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# History matters: New evidence on the long run impact of colonial rule on institutions

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## ABSTRACT

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This paper proposes a new instrument for institutional quality which varies across countries with historically low rates of European settlement. Using a new data set which exploits differences in the quality of colonial administration, it finds evidence that colonies with better paid colonial governors developed better institutions (and became wealthier) than colonies with lesser paid governors. Initially, the best paid governors were sent to colonies which generated the largest revenues but, since the governors' pay scale remained largely fixed for the next 40 years, the same colonies continued to receive the best governors. The data indicate that these early differences in colonial administration—and not initial differences in revenue generating capacity—had a long-run impact on economic development. *Journal of Comparative Economics* 41 (1) (2013) 181–200. Vassar College, Poughkeepsie, NY 12604, United States.

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## 1. Introduction

Most economists agree that institutional quality plays a key role in explaining differences in income per capita across countries. Strong economic institutions—such as those which secure property rights and enforce contracts—are believed to raise incomes by encouraging people to invest in themselves and in different forms of physical capital. Similarly, strong political institutions have been linked to greater public good provision, less intrusive regulation, and lower income inequality (La Porta et al., 1998, 1999; Rauch and Evans 2000; Djankov et al. 2002, 2003). Indeed, there is now a growing body of empirical evidence which indicates that differences in institutions—not geography or culture—are what *cause* differences in income per capita across countries (Acemoglu et al., 2001, 2002, 2005; Banerjee and Iyer, 2005).

To date, the strongest evidence comes from a handful of studies which use instrumental variables as a means of addressing the problem that institutions are endogenous to the growth process. The most celebrated of these studies is the work by Acemoglu, Johnson, and Robinson (2001, 2002), hereafter AJR. AJR argue that historical mortality rates (or indigenous population density) were influential in shaping the pattern of European settlement to former colonies. Historical patterns of migration matter because, where Europeans migrated in large numbers, they supplanted indigenous institutions with their own European-style institutions. The problem is: Europeans brought more than just institutions to the New World. They brought their own human capital as well (Glaeser et al., 2004). This troubling fact casts some doubt on the validity of the AJR instruments. As is well known, an instrument is only valid if it is uncorrelated with the error term. So, if European

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settlement influenced growth through any channel other than institutions, the AJR instruments are not valid. Given the difficulty in finding an alternative source of exogenous variation, it is fair to say that the problem of endogeneity still persists.

This paper proposes a new instrument for institutional quality—colonial governors' pay—which varies across countries with historically low rates of European settlement. Specifically, I argue that differences in the level of institutional quality across former colonies are correlated to differences in the pay of the colonial governors who ruled them nearly 100 years ago. My hypothesis is straight forward: better paid governors set up more effective institutions than their lesser paid counterparts. Since institutions are slow to change, early differences in institutional quality can have a long term impact on a country's economic performance. The exclusion restriction implied by my instrumental variable regression is that governors' salaries nearly 100 years ago have no impact on current economic performance, except through their impact on institutional quality.

One potential weakness of this exclusion restriction is that the best paid governors could have been sent to colonies with the greatest growth potential. If that were the case, the colonies with the highest paid governors would have gone on to achieve the highest levels of income but not because their governors influenced their institutions in any meaningful way. Several checks are carried out to investigate this possibility and I argue that these checks provide sufficient evidence to make the assumption that governors' salaries are exogenous to the growth process. Indeed, there is much indirect evidence to suggest that governors' salaries are a valid instrument for institutional quality. Simple correlations reveal that historical salaries are positively correlated to contemporary measures of institutional quality. Fig. 1 plots the logarithm of governors' salaries against the 'rule-of-law' variable as defined by Kaufmann et al. (2003). This measure varies according to indicators like the extent of tax evasion, police effectiveness, and how well financial assets and wealth are protected within the country. Fig. 1 shows a strong positive relationship between governors' salaries and the strength of property rights which later developed in countries that were administered by colonial governors. Similar relationships are found when governors' salaries are plotted against contemporary measures of government effectiveness and how well a country controls corruption. In Figs. 2 and 3, it is clear that colonies with higher paid governors went on to develop more effective political systems than colonies with lower paid governors. These simple correlations support the hypothesis that colonial institutions matter because they influenced the development of later institutions.

To demonstrate this relationship, I regress current income per capita on current institutions, and instrument the latter by governors' salaries. The two-stage least squares estimate of the impact of institutions on income per capita is large in magnitude and highly significant. It suggests, for example, that if Sierra Leone were to strengthen its rule of law to the level of Malaysia, its income per capita would increase by a factor of 15. This result remains significant, even after controlling for a country's latitude, ethnic diversity, and colonial background. In addition, several tests are carried out to check for reverse causality and omitted variable bias. These tests provide further evidence that the quality of colonial rule is an important determinant of present-day institutional quality.

Gubernatorial pay has one main advantage over historical settler mortality rates which have become the standard instrument for institutional quality. Unlike settler mortality rates, gubernatorial pay varies widely across countries with historically low rates of European settlement. This is important because most countries in Sub-Saharan Africa and South Asia experienced low rates of European migration but not all of these countries went on to develop predatory institutions and stagnant economic growth. All fifty countries listed in Table 1, for example, had less than 10% European settlement in 1900. By 1960 several of these countries had already moved up the global income distribution, breaking away from the original pack of non-settler colonies. More than one-third of the former colonies were at intermediate levels of income per capita (between \$1650 and \$3400) while the remaining had not moved beyond the lowest level of income per capita (less

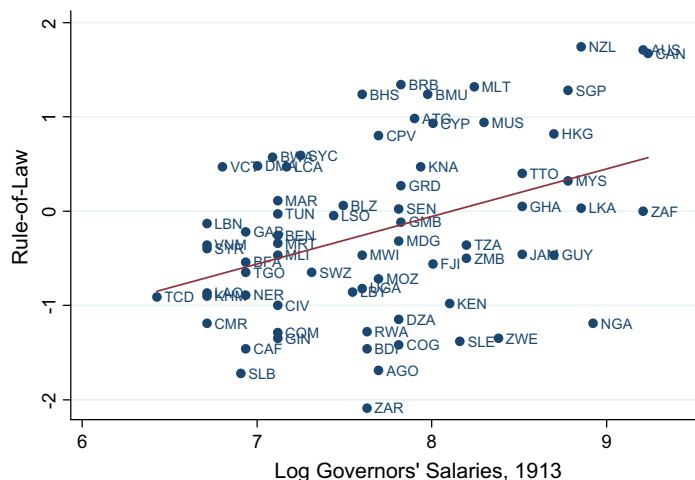


Fig. 1. Rule-of-law and quality of colonial rule.



**Table 1**

GDP per capita in 1960 (countries with &lt;10% European settlement in 1900).

Source: Kriekhaus, Table 3.1.

Poor (<\$1650)	Poor (<\$1650)	Intermediate (between \$1650 and \$3400)
Bangladesh	Mali	Angola
Benin	Morocco	Central African Republic
Burkina Faso	Mozambique	Guinea
Burundi	Nepal	Hong Kong
Cameroon	Niger	Iran
Chad	Nigeria	Jamaica
China	Pakistan	Japan
Congo, Dem. Rep.	Rwanda	Malaysia
Cote d'Ivoire	Sierra Leone	Papua New Guinea
Egypt	Sri Lanka	Philippines
Ethiopia	Syria	Senegal
Ghana	Taiwan	Singapore
India	Tanzania	Tunisia
Indonesia	Thailand	Turkey
Kenya	Togo	
Korea, Rep.	Uganda	
Madagascar	Zambia	
Malawi	Zimbabwe	

how some countries actually end up with more effective institutions than others. To tackle this issue, economists have begun to examine the importance of historical factors in shaping how institutions evolve.

Initially this research focused on differences which could be traced back to the identity of the colonial ruler. [La Porta et al. \(1998, 1999\)](#), for example, argue that former British colonies have stronger property rights today than other former colonies because they adopted the British legal system (based on common law) rather than the European legal system (based on civil law). In a similar vein, [Djankov et al. \(2002, 2003\)](#) provide evidence that former British colonies developed less intrusive regulatory systems and more expedient methods of dispute resolution than other colonies. These differences matter because they are correlated to differences in economic performance. [Bertocchi and Canova \(2002\)](#), for example, find evidence that former British colonies grew, on average, 1.1% faster per annum during the period than 1960–1988 than colonies that were ruled by the other European powers.

In a related set of papers, [Engerman and Sokoloff \(1997, 2000\)](#) highlight the role of geography in shaping the path of institutional development. Essentially, they argue that current levels of income inequality in Latin America and the Caribbean can be traced back to the type of institutions which were established during the colonial period. During the first wave of colonization, Europeans migrated to these regions because they had environments which were conducive for growing cash crops, like sugar and tobacco. By exploiting both the local environment and the large, indigenous supply of cheap (often slave) labor, Europeans generated large profits for themselves which they protected through restrictive institutions. These institutions, inter alia, limited the supply of new immigrants who could settle in these regions (thus restricting future competition) and protected the privileged status of the current Europeans. As a result, many countries in Latin American and the Caribbean developed strict, hierarchical institutions.

Geographic factors, however, are not the only source of variation related to institutional quality (although they are frequently used because they are a good source of exogenous variation). The colonial powers established a wide range of political structures in the colonies they ruled, particularly during the second wave of colonization which lasted from the mid-19th century to the eve of World War I.<sup>2</sup> It was during this period that nearly all non-settler colonies were acquired. One common characteristic of these colonies was their lack of representative government.<sup>3</sup> In the non-settler colonies, political power resided in the office of the colonial governor. As personal head of government, the colonial governor initiated policy, supervised its implementation, and managed the operations of all colonial departments. In theory, a governor's powers were rigidly circumscribed by the government he represented but, in reality, it did not work that way. Distance and claim to local expertise made the colonial governor essentially independent of the government he represented. Such independence had not existed during the previous wave of colonization but was necessary at the end of the 19th century due to the sheer size of the newly acquired territories.

According to one former Governor of French Africa, this independence was near total. He writes:

During my thirty years in colonial government, I never received a single instruction from the Minister of Colonies. We were the real leaders of the Empire; no one told us what to do. Theoretically, the Ministry of Colonies supervised

<sup>2</sup> There were two distinct waves of colonization. The first wave took place in the 16th, 17th, and 18th centuries and involved large numbers of Europeans migrating to settler colonies (e.g., the Americas, Australia, and New Zealand). The second wave took place from the mid-19th century onwards but did not involve much European migration because the new colonies were located mainly in the tropics.

<sup>3</sup> It was not until after the Second World War that representative government was first established in the non-settler colonies.

everything, but in practice it did not care to exercise its authority. Its only real function was to receive our suggestions and convert them into decrees. The Minister of Colonies was a politician, usually unfamiliar with our problems. We were the ones who held authority (Hubert Deschamps as quoted by Etemad (2007)).

There are many examples of colonies whose early institutions were shaped by the quality of their governors. In Singapore, for example, nepotism and other forms of corruption were commonplace before colonial rule. When the new Governor took office, he reorganized the administration “stamping on carelessness and corruption, and demanding higher standard of efficiency. His attack on nepotism and abuses of power, which had been accepted as normal before 1867, roused a fury of resentment” (Turnball, 2009, pp. 95–96). He found himself in direct opposition against the chief justice “who had enjoyed personal independence and considerable rights of patronage as Recorder of Singapore under the Indian regime” (Turnball, p. 96). When open conflict between the two men arose, the Colonial Office intervened, passing the Supreme Court Bill of 1868 which made the chief justice subordinate in power to the Governor. While in office, the new Governor introduced several laws that aimed to make the government in Singapore both more accountable and equitable. For example, he introduced legislation to reorganize the tax system, reduce illegal immigration and reform the judicial system, including setting up a new Court of Appeal. As a result of this restructuring, “the colony was set on a course of constitutional and political calm that lasted almost without interruption for nearly seventy years” (Turnball, p. 99).

Indeed, there is much indirect evidence to suggest that high paid governors were highly competent administrators. The best paid governors were, on average, the most experienced colonial officers. Typically, those at the top of the pay scale had some experience in colonial rule while those at the bottom of the pay scale had no gubernatorial experience. Surprisingly, gubernatorial pay was based on the colony—not the colonial officer. Therefore, the only way in which a governor could improve his salary was by being appointed to a higher paying colony. In theory, a governor could receive a pay cut if he chose to accept a lower paying appointment but, in reality, this rarely occurred. Instead, the custom was for a governor to move up the pay scale as he gained experience as a colonial administrator.

Of course, gubernatorial pay is only a valid instrument if it is uncorrelated with a country’s underlying growth process. Several pieces of historical evidence support the validity of the instrument. First, some colonies paid their governors more than others and this pay scale remained largely unchanged for nearly 40 years. This meant that the same colonies which received the highest (or lowest) paid governors during their early years of colonization continued to receive the highest (or lowest) paid governors for the next four decades. Fig. 4 plots the logarithm of British governors’ salaries in 1890 against the logarithm of British governors’ salaries in 1935. This graph shows a strong correlation across time between the salaries of governors in the same colony. The consistency of gubernatorial pay is important if the quality of colonial governors affected the quality of colonial institutions.

So, why were some colonies sent better paid governors than others? To answer this question, I estimate wage equations using data on both governors’ salaries and the individual characteristics of each colony. The results from these regressions are reported in Table 2. Column (1) reveals that governors’ salaries and colonial revenues are positively correlated – that is, the best paid governors were sent to the colonies which generated the largest colonial revenues at the end of the 19th century. Indeed, colonial revenues explain nearly half of the variation in gubernatorial pay. This is not surprising if we think of the early governors as similar to today’s CEOs whose pay is linked to the performance of their company. Colonial governors were under pressure to run their colony as efficiently as possible. Colonies had to be self-financing because European tax payers did not want their money used to subsidize colonial activities. Bigger budgets meant more responsibility for the governor and more political capital which could be lost if the governor was unable to maintain a balanced budget.

It is possible, of course, that the colonies with the largest revenues were also those with the highest income per capita or the greatest growth potential. Unfortunately, national accounts do not exist for this period so it is impossible to test directly

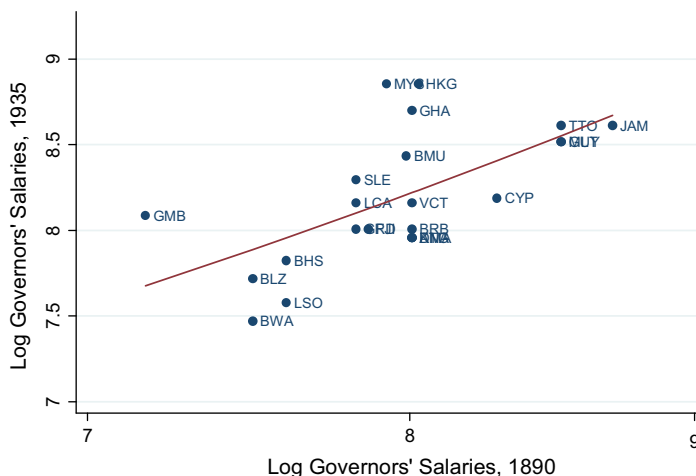


Fig. 4. Correlation between governors’ salaries.

**Table 2**

Wage equations for colonial governors, 1913.

	(1)	(2)	(3)	(4)	(5)
<i>Economic variables</i>					
Log (colonial revenues, 1890)	0.31** (0.06)	0.30** (0.05)	0.30** (0.04)	0.32** (0.04)	
Log (population density)		0.07* (0.04)	0.02 (0.04)	0.02 (0.05)	0.02 (0.06)
<i>Political variables</i>					
Colonized after 1815			0.28 (0.20)	0.38 (0.22)	0.01 (0.22)
Log (years of colonial rule, 1913)			0.12 (0.12)	0.20 (0.17)	0.15* (0.06)
British			0.73** (0.24)	0.74* (0.22)	0.22** (0.16)
<i>Geographic and demographic variables</i>					
Log (distance to metropole)				0.09 (0.18)	0.21 (0.16)
Tropics				0.24 (0.18)	-0.63** (0.21)
Landlocked				-0.29 (0.30)	-0.45* (0.19)
Ethnicity				0.28 (0.25)	0.86* (0.36)
Africa				0.03 (0.15)	-0.14 (0.25)
R-squared	0.46	0.52	0.71	0.79	0.48
Observations	39	37	37	37	63

Notes: Dependent variable is the logarithm of governors' salaries in 1913. Robust standard errors reported.

\* Significance at 5% level.

\*\* Significance at 1% level.

whether the best paid governors were sent to the colonies with the highest incomes. As a substitute, population density is added to the wage equation as a proxy for the colony's level of economic development.<sup>4</sup> In column (2) the coefficient on population density is positive and significant, providing some evidence that the best paid governors might have been sent to the most developed colonies. To check that population density is not simply capturing the effects of one or more missing variables, I add several variables to the wage equation.

There are several possible factors that might have led equally qualified governors to receive different wages. Some governors, for example, might have been paid more to compensate them for being posted to a colony which was far away or to a colony with a high-disease environment. To control for this possibility, I add two variables to the wage equation: (1) *distance* (the number of miles from the metropole to the colony), and (2) *tropics* (a dummy variable indicating whether the colony is located in the tropics). Similarly, some governors might have been paid more because they were assigned to a colony with greater political importance. Colonies where large numbers of Europeans had settled or colonies with a long history of colonization were likely to fall into this category. By contrast, colonies acquired during the second wave of colonization were likely to have less political importance. To control for these possibilities, I add three more variables to the wage equation: *expat* (the proportion of the colony's population comprised of foreign nationals), *rule* (the logarithm of years under colonial rule in 1913) and *late* (a dummy variable indicating whether the colony was acquired after 1815). Finally, I add three variables which control for geographic, cultural, and other political factors. These variables are: *landlocked* (a dummy variable indicating whether the colony was landlocked), *ethnicity* (the level of ethnic diversity within the colony), and *British* (a dummy variable indicating whether the colony was ruled by the British).

In column (3) of Table 2, we see that the coefficient on population density loses significance, once the political variables are added to the wage equation. The coefficient on *colonial revenues*, however, remains significant both in column (3) and in column (4) which adds the demographic and geographic controls. Indeed, *colonial revenues* remains positive and significant in all specifications, indicating that governors posted to colonies with large revenues in 1890 were paid a wage premium in 1913. Only one other variable – *British* – is significant in the wage equations that control for *colonial revenues*: The coefficient on British is significant at the 1% level in both columns (3) and (4), indicating that British governors were paid more than other governors.

These results, however, are based on a small sample. In columns (1) through (4) numerous observations have been dropped because data on *colonial revenues in 1890* are not available for all countries. Since these missing observations are

<sup>4</sup> In Malthusian economies, higher population density indicates higher levels of economic development. It is likely that the non-settler colonies were at (or close to) subsistence income at the beginning of the 20th century.

likely correlated to the colony's economic status in 1890, the estimated coefficients may be biased due to selection. Therefore, I re-estimate the wage equation without controlling for *colonial revenues in 1890*. Omitting colonial revenues, however, is not ideal because the estimated coefficients in column (5) are likely to be biased as well due to missing variables. For completeness, both sets of results are reported.

In column (5), population density remains insignificant although some of the geographic variables are now significant. Interestingly, the coefficient on *tropics* is negative which is the opposite of what would be expected if governors were paid a compensating differential. The coefficient on *landlocked* is also negative. This suggests that landlocked colonies might have been viewed as less valuable due to higher transport costs. Similarly, the coefficient on *ethnicity* is positive which indicates that governors were paid a wage premium when they were posted to colonies with high levels of ethnic diversity. Such colonies might have been harder to rule because of the difficulties which arose in getting local leaders to cooperate with each other.

So, why didn't the colonies with the largest colonial revenues go on to achieve the highest levels of income per capita? The answer lies in the way in which early colonial revenues were generated. At the end of the 19th century, the majority of colonial revenues came from trading profits. However, many of the newly annexed colonies had only nascent trading sectors. It was not until after colonization that many colonies began to expand their production into exportable products. In addition, there was not a great deal known about the natural resources of several colonies at the time of annexation. This was particularly the case for the colonies in Sub-Saharan Africa which were acquired during the Berlin Conference of 1884/1885.

Before proceeding to the IV analysis, it is important to point out the potential limitations of the instrument. First, governors' wages could be providing a compensating differential for unobserved environmental factors (e.g., a high disease environment). While the results from the wage equations indicate that the governors in the tropics did *not* receive a wage premium, the tropics variable is only a rough indicator of a colony's overall disease environment. Second, some colonies might have paid their governors lower wages because it was understood that, in such colonies, it would be possible to extract a larger share of rents from the locals. This possibility remains because it is difficult to control for a colony's rent-seeking environment. Third, colonies governed by indirect rule might have paid lower wages because local chiefs carried out the bulk of administrative duties. While indirect rule was not established as a formal system of government until the 1920s, it was practiced throughout much of the empire before the 1920s. Measuring indirect rule, however, is not easy. First, the level of autonomous power held by the local leaders varied widely across colonies. And, second, the decision by a colonial power to rule a colony by direct or indirect rule was not generated by a random process. Given these problems of heterogeneity and selection, it is difficult to control for indirect rule using data from before the inter-war period. Therefore is impossible to eliminate the possibility that informal relationships, like indirect rule, are what are driving the differences in governors' salaries across colonies rather than differences in governor quality.

### 3. Measuring the quality of colonial rule

Two new datasets (compiled by the author) are used for analysis. The first covers the British colonies and includes data on gubernatorial pay for the period 1890–1935. These data were obtained from a series of British government publications, *The Dominions Office and Colonial Lists*. This annual publication provides a complete listing of governors' salaries for every colony ruled by Britain over the period 1880–1960. The second data set covers all the major European powers (France, Germany, Belgium, Italy, and Portugal).<sup>5</sup> The data for the European governors were obtained from Gann and Duignan (1978) and cover a single year: 1913. The Gann and Duignan study, however, does not provide a complete listing of salaries for all European colonies—but it does provide the pay scale for different classes of European governors. For my analysis, European governors' salaries were assigned in two steps. First, I identified the class of the governor using Henige's (1970) *Colonial Governors: A Comprehensive List*. Second, I used Gann and Duignan's pay scale to match salaries to governors according to their class. Gubernatorial pay is defined as annual salary plus allowances. All pay is denominated in British pounds.<sup>6</sup>

Table 3 provides a list of the colonies used for analysis. It includes the identity of the colonizer, date of acquisition, date of independence, type of governor ('high quality' versus 'low quality'), and income per capita in 2005. 'High quality' governors are those with an income of £3000 while 'low quality' governors earned less than £3000. These colonies do not represent the population of all colonies ruled by the European powers. For my analysis I include only those colonies which: (1) remained under colonial rule for more than 30 years; and (2) were not ruled by more than one European power at the same time. The first restriction excludes countries, like Egypt, which came under formal British control for only a short period of time. The rationale for this exclusion is that institutions are durable by nature and change very slowly over time. The second restriction excludes countries, like the Sudan and Equatorial Guinea, which were jointly ruled by two European powers. I've included all colonies which meet these two criteria and were not Dutch colonies. Data on Dutch administrators' wages were unavailable although the Dutch controlled only a handful of colonies by the end of the 19th century so their omission is unlikely to affect the main results of the paper.

<sup>5</sup> Spain is excluded because it had lost most of its colonies by 1913.

<sup>6</sup> For the British data the following salaries were deflated to 1913 prices: Tanzania (1921), Zambia (1925), and Zimbabwe (1925). These dates correspond to the first year that the governors' salaries of these colonies were included in the *Colonial List*. To express these salaries in 1913 prices, I use the deflators listed in Mitchell (1988). In addition, several salaries had to be converted to pounds sterling. Belize salaries were in *gold dollars*; India, Uganda, Kenya, Sri Lanka, Mauritius, and the Seychelles were in *rupees*; Malaysia and Singapore were in *silver dollars*. To convert these salaries, I used the exchange rates listed in *Colonial Office* (1937).

**Table 3**

Political and economic characteristics of colonies in the sample.

Colony	Country code	Colonizer	Date acquired	Date of independence	Governor's salary, 1913	Income per capita, 2005
Algeria	DZA	France	1830	1962	Low	6291
Angola	AGO	Portugal	1880	1975	Low	3668
Antigua	ATG	Britain	1663	1981	Low	15,240
Australia	AUS	Britain	1788	1901	High	34,323
Bahamas	BHS	Britain	1711	1973	Low	26,042
Barbados	BRB	Britain	1663	1966	Low	23,792
Belize	BLZ	Britain	1862	1981	Low	9117
Benin	BLZ	Britain	1862	1981	Low	1380
Bermuda	BMU	Britain	1684	–	High	46,053
Botswana	BWA	Britain	1885	1966	Low	8558
Burkina Faso	BFA	France	1919	1960	Low	1291
Burundi	BFA	Belgium	1919	1960	Low	651
Cambodia	KHM	France	1863	1949	Low	2513
Cameroon	CMR	France	1916	1960	Low	2579
Canada	CAN	Britain	1760	1867	High	34,590
Cape Verde	CPV	Portugal	1550	1975	Low	6850
Ken. Afr. Rep.	CAF	France	1910	1960	Low	827
Chad	TCO	France	1920	1960	Low	2420
Comoros	COM	France	1912	1973	Low	1853
Congo	COG	France	1910	1960	Low	3683
Cyprus	CYP	Britain	1878	1960	High	23,219
Dominica	DMA	Britain	1783	1978	Low	4714
Fiji	FJI	Britain	1874	1970	High	6004
Gabon	GAB	France	1910	1960	Low	7897
Gambia	GMB	Britain	1821	1965	Low	1386
Ghana	GHA	Britain	1821	1957	High	1358
Grenada	GRD	Britain	1783	1974	Low	14,470
Guinea	GIN	France	1783	1975	Low	3612
Guyana	GUY	Britain	1814	1966	High	2295
Hong Kong	HKG	Britain	1842	1960	High	38,156
Ivory Coast	CIV	France	1882	1960	Low	2316
Jamaica	JAM	Britain	1655	1962	High	8108
Kenya	KEN	Britain	1920	1963	High	2017
Laos	LAO	France	1893	1949	Low	2033
Lebanon	LBN	France	1919	1946	Low	7782
Lesotho	LSO	Britain	1868	1966	Low	2070
Libya	LBV	Italy	1912	1951	Low	17,607
Madagascar	MDG	France	1896	1958	Low	863
Malawi	MWI	Britain	1891	1964	Low	1180
Malaysia	MYS	Britain	1874	1963	High	16,481
Mali	MLI	France	1920	1960	Low	1254
Malta	MLT	Britain	1814	1962	High	19,553
Mauritania	MRT	France	1903	1960	Low	2041
Mauritius	MUS	Britain	1814	1968	High	18,342
Morocco	MAR	France	1912	1956	Low	5096
Mozambique	MOZ	Portugal	1891	1975	Low	1988
New Zealand	NZL	Britain	1840	–	High	24,551
Niger	NER	France	1922	1960	Low	851
Nigeria	NGA	Britain	1900	1960	High	1810
Rwanda	RWA	Belgium	1919	1962	Low	1116
Sierra Leone	SLE	Britain	1848	1964	High	1700
Senegal	SEN	France	1854	1959	Low	1869
Seychelles	SYC	Britain	1810	1976	High	16,072
Singapore	SGP	Britain	1826	1965	High	38,441
Solomon Is.	SLB	Britain	1893	1978	Low	1243
South Africa	ZAF	Britain	1848	1964	High	9610
Sri Lanka	LKA	Britain	1815	1972	High	5329
St. Kitts and Nevis	NNA	Britain	1663	1983	Low	13,320
St. Lucia	LCA	Britain	1814	1979	Low	12,014
St. Vincent	VCT	Britain	1784	1979	Low	5313
Swaziland	SWZ	Britain	1868	1968	Low	7094
Syria	SYR	France	1919	1946	Low	2596
Tanzania	TZA	Britain	1919	1961	Low	859
Togo	TGO	France	1916	1960	Low	889
Trinidad	TTO	Britain	1888	1962	High	21,403
Tunisia	TUN	France	1881	1956	Low	9288
Uganda	UGA	Britain	1893	1962	Low	1167
Vietnam	VNM	France	1858	1954	Low	3256



Table 3 (continued)

Colony	Country code	Colonizer	Date acquired	Date of independence	Governor's salary, 1913	Income per capita, 2005
Zaire	ZAR	Belgium	1885	1967	Low	366
Zambia	ZMB	Britain	1893	1964	Low	1792
Zimbabwe	ZWE	Britain	1893	1980	High	2146

Notes: Governors' salaries in 1913 British pounds. Income per capita in PPP dollars.

India is not included in the sample for two reasons. First, large parts of India, known as the Princely States, were never conquered by the British but, instead, were bound to Britain by treaties and ruled by a system of indirect rule. Second, British India was not administered by the Colonial Office. It had its own department which recruited its own officers (by competitive exam) and had a separate system of promotion and tenure.

The summary statistics for the full sample and the non-settler colonies are reported in columns (1) and (2) of Table 4. The table reveals that gubernatorial pay varies widely across colonies. In 1913 the lowest paid governor, for example, earned just over £600 per annum while the highest paid governor (outside India) earned more than £10,000. Interestingly, the top salary for a colonial governor in the British Colonial Office matched that of the British Prime Minister who also earned £10,000 in 1913 (Gann and Duignan, 1978).<sup>7</sup> As reported in column (3), the former colonies in Africa and Asia have weaker institutions and lower income per capita than other former colonies.

One question which naturally arises is: were better paid governors more effective administrators? While my data do not allow me to test this hypothesis directly, there is evidence from historical documents that some low-paying appointments were refused by British colonial officers. For British officers, the decision to accept a low paying post was complicated by several factors. First, there were other assignments within the Colonial Office (e.g., chief secretary) which paid just as much as the lesser paid governorships but could be held for longer periods, thus providing more job security. Second, a governor's pension was granted after 10 years of service but most appointments lasted 6 years. Problems arose when the governor was not granted a second appointment. In such cases, the governor's pension would be based on the salary he made before his first governorship. Consequently, many senior officials choose to remain in more secure positions rather than gamble on being appointed to a second governorship. As stated by Nicolson and Hughes (1975, p. 96), "for all these reasons, and others, it can by no means be assumed that colonial governorships were all prizes for which there were strenuous competition in the ranks of the colonial service, or that their holders were all 'top people' in that service".

Previous studies have highlighted the influence which individual political leaders can have on economic performance. Jones and Olken (2005), for example, analyze data from 57 countries where the national leader died unexpectedly from natural causes or an accident. They find significant changes in the growth rates of countries where there was a change in leadership, particularly in countries where the government was autocratic. These results complement the large literature which stresses the importance of executive constraints that hold back the "predatory" nature of the state.

British governors, however, had few formal constraints on their behavior but they did not as a rule act in a predatory manner. This raises an important question: why didn't British governors resort to rent-seeking and other forms of predatory behavior? My answer is that British governors were more interested in career-building than rent-seeking. Others have made similar arguments about the objective function of bureaucrats. Alesina and Tabellini (2006), for example, argue that the main difference between politicians and bureaucrats is how they are held accountable. Politicians are held accountable at the ballot box (i.e., how well their performance 'pleased' the voters) but bureaucrats are motivated by career concerns (i.e., how well their performance fulfilled the goals of their organization and increased their probability of promotion). Cain and Hopkins (2002) present complementary evidence using historical analysis. They argue that British colonial officers formed a 'gentlemanly' class bound together by a strict social code in which they ardently believed in the virtues of colonial rule. Stated differently, the objective function of colonial officials was not to fleece the country they ruled but, instead, to spread British values and business opportunities.

Like the British, the French paid their colonial officers according to the prestige of the colony where they were posted. At the top of the pay scale were the Governor-Generals who were responsible for supervising governors posted to a specific region (e.g., North Africa). Below the Governor-General were three classes of French governors: 1st Class Governors, 2nd Class Governors, and 3rd Class Governors. The most prestigious colonies (e.g., French Congo) were assigned 1st class governors, while less prestigious colonies (e.g., Benin) were assigned 2nd class governors. Territories that were held as protectorates (e.g., Vietnam) were sent 3rd class governors. Similar rankings were used by the Belgium and Portuguese as well.

The remaining data used for my analysis are taken from existing data sources. Definitions of each variable and their source can be found in Appendix A. GDP per capita on a PPP basis for 2005 is the measure used for economic performance. This variable displays considerable variation across both samples. For the full sample, mean GDP per capita is \$8840 with a standard deviation of \$10,687. The poorest country in the sample is Zaire (\$366) while the richest country is Bermuda (\$46,053). Mean GDP per capita for the non-settler sample is slightly lower (\$7830) with a standard deviation of \$9822. As expected, mean GDP per capita for the former African colonies is much lower than the average (\$3807) while the mean GDP per capita for the former Asian colonies is significantly higher (\$12,606).

<sup>7</sup> The Vice-Roy of India was the highest paid government official in Britain. According to Gann and Duignan (1978), he earned £17,500 in 1913.

**Table 4**  
Descriptive statistics of colonies.

Characteristics of colonies	All (1)	Non-settler (2)	African and Asian (3)
Log GDP per capita (PPP) in 2005	8.39 (1.21)	8.30 (1.17)	7.94 (1.06)
Log(governor's salary, 1913)	7.69 (0.72)	7.61 (0.65)	7.57 (0.64)
Rule of law	−0.21 (0.92)	−0.30 (0.85)	−0.57 (0.75)
Government effectiveness	−0.19 (0.90)	−0.29 (0.82)	−0.53 (0.73)
Control of corruption	−0.11 (0.88)	−0.21 (0.77)	−0.39 (0.75)
Ethnic diversity	0.44 (0.32)	0.44 (0.32)	0.54 (0.30)
Latitude	0.19 (0.14)	0.17 (0.12)	0.16 (0.12)
Distance to colonizer (kilometers)	6821 (3354)	6486 (2852)	6649 (3120)
Landlocked	0.23 (0.42)	0.24 (0.43)	0.32 (0.47)
Tropics	0.73 (0.45)	0.78 (0.42)	0.82 (0.39)
Africa	0.59 (0.50)	0.61 (0.49)	0.82 (0.39)
Asia	0.13 (0.34)	0.13 (0.34)	0.18 (0.39)
Years of self-rule	39.01 (101.2)	36.10 (12.5)	37.96 (11.70)
British	0.56 (0.50)	0.54 (0.50)	0.42 (0.40)
French	0.34 (0.48)	0.36 (0.48)	0.44 (0.50)
Other	0.10 (0.30)	0.10 (0.31)	0.14 (0.35)
	All colonies (1)	Non-settler colonies (2)	Asian and African colonies (3)
Population density, 1913 <sup>a</sup>	40.90 (111.7)	43.37 (114.88)	27.97 (78.33)
Log(colonial revenues, 1890) <sup>b</sup>	12.12 (1.41)	12.07 (1.46)	12.52 (1.32)
% Expat population	6.19 (20.33)	1.54 (2.52)	0.78 (2.30)
Observations	71	67	50

<sup>a</sup> Population density has 66 observation in the full sample, 62 observations in the non-settler sample, and 45 observations in the Africa and Asia sample.

<sup>b</sup> Colonial revenue has 39 observations in the full sample, 39 observations in the non-settler sample, and 24 observations in the Africa and Asia sample.

To measure current institutions, I use two variables defined by Kaufman et al. (2003). These variables are “rule of law” and “government effectiveness”. Both variables range in values from −2.5 (weakest institutions) to +2.5 (strongest institutions). “Rule-of-law” varies according to indicators like the extent of tax evasion, police effectiveness, and how well financial assets and wealth are protected, whereas “government effectiveness” varies according to the efficiency of the country’s bureaucracy, particularly its ability to collect tax revenue, implement government policies, and respond effectively to domestic economic problems.

For the full sample, the mean value for “rule-of-law” is −0.21, with New Zealand having the strongest institutions (score of 1.74) and Zaire having the weakest institutions (score of −2.09). Indeed, Zaire has the lowest values for “government effectiveness” (score of −1.76) and “control of corruption” (score of −1.40) as well. By contrast, Singapore scores the highest for “government effectiveness” (score of 2.08) and “control of corruption” (score of 2.50) while Barbados scores the highest for “rule-of-law” (score of 1.34) in the non-settler sample.

Two other controls are added to the OLS and IV equations: (1) level of ethnic diversity and (2) distance from the equator. Previous empirical studies have found that ethnic diversity is negatively correlated to income per capita (see, for example, Easterly and Levine, 1997; Montalvo and Reynal-Querol, 2005). In this study, I use the measure of ethnic diversity employed by La Porta et al. (1999) which corresponds to the degree of ethno-linguistic fractionalization: that is, the probability that two random selected people from the same country will not belong to the same ethno-linguistic group. This variable varies from 0 to 1 with higher values indicating greater ethnic diversity. The mean values of ethnic diversity for the full sample and non-settler sample are the same (score of 0.44).

The estimated equations also include the country’s distance from the equator (defined in terms of the absolute value of the latitude of the country). This variable is intended to control for adverse geographic factors, like being located in the

tropics. Several studies have found that a tropical location has a negative impact on income per capita, apparently resulting from the higher disease burden in tropical climates (see, for example, Easterly and Levine, 2003; Gallop et al., 1999).

It is interesting to note that Africa and Asia had lower paid governors, on average, than other regions and subsequently developed weaker institutions. There is not much difference, however, between Africa and Asia and the other regions in terms of the other variables. Africa and Asia are slightly more ethnically diverse but are similarly positioned in terms of tropical status. One aim of this paper is to examine the role of institutions in explaining the divergent growth patterns experienced by these former colonies.

#### 4. OLS and IV results in the core specifications

This paper estimates the following equation:

$$\log y_i = \alpha + \beta INS_i + \rho ETH_i + \gamma LAT_i + \varepsilon_i \quad (1)$$

where  $y_i$  is the income per capita in country  $i$ ,  $INS_i$ ,  $ETH_i$ , and  $LAT_i$  measure the quality of institutions, level of ethnic diversity, and latitude of country  $i$ , respectively, and  $\varepsilon_i$  is the random error term. My main interest is in the size and significance of  $\beta$ , after controlling for ethnic diversity and ecological conditions (measured by a country's latitude).

Panel C of Table 5 reports OLS estimates of  $\beta$  for the two samples. For the full sample, the estimated value of  $\beta$  is precise and large in magnitude: its estimated value is 0.88 for rule-of-law, 0.94 for government effectiveness, and 0.92 for control of corruption. Similar results are found for the sample of non-settler colonies. The estimated value of  $\beta$  is 0.86 for rule-of-law, 0.97 for government effectiveness, 1.00 for control of corruption. As is well known, the OLS results cannot be interpreted as either causative or accurate for a number of reasons, including omitted variables, reverse causality, and measurement error. To tackle these problems, I employ a two-stage least squares (2SLS) estimation method which uses (log) governors' salaries as an instrument for institutional quality. In the first-stage regressions,  $INS_i$  is regressed on all the exogenous variables. That is,

$$INS_i = \eta + \lambda LNSALARY_i + \phi ETH_i + \sigma LAT_i + \varepsilon_{INSi} \quad (2)$$

where  $LNSALARY_i$  is (log) governors' salaries. The exclusion restriction is that  $LNSALARY_i$  does not appear in equation (1). Eqs. (1) and (2) are the core specifications. In these regressions, all colonies ruled by the same governor (e.g., colonies in French West Africa) are clustered and the standard errors are adjusted for the group structure. The reduced form effect of governors' salaries on GDP per capita in 2005 is reported in Panel D of Table 5. The coefficient on the logarithm of governors' salaries is significant at the 1% level.

Panel A of Table 5 reports the 2SLS results for the different samples. The results indicate that institutions—particularly those which provide strong legal environments—have a positive impact on a country's economic performance. When governors' salaries are used as an instrument for rule-of-law, the  $\beta$  estimates are both positive and significant for both samples. The  $\beta$  estimate for rule-of-law is 1.34 for the full sample and 1.60 for the non-settler colonies. Both estimates are significant at the 1% level and have a  $F$ -statistic which exceeds ten. Similar results are found for the other measures of institutional quality. The  $\beta$  estimates for government effectiveness range in value from 1.11 (full sample) to 1.33 (non-settler colonies) while those for control of corruption range in value from 1.22 (full sample) to 1.73 (non-settler colonies).

The IV estimates for both samples are similar in magnitude to those found by Rodrik et al. (2004) who use the same rule-of-law measure but a different set of instruments. They use settler mortality rates (proposed by AJR (2001)) and the fraction of the population speaking English and other Western languages (proposed by Hall and Jones (1999)) as their instruments.<sup>8</sup> In their study, the 2SLS estimates range from 1.19 to 1.78. My results are nearly identical to these earlier 2SLS estimates and provide further evidence that a country's history can have a lasting impact on its economic performance. Interestingly, the AJR instrument is not significant for any of my samples. This is not surprisingly because the estimated correlation of settler mortality on governors' salaries is very weak. The correlation coefficient between the two variables has an estimated value of only  $-0.20$ .

To compare the AJR instrument with my own, I add settler mortality as a covariate to all the 2SLS specifications. For these regressions, clustering at the colony level is not possible because of the small sample size and the possible bias resulting from estimation using a few clusters. Instead, group means are used for the 14 colonies in the sample which shared their governor with another colony. This approach is taken whenever the number of clusters is less than 42. The results from adding settler mortality to the regressions are reported in Table 6. The most important finding is that the coefficient on settler mortality is never significant when governors' salaries are included in the first-stage regression. By contrast, the coefficient on governors' salaries is significant at the 1% level in each of the first-stage regressions using the full sample (columns 1–3). Unfortunately, gubernatorial pay does not perform as well for the sample of non-settler colonies. As revealed in columns (4) through (6), the value of the  $F$ -statistic falls by about half in each of these specifications and remains well under a value of 10.

The poor performance of governors' salaries as an instrument for the non-settler colonies may be due to its small sample size. This sample is about half the size of that used in the regressions reported in Table 5. The sample is smaller because

<sup>8</sup> They use the Hall and Jones (1999) instrument because it covers a much larger sample (137 countries) than is possible using the Acemoglu, Johnson, and Robinson (2001) instrument (67 countries).

**Table 5**  
OLS and IV regressions of institutions and economic performance.

	All colonies (1)	All colonies (2)	All colonies (3)	Non-settler (4)	Non-settler (5)	Non-settler (6)
<i>Panel A: Two-stage least squares</i>						
Ethnic diversity	−0.08 (0.44)	−0.49 (0.31)	−0.46 (0.34)	0.20 (0.53)	−0.26 (0.36)	0.04 (0.51)
Latitude	0.12 (0.88)	0.47 (0.47)	0.43 (0.75)	0.41 (0.82)	0.81 (0.54)	1.12 (0.88)
Rule-of-law	1.34** (0.28)			1.60** (0.36)		
Govt. effectiveness		1.11** (0.15)			1.33** (0.23)	
Control of corruption			1.22** (0.21)			1.73** (0.44)
<i>Panel B: First stage for current institutions and governors' salaries</i>						
Ethnic diversity	−1.14** (0.29)	−0.99** (0.25)	−0.93** (0.26)	−1.11** (0.30)	−1.01** (0.26)	−0.94** (0.26)
Latitude	1.70** (0.68)	1.72** (0.60)	1.60* (0.73)	1.28 (0.88)	1.24 (0.72)	0.78 (0.77)
Log (governor's salary), 1913	0.48** (0.10)	0.57** (0.11)	0.52** (0.13)	0.39** (0.13)	0.47** (0.13)	0.37** (0.14)
F-statistic	22.67	33.62	19.78	11.29	13.55	9.86
<i>Panel C: OLS regressions</i>						
Rule-of-law	1.34** (0.22)			0.89** (0.13)		
Govt. effectiveness		0.94** (0.11)			0.97** (0.12)	
Control of corruption			0.92** (0.10)			1.00** (0.12)
R-squared	0.65	0.69	0.67	0.61	0.65	0.64
Observations	71	71	71	67	67	67
<i>Panel D: Reduced form</i>						
Log (governor's salary), 1913	0.64** (0.14)			0.63** (0.19)		

Notes: Panel A reports the two-stage least squares estimates with log GDP per capita in 2005 (PPP basis) as the dependent variable. Panel B reports the corresponding first-stage regression estimates with robust standard errors clustered by colonial governor. Panel C reports the OLS estimates with clustered standard errors. The OLS regressions also control for ethnic diversity and latitude. Non-settler colonies are those with less than 10% of their population in 1900 comprised of foreigners. See Appendix A table for variable definitions and sources. Panel D reports the reduced form effect of log governors' salaries on log GDP per capita.

\* Significance at 5% level.

\*\* Significance at 1% level.

several colonies in the AJR sample are not included in my sample and vice versa. The two samples differ because the AJR sample includes colonies which did not have colonial governors in 1913. Most Latin American colonies, for example, had already received their independence by the end of the 19th century and therefore did not have colonial governors. A full list of the colonies included in the AJR analysis and my analysis is reported in Appendix B.

To further compare my results with those found by AJR (2001), I use the same measure of institutional quality that they use (i.e., the average protection against expropriation risk from 1985 to 1995) and re-estimate the IV equations. The results from the 2SLS regressions with this measure of institutional quality are reported in Table 7. The coefficient on the logarithm of governors' salaries is significant at the 1% level although the *F*-statistic is very low (<5) for both samples, indicating that the instrument is weak. One possible reason for the poor performance of the instrument is, once again, due to small sample size. The polity measure of appropriation risk has many missing values for my sample of countries. For this reason, I chose to use the Kaufman et al. (2003) measures of institutional quality. While making a direct comparison between the AJR study and mine is complicated by the different samples used for analysis, the empirical evidence presented in both studies is complementary. In both studies, the results from the IV analysis indicate that history matters – that is, a country's early institutions affect how it later institutions develop and these later institutions influence its path of development.

## 5. Checking the results

The validity of the two stage least squares estimates reported in Table 5 depends on the assumption that governors' salaries have no direct impact on current economic performance. I test this assumption using several approaches. First, I employ Sargan's (1958) test of overidentifying restrictions. This test is carried out by adding instruments to the first-stage regression, and then testing the regressors for exogeneity. The test is, of course, only a starting point and certainly not full-proof. There are two main weaknesses of the Sargan test: (1) it may not lead to a rejection of the null hypothesis if all instruments are

**Table 6**  
IV regressions with settler mortality.

	All colonies (1)	All colonies (2)	All colonies (3)	Non-settler (4)	Non-settler (5)	Non-settler (6)
<i>Panel A: Two-stage least squares</i>						
Ethnic diversity	0.25 (0.69)	−0.32 (0.45)	−0.31 (0.45)	1.39 (2.00)	−0.01 (0.87)	0.71 (1.40)
Latitude	−0.06 (0.81)	0.15 (0.50)	0.10 (0.71)	0.75 (1.04)	0.47 (0.62)	1.10 (1.00)
Settler mortality	−0.00 (0.00)	−0.00 (0.00)	−0.00 (0.00)	−0.00 (0.00)	−0.00 (0.00)	−0.00 (0.00)
Rule-of-law	1.28** (0.33)			2.00 (1.13)		
Govt. effectiveness		1.03** (0.20)			1.23* (0.48)	
Control of corruption			1.04** (0.24)			1.71 (0.91)
<i>Panel B: First stage for current institutions and governors' salaries</i>						
Ethnic diversity	−1.37** (0.44)	−1.15** (0.40)	−1.15** (0.45)	−1.49** (0.44)	−1.35** (0.47)	−1.35** (0.47)
Latitude	1.44 (0.70)	1.59* (0.65)	1.62 (0.85)	0.28 (0.85)	0.13 (0.78)	0.13 (0.78)
Log (governor's salary), 1913	0.46** (0.14)	0.57** (0.12)	0.56** (0.15)	0.24 (0.17)	0.28 (0.20)	0.28 (0.20)
Settler mortality	0.00 (0.00)	−0.00 (0.00)	−0.00 (0.00)	0.00 (0.00)	−0.00 (0.00)	0.00 (0.00)
F-statistic	9.84	21.19	12.70	3.96	5.85	4.15
Observations	37	37	37	33	33	33

Notes: Panel A reports the two-stage least squares estimates with log GDP per capita in 2005 (PPP basis) as the dependent variable. Panel B reports the corresponding first-stage regression estimates with robust standard errors. Panel C reports the OLS estimates with robust standard errors. The OLS regressions also control for ethnic diversity and latitude. See Appendix A table for variable definitions and sources.

\* Significance at 5% level.

\*\* Significance at 1% level.

invalid but correlated to each other; and (2) it does verify the validity of *all* the instruments. Nevertheless, it is a useful starting point in determining whether governors' salaries are a valid instrument.

The Sargan test is carried out by adding three additional instruments to the first-stage equation. Two of these instruments indicate the identity of the colonizer—that is, whether the colony was acquired by the British or the French. Several studies demonstrate that colonial origin is important in determining the quality of a country's laws and their enforcement (La Porta et al., 1998, 1999; Djankov et al., 2002). The last instrument identifies the number of years which a country has been independent. This variable is added because colonial governors had no influence on institutions after independence.

The results of the overidentification tests are reported in Table 8. In Panel A of this table, I report the 2SLS estimates of the effect of institutional quality on per capita income using a different set of instruments. Panel B gives the corresponding first stage results and Panel C gives the  $p$ -value from  $\chi^2$  test statistic. This tests whether the 2SLS coefficients estimated with the instruments in Panels A and B are statistically different from those estimated with the logarithm of governors' salaries (i.e., the "true" instrument) as well as an additional set of instruments. When the number of instruments is expanded, the exogeneity of the over-identifying restrictions cannot be rejected at the 5% level for the full sample. This holds true when I test the exclusion restriction for each measure of institutional quality (i.e., rule-of-law, government effectiveness, and control of corruption). The failure to reject the over-identifying assumption provides weak evidence that governors' salaries are a valid instrument.

Second, I explore the possibility that better paid governors were sent to the colonies with the greatest growth potential. If that were the case, the countries with the highest per capita income today would have been sent the best governors but those governors would have had no impact on growth. To check for this possibility, I examine whether colonial revenues are a good predictor of future economic performance by regressing current levels of per capita income on historical levels of colonial revenue. The estimated coefficient on colonial revenue has a value of 0.02 with a robust standard error of 0.01. The explanatory power of this regression is very low—colonial revenues explain less than 5% of the variation in current levels of per capita income.<sup>9</sup> From an historical perspective, this is not surprising because little was known about many of the colonies which were acquired in the late 19th century. Without detailed knowledge about the natural resources in these colonies, the colonial powers could only guess as to their overall growth potential.

Third, I investigate the possibility of reverse causality; that is, higher paid colonial governors were placed in colonies with initially higher per capita income. While no national accounts exist for the non-settler colonies for the early colonial period, it is possible to proxy economic development using population density.<sup>10</sup> I construct measures of population density using

<sup>9</sup> In addition, colonial revenues are not correlated to historical levels of per capita income (as proxied by population density in 1891).

<sup>10</sup> Population density is often used by economic historians as a proxy for economic development—higher levels of population density correspond to higher levels of economic development.

**Table 7**  
OLS and IV regressions with polity IV measure of risk of expropriation.

	(1) All colonies	(2) Non-settler colonies
<i>Panel A: Two-stage least squares</i>		
Ethnic diversity	−1.08 (0.64)	−1.05 (0.67)
Latitude	0.11 (2.03)	0.17 (2.11)
Average protection against Expropriation risk, 1985–1985	0.57* (0.25)	0.61* (0.30)
<i>Panel B: First stage for current institutions and governors' salaries</i>		
Ethnic diversity	0.67 (0.79)	0.58 (0.83)
Latitude	5.03* (2.31)	4.67 (2.53)
Log (governors' salaries, 1913)	1.02** (0.33)	0.97* (0.36)
F-statistic	4.22	2.81
<i>Panel C: OLS regressions</i>		
Average protection against Expropriation risk, 1985–1985	0.12 (0.09)	0.10 (0.09)
R-squared	0.17	0.16
Observations	47	46

Notes: Panel A reports the two-stage least squares estimates with log GDP per capita in 2005 (PPP basis) as the dependent variable. Panel B reports the corresponding first-stage regression estimates with robust standard errors. Panel C reports the OLS estimates with robust standard errors. The OLS regressions also control for ethnic diversity and latitude. See Appendix A table for variable definitions and sources.

\* Significance at 5% level.

\*\* Significance at 1% level.

data from various population censuses which were conducted around 1890. To determine whether better paid governors were sent to richer colonies, I regress population density on governors' salaries for 6 years: 1895, 1905, 1913, 1925, 1930, and 1935. The results from these regressions are reported in Table 9. From these results, it is clear that higher quality governors were not placed in colonies that were initially more developed (as proxied by population density in 1891). The coefficient on population density is not significant in any of these regressions, indicating that better paid governors were not placed in colonies with the highest population density.

Fourth, I restrict my sample to only those colonies which received their first governor in 1880 or later. The rationale for this restriction is simple: if governor quality during the early years of colonial rule had a lasting effect on how a country's institutions developed, then only colonies acquired relatively recently before the wage data were collected should be included in the sample. The results from both the OLS and IV analysis are reported in Table 10. All of the institutional measures are all significant at the 1% level in the OLS regressions. The results from the IV analysis, however, are less supportive of my hypothesis. Only the coefficient on *government effectiveness* is significant—and it is significant at just the 10% level. One possible reason for these weak results is that the colonies included in the restricted sample have less variation in governors' salaries. Nearly 80% of the 42 colonies in the sample are located in Sub-Saharan Africa—and the wage scale for governors posted to sub-Saharan Africa was more compressed than the wage scale for governors posted to other regions. Therefore, this robustness check should be interpreted as weak evidence that bureaucratic talent was not important during the early years of colonial rule.

As a final check, I normalize the governors' wages by the average wage of civil servants in the home country. If higher wages were what attracted bureaucratic talent to the colonies, the wage premium of Governors relative to other civil servants should be important. Historical data on government wages for Britain and France were collected from secondary sources<sup>11</sup> and used to normalize the governors' wages. The average wage for French civil servants in 1905–1913 was converted to British pounds using the average exchange rate for the same period as reported in Acominotti et al. (2011). For British civil servants, the average wage was defined as the average salary of an Executive civil servant. Both French and British governors earned substantially higher salaries than the average civil servant in their country. In Britain, for example, an Executive civil servant earned approximately £190 in 1913 whereas the average salary of a British governor was nearly £4000 per annum. British governors earned more than other senior officials outside of the government as well. The Commissioner of the Metropolitan police, for example, earned £2500 whereas a county court judge earned £1500 (Gann and Duignan, 1978).

Table 11 presents the results for the IV regressions in which instrumental variable for institutional quality is the logarithm of governors' salaries normalized by the average wage of civil servants in the home country. These regressions also include a dummy variable for British colonies which controls for systematic differences in the salary structure between

<sup>11</sup> Civil service wages for Britain were obtained from Routh (1954) while those for France were obtained from de Faria and Diebolt (2000).

**Table 8**  
Overidentification tests.

	All colonies (1)	All colonies (2)	All colonies (3)	Non-settler (4)	Non-settler (5)	Non-settler (6)
<i>Panel A: Two-stage least squares</i>						
Ethnic diversity	−0.35 (0.37)	−0.55 (0.35)	−0.51 (0.39)	−0.35 (0.41)	−0.45 (0.40)	−0.45 (0.46)
Latitude	0.54 (0.63)	0.57 (0.53)	0.53 (0.71)	0.76 (0.62)	0.92 (0.54)	1.26 (0.67)
Rule-of-law	1.10** (0.20)			1.14** (0.25)		
Govt. effectiveness		1.06** (0.17)			1.14** (0.23)	
Control of corruption			1.17** (0.21)			1.24** (0.28)
<i>Panel B: First stage for current institutions and governors' salaries</i>						
Ethnic diversity	−1.05** (0.25)	−0.91** (0.23)	−0.84** (0.27)	−1.01** (0.25)	−0.91** (0.23)	−0.83** (0.26)
Latitude	1.48 (0.64)	1.59 (0.59)	1.51* (0.76)	1.08 (0.74)	1.08** (0.64)	0.67 (0.74)
British	1.02** (0.36)	0.89** (0.29)	0.78** (0.27)	1.01** (0.36)	0.88** (0.28)	0.75** (0.26)
French	0.44 (0.36)	0.39 (0.33)	0.27 (0.31)	0.47 (0.35)	0.43** (0.31)	0.34 (0.29)
Years of colonial rule	0.00 (0.01)	−0.00 (0.01)	0.00 (0.01)	−0.00 (0.01)	−0.01 (0.01)	−0.01 (0.01)
Log(governor's salary), 1913	0.20 (0.19)	0.34 (0.18)	0.29 (0.19)	0.14 (0.20)	0.25 (0.19)	0.15 (0.19)
F-statistic	14.67	20.80	10.67	9.87	12.22	12.70
Observations	71	71	71	67	67	67
<i>Panel C: Results from overidentification tests</i>						
p-Value (from chi-square test)	0.29	0.70	0.74	0.33	0.84	0.47

Notes: Panel A reports the two-stage least squares estimates with log GDP per capita in 2005 (PPP basis) as the dependent variable. Panel B reports the corresponding first-stage regression estimates with robust standard errors clustered by colonial governor. See Appendix A table for variable definitions and sources. Panel C reports the *p*-value for the null hypothesis that the coefficient on institutional quality (i.e., rule-of-law, government effectiveness, control of corruption) in the second-stage regression (i.e., Panel A) is the same as when instrumented using the logarithm of governors' salaries as well as the additional instruments (i.e., British, French, years of colonial rule).

\* Significance at 5% level.

\*\* Significance at 1% level.

**Table 9**  
Testing for reverse causality.

	Population density, 1891	R-squared	Observations
Log (governor's salary, 1895)	0.02 (0.02)	0.02	33
Log (governor's salary, 1905)	0.01 (0.02)	0.01	34
Log (governor's salary, 1913)	−0.00 (0.02)	0.00	39
Log (governor's salary, 1925)	−0.00 (0.02)	0.00	39
Log (governor's salary, 1930)	0.01 (0.02)	0.00	39
Log (governor's salary, 1935)	0.01 (0.02)	0.00	39

Notes: All regressions are OLS with robust standard errors. The log(governor's salary) in 1913 is regressed on population density in 1891.

Britain and France.<sup>12</sup> The coefficients on both *government effectiveness* and *control of corruption* are significant at the 1% level whereas the coefficient on *rule-of-law* is significant at the 5% level. The F-statistic is large (>15) for each regression, providing additional evidence that the instrument is appropriate. Indeed, all the checks for robustness, except for those reported in Table 10, support the hypothesis that governor quality during the early years of colonial rule had a lasting impact on the quality of institutions which later developed in the former colonies.

<sup>12</sup> Civil service wages for Portugal, Italy, and Belgium were not available. British and French colonies, however, account for 64 of the 71 colonies in the full sample.

**Table 10**  
OLS and IV regressions of colonies whose initial governor was appointed after 1880.

	All colonies (1)	All colonies (2)	All colonies (3)
<i>Panel A: Two-stage least squares</i>			
Ethnic diversity	0.16 (0.96)	−0.51 (0.49)	0.32 (1.23)
Latitude	0.28 (1.74)	0.48 (1.39)	0.16 (2.10)
Rule-of-law	1.57 (1.06)	1.18 <sup>+</sup> (0.68)	
Govt. effectiveness			2.07 (1.63)
Control of corruption			
<i>Panel B: First stage for current institutions and governors' salaries</i>			
Ethnic diversity	−0.86 <sup>**</sup> (0.31)	−0.58 <sup>*</sup> (0.27)	−0.73 <sup>**</sup> (0.28)
Latitude	1.45 (0.74)	1.77 <sup>**</sup> (0.66)	1.16 (0.68)
Log(governor's salary), 1913	0.21 (0.17)	0.29 <sup>+</sup> (0.15)	0.16 (0.15)
F-statistic	5.39	5.72	4.36
<i>Panel C: OLS regressions</i>			
Rule-of-law	0.81 <sup>**</sup> (0.18)		
Govt. effectiveness		0.89 <sup>**</sup> (0.21)	
Control of corruption			0.86 <sup>**</sup> (0.21)
R-squared	0.53	0.53	0.51
Observations	42	42	42

Notes: Panel A reports the two-stage least squares estimates with log GDP per capita in 2005 (PPP basis) as the dependent variable. Panel B reports the corresponding first-stage regression estimates with robust standard errors. Panel C reports the OLS estimates with robust standard errors. The OLS regressions also control for ethnic diversity and latitude. See Appendix A table for variable definitions and sources.

<sup>+</sup> Significance at 10% level.

<sup>\*</sup> Significance at 5% level.

<sup>\*\*</sup> Significance at 1% level.

**Table 11**  
IV regressions with governors' salaries normalized by the average wage of civil servants in their home country.

	British and French colonies (1)	British and French colonies (2)	British and French Colonies (3)
<i>Panel A: Two-stage least squares</i>			
Ethnic diversity	0.52 (1.47)	−0.51 (0.38)	−0.48 (0.43)
Latitude	−0.48 (1.45)	−0.01 (0.92)	−0.43 (1.38)
British	−0.31 (0.73)	−0.04 (0.47)	−0.16 (0.48)
Rule-of-law	1.64 <sup>+</sup> (0.77)		
Govt. effectiveness		1.16 <sup>**</sup> (0.39)	
Control of corruption			1.37 <sup>**</sup> (0.54)
<i>Panel B: First stage for current institutions and governors' salaries</i>			
Ethnic diversity	−1.15 <sup>**</sup> (0.26)	−1.02 <sup>**</sup> (0.25)	−0.88 <sup>**</sup> (0.29)
Latitude	1.33 <sup>+</sup> (0.61)	1.49 <sup>+</sup> (0.60)	1.56 (0.79)
British	0.78 <sup>**</sup> (0.15)	0.87 <sup>**</sup> (0.15)	0.82 <sup>**</sup> (0.16)
Log(normalized governor's salary)	0.26 (0.16)	0.37 <sup>+</sup> (0.16)	0.31 <sup>+</sup> (0.17)
F-statistic	17.44	25.95	17.80
Observations	64	64	64

Notes: Panel A reports the two-stage least squares estimates with log GDP per capita in 2005 (PPP basis) as the dependent variable. Panel B reports the corresponding first-stage regression estimates with robust standard errors clustered by colonial governor. Panel C reports the OLS estimates with robust standard errors. The OLS regressions also control for ethnic diversity and latitude. See Appendix A table for variable definitions and sources.

<sup>+</sup> Significance at 10% level.

<sup>\*</sup> Significance at 5% level.

<sup>\*\*</sup> Significance at 1% level.



## 6. Conclusion

Several recent studies have examined how colonial institutions are related to current institutions and economic performance. The earliest of these studies focused on differences in institutional quality based on the identity of the colonizer. These studies demonstrate that, on average, former British colonies developed better institutions than other European colonies. A major shortcoming of this work is that it neglects differences in colonial institutions in colonies ruled by the same colonial power. The innovative paper by Acemoglu et al. (2001) resolved this problem by proposing a new instrument for institutional quality—settler mortality rates. The main weaknesses of this instrument are: (1) it does not vary significantly across former colonies with low levels of European settlement, and (2) it may be correlated with levels of human capital.

To overcome this problem, I propose a new instrument—the salary of colonial governors—for measuring the quality of colonial institutions. This instrument provides a good source of exogenous variation due to the method by which governors' salaries were set across colonies at the end of the 19th century. Using a two-stage least squares estimation procedure, I find evidence that colonies with higher paid governors developed better institutions (and higher per capita income) than those with lesser paid governors. To confirm these results, I conduct several checks which include tests for omitted variable bias and reverse causality, as well as tests to validate the stability of the instrument over time. The results from these tests indicate that history does matter: that is, countries with higher quality colonial administrations developed stronger institutions and became wealthier than countries with lower quality administrations.

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## Appendix A. Data description and sources

Log GDP per Capita, 2000	Purchasing Power Parity Basis. From Heston et al. (2009). Penn World Tables, Version 6.3
Ethnic diversity	Average value of five indices of ethno-linguistic fractionalization. Values range from 0 to 1. Higher values indicate a higher probability that two randomly selected individuals will not speak the same language. From La Porta et al. (1999)
Latitude	Absolute value of the country's latitude. From La Porta et al. (1999)
Distance	Distance between the colonizer's capital city and the colony's capital city. From <a href="http://www.timeanddate.com">www.timeanddate.com</a>
Rule-of-law	Varies from $-2.5$ (weakest institutions) to $+2.5$ (strongest institutions). From Kaufman et al. (2003)
Control of corruption	Varies from $-2.5$ (weakest institutions) to $+2.5$ (strongest institutions). From Kaufman et al. (2003)
Government effectiveness	Varies from $-2.5$ (weakest institutions) to $+2.5$ (strongest institutions). From Kaufman et al. (2003)
Governor's salary	Salaries represent base salary plus allowances, denominated in British pounds sterling. British salaries from Colonial Office (1913, 1935). European salaries based on data from Gann and Duignan (1978)
British civil honors	The number of civil honors awarded to a governor weighted by their prestige. From Great Britain (1915)
Colonial dummies	Dummy indicating whether the colony was acquired by the French, English, or another colonial power. From Henige (1970)
Late	Dummy indicating if colony was acquired after 1815. Date of acquisition from Etemad (2007)
Colonial revenues, 1898	Colonial revenues in pounds sterling. From US Bureau of Statistics (1901)
Population density, 1915	Population divided by area in square miles. Both population and area (in square kilometers). From Etemad (2007)
Size of foreign communities, 1915	Percentage of the colony's population comprised of foreign nationals. From Etemad (2007)

## Appendix B. Comparison of AJR and Jones samples

Former colonies	AJR sample	Jones sample	Combined sample	Acquired after 1815	Settler colonies	Income category
Algeria	✓	✓	✓	✓		Lower middle
Angola	✓	✓	✓	✓		Lower-middle
Antigua		✓				High
Argentina (1816)	✓				✓	Upper middle
Australia	✓	✓	✓		✓	High
Bahamas	✓	✓	✓			High
Bangladesh*	✓					Low
Barbados		✓				High
Belize		✓		✓		Upper-middle
Benin		✓		✓		Low
Bermuda		✓				High
Bolivia (1825)	✓					Lower-middle
Botswana		✓		✓		Upper-middle
Brazil (1822)	✓					Upper-middle
Burkina Faso	✓	✓		✓		Low
Burundi		✓	✓	✓		Low
Cambodia		✓		✓		Low
Cameroon	✓	✓	✓			Lower-middle
Canada	✓	✓	✓		✓	High
Cape Verde		✓				Lower-middle
Central African Rep		✓		✓		Low
Chad		✓		✓		Low
Chile (1818)	✓					Upper middle
Colombia (1821)	✓					Lower-middle
Comoros		✓		✓		Low
Congo (Brazzaville)	✓	✓	✓	✓		Lower-middle
Costa Rica (1821)	✓					Upper middle
Cote d'Ivoire	✓	✓	✓	✓		Low
Cyprus		✓		✓		High
Dominica		✓				Upper middle
Dominican Rep. (1821)	✓					Lower middle
Ecuador (1822)	✓					Lower middle
Egypt*	✓			✓		Lower middle
El Salvador (1822)	✓					Lower middle
Ethiopia*	✓			✓		Low
Fiji		✓		✓		Upper middle
Gabon	✓	✓	✓	✓		Upper middle
Gambia	✓	✓	✓	✓		Low
Ghana	✓	✓	✓			Low
Grenada		✓				Upper middle
Guatemala (1821)	✓					Lower middle
Guinea	✓	✓	✓			Low
Guyana	✓	✓	✓	✓		Lower middle
Haiti (1804)	✓					Low
Honduras (1821)	✓					Lower middle
Hong Kong	✓	✓	✓	✓		High
India*	✓					Lower middle
Indonesia (1811)	✓					Lower middle
Jamaica	✓	✓	✓	✓		Upper middle
Kenya	✓	✓	✓	✓		Low
Laos		✓		✓		Low
Lebanon		✓		✓		Upper middle
Lesotho		✓		✓		Low
Libya		✓				Upper middle

## Appendix B (continued)

Former colonies	AJR sample	Jones sample	Combined sample	Acquired after 1815	Settler colonies	Income category
Madagascar	✓	✓	✓	✓		Low
Malawi		✓		✓		Low
Malaysia	✓	✓	✓	✓		Upper middle
Mali	✓	✓	✓	✓		Low
Malta	✓	✓	✓	✓		High
Mauritania		✓		✓		Low
Mauritius		✓		✓		Upper middle
Mexico (1821)	✓					Upper middle
Morocco	✓	✓	✓	✓		Lower middle
Mozambique		✓		✓		Low
New Zealand	✓	✓	✓		✓	High
Nicaragua (1821)	✓					Lower middle
Niger	✓	✓	✓	✓		Low
Nigeria	✓	✓	✓	✓		Low
Pakistan*	✓					Low
Panama (1821)	✓					Upper middle
Paraguay (1811)	✓					Lower middle
Peru (1821)	✓					Lower middle
Rwanda		✓		✓		Low
Senegal	✓	✓	✓	✓		Low
Seychelles						Upper middle
Sierra Leone	✓	✓	✓	✓		Low
Singapore	✓	✓	✓	✓		High
Solomon Islands		✓		✓		Low
South Africa	✓	✓	✓	✓		Upper middle
Sri Lanka	✓	✓	✓			Low
St. Kitts and Nevis		✓				Upper middle
St. Lucia		✓				Upper middle
St. Vincent		✓				Upper middle
Sudan*	✓					Lower middle
Swaziland		✓		✓		Lower middle
Syria		✓		✓		Lower middle
Tanzania	✓	✓	✓	✓		Low
Togo	✓	✓	✓	✓		Low
Trinidad and Tobago	✓	✓	✓	✓		High
Tunisia	✓	✓	✓	✓		Lower middle
Uganda	✓	✓	✓	✓	✓	Low
Uruguay (1811)	✓				✓	Upper middle
USA (1776)	✓				✓	High
Venezuela (1821)	✓					Upper middle
Vietnam	✓	✓	✓	✓		Low
Zaire	✓	✓	✓	✓		Low
Zambia		✓				Low
Zimbabwe		✓				Low
Number of observations	64	71				

Notes: Dates of independence are listed in parentheses for those colonies which became independent before 1900. Countries with an \* are not included in the Jones sample because they were: (1) ruled by more than one colonial power; or (2) under colonial rule for less than 50 years. "Settler" colonies are those with >50% European descent in 1900 (as reported by Krieckhaus (2006)). Income categories are based on GNI per capita in 2007 as reported by the 2009 *World Development Report*. The following income categories are used: Low-income (\$935 or less); Lower-middle (\$936–3705); upper-middle (\$3706–11,455); and high-income (\$11,456 or more).

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