KYKLOS ,Vol. 69 – February 2016 – No. 1, 32–64

The Long Shadows of Spanish and French Colonial Education

Horst Feldmann*

I. INTRODUCTION

A series of econometric studies published since the late 1990s find that colonial-era institutions and policies still affected economic and social development of the formerly colonized countries in the recent past. Almost all of them suggest that the identity of the colonial power mattered. While most papers study the impact on economic growth,[1] others study the impact on education. This paper contributes to the latter strand of the literature. Given both the intrinsic value of education and its key role in economic and social development, it is important to find out whether remnants of the colonial era still affected education in the recent past.[2]

This paper makes several contributions. First, whereas most previous papers studying the impact of the colonial legacy on recent education take a case-study approach, this paper uses data from a large sample of countries. Second, whereas most previous papers focus on former French and/or British colonies, this paper additionally covers ex-colonies of Spain, the third of the former big three colonial powers. Third, whereas the previous papers focusing on former French and/or British colonies study colonies in Africa only, this paper additionally takes French and British colonies in other parts of the world into account. Fourth, in contrast to all previous papers, we use a large number of controls and perform a battery of robustness checks. Fifth, whereas almost all papers' sample periods for recent development end in the 1990s at the latest, this paper extends it to 2012. Sixth, in contrast to almost all previous papers, we estimate not only the effect on both genders combined but also the effect on females only.

The paper is structured as follows. Section II describes the historical background and, against this background, develops our hypotheses. Section III briefly surveys the relevant previous econometric studies. While section IV describes our sample,

* Department of Economics, University of Bath, Bath BA2 7AY, United Kingdom. E-mail: h.feldmann@bath.ac.uk.

[1]For example, Grier (1999), Acemoglu et al. (2001), Bertocchi and Canova (2002) and Bolt and Bezemer (2009).

[2]We use the phrase "in the recent past", rather than the word "today", because our sample period ends a few years ago.

section V explains our variables and methodology. Section VI reports and discusses the regression results. Section VII concludes.

II. HISTORICAL BACKGROUND

1. Spanish colonies

Spain's colonialization of the Americas (where almost all of its colonies were located) began soon after the 1492 arrival of Christopher Columbus.[3] At its peak the Spanish Empire covered half of South America, most of Central America and the Caribbean as well as the southern part of North America. For the most part, Spain's colonial rule of the Americas ended in 1833 after several wars of independence.

Shortly after the conquest, Catholic orders arrived in Spanish America. They founded monasteries and opened schools. Throughout the colonial period in the whole Spanish Empire, education was almost exclusively in the hands of the Catholic Church. A major goal of education was to force the indigenous population to accept Spanish culture and Roman Catholicism (Newland 1991). Therefore, teaching was in Spanish and consisted of little more than instruction in the catechism, accompanied by the rudiments of reading and writing (Newland 1991, Elliott 2006). In all, little education took place (Burkholder and Johnson 2014, Watras and Cavour 2015). The colonial rulers limited education of the natives fearing it would lead to rebellion (French and Manzanárez 2015).

Education was provided for a small minority only (Haring 1947). The education of girls was largely neglected (Newland 1991, Burkholder and Johnson 2014, Arrey-Wastavino 2015). Indians were also largely excluded from education, especially beyond the primary level (Burkholder and Johnson 2014). Discrimination was practiced against those not considered to be of "pure blood": the mulattoes, mestizos and blacks (Newland 1991). Occasionally, these people were even deprived of becoming literate.

The Jesuits dominated education until the Spanish king expelled them in 1767 (Lockhart and Schwartz 1983, Burkholder and Johnson 2014). They provided education mostly to the sons of the creole elite (Elliott 2006). The Jesuits' secondary education was to a relatively high standard but all their teaching remained strictly within an officially approved theological framework (Elliott 2006).

The expulsion of the Jesuits, which was revoked only in 1814, had a substantial negative impact on educational facilities (Newland 1991, Elliott 2006). In many places, especially in small towns and villages, there was nothing to replace them. Education became even more urban than it had previously been. From the end of the 18th century, the state finally assumed some responsibilities in

[3]On the history of Spanish colonialism, see, e.g., Kamen (2003).

education. However, when the wars of independence broke out, the Spanish rulers attempted to politicize the curriculum. Education was now to be primarily intended to instill loyalty to the Spanish crown (Newland 1991).[4]

In 1819, Simón Bolívar, who played a key role in Latin America's struggle for independence, called for the establishment of universal free education (Watras and Cavour 2015). Yet, for many years after independence Bolívar's call remained largely unheeded (Jaimes 2015, Watras and Cavour 2015). Although in all countries of the former Spanish Empire various governments embarked on educational reforms, throughout the 19th century and the first half of the 20th century progress was slow (Engerman et al. 2009). The goal of free and compulsory education was not strongly pursued. To a large extent, education remained a privilege for the wealthy (Engerman et al. 2009, French and Manzanárez 2015). Spanish remained the sole language of instruction, although many indigenous Indian groups knew only their native languages (Arrey-Wastavino 2015, Cunningham 2015, Raquidel 2015). Schools remained concentrated in major cities; educational opportunities in rural areas remained poor (Cunningham 2015, Morris 2015, Raquidel 2015, Watras and Cavour 2015).

A major reason for the slow reform and expansion of education in the former Spanish colonies until the mid-20th century was that these countries were characterized by a deep political divide between conservatives, who were pro-Catholic and elitist, and liberals, who were anti-clerical and reform-minded. This led to frequent political turns: educational reforms of a liberal government were reversed by the next conservative government. Not only conservative policies but some radical liberal reforms too had a negative impact on education. In Columbia, for example, Congress abolished all small monasteries in 1821, and in 1850 it disbanded all universities and the President expelled the Jesuits yet again (Watras and Cavour 2015).

On several occasions in many countries the clashes between conservatives and liberals led to civil war. Several of the newly independent countries also fought interstate wars. These civil and interstate wars starved schools of resources and often destroyed them (French and Manzanárez 2015, Watras and Cavour 2015).

In the first half of the 20th century, many countries experienced military coups and dictatorships, sometimes as a result of a previous civil war. In several cases,

[4]How little education was provided in the Spanish colonies also becomes obvious when contrasting their situation with that of the thirteen British colonies that later formed the United States. By the middle of the 18th century, literacy in New England approached 85% among men and 50% among women (Reich 2011, p. 216). These were exceptionally high figures, not only when compared with Spanish America but even by the standards of Western Europe (Elliott 2006, Engerman et al. 2009). Indeed, by the time of the American Revolution (1765–1783) education in the thirteen British colonies "was more accessible […] than in any nation of Western Europe" (Reich 2011, p. 215). Furthermore, the curriculum was much broader and more modern than in Spanish America: in the thirteen colonies, before the end of the colonial period secondary schools began introducing modern languages, mathematics, science, history and commercial subjects.

the military juntas severely curtailed education. For example, in Chile in the early 1930s General Carlos Ibáñez del Campos incarcerated teachers and closed schools (Arrey-Wastavino 2015). Similarly, in Venezuela during the dictatorship of Marcas Pérez Jiménez from 1948 to 1958, the educational budget was cut and the number of students decreased substantially (Jaimes 2015).

Only in the second half of the 20th century, long-lasting progress in the expansion and reform of education was made (Arrey-Wastavino 2015). In most countries, educational provision finally improved markedly – albeit gradually. Free and compulsory education was established in most countries. In several countries, bilingual education was made available for communities where the population spoke an indigenous language (Raquidel 2015, Watras and Cavour 2015). Educational provision in rural areas was improved, although it generally still remained poor. For example, in Mexico even in the early 21st century secondary schools were virtually non-existent in rural areas (Griffin 2015).

One factor that continued to affect education in the former Spanish colonies post-independence was the high degree of political and economic inequality, which continued to limit educational provision for everyone except the wealthy (Engerman et al. 2009). Another factor was the continuing strong influence of the Catholic Church. This is even true in a country such as Colombia where the constitutional reform of 1991 eliminated any reference to Catholicism as the national religion (Watras and Cavour 2015). Still, in this country as well as in other former Spanish colonies, the Catholic Church continued to play an important role in the educational system (Cunningham 2015, Morris 2015, Raquidel 2015). These two factors largely explain the persistence of many features of the colonial system of education: the limited provision of education for girls, the poor and those living in rural areas, and the fact that Spanish remained the sole, or at least dominant language of instruction.

2. French colonies

French colonialization began in the 17th century, mainly in North America, but by 1814 most of this "first colonial empire" had been lost.[5] The "second colonial empire", to which we therefore largely confine ourselves, began with the conquest of Algiers in 1830. Later in the 19th century and in the early 20th century, it came to include large areas of West Africa and the Maghreb as well as several areas in East Africa, the Middle East, East Asia and the Pacific. For the most part, French colonialism ended in 1960, when most colonies were granted independence.

In all its colonies, the French government established a highly centralized and uniform system of education (Clignet and Foster 1964, White 1996, Garnier and

[5]On the history of French colonialism, see, e.g., Aldrich (1996).

Schafer 2006). Schools could not operate without government permission. Ministry officials ensured that national educational policy was implemented. All schools, including private and missionary schools, were placed under inspection of the colonial administration. They had to follow a national curriculum and employ government-certified teachers only. Most of the teachers were from France and other European countries. French was the sole language of instruction.[6] Only metropolitan educational materials were used. Class size was often large and, apart from a small elite, pupils in French colonial schools received training in basic skills only.

With this policy, the French intended to impose their own culture onto the colonies (Gifford and Weiskel 1971, Swink 2014, Bryant 2015). They ignored and displaced local traditions and customs, including traditional forms of education. The colonial rulers felt that they were obliged to "liberate" the people in the colonies from their traditional culture and prepare them for a higher level of civilization (Heggoy 1984, Sagini 2015).

From the beginning of the 20th century, the French government added three further elements to its colonial educational policy (Gifford and Weiskel 1971). First, school fees were abolished at all levels. Second, all education was to be secular. This implied the secularization of all missionary and other church-directed schools. The state became by far the largest provider of education. The third element was that education was to be tied to the need for administrative personnel. The French educational system had long been highly selective and elitist. The third element underscored and strengthened this characteristic in the colonies. Enrollment at elite schools was now strictly limited based on estimates of job availability, especially in the colonial administration.

There were three phases in the history of France's colonial education policy (Gifford and Weiskel 1971): the 19th century, the period from the early 20th century until 1945, and the subsequent period of decolonization. In the 19th century, the policy was based on the principle of assimilation. Indigenous people were to be converted into Frenchmen and education was regarded as the main tool to implement this goal. The policy of assimilation degraded cultural traditions of the colonized societies. For example, the textbooks used in colonial schools continuously reminded local pupils that everything about their environment was inferior to France and the French way of life (Gifford and Weiskel 1971).

At the beginning of the 20th century, "l'adaption" replaced "l'assimilation" as the guiding principle for educational programs (Gifford and Weiskel 1971). Now

[6]One exception was French Indochina, where the first three years of education were given in the mother tongue. But even there, French was a core subject in primary school (Kelly 1984). Another exception was Lebanon, were half of the curriculum was taught in Arabic and the other half in French (Hashem 2015).

the curriculum was adapted to local circumstances. Rather than trying to convert natives into Frenchmen, they were only to be enabled to incrementally improve their traditional patterns of living. A two-track educational system was established: basic education for the masses, and advanced education for Europeans and a few elite locals. This policy of adaptation was the result of an increased sense of European racial superiority and a distrust of indigenous people's capacities (Gifford and Weiskel 1971, Kelly 1984).

Finally, in the era of decolonization after 1945 the policy of assimilation was reinstated (Gifford and Weiskel 1971). The French government created in the colonies strict copies of French metropolitan schools. Enrollment increased markedly but the system remained highly selective. The new change in policy was partly the result of the Brazzaville Conference of 1944, which declared that education should be aimed at making Africans high-ranking administrators and not only subordinates (Cowan et al. 1965).[7]

Apart from the period of decolonization, enrollment rates were very low. For example, on average across French colonies the gross primary enrollment rate was around 6% in 1880, between 13% and 14% between 1890 and 1910, around 18% between 1920 and 1930, and 24% between 1935 and 1940. By contrast, in France itself it was around 84% between 1890 and 1910 and around 74% between 1920 and 1930 (Benavot and Riddle 1988).

After independence, the traditional French system of education persisted in all former colonies to a large extent (Clignet and Foster 1964, Corbett 1972, Heggoy 1984, Garnier and Schafer 2006). The persistence of the educational system pertained particularly to its structure but also to its selectivity and elitist nature (Corbett 1972, White 1996). Curriculum reform was slow (Swink 2014). Furthermore, most teaching continued to be in French (Corbett 1972, Swink 2014, Paasche 2015). Only later on and only in some countries French was mostly or fully replaced by the respective dominant local language. For example, in Laos, which gained full independence from France in 1953, Lao became the language of instruction at all levels of education only after the revolution of 1975 (Fry 2015).

The only major change from the colonial period was that enrollment at the primary level was increased substantially after independence – initially quite quickly but much more slowly later on (Clignet and Foster 1964, Swink 2014, Bryant 2015). For example, across the former French colonies in Africa, the gross primary enrollment rate rose from an average of about 30% in 1960 to about 50% in 1970. It surpassed 60% only in the late 1970s and remained slightly above 60% until 1995. Only during the late 1990s and the 2000s was it increased further. By 2009, it reached close to 100% (Dupraz 2013).

[7]For an English translation of the resolution of the Brazzaville Conference, see Scanlon (1964).

3. British colonies

British overseas colonization began during the last decades of the 16th century in North America.[8] The colonies established there were lost in 1776, when the United States declared independence. A second and geographically much more wide-ranging period of colonization started after the victory over Napoleon in 1815. The British Empire that was built over the following century included colonies on all continents. The largest ones were India, Australia, Egypt, Sudan, Kenya, Nigeria, South Africa and Canada. The "white colonies" of the Empire (e.g., Canada and Australia) soon achieved a high level of self-government and are thus not considered as colonies here. After World War II, Britain adopted a policy of gradual disengagement from its colonies. By 1965, most had achieved independence.

In British colonies, the educational system was decentralized. This was in line with the official doctrine of "indirect rule", which formed the basis of Britain's administration of its colonies (Clignet and Foster 1964, White 1996). According to this doctrine, traditional structures and institutions were left largely intact. Colonial rulers cooperated with traditional chiefs, who maintained most of their direct power over their peoples and lands.

In education, the concept of "indirect rule" implied that educational organizations enjoyed a high degree of autonomy (Garnier and Schafer 2006). For the most part, the British government left education in the hands of missions and other voluntary organizations (Clignet and Foster 1964). During the first decades of colonization, missionaries were the only ones introducing European-style education (Berman 1975, Bellenoit 2007). State schools came later and for a long time constituted a small minority. For example, in Nigeria in 1899 only 33 of the 8,154 primary schools were government-run (Gelpi 2014). The government subsidized missionary schools and other voluntary educational organizations, provided they met minimum standards. Most teachers were converted natives. In Uganda, for example, there were 8,456 African and just 285 European teachers in primary schools in 1938 (Frankema 2012).

The British approach to colonial education stimulated competition among missions of various denominations, resulting in a rapid proliferation of missionary schools (Frankema 2012). In British colonies, missionaries were predominantly Protestant. Unlike their Catholic rivals, Protestant missionaries did not only intend to win converts to Christianity. They also wanted to enable the new Christians to read the Bible (Berman 1975). Therefore, Protestant missionaries placed high emphasis on spreading the key skill of reading. Furthermore, they did pioneering work with women's education early on (White 1996). They were also the first to provide post-primary education (Berman 1975). There

[8]On the history of British colonialism, see, e.g., James (1998).

was, however, a wide variety in standards between missionary schools (Clignet and Foster 1964).

During the first half of the 20th century, the British government gradually involved itself more (Cowan et al. 1965, Gifford and Weiskel 1971).[9] It reserved to itself the general direction and supervision of education. Schools were inspected regularly. Voluntary organizations continued to be encouraged and supported with grants-in-aid, provided their schools conformed to the established secular standards for certificates and diplomas. Native teaching staff were better trained. The education of girls and women was expanded. It was government policy that education should be adapted to local conditions, such as the traditions of the various people.[10] In line with this policy, instruction in all primary schools was in the local vernacular in the first grades, with English as a subject. This had already been the rule before (Clignet and Foster 1964, White, 1996).

Even after the government started to involve itself more in education, the growth of state schools remained slow (Gelpi 2014). However, various types of voluntary organizations set up a large number of primary schools, not least because of the grants-in-aid provided by the British government. There were also more secondary schools and universities than in the French colonies, although before 1945 the absolute number of these institutions remained small in the British colonies too (Clignet and Foster 1964, Gifford and Weiskel 1971). As in the Spanish and French colonies, until the period of decolonization the British tried to confine advanced education of locals to a small employable number, in order to avoid the creation of nationalist movements (Gifford and Weiskel 1971, Bellenoit 2007). After World War II, there finally was a large increase in government investment in education, albeit from a low level. All sectors of education, including secondary and tertiary, expanded rapidly (Gelpi 2014).

Throughout the colonial period, school enrollment rates were substantially higher in the British than in the French colonies. For example, in the former the gross primary enrollment rate increased from about 14% around 1870 to 21% in 1880, 26% in 1890 and 32% in 1900. After fluctuating around 30% between 1910 and 1930, it rose to 40% by 1935–40 (Benavot and Riddle 1988). This was significantly more than in the French colonies (section II.2).

The British lead persisted after independence. For example, on average across the former British colonies in Africa, the gross primary enrollment rate increased from about 45% in 1960 to about 55% in 1970. Subsequently, it rose to about

[9]In British India, the process of increased government involvement began already in the 1860s, when a new state system of education emerged in which publicly funded and managed schools existed alongside non-state schools (Chaudhary 2012).

[10]As in the case of France, at the beginning of the 20th century Britain's policy of adaptation was prodded by Social Darwinism and other racial theories that touted white superiority (Gifford and Weiskel 1971).

85% in 1980 and then gradually increased towards 100% throughout the 1990s (Dupraz 2013). These figures, too, are much higher than the figures for the former French colonies in Africa (section II.2).

The continued lead post-independence was probably mostly due to the fact that the British colonial system of education was little changed by the new rulers. Of key importance was the intense competition between different providers of education. The British system also allowed more room for local practices to emerge, and these practices facilitated educational expansion (Garnier and Schafer 2006). Further persistent characteristics of the British system that encouraged parents in the former British colonies to enroll their children in the decades following independence included the recruitment of teachers and the control of parents over teachers' behavior, combined with the tradition of teachers' autonomy (Garnier and Schafer 2006). Furthermore, after independence most governments continued the British colonial practice of offering subsidies to non-state schools. Additionally, some governments expanded education by, for example, increasing the number of primary and secondary schools offering free or partly free instruction, and by creating numerous institutions of higher learning (Gelpi 2014).

4. Comparison and hypotheses

As this brief overview indicates, there were substantial differences in educational policies and provision between the three colonial powers, especially between Britain, on the one hand, and Spain and France, on the other. Whereas the British system allowed intense competition between different providers of education and granted them a high degree of autonomy, both the Spanish and the French system were highly centralized, controlled by the Catholic Church and the French government, respectively. The British system led to a large number and variety of educational providers, who employed many native teachers. This in turn led to education being provided on a relatively large scale and being relatively well adapted to local conditions. By contrast, both the Spanish and the French system were relatively small scale, highly uniform and little adapted to local conditions. This was partly due to the fact that neither the Spanish nor the French employed many native teachers. It was also due to the fact that both systems were highly elitist, providing education to a small number of natives only.

Another key difference pertained to the language of instruction. The fact that in British colonies teaching was in the local vernacular in the first grades enabled practically all native children to enter school. By contrast, the fact that the language of the colonial power was the sole language of instruction in both Spanish and French colonies excluded a large majority of native children from schooling in the first place.

A final key difference pertained to the contents of instruction. Whereas in the British colonies the dominant Protestant missionaries placed high emphasis on the key skill of reading, teaching in Spanish colonies consisted of little more than instruction in the Roman catechism. Even in French colonies, most pupils received training in basic skills only.

Why might the characteristics of colonial education have been still relevant in the recent past? Because, in all three groups of ex-colonies, many of them persisted long after independence. Indeed, it is remarkable that the historical literature on colonial education – whether on Spanish, French or British – consistently highlights this persistence. Thus we hypothesize that, in the recent past, former colonies of Spain and France on average had comparatively low rates of secondary school enrollment, ceteris paribus. (Primary enrollment was substantially increased in all three groups of countries from the mid-20th century. Therefore, we do not expect to find a negative effect on the primary enrollment rate.) Furthermore, we hypothesize that the negative effect of both the Spanish and the French colonial legacy was particularly strong on females. This is because Spanish colonial education neglected the education of girls and because the elitist nature of French colonial education is also likely to have disadvantaged females.[11]

III. PREVIOUS ECONOMETRIC STUDIES

The first paper to econometrically study the impact of colonial legacies on education is by Grier (1999). Using a sample of 24 former British and French colonies in Africa, he finds that the percentage of the population attending primary and secondary school at independence was significantly higher in former British colonies. Using data from 1960 to 1985, Brown (2000) compares educational enrollment rates in 33 former British and French colonies in Sub-Saharan Africa. Similar to Grier (1999), he finds that the former British colonies had significantly higher primary enrollment rates and that since independence the British lead grew over time. However, he also finds that, among the poorest countries, secondary enrollment rates were higher in former French colonies.

Cogneau (2003) studies the differences between former British and French colonies in Sub-Saharan Africa as well. He uses both macro- and microeconomic data. His macroeconomic data cover 45 Sub-Saharan countries, 15 of which are former British and 18 former French colonies. In these data, he finds that the former British colonies had higher rates of both primary and secondary enrollment in 1960 and that this advantage persisted through to 1990. The secondary

[11]Whether or not our hypotheses are corroborated is not evident from the historical literature – especially given the fact that none of the historical publications statistically analyze the determinants of recent enrollment rates.

enrollment rate differential even widened. Cogneau's (2003) microeconomic data come from surveys conducted between 1985 and 1994 in the two former British colonies of Ghana and Uganda and the two former French colonies Côte d'Ivoire and Madagascar. In line with his macroeconomic results, he finds that Ghana and Uganda had both higher completion rates in primary education and higher rates of graduation from primary to secondary school.

Using quinquennial data from 1970 to 2000 covering 28 Sub-Saharan countries, Garnier and Schafer (2006) find that in the 1970 to 1985 sub-period the former French colonies had both lower primary enrollment rates and a slower expansion of primary enrollments than the former British colonies. Additionally, they report that in the 1985 to 2000 sub-period there was a more rapid expansion of primary enrollments in the former French colonies – i.e., these countries narrowed the gap vis-à-vis the former British colonies.

Using district-level data from French West Africa, Huillery (2009) finds colonial investments in education to have a persistent effect on current education. As indicators of colonial investments she uses the number of teachers, or new teachers, and the number of new schools in the 1910 to 1939 period. Her indicator of current education is the 1995 school attendance rate of 7–12 year old children. Huillery (2009) argues that the enduring positive effect of colonial investments can be explained by the fact that later investments continued to be concentrated in districts that already had many of them.

To identify the causal effect of different education policies, three recent papers exploit the fact that some colonies were split up between different colonial powers (natural experiments). Dupraz (2013) studies the case of Cameroon, which was divided between Britain and France after World War I. He finds significant differences between the two parts of the country. Specifically, for cohorts schooled during the interwar period he finds the effect of British colonization to be positive and large (about ten percentage points for school attendance rates and five percentage points for primary school completion rates). By contrast, for cohorts schooled during the last decades of colonization, there is no significant difference for school attendance and a positive effect of French rather than British colonization for primary completion. The latter is probably because educational expenditure surged in French Cameroon in the wake of the Brazzaville conference. Lee and Schultz (2012), who also study the Cameroonian case, use data from an individual-level survey carried out in 2004 and find no significant differences between the British and French regions in literacy rates among male survey respondents.

Cogneau and Moradi (2014) exploit the fact that German Togoland was split into a British and a French part after World War I. They find that literacy increased more strongly in the English part from the 1920s onwards and ascribe this to differences in educational policy: whereas the French took a hostile stance against missionary schools, the British subsidized them and spent more on education overall. Additionally, using 1998 survey data Cogneau and Moradi

(2014) show that the differences in literacy that began shortly after the partition of German Togoland persisted long after independence.

The only paper to econometrically analyze the effect of Spanish colonial education is by Waldinger (2013). She examines the long-term effect different Catholic missionary orders had in Mexico. In colonial Mexico, there were two types of orders: Mendicant orders (such as the Franciscan, Dominican and Augustinian orders), which emphasized educating the native population, and the Jesuits, who focused on educating the colonial elite. Waldinger (2013) finds that people in localities that had a Mendicant mission station during the colonial period had significantly higher educational attainment in 2000, compared with places without a mission. By contrast, the estimated effect of the Jesuits is negative.

As the historical literature, almost all previous econometric studies suggest that the impact of colonial education persisted long after independence. The bulk of these studies indicate that the effect of France's colonial education was less favorable than the effect of Britain's. As pointed out in section I, our paper adds to the previous literature in several respects. The following sections explain our data and methodology.

IV. SAMPLE OF COUNTRIES

We focus on the colonial powers Spain, France and the United Kingdom because these countries had by far the largest number of colonies. Whereas all previous econometric studies cover either a sample of former African colonies or a single former colony only, our sample includes a large number of former colonies from all over the world. For example, it includes the former French colonies Cambodia, Laos, Lebanon and Syria as well as the former British colonies India, Bangladesh, Pakistan, Jordan and Malaysia. In total, there are 17 former Spanish, 23 former French and 36 former British colonies in our sample (Table 1). This large coverage avoids peculiarities of Africa, or of a single country, and is thus likely to lead to more general results. However, due to data availability a few former colonies of the three colonial powers covered could not be included in our sample, the former French colonies of Algeria and Vietnam being cases in point.

In line with the previous econometric literature, we focus on overseas colonies – i.e., we exclude colonies that Spain, France or Britain had in Europe. For example, until the early 18th century Spain colonized the Netherlands, the south of Italy and several other parts of continental Europe. Another example is France, which under Napoleon Bonaparte conquered and ruled large parts of continental Europe between 1804 and 1814 (Napoleonic Empire). Ireland was an English and later a British colony since the 12th century and was part of the United Kingdom from 1801 until 1922.

Table 1

List of countries

	Countries
Former Spanish overseas colonies	Argentina, Bolivia, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Equatorial Guinea, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Uruguay, Venezuela.
Former French overseas colonies	Benin, Burkina Faso, Cambodia, Cameroon, Central African Republic, Chad, Comoros, Côte d'Ivoire, Djibouti, Gabon, Guinea, Laos, Lebanon, Madagascar, Mali, Mauritania, Morocco, Niger, Republic of the Congo, Senegal, Syria, Togo, Tunisia.
Former British overseas colonies	Antigua and Barbuda, Bahrain, Bangladesh, Barbados, Belize, Bhutan, Botswana, Brunei Darussalam, Cyprus, Egypt, Fiji, Gambia, Ghana, Grenada, India, Jamaica, Jordan, Kenya, Kuwait, Lesotho, Malawi, Malaysia, Mauritius, Namibia, Oman, Pakistan, South Africa, Sri Lanka, Saint Lucia, Saint Vincent and the Grenadines, Swaziland, Tanzania, Trinidad and Tobago, Uganda, Zambia, Zimbabwe.
Reference group	Albania, Angola, Armenia, Australia, Austria, Azerbaijan, Belarus, Belgium, Bulgaria, Burundi, Cabo Verde, Canada, China, Croatia, Czech Republic, Denmark, Estonia, Ethiopia, Finland, France, Georgia, Germany, Greece, Guinea Bissau, Hungary, Iceland, Indonesia, Iran, Ireland, Israel, Italy, Japan, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Luxembourg, Macedonia, Malta, Moldova, Mongolia, Mozambique, Nepal, Netherlands, New Zealand, Norway, Philippines, Poland, Portugal, Romania, Russia, Rwanda, Saudi Arabia, Slovakia, Slovenia, South Korea, Spain, Sweden, Switzerland, Tajikistan, Thailand, Turkey, Ukraine, United Kingdom, United States.

Note: Former British overseas colonies exclude Britain's former settler colonies that enjoyed broad privileges of home rule (Australia, Canada, Israel, New Zealand and United States).

Overseas colonies that were lost before or around the time of the Congress of Vienna (1814–15) are disregarded here as well. Major examples are the thirteen British colonies that formed the United States in 1776 and France's "first colonial empire" that existed until 1814. Although the legacies of those colonial powers are still present in these countries today, they are likely to be less vivid than more recent developments (including, in some cases, subsequent colonization by other powers).

An additional reason for not considering the United States as a former colony is that even during the time of British colonial rule the relevant British colonies enjoyed broad privileges of home rule, which also covered education policy (Reich 2011). The other "white colonies" of the British Empire enjoyed these privileges too. Thus Canada, Australia, New Zealand and Israel are not regarded as ex-colonies either. This is in line with much of the relevant previous literature (e.g., Bernhard et al. 2004). However, to check the robustness of our results, we code these five countries as former British colonies in one alternative specification.

We classify as colonies several countries that had a different official status (at least for some time) but were subject to de facto colonial rule for most or

all of the time. One example is South Africa, which achieved home rule in 1909 but remained a British territory until independence in 1961. Other examples are Lebanon and Syria, which were placed under French mandate by the League of Nations after World War I.

When a colony was transferred from one colonial power to another, we select the most recent one, which in our sample was almost always also the one in power for longer. For example, Germany's colonial efforts only began in 1884 and already ended with World War I, when its enemies took over its colonies. Consequently, we classify Namibia as a British colony and Cameroon as a French. The latter is because Cameroon largely consists of former French Cameroon and its institutions have therefore largely been shaped by France.

In addition to the former Spanish, French and British colonies, our sample also includes 65 other countries. This is a diverse group of developing and industrial countries from all over the world (Table 1). Including this large and diverse group of countries helps us to identify the effect of the colonial past on recent schooling because the coefficients on the colony dummies estimate this effect relative to other countries. As in the case of the former colonies, the reference group is determined by data availability only.

V. VARIABLES AND METHODOLOGY

1. Dependent variables

The goal of our research is to measure whether the colonial past still affected schooling, particularly secondary schooling, in recent decades. Therefore, our main dependent variable is the secondary enrollment rate. It is calculated on a gross basis – i.e., it includes all children enrolled in secondary education, regardless of age (for definitions, descriptive statistics and sources of all variables, see online appendix[12]). To test our second hypothesis, we additionally use the female secondary enrollment rate.

We prefer gross to net enrollment rates because the latter cover only children of the official school age for the respective level of education. Thus they exclude overage and underage students. This is a downside because in developing countries many children are able to join school only after they have passed the official entry age. A further downside of net enrollment rates is that data are available for far fewer countries and years than for gross enrollment rates. In any case, in one robustness check we use net rather than gross enrollment rates.

In an alternative specification, we use the primary rather than the secondary enrollment rate (both for boys and girls combined and for girls only). We do not use the primary enrollment rate as our main dependent variable because in

[12]The online appendix is in the Supporting Information section of the article web page: http://dx.doi.org/10.1111/kykl.12102.

most countries, including in most ex-colonies, primary education has been compulsory for many years and thus there is much less variation in this indicator. However, it is still useful to investigate whether in recent decades the colonial past still affected education even at the basic level.

In another alternative specification, we use an indicator of human capital stock: adults' average years of schooling. We do not use indicators of human capital stock as main dependent variables because such indicators do not reflect recent schooling but schooling that took place several decades earlier. In the French and British cases, they may even capture some schooling that took place during the final years of colonization. Also, data on human capital stock are available for even fewer countries and years than data on net enrollment rates. In any case, for the reasons given in section II we expect adults in both former Spanish and former French colonies to have fewer years of schooling.

2. Control variables

We use a large number of variables to control for the impact of other potential determinants of schooling. To start with, we control for the share of public spending on education in GDP. This is important because many ex-colonies substantially increased this type of spending post-independence. One should expect higher spending to increase school enrollment. However, in their cross-country regressions neither Flug et al. (1998) nor Papagapitos and Riley (2009) are able to find a statistically significant effect on the secondary enrollment rate. In one robustness check, we additionally control for the duration of compulsory secondary education, the purpose being to disentangle the effects of colonial legacy from recent government rules on compulsory education. Furthermore, in all of our regressions we include the 'political rights & civil liberties' variable because several studies find political freedom or democracy to have a positive impact on enrollment rates (e.g., Lake and Baum 2001, Rudra and Haggard 2005, Eterovic and Sweet 2014).

We employ several demographic variables. A large theoretical literature argues that improvements in life expectancy or mortality should increase investment in human capital (e.g., Kalemli-Ozcan et al. 2000, Cervellati and Sunde 2005, Soares 2005). Indeed, many empirical papers find life expectancy to have a positive effect and mortality, including parental death, to have a negative effect on schooling (e.g., Forston 2011, Boikos et al. 2013, Stoler and Meltzer 2013). Therefore, we use both 'life expectancy' and 'death rate'. Additionally, we control for urbanization because access to school is usually better in urban areas than in rural ones. Castelló-Climent and Hidalgo-Cabrillana (2012) find that a higher urbanization rate is related to higher levels of secondary education.

We also include the share of children in the population and, in one robustness check, the population growth rate. A higher share of children or a higher population growth rate could lead to a lower secondary enrollment rate. This is

because both parents and societies face a trade-off between child quantity and quality: the higher the number of children, the less they are usually able to invest into each of them (e.g., Becker and Lewis 1973, Hanushek 1992). In a further robustness check we add the share of old people in the population. Because resources are limited, there is also a trade-off between caring for the elderly and investing in children (e.g., Poterba 1997).

We control for ethnic fractionalization and, in one robustness check, additionally for religious fractionalization. Several theoretical models suggest that fractionalized societies have difficulties agreeing on public goods like education (e.g., Alesina et al. 1999). Previous empirical studies find that whereas ethnic fractionalization is indeed associated with low levels of education, religious fractionalization is not (e.g., Alesina et al. 2003). The latter is probably because religious diversity tends to be higher in more tolerant societies.

We include GDP per capita because many previous papers find a positive effect on schooling (e.g., Mincer 1996). Since results for the US suggest that schooling is countercyclical (e.g., Méndez and Sepúlveda 2012), we also employ the GDP growth rate. Furthermore, we use 'private credit' as a proxy for borrowing constraints. De Gregorio (1996), among others, theoretically argues and empirically shows that such constraints can have a negative effect on the secondary enrollment rate. We also include 'physical capital stock' and, in one robustness check, 'physical investment'. The intention here is to capture the complementarity or substitutability of physical and human capital, similar to Griliches (1969). We control for trade openness because several theoretical papers argue that it may affect human capital accumulation, either positively or negatively (e.g., Ranjan 2001). In our final four robustness checks, we additionally control for economic instability and different types of crises. As several papers show theoretically and/or empirically, they too can positively or negatively affect the accumulation of human capital (e.g., Heylen and Pozzi 2007, Crespo Cuaresma 2010).

Throughout, we control for major religions. Some religions, Protestantism in particular, highly value education (Becker and Woessmann 2009). Islam, by contrast, is much less favorable and particularly restricts the education of girls. This is important because in Africa many French colonies were in Muslim areas, hampering France's efforts to introduce its educational system. Controlling for Roman Catholicism in turn ensures that our 'former Spanish colony' variable does not proxy for this religion.

We employ several geographic variables. In our baseline specification, we use both 'tropical area' and 'navigable water'. As tropical climates inhibit activity and favor infectious diseases, they may have a negative effect on schooling. By contrast, access to an ocean or ocean-navigable river enhances earnings opportunities and may thus affect schooling. In one robustness check, we replace these two

variables with 'latitude' and 'landlocked'. Additionally, in all regressions we include four regional dummies: Africa and the Middle East, America, Asia, and Europe. This is important because otherwise a colonial dummy may proxy for general regional characteristics – particularly, 'former Spanish colony' for general regional characteristics of America.

3. Estimation methods

In most cases, we estimate the following model:

$$Y_{i,t} = \alpha + \beta_1 S_i + \beta_2 F_i + \beta_3 B_i + \beta_4 \boldsymbol{X}_{i,t-1} + \beta_5 \boldsymbol{Z}_i + \lambda_t + \varepsilon_{i,t} \quad (1)$$

$Y_{i,t}$ is a schooling variable of country i at year t, either covering both genders jointly or girls only. While α is a constant, S, F and B denote dummies for former Spanish, French and British colonies, respectively. $\boldsymbol{X}$ is a vector of time-variant control variables and $\boldsymbol{Z}$ is a vector of time-invariant controls, including regional dummies. While λ_t denotes year dummies, $\varepsilon_{i,t}$ denotes the error term. Year effects are included to control for the impact of shocks that are common across countries.

In most regressions, the time-variant variables use annual data from the 1972–2012 period. In the regressions to explain average years of schooling, they use quinquennial data for the period 1975 to 2010 instead because data on human capital stock are available at five-year intervals only. The panel is unbalanced – i.e., data on many variables are unavailable for some, especially early years. This feature is one reason why we choose as long a sample period as possible. A second reason is that we want to give the control variables, including the time-variant ones, the best chance possible to reveal their effects, if any, on our schooling variables.

To control for unobserved country effects, we use the GLS random effects estimator. Random effects estimators have the advantage of exploiting both the cross-country and the time-series variation included in the sample. By contrast, fixed effects models are less efficient because they only use the time-series variation within the sample. They are not an option here anyway because our colony variables are constant over time.

The error term $\varepsilon_{i,t}$ can be decomposed as

$$\varepsilon_{i,t} = w_i + u_{i,t} \ , \quad (2)$$

where w_i denotes time-invariant country-specific characteristics and $u_{i,t}$ is the combined time-series and cross-section error term. The random effects estimation treats the country-specific effects (w_i) as random. However, it requires that they are uncorrelated with the explanatory variables included in the estimated equation. If this condition is violated, the GLS random effects estimator yields

inconsistent estimates. Therefore, a Hausman (1978) test for misspecification of the random effects model has been performed for each regression. As the results from this test indicate, the estimates from both baseline regressions and from 25 out of the 30 other random effects regressions are consistent (Tables 2 to 6).

In our baseline specification, all time-variant explanatory variables are lagged by one year. The intention here is to lessen concerns about simultaneity bias. As some determinants, such as life expectancy, are likely to affect school enrollment only after several years, we use a five-year rather than a one-year lag in an alternative specification. We do not use a five-year lag throughout because, according to the results from the Hausman test, such estimates are inconsistent in all regressions to explain the secondary enrollment rate. In the regressions to explain 'average years of schooling' and 'average years of schooling females', we use a ten-year lag because human capital stock has been determined by conditions prevailing many years earlier.

In one alternative specification, we use country averages across years rather than panel data and run OLS regressions. The main intention is to check whether our estimates for the colony dummies are robust to such a modification. Additionally, the cross-country regressions are intended to lessen concerns about both slow adjustment of some control variables and inconsistent estimates from some random effects regressions.

We report robust standard errors throughout. When using panel data, they are adjusted for clustering at the country level. Most of our regressions explain a substantial share of the variability in the data – both over time and between countries (Tables 2 to 6). For example, in our regressions to explain the secondary enrollment rate and the female secondary enrollment rate, 'R^2 overall' is in the range of 0.82 to 0.90.

VI. RESULTS

Tables 2 to 6 present our regression results. Tables 2 and 3 report the results from our main regressions – Table 2 for both genders combined, Table 3 for girls only. While Tables 4 and 5 report the results from the robustness checks using the secondary enrollment rate and the female secondary enrollment rate, respectively, Table 6 reports the results from the regressions using alternative dependent variables. To save space, the estimates for the standard control variables are omitted in Tables 3 to 6. Each of the regressions in these tables additionally uses the same control variables as the corresponding baseline regression reported in Table 2. The only exception is regression 5 of Tables 4 and 5, in which two of the standard controls are replaced by two alternative ones.

Table 2

Main regressions to explain the secondary enrollment rate

	(1)	(2)	(3)	(4)
	Baseline specification	Former British settler colonies coded as former British colonies	Five-year rather than one-year lag on time-variant explanatory variables	Country averages across years rather than panel data
Former Spanish colony	−19.16***	−17.86**	−23.04***	−17.17**
	(6.90)	(7.31)	(6.97)	(7.73)
Former French colony	−14.61***	−13.93***	−17.69***	−9.57***
	(4.34)	(4.24)	(4.88)	(3.24)
Former British colony	1.91	3.07	−0.18	3.16
	(4.31)	(4.39)	(4.93)	(3.92)
Public spending on education	42.57	42.28	6.59	38.87
	(32.56)	(32.55)	(32.73)	(51.53)
Political rights & civil liberties	−1.69	−1.72	−1.85	4.72
	(3.07)	(3.08)	(3.38)	(5.26)
Life expectancy	0.81*	0.82*	0.61	0.80
	(0.42)	(0.42)	(0.42)	(0.73)
Death rate	9.93	10.00	6.16	−6.72
	(6.32)	(6.30)	(7.16)	(9.76)
Urbanization rate	32.54***	32.46***	31.74**	28.73***
	(10.66)	(10.59)	(12.57)	(9.96)
Population ages 0-14	−1.01***	−1.01***	−0.98***	−1.29***
	(0.21)	(0.21)	(0.24)	(0.39)
Ethnic fractionalization	−8.98	−9.33*	−10.51*	−2.70
	(5.58)	(5.62)	(5.99)	(5.36)
GDP per capita	−1.39	−1.42	−2.85	0.50
	(1.26)	(1.27)	(1.89)	(1.92)
GDP growth rate	−11.33	−11.39	−1.11	41.89
	(8.21)	(8.22)	(5.52)	(48.37)
Private credit	1.94	1.93	2.32	−6.37
	(1.56)	(1.55)	(3.09)	(5.55)
Physical capital stock	−1.35***	−1.36***	−1.15***	−0.46
	(0.46)	(0.45)	(0.44)	(0.32)
Openness	−3.52	−3.52	−0.40	1.84
	(2.42)	(2.41)	(2.99)	(4.50)
Protestant population	2.70	2.63	5.97	12.86***
	(8.76)	(8.74)	(8.85)	(4.86)
Roman Catholic population	−4.32	−4.24	−1.01	1.73
	(6.73)	(6.71)	(6.70)	(4.47)
Muslim population	1.03	1.13	0.78	−0.67
	(5.82)	(5.88)	(6.13)	(5.18)
Eastern religions population	−1.75	−1.92	8.24	−9.66
	(9.03)	(9.02)	(10.22)	(8.18)
Tropical area	−7.15	−6.93	−8.77	−1.10
	(4.55)	(4.51)	(5.34)	(4.19)
Navigable water	0.79	0.63	0.82	−6.38*
	(4.33)	(4.25)	(4.97)	(3.66)
Number of observations	2,009	2,009	1,702	141
Number of countries	141	141	136	141
R^2 within	0.68	0.68	0.63	n/a
R^2 between	0.86	0.86	0.84	n/a

(Continues)

Table 2.
(Continued)

	(1)	(2)	(3)	(4)
	Baseline specification	Former British settler colonies coded as former British colonies	Five-year rather than one-year lag on time-variant explanatory variables	Country averages across years rather than panel data
R^2 overall	0.83	0.83	0.83	0.89
Hausman test (χ^2 statistic)	59.15	56.80	112.65***	n/a

Notes: GLS estimates with country-specific random effects, except for column 4, which reports OLS estimates from a regression using cross-country rather than panel data. All regressions also include four regional dummies (Africa and the Middle East, America, Asia, Europe) and a constant term. Regressions 1, 2 and 3 additionally include year dummies. The colony, fractionalization, geographic and regional variables are time-invariant. In regressions 1, 2 and 3, all other variables vary over time and use annual data for the years 1972 to 2012. For regression 4, the data have been averaged across these years. In regressions 1 and 2, all time-variant explanatory variables are lagged by one year. In regression 3, the lag is five years. In regression 2, the former British colonies include Britain's former settler colonies that enjoyed broad privileges of home rule (Australia, Canada, Israel, New Zealand and United States). Robust standard errors are reported in parentheses. In regressions 1, 2 and 3, they are adjusted for clustering at the country level.***(**/*) denotes statistically significant at the 1%(5%/10%) level.

The estimates consistently indicate that, over the 1972 to 2012 period, secondary enrollment was lower both in former Spanish and in former French colonies. This is the case for the combined group of boys and girls as well as for girls only. In most of the robustness checks reported in Tables 4 and 5, the size of the coefficients on the two colony variables is very similar to the respective estimate from the corresponding baseline regression. The results are also very similar when including the former British settler colonies in the group of former British colonies; when extending the lag on time-variant controls from one to five years; when using country averages rather than panel data; and when using net rather than gross enrollment rates. Additionally, we find that between 1975 and 2010 adults both in former Spanish and in former French colonies had fewer years of schooling, ceteris paribus. Only primary education was no longer affected by the colonial past.

Except for basic education, the colonial past seems to have left a large imprint on both former French and, especially, former Spanish colonies. Specifically, in the latter countries during the 1972–2012 period the secondary enrollment rate was at least 17 percentage points and the net secondary enrollment rate roughly 16 percentage points lower than in other countries, ceteris paribus. The corresponding figures for the former French colonies are 10 and 14 percentage points, respectively. In both groups of countries, adults attained about 1.6 fewer years of schooling, ceteris paribus. These figures are for both genders combined. The effect on females is larger still. Specifically, in the former French colonies the

Table 3

Main regressions to explain the female secondary enrollment rate

	(1)	(2)	(3)	(4)
	Baseline specification	Former British settler colonies coded as former British colonies	Five-year rather than one-year lag on time-variant explanatory variables	Country averages across years rather than panel data
Former Spanish colony	−20.50***	−19.30***	−23.62***	−15.61*
	(6.56)	(6.93)	(6.78)	(7.94)
Former French colony	−15.97***	−15.62***	−19.47***	−11.55***
	(4.07)	(4.05)	(4.59)	(3.37)
Former British colony	3.30	3.97	0.74	3.93
	(4.32)	(4.37)	(4.74)	(4.27)
Standard control variables	Yes	Yes	Yes	Yes
Number of observations	1,906	1,906	1,613	141
Number of countries	141	141	136	141
R^2 within	0.69	0.69	0.62	n/a
R^2 between	0.88	0.88	0.87	n/a
R^2 overall	0.84	0.84	0.83	0.90
Hausman test (χ^2 statistic)	33.30	32.52	61.03	n/a

Notes: GLS estimates with country-specific random effects, except for column 4, which reports OLS estimates from a regression using cross-country rather than panel data. Each regression uses the same control variables as the corresponding regression reported in Table 2. For brevity, the estimates for these standard control variables are omitted. All regressions also include four regional dummies (Africa and the Middle East, America, Asia, Europe) and a constant term. Regressions 1, 2 and 3 additionally include year dummies. The colony, fractionalization, geographic and regional variables are time-invariant. In regressions 1, 2 and 3, all other variables vary over time and use annual data for the years 1972 to 2012. For regression 4, the data have been averaged across these years. In regressions 1 and 2, all time-variant explanatory variables are lagged by one year. In regression 3, the lag is five years. In regression 2, the former British colonies include Britain's former settler colonies that enjoyed broad privileges of home rule (Australia, Canada, Israel, New Zealand and United States). Robust standard errors are reported in parentheses. In regressions 1, 2 and 3, they are adjusted for clustering at the country level.***(**/*) denotes statistically significant at the 1%(5%/10%) level.

secondary enrollment rate was at least 12 percentage points lower, the net secondary enrollment rate approximately 15 percentage points lower and the duration of schooling about 1.8 years shorter than in other countries, ceteris paribus. Most of our estimates suggest that in the former Spanish colonies, the effect on females was larger too, the gap vis-à-vis the combined group of males and females being about as large as in the French case.

In contrast to the estimates for the former Spanish and French colonies, the coefficient on the 'former British colony' variable is statistically insignificant throughout, both when looking at the combined group of males and females and when looking at females only. This is the case in the regressions to explain the secondary enrollment rate, including when the former British settler colonies are coded as former British colonies. It is also the case in the regressions to explain the net secondary enrollment rate, the primary enrollment rate and

Table 4

Supplementary regressions to explain the secondary enrollment rate

	(1)	(2)	(3)	(4)	(5)
	Years compulsory at secondary level added	Population ages 65+ added	Population growth rate added	Religious fractionalization added	Latitude substituted for tropical area and landlocked substituted for navigable water
Former Spanish colony	−16.96**	−19.02***	−18.68***	−19.44***	−17.62**
	(7.29)	(6.80)	(6.88)	(6.86)	(6.86)
Former French colony	−14.26***	−14.40***	−14.47***	−14.57***	−14.90***
	(4.83)	(4.37)	(4.32)	(4.38)	(4.33)
Former British colony	2.61	1.63	2.13	2.03	2.86
	(4.93)	(4.33)	(4.32)	(4.48)	(4.33)
Years compulsory at secondary level	0.73*				
	(0.42)				
Population ages 65+		−0.73			
		(0.60)			
Population growth rate			−0.51		
			(0.56)		
Religious fractionalization				−0.97	
				(7.04)	
Latitude					22.45*
					(13.07)
Landlocked					−2.96
					(3.02)
Standard control variables	Yes	Yes	Yes	Yes	Yes
Number of observations	932	2,009	2,007	2,009	2,009
Number of countries	122	141	141	141	141
R^2 within	0.30	0.68	0.69	0.68	0.68
R^2 between	0.85	0.86	0.86	0.86	0.86
R^2 overall	0.82	0.84	0.83	0.83	0.84
Hausman test (χ^2 statistic)	33.84	62.74	72.14*	63.42	24.68

(Continues)

Table 4

(Continued)

	(6)	(7)	(8)	(9)	(10)
	Physical investment added	Inflation rate added	Systemic banking crises added	Natural disasters added	Wars added
Former Spanish colony	−19.39***	−19.20***	−18.86***	−19.34***	−19.26***
	(6.77)	(6.90)	(6.87)	(6.84)	(6.89)
Former French colony	−14.52***	−14.44***	−14.76***	−14.48***	−14.83***
	(4.39)	(4.30)	(4.35)	(4.30)	(4.31)
Former British colony	2.01	2.03	1.80	2.10	1.73
	(4.38)	(4.29)	(4.32)	(4.31)	(4.31)
Physical investment	5.25				
	(6.01)				
Inflation rate		−0.03			
		(0.11)			
Systemic banking crises			−1.66*		
			(0.88)		
Natural disasters				2.94	
				(2.38)	
Wars					−11.32
					(14.36)
Standard control variables	Yes	Yes	Yes	Yes	Yes
Number of observations	2,000	2,001	2,009	2,008	2,009
Number of countries	141	141	141	141	141
R^2 within	0.68	0.68	0.68	0.69	0.68
R^2 between	0.86	0.87	0.86	0.86	0.86
R^2 overall	0.83	0.84	0.83	0.83	0.83
Hausman test (χ^2 statistic)	67.72*	34.45	68.57*	79.35**	61.43

Notes: GLS estimates with country-specific random effects. Unless otherwise noted at the top of the table, each regression additionally uses the same control variables as the corresponding baseline regression reported in Table 2. For brevity, the estimates for these standard control variables are omitted. All regressions also include four regional dummies (Africa and the Middle East, America, Asia, Europe), year dummies and a constant term. The colony, fractionalization, geographic and regional variables are time-invariant. All other variables vary over time and use annual data for the years 1972 to 2012. In regression 1 the sample period starts not till 1998 because data on 'years compulsory at secondary level' are unavailable for earlier years. All time-variant explanatory variables are lagged by one year. Robust standard errors, adjusted for clustering at the country level, are reported in parentheses.***(**/*) denotes statistically significant at the 1%(5%/10%) level.

Table 5

Supplementary regressions to explain the female secondary enrollment rate

	(1)	(2)	(3)	(4)	(5)
	Years compulsory at secondary level added	Population ages 65+ added	Population growth rate added	Religious fractionalization added	Latitude substituted for tropical area and landlocked substituted for navigable water
Former Spanish colony	−16.53**	−20.20***	−19.51***	−21.23***	−18.49***
	(7.50)	(6.49)	(6.44)	(6.66)	(6.71)
Former French colony	−15.24***	−15.70***	−15.74***	−15.86***	−15.65***
	(4.86)	(4.12)	(4.02)	(4.10)	(4.06)
Former British colony	4.06	2.98	3.57	3.63	4.61
	(5.27)	(4.33)	(4.29)	(4.47)	(4.29)
Years compulsory at secondary level	1.02**				
	(0.44)				
Population ages 65+		−0.99			
		(0.64)			
Population growth rate			−1.00*		
			(0.58)		
Religious fractionalization				−2.63	
				(6.90)	
Latitude					23.49*
					(13.44)
Landlocked					−1.63
					(2.89)
Standard control variables	Yes	Yes	Yes	Yes	Yes
Number of observations	913	1,906	1,904	1,906	1,906
Number of countries	121	141	141	141	141
R^2 within	0.25	0.69	0.69	0.69	0.69
R^2 between	0.86	0.88	0.88	0.88	0.88
R^2 overall	0.82	0.84	0.84	0.84	0.85
Hausman test (χ^2 statistic)	39.01	39.65	45.52	32.43	2.64

Table 5

(Continued)

	(6)	(7)	(8)	(9)	(10)
	Physical investment added	Inflation rate added	Systemic banking crises added	Natural disasters added	Wars added
Former Spanish colony	−20.75***	−20.52***	−20.10***	−20.75***	−20.60***
	(6.49)	(6.56)	(6.51)	(6.52)	(6.57)
Former French colony	−15.98***	−15.85***	−16.14***	−15.79***	−16.25***
	(4.12)	(4.04)	(4.08)	(4.04)	(4.04)
Former British colony	3.36	3.39	3.18	3.51	3.08
	(4.39)	(4.30)	(4.33)	(4.33)	(4.33)
Physical investment	5.87				
	(6.03)				
Inflation rate		−0.31			
		(0.66)			
Systemic banking crises			−1.96**		
			(0.98)		
Natural disasters				2.48	
				(2.27)	
Wars					−14.71
					(16.44)
Standard control variables	Yes	Yes	Yes	Yes	Yes
Number of observations	1,898	1,898	1,906	1,905	1,906
Number of countries	141	141	141	141	141
R^2 within	0.69	0.68	0.69	0.69	0.69
R^2 between	0.88	0.88	0.88	0.88	0.88
R^2 overall	0.84	0.84	0.84	0.84	0.84
Hausman test (χ^2 statistic)	38.42	25.93	29.70	40.44	27.34

Notes: GLS estimates with country-specific random effects. Unless otherwise noted at the top of the table, each regression additionally uses the same control variables as the corresponding baseline regression reported in Table 2. For brevity, the estimates for these standard control variables are omitted. All regressions also include four regional dummies (Africa and the Middle East, America, Asia, Europe), year dummies and a constant term. The colony, fractionalization, geographic and regional variables are time-invariant. All other variables vary over time and use annual data for the years 1972 to 2012. In regression 1 the sample period starts not till 1998 because data on 'years compulsory at secondary level' are unavailable for earlier years. All time-variant explanatory variables are lagged by one year. Robust standard errors, adjusted for clustering at the country level, are reported in parentheses.***(**/*) denotes statistically significant at the 1%(5%/10%) level.

Table 6

Alternative dependent variables

	(1)	(2)	(3)	(4)	(5)	(6)
	Males and females			Females only		
	Net secondary enrollment rate	Primary enrollment rate	Average years of schooling	Female net secondary enrollment rate	Female primary enrollment rate	Average years of schooling females
Former Spanish colony	−16.12**	−9.38	−1.57*	−18.57***	−7.39	−1.76**
	(6.97)	(6.88)	(0.88)	(6.39)	(7.27)	(0.84)
Former French colony	−13.82***	1.19	−1.60***	−14.52***	−1.08	−1.83***
	(4.84)	(4.89)	(0.53)	(4.68)	(5.02)	(0.57)
Former British colony	0.28	0.33	−0.57	2.00	2.51	−0.67
	(4.27)	(3.76)	(0.52)	(4.25)	(4.10)	(0.54)
Standard control variables	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	1,034	2,187	312	990	2,145	312
Number of countries	119	140	110	118	140	110
R^2 within	0.74	0.36	0.87	0.77	0.43	0.87
R^2 between	0.87	0.39	0.80	0.89	0.46	0.82
R^2 overall	0.86	0.39	0.81	0.87	0.48	0.83
Hausman test (χ^2 statistic)	63.50	47.09	n/a	56.30	n/a	41.47***

Notes: GLS estimates with country-specific random effects. Each regression uses the same control variables as the corresponding baseline regression reported in Table 2. For brevity, the estimates for the control variables are omitted. All regressions also include four regional dummies (Africa and the Middle East, America, Asia, Europe), year dummies and a constant term. The colony, fractionalization, geographic and regional variables are time-invariant. All other variables vary over time. In regressions 1, 2, 4 and 5, the time-variant variables use annual data for the years 1972 to 2012. In regressions 3 and 6, they use quinquennial data for the period 1975 to 2010 because data on 'average years of schooling' and 'average years of schooling females' are available at five-year intervals only. In regressions 1, 2, 4 and 5, all time-variant explanatory variables are lagged by one year. In regressions 3 and 6, the lag is ten years. Regressions 3 and 5 fail to meet the asymptotic assumptions of the Hausman test. Robust standard errors, adjusted for clustering at the country level, are reported in parentheses.***(**/*) denotes statistically significant at the 1%(5%/10%) level.

average years of schooling. These results suggest that in former British colonies the colonial past did not negatively affect schooling after independence – very much in contrast to former Spanish and French colonies.

The results for the former Spanish colonies are especially remarkable – not only because the magnitude of the estimated effect for this group is large, in most cases even larger than for the former French colonies, but also because Spain's colonial rule ended much earlier – almost two centuries ago. The fact that the impact of Spanish colonialism is negative is plausible nonetheless, given that many characteristics of Spanish colonial education persisted long after independence (section II.1). These include the continued important role of the Catholic Church, the fact that Spanish remained the sole, or at least dominant, language of instruction, and the very limited provision of education in rural areas and for the poor. Apparently, all of this, as well as the continuing high degree of inequality, had the effect of persistently limiting both the scope of and access to education. The large negative impact of the Spanish colonial past on girls is likely to reflect that their education was mostly neglected under Spanish rule and that this feature, too, persisted long after independence.

The persistent and large effect of former French colonial rule is remarkable too. After all, most former French colonies became independent more than fifty years ago. Similar to the case of Spain, the negative impact of French colonial education is likely due to the fact that, in all former colonies, most of its features persisted after independence (section II.2). Here, the most important features limiting education were the high degree of centralization and government control, the very limited scope for non-governmental organizations to provide education, the neglect of both local conditions and parents' preferences, and the selectivity and elitist nature of the system, which apparently disadvantaged girls in particular. All of this was in stark contrast to education in former British colonies where, based on their colonial past, there was generally a high degree of autonomy of schools and teachers, educational provision was adapted to parents' preferences and local practices, voluntary organizations were subsidized and granted a wide scope to engage and compete, and both the education of girls and secondary schooling were established early on (section II.3). These differences between the ex-French and the ex-British colonies resulted in substantially lower enrollment rates in the former countries – also a continuing trend from the colonial period.

Our results corroborate the hypotheses developed in section II.4. They are also in line with our expectations regarding average years of schooling and primary enrollment. Furthermore, our results accord with previous econometric studies on the effects of colonial education, almost all of which find that these effects persisted long after independence (section III). It is also noteworthy that most of the studies comparing British and French colonial education find that the former had more favorable effects than the latter. This too is in line with our

findings. However, as pointed out in section I, our paper adds to the previous econometric literature in several respects – most importantly by additionally covering former Spanish colonies.

Finally, a brief comment on the estimates for the control variables (Tables 2, 4 and 5). Several of them accord with the previous literature (section V.2). For example, we find higher urbanization to be associated with higher secondary school enrollment. In line with expectations, we find a larger share of children in the population to be negatively associated with secondary enrollment. A higher population growth rate is negatively correlated with secondary schooling of girls, suggesting that during our sample period their education was curtailed when the population grew quickly. Also in line with theory and previous empirical research we find life expectancy to have a positive and ethnic fractionalization to have a negative effect on secondary schooling – although in our data both effects are weak and non-robust.

Interestingly, we find a larger physical capital stock to be negatively correlated with secondary enrollment, suggesting that investment in human capital might have been primarily a substitute for rather than a complement to physical capital. However, the coefficient on 'physical capital stock' is statistically insignificant when using data averaged across years. The coefficient on 'physical investment' is insignificant too.

We also find that countries with a larger share of Protestants in the population had higher secondary enrollment rates. This is likely to reflect the fact that Protestantism has always put a greater emphasis on education than most other religions. 'Protestant population' is significant when using averaged data only though.

'Systemic banking crises' is negatively correlated with the secondary enrollment rate. The effect is slightly stronger among girls. This suggests that during our sample period economic crises adversely affected secondary schooling, especially of girls.

It is plausible that a longer duration of compulsory secondary education is associated with a higher secondary enrollment rate. Interestingly, adding this control variable hardly affects the estimates for the colony dummies, suggesting that during our sample period the colonial legacy did not primarily affect the secondary enrollment rate via governmental regulations on the duration of compulsory secondary education.

VII. CONCLUSION

Our results suggest that the colonial legacy in education had a large negative impact on secondary school enrollment in both Spain's and France's former colonies in the recent past – i.e., long after the end of colonization. The effect is particularly large in Spain's former colonies – which is all the more

remarkable, given that colonization here ended much earlier than elsewhere. Furthermore, we find that in the recent past adults in former Spanish as well as in former French colonies had fewer years of schooling than in other countries. For both secondary enrollment and average years of schooling, the adverse effect on females appears to be particularly large. By contrast, Britain's colonial education does not appear to have adversely affected schooling in its former colonies in the recent past. Although the persistent negative effects of both Spanish and French colonial education are remarkable, they are plausible nonetheless because many characteristics that limited education in these colonies persisted long after independence. In former colonies of Britain, many features of its colonial education persisted too, but these were mostly benign and it is thus unsurprising that we do not find a negative effect of Britain's colonial education.

Our results are in line with other recent econometric studies which also show that colonial-era institutions and policies still affected ex-colonies in the recent past, and that the effects depended on the identity of the colonial power. Particularly, they accord with those studies that show this to be the case for colonial education. As pointed out in section I, our paper adds to this literature in several ways – most importantly by covering not only former French and British but also former Spanish colonies, and also by using a large number of controls.

Although we control for many factors and although our results are robust, plausible and in line with similar studies, more research is clearly warranted. For example, while there are already several in-depth case studies on the long-term effects of colonial education in some former French and British colonies, such studies have yet to be undertaken for almost all former colonies of Spain. Furthermore, for all ex-colonies the causes and characteristics of the persistence of the colonial legacy need to be better understood. Given the importance of the colonial legacy in education, a better understanding appears to be a key prerequisite for successful educational reform.

REFERENCES

Acemoglu, Daron, Simon Johnson and James A. Robinson (2001). The Colonial Origins of Comparative Development: An Empirical Investigation, *American Economic Review*. 91(5): 1369–1401.

Aldrich, Robert (1996). *Greater France: A History of French Overseas Expansion*. Basingstoke: Palgrave Macmillan.

Alesina, Alberto, Reza Baqir and William Easterly (1999). Public Goods and Ethnic Divisions, *Quarterly Journal of Economics.* 114(4): 1243–1284.

Alesina, Alberto, Arnaud Devleeschauwer, William Easterly, Sergio Kurlat and Romain Wacziarg (2003). Fractionalization, *Journal of Economic Growth.* 8(2): 155–194.

Arrey-Wastavino, Angela M. (2015). Chile, *Education Encyclopedia*. Available at http://education.stateuniversity.com, accessed 4 January 2015.

Becker, Gary S. and H. Gregg Lewis (1973). On the Interaction between the Quantity and Quality of Children, *Journal of Political Economy*. 81(2, Pt. 2): S279–S288.

Becker, Sascha O. and Ludger Woessmann (2009). Was Weber Wrong? A Human Capital Theory of Protestant Economic History, *Quarterly Journal of Economics.* 124(2): 531–596.

Bellenoit, Hayden J. A. (2007). *Missionary Education and Empire in Late Colonial India, 1860–1920*. London: Pickering and Chatto.

Benavot, Aaron and Phyllis Riddle (1988). The Expansion of Primary Education, 1870–1940: Trends and Issues, *Sociology of Education.* 61(3): 191–210.

Berman, Edward H. (1975). Christian Missions in Africa, in: Edward H. Berman (ed), *African Reactions to Missionary Education*. New York: Teachers College Press: 1–53.

Bernhard, Michael, Christopher Reenock and Timothy Nordstrom (2004). The Legacy of Western Overseas Colonialism on Democratic Survival, *International Studies Quarterly.* 48(1): 225–250.

Bertocchi, Graziella and Fabio Canova (2002). Did Colonization Matter for Growth? An Empirical Exploration into the Historical Causes of Africa's Underdevelopment, *European Economic Review.* 46(10): 1851–1871.

Boikos, Spyridon, Alberto Bucci and Thanasis Stengos (2013). Non-Monotonicity of Fertility in Human Capital Accumulation and Economic Growth, *Journal of Macroeconomics.* 38(A): 44–59.

Bolt, Jutta and Dirk Bezemer (2009). Understanding Long-Run African Growth: Colonial Institutions or Colonial Education? *Journal of Development Studies.* 45(1): 24–54.

Brown, David S. (2000). Democracy, Colonization, and Human Capital in Sub-Saharan Africa, *Studies in Comparative International Development.* 35(1): 20–40.

Bryant, Jo Anne R. (2015). Syria, *Education Encyclopedia*. Available at http://education.stateuniversity.com, accessed 4 January 2015.

Burkholder, Mark A. and Lyman L. Johnson (2014). *Colonial Latin America*, 9th edn. Oxford: Oxford University Press.

Castelló-Climent, Amparo and Ana Hidalgo-Cabrillana (2012). The Role of Educational Quality and Quantity in the Process of Economic Development, *Economics of Education Review.* 31(4): 391–409.

Cervellati, Matteo and Uwe Sunde (2005). Human Capital Formation, Life Expectancy, and the Process of Development, *American Economic Review.* 95(5): 1653–1672.

Chaudhary, Latika (2012). *Caste, Colonialism and Schooling: Education in British India*, mimeo. Claremont (CA): Scripps College.

Clignet, Remi P. and Philip J. Foster (1964). French and British Colonial Education in Africa, *Comparative Education Review.* 8(2): 191–198.

Cogneau, Denis (2003). Colonisation, School and Development in Africa: An Empirical Analysis, Working Paper DT/2003/01. DIAL – UR CIPRÉ de l'IRD.

Cogneau, Denis and Alexander Moradi (2014). Borders that Divide: Education and Religion in Ghana and Togo since Colonial Times, *Journal of Economic History.* 74(3): 694–729.

Corbett, Edward M. (1972). *The French Presence in Black Africa*. Washington, D.C.: Black Orpheus Press.

Cowan, L. Gray, James O'Connell and David G. Scanlon (1965). Introduction, in: L. Gray Cowan, James O'Connell and David G. Scanlon (eds), *Education and Nation-Building in Africa*. London: Pall Mall Press: 3–42.

Crespo Cuaresma, Jesus (2010). Natural Disasters and Human Capital Accumulation, *World Bank Economic Review.* 24(2): 280–302.

Cunningham, Merrilee A. (2015). Ecuador, *Education Encyclopedia*. Available at http://education.stateuniversity.com, accessed 4 January 2015.

De Gregorio, José (1996). Borrowing Constraints, Human Capital Accumulation, and Growth, *Journal of Monetary Economics.* 37(1): 49–71.

Dupraz, Yannick (2013). *British and French Colonial Education in Africa: A Discontinuity Analysis at the Border between French and English Speaking Cameroon*, mimeo. Paris: Paris School of Economics.

Elliott, John H. (2006). *Empires of the Atlantic World: Britain and Spain in America 1492–1830.* New Haven (CT): Yale University Press.

Engerman, Stanley L., Elisa V. Mariscal and Kenneth L. Sokoloff (2009). The Evolution of Schooling in the Americas, 1800–1925, in: David Eltis, Frank D. Lewis and Kenneth L. Sokoloff (eds), *Human Capital and Institutions: A Long Run View*. Cambridge: Cambridge University Press: 93–142.

Eterovic, Dalibor S. and Cassandra M. Sweet (2014). Democracy and Education in Twentieth-Century Latin America, *Economics and Politics.* 26(2): 237–262.

Flug, Karnit, Antonio Spilimbergo and Erik Wachtenheim (1998). Investment in Education: Do Economic Volatility and Credit Constraints Matter? *Journal of Development Economics.* 55(2): 465–481.

Forston, Jane G. (2011). Mortality Risk and Human Capital Investment: The Impact of HIV/AIDS in Sub-Saharan Africa, *Review of Economics and Statistics.* 93(1): 1–15.

Frankema, Ewout H. P. (2012). The Origins of Formal Education in Sub-Saharan Africa: Was British Rule More Benign? *European Review of Economic History.* 16(4): 335–355.

French, Lawrence Armand and Magdaleno Manzanárez (2015). Mexico, *Education Encyclopedia*. Available at http://education.stateuniversity.com, accessed 4 January 2015.

Fry, Gerald W. (2015). Lao, *Education Encyclopedia*. Available at http://education.stateuniversity.com, accessed 4 January 2015.

Garnier, Maurice and Mark Schafer (2006). Educational Model and Expansion of Enrollments in Sub-Saharan Africa, *Sociology of Education*. 79(2): 153–175.

Gelpi, Ettore (2014). Education in British Colonies and Former Colonies, *Encyclopedia Britannica.* Available at http://www.britannica.com, accessed 27 November 2014.

Gifford, Prosser and Timothy C. Weiskel (1971). African Education in a Colonial Context: French and British Styles, in: Prosser Gifford and W. M. Roger Louis (eds), *France and Britain in Africa: Imperial Rivalry and Colonial Rule*. New Haven (CT): Yale University Press: 663–711.

Grier, Robin M. (1999). Colonial Legacies and Economic Growth, *Public Choice.* 98(3–4): 317–335.

Griffin, Ernst C. (2015). Mexico – Government and Society, *Encyclopedia Britannica*. Available at http://www.britannica.com, accessed 3 January 2015.

Griliches, Zvi (1969). Capital-Skill Complementarity, *Review of Economics and Statistics.* 51(4): 465–468.

Hanushek, Eric A. (1992). The Trade-off between Child Quantity and Quality, *Journal of Political Economy*. 100(1): 84–117.

Haring, Clarence H. (1947). *The Spanish Empire in America*. New York: Oxford University Press.

Hashem, Mahboub E. (2015). Lebanon, *Education Encyclopedia*. Available at http://education.stateuniversity.com, accessed 4 January 2015.

Hausman, Jerry A. (1978). Specification Tests in Econometrics, *Econometrica.* 46(6): 1251–1271.

Heggoy, Alf Andrew (1984). Colonial Education in Algeria: Assimilation and Reaction, in: Philip G. Altbach and Gail P. Kelly (eds), *Education and the Colonial Experience*, 2nd revised edition. New Brunswick (NJ): Transaction Books: 97–116.

Heylen, Freddy and Lorenzo Pozzi (2007). Crises and Human Capital Accumulation, *Canadian Journal of Economics.* 40(4): 1261–1285.

Huillery, Elise (2009). History Matters: The Long-Term Impact of Colonial Public Investments in French West Africa, *American Economic Journal: Applied Economics*. 1(2): 176–215.

Jaimes, Héctor (2015). Venezuela, *Education Encyclopedia*. Available at http://education.stateuniversity.com, accessed 4 January 2015.

James, Lawrence (1998). *The Rise and Fall of the British Empire*. Abacus: London.

Kalemli-Ozcan, Sebnem, Harl E. Ryder and David N. Weil (2000). Mortality Decline, Human Capital Investment, and Economic Growth, *Journal of Development Economics*. 62(1): 1–23.

Kamen, Henry (2003). *Empire: How Spain Became a World Power, 1492–1763*. New York: HarperCollins.

Kelly, Gail P. (1984). Colonialism, Indigenous Society, and School Practices: French West Africa and Indochina, 1918–1938, in: Philip G. Altbach and Gail P. Kelly (eds), *Education and the Colonial Experience*, 2nd revised edition. New Brunswick (NJ): Transaction Books: 9–32.

Lake, David A. and Matthew A. Baum (2001). The Invisible Hand of Democracy: Political Control and the Provision of Public Services, *Comparative Political Studies*. 34(6): 587–621.

Lee, Alexander and Kenneth A. Schultz (2012). Comparing British and French Colonial Legacies: A Discontinuity Analysis of Cameroon, *Quarterly Journal of Political Science*. 7(4): 365–410.

Lockhart, James and Stuart B. Schwartz (1983). *Early Latin America: A History of Colonial Spanish America and Brazil*. Cambridge: Cambridge University Press.

Méndez, Fabio and Facundo Sepúlveda (2012). The Cyclicality of Skill Acquisition: Evidence from Panel Data, *American Economic Journal: Macroeconomics*. 4(3): 128–152.

Mincer, Jacob (1996). Economic Development, Growth of Human Capital, and the Dynamics of the Wage Structure, *Journal of Economic Growth.* 1(1): 29–48.

Morris, Bernard E. (2015). Argentina, *Education Encyclopedia*. Available at http://education.stateuniversity.com, accessed 4 January 2015.

Newland, Carlos (1991). Spanish American Elementary Education before Independence: Continuity and Change in a Colonial Environment, *Itinerario*. 15(2): 79–95.

Paasche, Karin I. (2015). Djibouti, *Education Encyclopedia*. Available at http://education.stateuniversity.com, accessed 4 January 2015.

Papagapitos, Agapitos and Robert Riley (2009). Social Trust and Human Capital Formation, *Economics Letters.* 102(3): 158–160.

Poterba, James M. (1997). Demographic Structure and the Political Economy of Public Education, *Journal of Policy Analysis and Management.* 16(1): 48–66.

Ranjan, Priya (2001). Dynamic Evolution of Income Distribution and Credit-Constrained Human Capital Investment in Open Economies, *Journal of International Economics.* 55(2): 329–358.

Raquidel, Danielle (2015). Bolivia, *Education Encyclopedia.* Available at http://education.stateuniversity.com, accessed 4 January 2015.

Reich, Jerome R. (2011). *Colonial America*, 6th edn. Boston (MA): Prentice Hall.

Rudra, Nita and Stephan Haggard (2005). Globalization, Democracy, and Effective Welfare Spending in the Developing World, *Comparative Political Studies.* 38(9): 1015–1049.

Sagini, Meshack M. (2015). Madagascar, *Education Encyclopedia*. Available at http://education.stateuniversity.com, accessed 4 January 2015.

Scanlon, David G. (ed, 1964). *Traditions of African Education*. New York: Columbia University Press.

Soares, Rodrigo R. (2005). Mortality Reductions, Educational Attainment, and Fertility Choice, *American Economic Review*. 95(3): 580–601.

Stoler, Avraham and David Meltzer (2013). Mortality and Morbidity Risks and Economic Behavior, *Health Economics*. 22(2): 132–143.

Swink, Roland Lee (2014). Education in French Colonies and Former Colonies, *Encyclopedia Britannica*. Available at http://www.britannica.com, accessed 26 November 2014.

Waldinger, Maria (2013). *Colonial Missionaries and Long Run Development in Mexico*, mimeo. London: London School of Economics and Political Science.

Watras, Joseph and Isabel Cavour (2015). Colombia, *Education Encyclopedia*. Available at http://education.stateuniversity.com, accessed 4 January 2015.

White, Bob W. (1996). Talk about School: Education and the Colonial Project in French and British Africa (1860–1960), *Comparative Education*. 32(1): 9–25.

SUPPORTING INFORMATION

Additional supporting information may be found in the online version of this article at the publisher's website (http://dx.doi.org/10.1111/kykl.12102)

Appendix A. List of variables

Appendix B. References for list of variables

SUMMARY

Both Spanish and French colonial education included several features that restricted education. Many of them persisted long after independence. Against this background, this paper econometrically studies whether in the recent past the colonial legacy still affected schooling in the ex-colonies of these two former colonial powers – and, for comparison, in the ex-colonies of Britain, the third of the former big three colonial powers. Using a large sample of countries and numerous controls, it finds substantial negative effects on both secondary enrollment and average years of schooling in former French and, especially, in former Spanish colonies. The negative effects on females are particularly large. By contrast, there are no effects in former British colonies.