

# Long-Term Consequences of Colonial Institutions and Human Capital Investments: Sub-National Evidence from Madagascar

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**Summary.** — This study from Madagascar exploits local variation in the timing and organization of colonial settlement and missionary education to distinguish long-run effects of colonial institutions and human capital. Results indicate that only colonial institutions had robust impacts on local economic outcomes. Analysis of transmission mechanisms suggests that these effects are explained by higher-quality property rights institutions, but not by persistence in economic activities like the production of cash crops. There are also indications that migration-induced human capital spill-overs from missionary areas contributed to superior outcomes in former settler districts.

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## 1. INTRODUCTION

Most analysts of economic history agree that institutions and human capital matter for development. However, they often differ about the timing of these two factors in the development process. Proponents of institutionalist approaches argue that legal and political reforms are at the origin of successful growth performances. This case has been made forcefully by Acemoglu, Johnson, and Robinson (2001, 2002), who posit that former colonies that were chosen for European settlement do better today due to the higher quality of the institutions they received in the colonial era (Acemoglu *et al.*, 2001, 2002, see also Dell, 2010; Gallego, 2010; Savoia, Easaw, & McKay, 2010; Yasar, Morrison Paul, & Ward, 2011). While the authors acknowledge that better institutions tend to be associated with higher rates of investment in human capital, they interpret this as a result, not cause, of institutional development (Acemoglu & Robinson, 2006, 2012, see also Banerjee & Iyer, 2005; Iyer, 2010).

The competing view places human capital and education at the beginning of the causal chain. Theorists of economic modernization have long maintained that education can be a potent driver of economic growth and political reform (see for example Lipset, 1960). This argument has been repeated more recently in a widely-cited study by Glaeser, La Porta, Lopez de Silanes, and Shleifer (2004), who claim that educational investments and the skill advantage of Europeans in the colonial period are sufficient for explaining higher growth rates and better political outcomes in colonies that were identified as ‘success cases’ under the institutionalist view. Subsequent studies have made similar arguments, based on estimates of long-run effects of historical stocks of human capital (Bolt & Bezemer, 2009; Duflo, 2001; Glaeser *et al.*, 2004; Huillery, 2010; Wantchekon, Novta, & Klasnja, 2013), and missionary education campaigns (Gallego & Woodberry, 2010; Grier, 1997; Lankina & Getachew, 2012; Nunn, 2011; Woodberry, 2012, see also Becker and Woessmann, 2009).

The primary problem in the institutions *versus* human capital debate has been a shortage of appropriate empirical specifications. Earlier comparisons of the long-term effects of colonial institutions and human capital have relied almost

exclusively on cross-country data.<sup>1</sup> This has complicated identification of the relevant causal mechanisms, because colonial institutions and education, as well as their respective instruments, are typically observed simultaneously at the national level (Glaeser *et al.*, 2004; Nunn, 2009; Savoia *et al.*, 2010).<sup>2</sup> Also more recent contributions that rely on sub-national data do not typically account for possible interactions between institutions and human capital within localities. For example a new article by Gennaioli, La Porta, Lopez-de-Silanes, and Shleifer (2013), who document that economic effects of local human capital outweigh those of local institutions in a large sample of developing and developed regions, only uses contemporaneous data (see also Acemoglu & Dell, 2010). As a consequence, the authors cannot fully account for the possibility that local skill and education levels are influenced by the quality of local institutions, or by other local processes of endogenous human capital accumulation, like domestic migration or learning-related spill overs (Glaeser & Gottlieb, 2009; Lucas, 1988; Romer, 1990).

This study from Madagascar seeks to overcome these shortcomings by exploiting historical differences in the timing and organization of historical school investments and colonial legal-institutional reforms. As in many other countries in equatorial Africa formal education for most of the 19th century was exclusively provided by Christian missionaries. These interventions occurred several decades before the imposition of French colonial rule and were thus unrelated to the economic or military objectives of the colonizers. Institutional divides between missionaries and the colonial administration

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remained intact in the colonial era, due to the French doctrine of the separation between the state and the church. I argue that this setting justifies treating human capital investments in the heydays of missionary activity as exogenous to the introduction of modern legal and economic institutions. Additional historical and statistical evidence also suggests that 19th century missionary work and colonial exploitation were two unrelated processes with little overlap in the spatial organization of religious schools and French colonial activities.

The study findings indicate that colonial institutions had comparatively stronger effects on local economic outcomes than missionary school investments. Using district-level European population proportions as a proxy for the quality of local property rights and legal institutions (Easterly & Levine, 2012; Hariri, 2012, see also Acemoglu *et al.*, 2001, 2002), I find positive long-term effects on current rates of household consumption. This result holds across a wide range of specifications and robustness tests, including controls for historical and geographic conditions, regional fixed effects, instrumental variable estimates, and tests with data from alternative time periods. There is also support for the postulated institution-based transmission mechanism. For example, even controlling for colonial era incomes (wages) and school investments in subsequent periods I find a strong and robust residual effect of historical European presence that could be attributed to underlying differences in local institutional quality. There are also direct signs of persistence in local institutional outcomes: districts that benefited from stronger property rights in the colonial period continue to have more developed land titling systems and higher levels of investments in manufacturing activity today.

My findings provide much less support for the claim that education alone can ‘kick start’ economic growth. Contrary to recent evidence about the dominant role of human capital in local economic growth (Acemoglu & Dell, 2010; Gennaioli *et al.*, 2013), I find no significant association between past school investments and current district level incomes. I speculate that this result primarily has to do with the very uneven integration of religious schools in the colonial and postcolonial economy. While religious education was relatively well embedded in the political and economic structures of precolonial Madagascar, links to local markets were often weakened when existing economic relations and inward-looking processes of development were disrupted in the colonial period. There are also signs that, even though former missionary areas continued to benefit from better supply of private schools, many advantages related to education were lost due to migration of educated adults to more dynamic districts in areas of former colonial exploitation. These results are consistent with endogenous processes of human capital formation that are often mentioned in the literature on economic geography and urban agglomeration (Acemoglu & Dell, 2010; Gennaioli *et al.*, 2013; Glaeser & Gottlieb, 2009; Lucas, 1988; Romer, 1990). However, there are no signs that human capital spill overs alone explain higher growth rates in former settler areas.

The paper contributes in several ways to the wider literature about colonial institutions and human capital in sub-Saharan Africa. The detailed analysis of European activities across localities of Madagascar represents, to my knowledge, the first systematic attempt to document the very uneven penetration of African territories by the colonial state. This is particularly relevant in the historical context of indirect colonial rule, which is often seen as a cause of the highly uneven development of local markets and institutions within African nations (Lange, 2004; Mamdani, 1996).

The findings also contain lessons for the design of education and development policies. Missionaries in Madagascar in many ways can be compared to developmental NGOs in sub-Saharan Africa today, in that they provided schooling to populations that were often marginal to the national economy (Baldwin, 2011; Bratton, 1989). My findings suggest that contemporary development strategies that rely on educational investments alone are less likely to have a strong impact on local economic outcomes. In the setting of Madagascar former missionary areas appear to have failed to reap the benefits of better local education supply because religious school investments were not accompanied by a parallel development of local labor markets (see also Easterly, 2002, 71ff; Pritchett, 2001).

The paper proceeds as follows. The next section discusses the country context, followed by a description of the historical data and instrumental variable strategy of the paper (Section 3). Section 4 presents the basic results. Section 5 discusses threats to causal identification and the results of robustness tests. Section 6 explores transmission mechanisms. The last section discusses the policy implications and generalizability of the findings and concludes.

## 2. COUNTRY CONTEXT

The methodological design of the paper centrally depends on the independence of religious school investments and colonial institutions. This is primarily assured by large differences in the timing of missionary work and colonial rule in Madagascar. The first missionaries to establish a permanent presence in the island, Anglican priests of the London Missionary Society (LMS), arrived in 1820, three quarters of a century before the imposition of French colonial rule. They were invited by Radama I (1810–28) the king of the precolonial Merina Empire, to baptize and educate the ruling elites in the capital Antananarivo.<sup>3</sup> Also in the following decades missionary work continued to thrive under Merina rule. As with other African kingdoms with expanding and ethnically diverse populations (Ranger & Vaughan, 1993), Merina rulers relied on missionaries to modernize political institutions and unify conquered tribes. Following a tumultuous period under the long reign of Queen Ranavalona I (1828–61), the Merina court officially converted to Christianity in 1869 and local congregations and schools created by European missionaries were turned over to a newly formed state church (Ellis, 1985; Raison-Jourde, 1983, 1991). This close link to the Merina state greatly facilitated the expansion of churches and mission schools. Church attendance increased to over 150,000 adherents as a result of the court’s conversion and churches were built across the Merina Empire. These churches were often built “with the villagers’ own hands and money, serving ‘in nine cases out of ten’ as a schoolroom during the week” (Ellis, 1985, 19, citing a report by the missionary J. Pearse).

Most historical observers agree that this enabled most missionary groups to establish the bulk of their church and school networks by the time French rule was imposed in 1896. The LMS and other Protestant churches reported close to 137,000 students in school by the time of the colonial conquest (Deschamps, 1960, 220; Koerner, 1999, 122, see also Hugon, 1980). Catholic missionaries, who began to compete with reformist churches since the middle of the 19th century, also invested heavily in education. In 1895 the Catholic Church taught 24,901 students, including almost as many girls as boys (Koerner, 1999, 77).<sup>4</sup> Missionaries further influenced local development outcomes through the introduction of various

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