	France	0	
Mozambique	MOZ		1750	1975	Portugal	0	
Myanmar	MMR		1885			0	
Namibia	NAM		1884	1990	South Africa	0	
New Zealand	NZL	1	1840	1907	UK	0	
Nicaragua	NIC	1	1524	1821	Spain	0	
Niger	NER	1	1922	1960	France	1	
Nigeria	NGA	1	1885	1960	UK	0	
Pakistan (1971-)	PAK	1	1849	1947	UK	0	
Panama	PAN	1	1538	1821	Spain	0	
Papua New Guinea	PNG		1884	1975	UN/Australia	0	
Paraguay	PRY	1	1537	1811	Spain	1	
Peru	PER	1	1533	1821	Spain	0	
Philippines	PHL		1600	1896	Spain	0	
Rwanda	RWA		1899	1962	UN/Belgium	1	
Senegal	SEN	1	1865	1960	France	0	
Sierra Leone	SLE	1	1896	1961	UK	0	
Singapore	SGP	1	1824	1965	Malaysia	0	
South Africa	ZAF	1	1780	1910	UK	0	
Sri Lanka	LKA	1	1658	1948	UK	0	
Sudan	SDN	1	1898	1956	UK	0	
Swaziland	SWZ		1893	1986	UK	1	
Syria	SYR		1920	1946	French	0	
Tanzania	TZA	1	1891	1964	UN/UK	0	
Togo	TGO	1	1897	1960	UN/France	0	
Trinidad and Tobago	TTO	1	1592	1962	UK	0	
Tunisia	TUN	1	1881	1956	France	0	
Uganda	UGA	1	1894	1962	UK	1	
United States	USA	1	1650	1776	UK	0	
Uruguay	URY	1	1726	1825	Brazil	0	
Venezuela	VEN	1	1600	1811	Spain	0	
Vietnam	VNM	1	1867	1945	France	0	
Zaire	ZAR	1	1780	1910	UK	0	To avoid confusion I use 'Zaire' and not DRC
Zambia	ZMB		1890	1964	UK	1	
Zimbabwe	ZWE		1897	1980	UK	1	

Methodology and sources:

Variables:

The following variables were taken directly from AJR's data, which is available online:

Average Protection Against Expropriation Risk, Constraint on the executive at Independence, the share of the population that is European in 1900, Settler Mortality, as well as the log of GDP 1995 (which they also sourced from the World Bank).

GDP per capita figures were taken from the World Bank Development indicators, in the prices available (usually 2005 prices). They were also the PPP adjusted figures as in AJR.

The institutions variables were all averaged across various times according to the given specification. Although these variables have their own unique sources, they were all taken from an agglomerated dataset called the Quality of Government Dataset, which is available online for download. The managers of the dataset request the following citation:

Teorell, Jan, Nicholas Charron, Stefan Dahlberg, Sören Holmberg, Bo Rothstein, Petrus Sundin & Richard Svensson. 2013. The Quality of Government Dataset, version 20Dec13. University of Gothenburg: The Quality of Government Institute, http://www.qog.pol.gu.se

The date of colonization was taken from Ertan, Putterman & Fiszbein (2012), Table A.1. The identity of the colonizer was taken at the time of independence, on the logic that the last colonizer will have the most significant lasting impression on institutional formation. This information was sourced from the CIA World Factbook (2014).

APPENDIX 3 – ROBUSTNESS CHECKS ON THE INSTRUMENTATION STRATEGY

From the analysis of the first-stage regression, it is known that both settler mortality and latitude act through the European population to create better institutions. While AJR argued that settler mortality is excludable, they also implied indirectly that latitude is excludable from the structural equation, as they wanted to prove that it was not a significant independent predictor of GDP. Furthermore, it has already been shown that both latitude and mortality influence institutions through the European Population, and Column (4) of Table 3 showed that settler mortality and latitude together explained about 45% of the variation in institutions. Therefore, another useful element of instrumenting with latitude as introduced in this paper is that we now have two excludable instruments and can perform over-identification tests. These tests were performed on all specifications in Table 7 that did not control for settler mortality, by simply adding settler mortality to the instrument set, and running the necessary post-estimation commands. In none of the specifications was the null hypothesis (that both instruments are excludable) rejected at any significance level using the typical Hansen J-statistic[14]. Instrumenting with both settler mortality and latitude only increased the significance further, whereas the magnitude of coefficients remained somewhat similar. This is evidence that the model is accurately predicting the effect of institutions, as it is robust to re-specification of the instrument set.

[14] I do not report these tests but the code is available on request.

REFERENCE LIST

Acemoglu, D., Johnson, S. & Robinson, J. 2001. The Colonial Origins of Comparative Development: An Empirical Investigation. *American Economic Review*. 91(5): 1369-1401.

Acemoglu, D., Johnson, S. & Robinson, J., Yared, P. 2008. Income and Democracy. *American Economic Review.* 98(3):808-842.

Acemoglu, D., Robinson, J.A. 2012. *Why Nations Fail: The Origins of Power, Prosperity, and Poverty*. United States: Crown Publishers.

Albouy, D.Y. 2008. *The Colonial Origins of Comparative Development: An Investigation of the Settler Mortality Data*. Cambridge: National Bureau of Economic Research, Working Paper 14130.

Auer, R. 2007. *The Colonial Origins Of Comparative Development: Comment. A Solution to the Settler Mortality Debate.* Swiss National Bank.

Bloom, D.E. & Sachs, J.D. 1998. Geography, Demography, and Economic Growth in Africa. Brookings Papers of Economic Activity. 2(1):209-273.

CIA World Factbook. 2014. *Field Listing: Independence.* United States of America: Central Intelligence Agency.

Collier, P. & Hoeffler, A. 2004. Greed and Grievance in civil war. *Oxford Economic Papers.* 56(1):563-595. Diamond, J. 1997. *Guns, Germs, and Steel: The Fates of Human Societies*.

Easterly, W. & Levine, R. 2002. *Tropics, Germs, And Crops: How Endowments Influence Economic Development*. Cambridge: National Bureau of Economic Research, Working Paper 1906.

Easterly, W. & Levine, R. 2013. *The European Origins of Economic Development*. National Bureau of Economic Research, Working Paper 18162/18182.

Ertan, A., Putterman, L. & Fiszbein, M. 2012. *Determinants and economic consequences of colonization: A global analysis.*Brown University Department of Economics. Working Paper 2012-5.

Freedom House. 2013. *Freedom in the World: The annual survey of Political Rights and Civil Liberties*. New York, NY: Freedom House. Available online: http://www.freedomhouse.org/report/freedom-world/freedom-world-2013#.VBXssxZD6So [Accessed 14/9/2014].

Ertan, A., Putterman, L. & Fiszbei, M. 2012. *Determinants and Economic Consequences of Colonization: A Global Analysis*. Brown University, Working Paper.

Halperin, M.H., Siegle, J.T. & Weinstein, M.M., 2004. Why Democracies Excel. *Foreign Affairs*. 83 (5):51-71.

Heilbroner, R. 2000. *The Worldly Philosophers, 7th edition.* London: Penguin Books.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A. & Vishny, R.W. 1998. Law and Finance. *Journal of Political Economy.* 106(6).

Rotberg, R. I. 1988. *The Founder: Cecil Rhodes and the pursuit of power.* Oxford: Oxford University Press.

Sachs, J.D. 2003. Institutions Matter, but Not for Everything: The role of geography and resource endowments in development shouldn't be underestimated. *International Monetary Fund: Finance and Development.* 40(2).

Schneider, C.Q. & Schmitter, P.C. 2004. Liberalization, Transition and Consolidation: Measuring the Components of Democratization. *Democratization.* 11(5):59-90.

Wooldridge, J. M. 2013. *Introductory Econometrics, 5th edition.* Canada: Cengage Learning.

Von Hayek, F.A. 1960. *The Constitution of Liberty.* Chicago: University of Chicago Press.