

Who Counts? Information Capacity and the Origins of Education Inequality in Morocco

Gabriel Koehler-Derrick
gkd225k@nyu.edu
New York University Abu Dhabi

Abstract

Education drives economic growth. However, many developing countries are characterized by high variation in local education outcomes. This article argues that the expansion of public education in former colonies was shaped by the relative inclusivity of civil registration under colonialism, which determined local information capacity of the state at independence. Where information was low, governments were less likely to build schools, and enforcing policies like compulsory schooling was more difficult. These theoretical claims are tested in Morocco, a lower middle income country and former French colony characterized by stark variation in local education outcomes.

Acknowledgments

The author wishes to acknowledge the statistical offices that provided the underlying data making this research possible: the Department of Statistics, Morocco. Amani Selmi and Rita Slaoui provided research assistance. Thanks to Ariane Salem and Ambra Seck for sharing data. Scott Walker assisted with map digitization. Thanks to Lydia Assouad, Samuel Bazzi, Matt Blackwell, Jeremy Bowles, Steven Brooke, Melani Cammett, Andy Harris, Allison Hartnett, Hanno Hilbig, Horacio Larreguy, Melissa Lee, Benjamin Marx, Nathan Nunn, Christopher Paik, Soledad Prillaman, Matthew Reichert, James Robinson, Ariane Salem, and Daniel Ziblatt for their comments. All errors are my own.

Introduction

Education drives economic growth (North and Thomas 1973). Decades of experimental (Kremer and Holla 2009), and observational evidence (Duflo 2001), demonstrate that education has been *a*, if not, *the* key driver of economic development for more than a century (Gennaioli, Lopez-de Silanes and Shleifer 2013). Despite education’s theoretical prominence and empirical impact, we are only beginning to understand why some countries expanded access to public education while others did not, and why these efforts were successful in some cases but not others (Paglayan 2020, 2022). In other words, we know much more about the effects of mass education, than its origins.

This gap in the literature is particularly acute in the developing world. While there are many possible explanations for variation in the expansion of public education, the legacies of colonial institutions loom large in the existing literature (Cogneau and Moradi 2014, Dupraz 2019, Gallego 2010, Acemoglu, Gallego and Robinson 2014, Huillery 2009, Hong and Paik 2018, Saleh 2016). Two distinct channels link colonialism and the *supply of* and *demand for* mass education post-independence.

A large body of scholarship argues that demand for public schooling was high post-independence, and attributes low rates of enrollment to failures in the supply of public schooling. From a dearth of facilities, to failures in the oversight, administration, and quality of instruction, these explanations lay responsibility for low rates of enrollment squarely at the feet of public officials (Pritchett 2013). These challenges were particularly acute in former colonies, because colonial governments invested little in education (Benavot and Riddle 1988), tending to prioritize security and infrastructure (Young 1994).¹ While some settler colonies made concerted efforts to replicate the expansion of public education in the metropole, these initiatives typically prioritized educating European citizens, rather than colonial subjects (Cappelli and Baten 2017). In most colonies, it was only after World War I that serious deliberations about expanding public education emerged, and only after

¹For a notable exception see Hong and Paik (2018).

World War II that any significant expansion of public schools occurred. Given decades of limited spending on education under colonialism, most former colonies took two steps to expand public schooling post-independence. First, governments expanded access to primary schooling and devoted considerable resources to training teachers and bureaucrats to staff and oversee this expansion (Dufflo 2001, Kramon and Posner 2016, Salah, Chambru and Fourati 2022). Second, most former colonies, following a template established in the late 1800s and early 1900s in the United States and Europe, made primary schooling compulsory (Edwards 1978, Landes and Solmon 1972). However, despite the introduction of compulsory primary education in former colonies all over the world, rates of compliance vary dramatically more than 50 years later (Barro and Lee 2013, Gennaioli, Lopez-de Silanes and Shleifer 2013, Graetz 2020).

A second group of scholars note that there was often considerable variation in the demand for public schooling post-independence. Two broad categories of explanation exist to explain why local demand for public schooling might vary in former colonies post-independence. The first category of explanations highlights the important role played by children in contributing to household production, especially in agriculture. Limited investment in industrialization by colonial governments meant that most former colonies were overwhelmingly reliant on agricultural production post-independence. This meant that even if families recognized the benefits of education, the loss in productivity associated with enrolling their children in primary school was significant, especially in rural areas where the government often had more limited oversight and ability to enforce compulsory schooling (Filmer and Pritchett 2001). A second category of explanation, highlight how identity shapes education preferences. In most colonies education was the purview of the Catholic Church (Valencia Caciado 2019), or Protestant Missionaries for a century or more (Cogneau and Moradi 2014, Frankema 2012, Nunn 2010, 2014).² In sub-Saharan Africa the prominent association between Christianity

²There is considerable variation in the influence of missionary schools across Africa. Morocco's first and most influential *resident general*, Hubert Lyautey, limited missionary schools because he sought to cultivate traditional authorities as allies of the colonial government (Segalla 2009, Chapter 1) (Amster 2014).

and schooling under colonialism increased demand for modern schooling among Christians, but a preference for Quranic schools among Muslims post-independence (Platas 2018).

This article explores an alternative institutional channel through which colonialism shaped education outcomes after independence. It argues that in former colonies, contemporary disparities in education outcomes are in part explained by local variation in one of the defining characteristics of the modern state: information (Mann 1984). It theorizes that colonial policies created disparities in information capacity available to the state post-independence. This local variation in information capacity had long term consequences for both the supply of and demand for public schooling, because the absence of basic demographic data made planning more difficult and the enforcement of policies that relied on legally defined ages, like compulsory education, impractical. In the absence of significant efforts by the state, disparities in information capacity introduced under colonialism could persist for decades facilitating the expansion of public goods where rates of information were relatively high but slowing expansion in areas where rates of registration were low.

I test this theory in Morocco, a developing country characterized by extreme disparities in education outcomes (UNESCO 2020). Although Morocco's colonial period was brief (1913-1956) and the European population never exceeded 6% of the total estimated population, the colonial government systematically prioritized the registration of European citizens over its Muslim and Jewish subjects. At independence, the Moroccan government, like many former settler colonies in Africa, inherited limited information about its own population. Addressing these informational disparities was a major challenge for the Moroccan government, especially in rural areas systematically marginalized by the colonial state where the vast majority of Moroccans lived at independence.

Estimating the effect of information capacity on education outcomes in Morocco is confounded by the fact that colonial administration was clustered in a few major cities: Casablanca, Rabat, Fez, Marrakesh, and Meknes. This raises a concern that many variables could have simultaneously impacted local rates of registration and education outcomes

post-independence. To address concerns of endogeneity and reverse causality, I employ a difference in differences research design. I exploit variation in an exogenous shock to registration to measure a local average treatment effect of this difference in differences on rates of registration and mass education. I show that individuals in provinces impacted by an expansion in the civil registry under colonialism reported a 2% increase in registration, a 2.3% increase in formal school attendance, a 2.4% increase in literacy in French and Arabic, and an increase of $1/5^{\text{th}}$ of a year of formal education post-independence relative to the cohorts born before the law was passed.

This article makes three contributions to a growing body of scholarship on the “informational foundations” of the state (Lee and Zhang 2017). Theoretically it explains why information capacity is often particularly uneven in former colonies, underlining the intimate connection between statistics and mass education (Mann 1984, Paglayan 2020). Empirically it contributes to recent evidence on the significant effects of registration for the provision of public goods (Bowles 2023, Hunter and Brill 2016). Conceptually, it extends previous studies (Brambor et al. 2019, Lee and Zhang 2017), by providing a novel micro level measure of “legibility” that can be generalized to a range of different countries and contexts.

The article proceeds as follows: the next section elaborates a theory that colonial policy shaped local variation in information capacity in former colonies post-independence and explains why this variation was consequential for the provision of public goods like public schooling. I then provide background information on the civil registry in colonial Morocco and describe a reform just prior to independence that provided an exogenous shock to subjects’ incentive to register their children with the colonial administration. The following section introduces the research design that allows me to identify the effects of colonial information capacity on rates of registration and education outcomes and the data I use to test my theoretical claims. I then present my results and conduct a number of tests of the mechanisms linking colonial information capacity and registration and education outcomes post-independence. The article concludes with a discussion of the broader theoretical and

conceptual implications of my argument for patterns of state building in former colonies and the expansion of compulsory education generally.

Colonialism, Information Capacity, and Mass Education

Following its introduction in the late 1700s, civil registration spread rapidly throughout Europe where it became mandatory for all citizens by the late 1800s (Caplan and Torpey 2001). As European governments expanded their overseas empires throughout the 1800s, identification documents and passports became mandatory for citizens traveling overseas. In the colonies, birth certificates were required to register children for schools or receive benefits from the colonial government. As in the metropole, draft registration was imposed on all male citizens of eligible age. In the countryside, citizens registered their property with the cadastral authority to receive protection from rival claims to their land. In the French Empire, identity documents were required to vote in local and national elections.

None of these conditions held for subject populations. No law required that subjects register births and deaths, and when these laws were introduced they were often unenforced. Generally, colonial subjects were ruled as collectives not individuals, especially in rural areas. Military conscription was typically organized through tribal levies, and subjects relied overwhelmingly on traditional property regimes to protect their access to land. Formal restrictions on movement limited internal migration for much of the colonial period. When colonial governments gradually began to expand the provision of public goods to key constituencies, particularly veterans after World War I and World War II, it was forced to create its own system for registering individual veterans and their family members.

These fundamental administrative distinctions between citizen and subject meant that colonial policy drove local variation in formal registration and information after independence. Few subjects outside the urban enclaves populated by Europeans had either the opportunity or incentive to obtain a birth or death certificate or register with authorities, despite representing the overwhelming majority of the population.

At independence former colonies faced a common challenge: how to develop the peripheries neglected by the colonial state, given infrastructure and bureaucratic procedures designed for a tiny minority of departed colonial citizens. However, what little information the state possessed about former subjects was largely restricted to urban populations proximate to former colonial enclaves. This meant that in most instances newly independent states knew little about the rural regions just a short distance from major urban areas. Limited bureaucratic infrastructure and the poor quality of public goods meant there was less incentive to register with the state in these marginalized peripheries. Under such conditions, discrepancies in information at independence proved remarkably durable, absent major intervention by the state.

Given that last names, cadastral records, and civil registries were imposed by the colonial state, why did governments not do away with these arbitrary innovations and come up with other criteria for expanding access to public goods like mass education post-independence?

Because of systematic underinvestment, the first decades after independence required a massive expansion of public infrastructure in former colonies across the developing world. However, in most former colonies, bureaucrats could not afford to simply expand public services everywhere, and had to make difficult decisions about where to allocate scarce resources. In the crucial decades following independence local variation in inherited information capacity functioned as a form of latent state capacity. Greater information capacity meant that planning and implementation were much more likely to be successful than areas where information capacity was limited.

Additionally, formal registration transformed local representatives of the state into gatekeepers. Although states can require a birth certificate to enroll a child in school, where no children are registered this policy is unenforceable. As registration increases, local authorities can deny unregistered families access to public goods like education, increasing the incentive for parents to register. Local disparities in information capacity exacerbated by colonial policies meant that these incentives could vary dramatically across localities. Absent

efforts to expand registration, especially in the countryside, uneven patterns of development introduced by colonialism were much more likely to endure, even when access to these public goods was nominally guaranteed by law.

No theory can account for local variation in information capacity in all places and times. This theory's emphasis on the systematic differentiation between colonial citizens and subjects, means that it is most applicable in former colonies where there was significant local variation in the settler population. Examples include former colonies in South Africa, Algeria, Kenya, Tunisia, Zimbabwe, Namibia, Israel-Palestine, and Morocco. This theory is less applicable in colonies where the settler population was extremely limited, as in the Sahel, and much of South Asia.³

The 1950 Civil Registry Reform

The establishment of the civil registry was one of the foremost priorities of the colonial government in Morocco. Within two years of the declaration of the French Protectorate, a law passed on the 4th of September 1915, made civil registration mandatory for all European citizens. Moroccan subjects had the option of registering births and deaths but were under no legal obligation to do so (Filizzola 1958, Part 1). Instead, Moroccan subjects who needed to prove their place and date of birth, relied on a written statement from an *adoul*, a traditional religious authority, who issued a formal written attestation after receiving testimony from two male witnesses confirming the individual's identity (Decroux 1950, 31-32).

Why were Moroccan subjects excluded from the civil registration system? Historians highlight a number of practical challenges: the absence of patronyms, a limited number of local offices, and widespread illiteracy meant that there was initially little willingness on the part of French colonial officials to extend the civil registry to include Moroccan subjects

³In former settler colonies in the Americas and Oceania that achieved independence before the diffusion of civil registration in the mid-1800s, evidence from Latin America suggests that while colonial settlement certainly shaped information capacity, its effects are confounded by legacies of racial and ethnic discrimination (Hunter and Brill 2016, Loveman 2014, Harbers and Steele 2020).

(Decroux 1952, Filizzola 1958). As a result, few Moroccans beyond a tiny share of elite urban subjects ever registered with the colonial authorities.

Legal scholars cite a meeting of French scholars and government officials (*Congrès des Sociétés Savants d'Afrique du Nord*) in 1938, as the genesis of the first attempt to reform the civil registry. This appears to have been the first official meeting in which the question of whether the the civil registry could be expanded to include Moroccan subjects was raised (Filizzola 1958, 149).⁴ However, any significant attempts at reform were delayed by the outbreak of World War II and it was not until 1944 that negotiations between the French colonial government and their Moroccan counterparts resumed.

By the end of World War II it was obvious that the decision to exclude Moroccans from the civil registry imposed significant constraints on the colonial government. In 1944 Morocco's Resident General, Gabriel Puaux, publicly stated that the expansion of a mandatory civil registry for all Moroccan subjects was "increasingly necessary for law and order and [to provide the] information [essential] for political reform" (Filizzola 1958, 151). That same year, the colonial government set in motion multiple studies to prepare the way for a revision and expansion of the civil registry. The initial proposal was ambitious: to make the civil registry mandatory for all Moroccan subjects and keep the system entirely under the control of French authorities. This proposal quickly ran afoul of Moroccan elites, resulting in a protracted stalemate that endured for almost six years (Filizzola 1958, 149-154). Moroccan officials appear to have been particularly concerned that its representatives, not French administrators, have authority over this powerful new system of individual registration (Filizzola 1958, 154-158). In addition, any proposed extension had to contend with the significant practical difficulties of registering and monitoring a largely rural and overwhelmingly illiterate population (Filizzola 1958, 160-163).

Archival evidence suggests the consequences of this protracted negotiation. A 1949 memo from the Office of the Resident General noted that even in urban areas the colonial govern-

⁴This proposal was formally supported by the *La Comite d'Action Marocaine*, the foremost nationalist movement at the time in 1939 (Decroux 1952, 8).

ment had little in the way of demographic information:

... Moroccans, that is to say 97% of the population, are not counted except in the enumerations held every five years which provide marital status and family structure in a very approximate manner. To decrease this uncertainty, it would be very helpful to have vital statistics. Currently we have nothing but death statistics established by the health authorities in the nineteen municipalities (about 1/5th of the Moroccan population) and these figures are highly speculative... The number of births and deaths [among Moroccans] are practically unknown...⁵

In 1950 a compromise was finally reached. Local Moroccan officials would administer the new system under the supervision of French authorities (Decroux 1952, 10), but registration would be mandatory only for Moroccans employed in the formal sector. This group, which notably included all Moroccan employees of the colonial government, were prioritized because their children and dependents were eligible for a range of benefits and protections that were impossible to administer in the absence of civil registration. Moroccans employed in agriculture, or the informal urban sector, the overwhelming majority of the working population, were not required to register (Decroux 1952, 11).

Given its limited scope, compliance with the registration law in 1950 was predictably low. As one contemporary observer noted, “seven years after the reform and in fact, only a small portion of the [Moroccan] population is obliged to be registered... it is clear that the *Dahir* [royal decree] of March 8th 1950, was a reform in name only” (Filizzola 1958, 215). In December 3rd 1963 a law was passed modifying the 1950 reform and requiring that all births and deaths in the country be registered with the local authorities. However, there was significant local variation in compliance with this requirement. As one observer noted a decade later, “Reference to an official paper reflects the degree to which members of the population have come under governmental authority and their submission to government registration systems. This, like knowledge of birth dates, varies by region and sector” (Quandt 1973,

⁵This memo is contained in box 1MA/200/423 in the Archive of the Ministry of Foreign Affairs, Nantes.

p. 50). Rates of registration varied considerably until the Ministry of Interior undertook a major campaign in the late 1970s to register all Moroccan citizens.

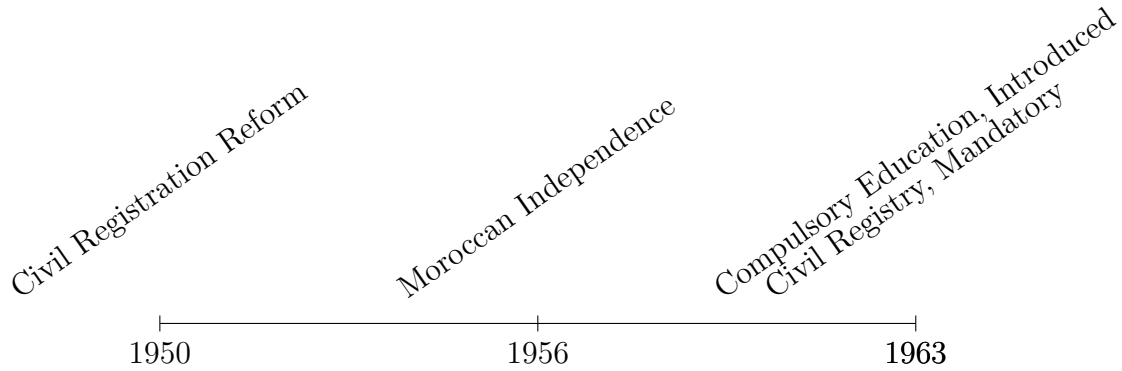
Research Design

Incentives to register and education outcomes vary at the individual and local level. Gender, ethnicity, occupation, and social class exert an influence on both civil registration and education outcomes (Harbers 2020, McMurry 2021, Scott 2009). In Morocco, older, rural respondents and speakers of Morocco’s three Amazigh dialects were less likely to be registered or educated than their younger, urban, or Arabic speaking peers. This presents a major challenge to estimating the effect of registration on education outcomes, because even after controlling for these key confounders it is difficult to discern whether variation in registration is driving rates of education or the reverse.⁶ Another concern, particularly in former settler colonies like Morocco, is that an association between education outcomes and registration is simply driven by higher levels of colonial era investment in physical infrastructure in areas settled by Europeans, rather than registration.

I exploit temporal variation in the expansion of the civil registry following the 1950 reform in a difference in differences research design to address these empirical challenges. The basic intuition of this approach is to exploit an exogenous shock, often a shift in policy, interacted with spatial variation in a variable that limits or enhances that shock. By examining the difference between “treated” and “control” groups, we can causally estimate the effect of this “difference in differences” on our outcome of interest. Figure 1 uses data from the *Jarida Rasmiya*, a comprehensive dataset of all laws and reforms passed by the Moroccan government, to situate the reform exploited by the difference in differences research design relative to Moroccan independence and subsequent reforms passed in 1963 imposing compulsory schooling and making the civil registry mandatory for all Moroccan citizens (Government of

⁶Table 1 in the Appendix includes evidence demonstrating this claim empirically.

Figure 1: Timeline of Major Reforms



Morocco 2021).⁷

My theory argues that this increase in local information available to bureaucrats following the reform should have facilitated the expansion of primary schooling. In the sections that follow I describe the main dependent and explanatory variables, before introducing my estimation approach, and assumptions used to test these claims.

Data

To control for individual level characteristics like gender and ethnicity I rely on census data from the 1994 population census, made available by the Integrated Public Use Microdata Series (IPUMS), managed by the University of Minnesota Population Center (Minnesota Population Center 2018). The IPUMS data is a weighted population sample that includes 5% of all respondents, with each individual response weighted evenly. These microdata allow me to control for individual characteristics like age, ethnicity, gender, that are likely confounders of the relationship between information capacity and registration and education outcomes.

⁷The two most authoritative secondary sources on the civil registry in Morocco make no mention of any significant reforms to the civil registry, except the 1950 reform during this period (Decroux 1950, Filizzola 1958). The *Jarida Rasmiya* confirms that the last major reform to colonial education policy was a 1944 law which formalized rules governing public education for Muslims (Government of Morocco 2021).

Registration

An important first test of these theoretical claims, is determining whether the civil registry reform of 1950 actually increased rates of registration. In 1994, Moroccan census enumerators were tasked with determining levels of compliance with civil registration, asking the Head of Household (HoH) whether the family was registered, and checking official documents to verify the reported status. However, the Moroccan census does not specify *when* the family was registered, making it difficult using this variable to determine whether education outcomes occurred before or after registration.

I address this conceptual challenge in the specifications that follow using a variable that recorded whether a respondent provided census enumerators with a document that included their month of birth. Like a birth certificate, the presence or absence of a recorded month of birth helps address the concern that individuals might have been registered *after* they had learned to read or enrolled in school. While 90% of respondents were reported registered, only 42% of respondents were able to document their month of birth to census enumerators. This would suggest that many individuals were enrolled in the civil registry retrospectively.

Is documenting a month of birth a valid proxy measure for being registered at or around one's birth? I test this claim by examining a few descriptive statistics to gauge the conceptual validity of this measure and then more rigorously using a demographic measure of the accuracy of age reporting that relies on simple assumptions about the distribution of ages.

In the 1994 census reporting a year of birth and month of birth were separate questions but the two outcomes are highly correlated. Only 400 of the 1.2 million respondents in the IPUMS sample documented a year of birth without reporting a month of birth as well, and no Moroccan documented a month of birth without a year of birth. Finally, only half of a percent of the Moroccan sample reported their birth month but were unregistered in the civil registry, ruling out concern that census enumerators simply recorded a month of birth without documentation.

Figure 2: Months of Birth

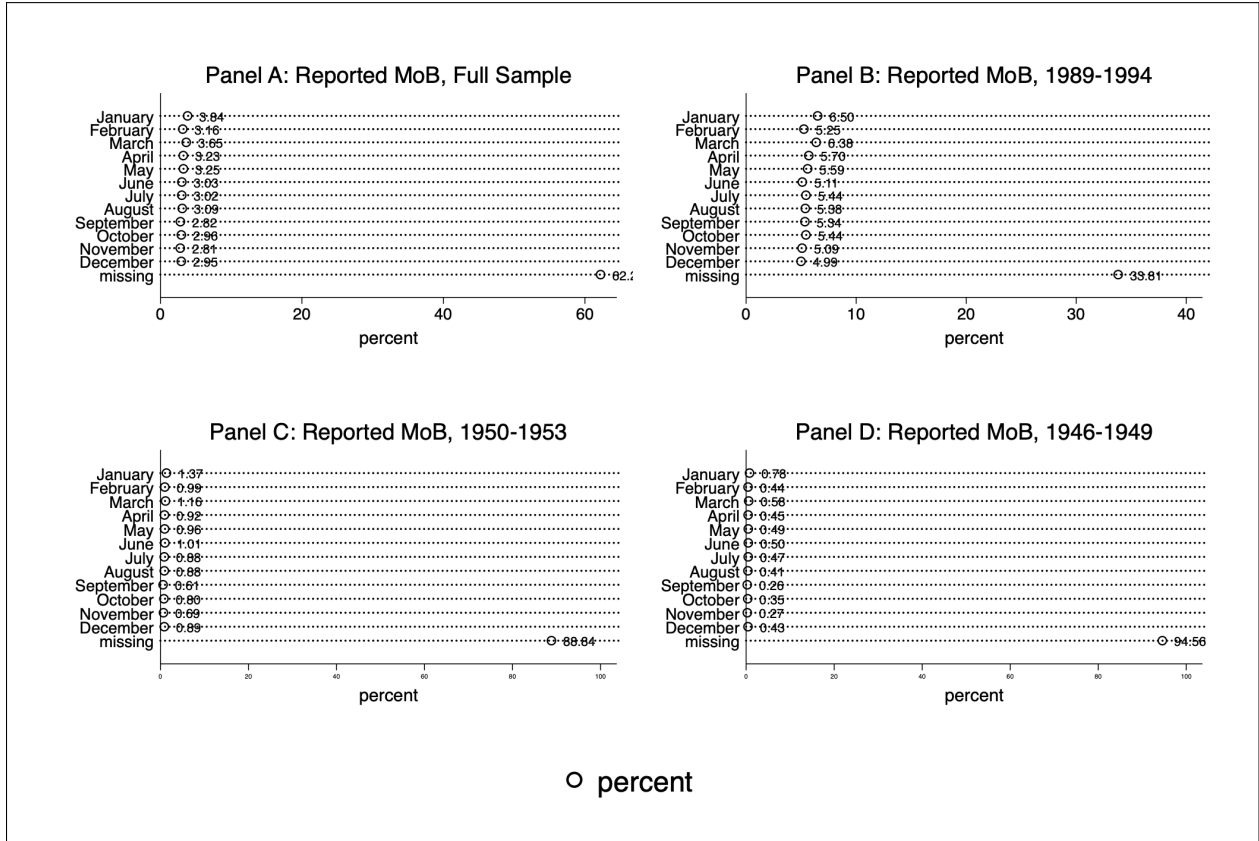


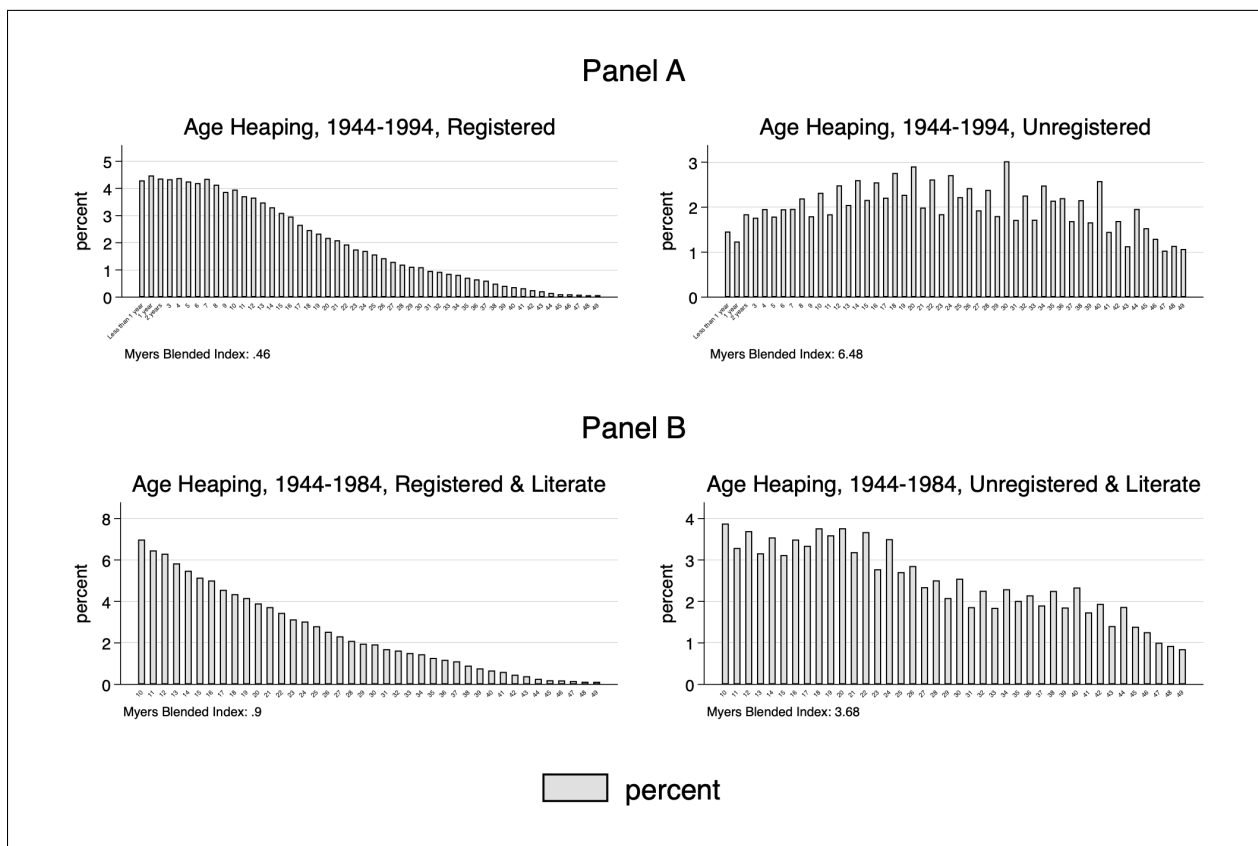
Figure 2 shows that there is significant temporal variation in the presence or absence of a reported month of birth. Panel A indicates that only 38% of Moroccans reported their month of birth across the entire sample, but as illustrated in Panel B, almost 67% reported the month of birth of children born in the five years before the census.

Turning to older cohorts we see more than a 5% increase in rates of reported months of birth in the cohorts born 3 years before (Panel C) and 3 years after (Panel D) the 1950 reform. This provides preliminary evidence consistent with the argument that the 1950 reform had a significant impact on rates of registration. We see no over reporting of specific months of birth, consistent with the claim that recorded months of birth reflect the actual distribution of births even among these older cohorts.

Another way to test the claim that the reported presence of a month of birth serves as a proxy for registration status concerns the accuracy of reported ages. Uncertainty about

age is associated with “heaping,” where digits divisible by five are often over reported in the population census (Lee and Zhang 2017). Variation in heaping provides a natural preliminary test for discerning whether Moroccans who reported a month of birth report their age more accurately than those Moroccans who do not report a month of birth, and were presumably not registered at birth. An anecdote from a sociological study of the 1971 Moroccan census provides some support for this interpretation: “knowledge of children’s ages is aided by increasing civil registration. Children’s births are recorded and remembered by parents. Parents may express great uncertainty over their own ages but give children’s ages with some confidence” (Quandt 1973, p.51).

Figure 3: Age Heaping, Registered and Unregistered Respondents



Panel A in Figure 3 visually illustrates the stark contrast in age heaping between registered and unregistered Moroccans, providing preliminary evidence of a substantive difference

in the accuracy of reported ages between the two groups. The figure also reports the results of the Myer's Blended Index, a formal test for the over representation of final digits in reported ages. The Myers scores indicate that specific digits are over represented in the reported ages for about 6.5% of unregistered respondents but only about .5% of registered respondents.

Because of concerns that age heaping is itself a proxy for basic education (A'Hearn, Baten and Crayen 2009), Panel B subsets respondents to only those Moroccans that were recorded as literate in the population census. This excludes all respondents under the age of 10, whose literacy status was not recorded by census enumerators. While more muted, there is still a stark difference in the Myers index between respondents who reported a month of birth and those that did not, increasing confidence that the civil registration measure captures a substantive difference in actual knowledge of reported ages and is not simply driven by differences in literacy.

Mass Education

The Moroccan population census asked multiple questions about education outcomes. Recent research notes that in authoritarian contexts like Morocco the incentives to expand education may have as much to do with the promotion of nationalism and loyalty as the promotion of human capital (Kosack 2014, Paglayan 2020). Building on this insight I include a binary measure indicating whether a respondent ever attended formal schooling, as well as the total number of years of formal education recorded by census enumerators.

Previous research notes that measuring literacy in developing countries is complicated because the definition of "literacy" is inherently contextual, especially in a country like Morocco where the main language, *darija*, is spoken but not written (Wagner 1993). Drawing on these insights, I opt for a particularly political dimension of literacy in the Moroccan context: whether respondents reported that they were literate in French as well as Arabic. Despite the end of colonialism, French literacy was essential for upward mobility, particularly

in government service and the private sector, and remains a clear marker of social class to this day. This meant that being literate in French as well as Arabic was particularly consequential in shaping employment opportunities in the decades following independence.

Estimation

Ideally, I would know whether an individual was born in a family subject to the 1950 civil registry reform. This would require detailed information on family histories that to the best of my knowledge have never been systematically collected. Instead, I exploit the fact that only those families who received public benefits, typically a pension, were required to register after the reform, whereas for the rest of Moroccans the law was *facultative* (optional). As one early study noted, because the 1950 reform was an attempt to, “promote and regulate the family allowance... the law only applied to salaried Moroccan employees in public administration, commerce and industry. For other sectors, the middle class, traders, and rural inhabitants, that is to say the vast majority [of Moroccans] the law remained optional” (Decroux 1952, 11). This meant that the reform increased the incentive to register only for Moroccans who were recipients of formal benefits like pensions and a family allowance. In practice this meant that only the small minority of Moroccans working in the formal sector were subject to the punitive sanctions authorized by the reform and were therefore more likely to register after the reform. The scope of the 1950 reform suggests that the expansion of civil registration should have been highest among Moroccans working in the formal economic sector.⁸

I use spatial variation in the urban European population as a proxy measure for the formal economy and therefore exposure to the 1950 reform which increased the incentive to register but only for Moroccans working in the formal sector. Specifically, I exploit data from the 1951 census for Morocco’s 19 municipalities and 29 towns (Service des Statistiques 1954),⁹ to create a dummy variable indicating whether there were any Europeans enumerated at the

⁸Section 9.2 in the Appendix presents evidence inconsistent with a more general shift in preferences for public schooling based on proximity to Europeans in rural areas.

⁹The 1951 population census was the most detailed and comprehensive enumeration of the European population ever conducted in colonial Morocco.

municipal and town level in 1951, aggregated at the contemporary province as reported in the IPUMS data, and interact this historic measure of an urban European presence with a dummy variable indicating whether an individual respondent was born before or after the civil registry reform of 1950. This suggests a standard two-way fixed effects difference in differences equation:

$$Y_{ijk} = \alpha_j + \beta_k + (P_j T_i)\gamma + (C_j T_i)\delta + \epsilon_{ijk} \quad (1)$$

Where Y is an outcome of interest (registration and education outcomes) for an individual i in province j for a given age k , α_j is the province of birth fixed effect for each of the 46 contemporary provinces in the former French protectorate, β_k is a cohort of birth fixed effect, the difference in differences term is the interaction of P_j denoting whether any foreigners were enumerated in municipalities and towns in the 1951 census, and T_i indicating whether the individual was born in 1951 or later, C_j is a vector of province specific controls, including interactions of all control variables with the European dummy as enumerated in 1951 and my post-1950 dummy and ϵ is an error term. All specifications include clustered robust standard errors at the level of the province, the lowest geographic unit available in the public IPUMS data.

Because I include fixed effects for cohorts of birth and province, the equation is comparing outcomes between those born before and after the reform within provinces with and without urban European enclaves under colonialism. Although the inclusion of provincial fixed effects soak up variation between treated and untreated provinces, the interaction of the pre/post dummy and the presence or absence of an urban European population, my proxy for the presence or absence of the formal economic sector, is identified.¹⁰

A central challenge with all difference in difference designs is selecting the relevant period of analysis. A greater number of cohorts increases the chance that some other unmeasured

¹⁰Section 7.3 in the Appendix includes the results of specifications with regional, rather than provincial fixed effects. This less conservative specification, which takes averages across treated and untreated provinces in the same region, increases the difference in differences coefficient for all outcome variables.

variable or intervention, and not the theorized shock, is driving the result. The two main concerns given the timing of the 1950 civil registry reform is Moroccan independence in 1956 and a 1963 law that made primary education compulsory for boys and girls between the ages of 7-12. To address these concerns I subset the IPUMS sample to cohorts born between 1945 and 1956. Because primary schooling generally started at the age of 6, this means that pre-treatment cohorts would have started school between 1951 and 1956 and post-treatment cohorts would have started school between 1957 and 1963, when primary schooling was not compulsory. While independence could have increased rates of enrollment, the fact that the Moroccan government felt it necessary to pass a law making public school compulsory, and low rates of compliance with that law for decades subsequently, suggests independence alone was not enough to encourage parents to send their children, especially girls, to public schools.

A second major challenge for any difference in differences design concerns the timing of the reform. If there was widespread knowledge that a reform was imminent, and parents shifted their behavior, for example by moving to certain provinces prior to the passage of the reform we might be concerned about the validity of the research design. The available historical evidence suggests that this was not the case. As noted above, the implementation of the reform was a protracted negotiation among political elites that lasted more than 12 years and was interrupted by the outbreak of World War II. The political impasse was finally broken in 1949 and the official proclamation was made shortly afterwards in March 1950 (Decroux 1950). While keen observers would have been aware that there were ongoing debates about the extension of the civil registry, secondary sources make it clear that even participants in this debate could not have known exactly when or even if the reform would be implemented until months prior to its announcement (Filizzola 1958, 148-163).

Controls

I drop four categories of respondents from the dataset. Because the 1950 reform was implemented only in the French protectorate rather than the Spanish protectorate, I drop all respondents in the contemporary provinces previously colonized by Spain (n=30,768). I then drop all non-citizens(n=679), and Moroccan citizens born abroad (n=724). Finally, I drop respondents who were “absent,” often because they were living abroad, meaning that a family member completed the census on their behalf (n=11,194).

Table 1: Summary Statistics, (1945-1956)

<i>Microdata</i>	count	mean	sd	min	max
Reported Month of Birth	111560	0.089	0.285	0	1
Years of Formal Education	111560	2.408	4.150	0	18
Literate in French and Arabic	111560	0.228	0.420	0	1
Any Formal Schooling	111560	0.313	0.464	0	1
Born After 1950	111560	0.588	0.492	0	1
Native Language Arabic	111560	0.681	0.466	0	1
Women	111560	0.509	0.500	0	1
<i>Provincial Controls</i>					
Urban Foreigners, 1950	111560	0.830	0.376	0	1
No. Civil Registry Offices	111560	9.073	7.958	0	40
No. Muslim Primary Classrooms, 1952	111560	131.574	117.561	0	547
No. Muslim Primary Schools, 1952	111560	22.160	13.093	0	76
No. Muslim Students, 1952	111560	4400.924	3615.294	0	11888
Coastal	111560	0.504	0.500	0	1
Mean Elevation	111560	522.181	449.442	14.719	1631.237
Estimated pre-Colonial Cropland	111451	17.435	8.033	0.051	29
Estimated pre-Colonial Population Density	111451	227.970	413.474	0.595	1190.295
<i>N</i>	111560				

Table 1 report the descriptive statistics after these groups have been removed from the IPUMS sample. Reporting a month of birth, enrollment in formal schooling, years of formal education and literacy in French and Arabic are the main outcomes of interest. To account for variation over time and space, I include fixed effects for each province, the lowest level of administration reported in the IPUMS sample as well as annual cohorts based on reported age. I control for gender and ethnicity but do not include any other contemporary controls

because of concerns about biasing the results through the inclusion of “bad controls” which are themselves correlated with variation in historic levels of European presence (Angrist and Pische 2009, Chapter 3). This is most important with respect to urban and rural households. A large body of evidence suggests that state capacity is generally lower in rural areas. While the 1994 census included a measure of whether a contemporary household was rural or urban, this is clearly a result of patterns of European settlement during the colonial period.¹¹

Because environmental characteristics like elevation, soil quality, and agricultural traditions impact rates of registration (Scott 2009), I also include controls to account for variation in elevation, access to the sea, estimations of the amount of cultivated land and population density prior to colonialism (Klein Goldewijk et al. 2011).

The inclusion of provincial fixed effects helps address the concern that any association between the European population and education outcomes is simply a legacy of colonial infrastructure and not registration. To account for differences in levels of colonial infrastructure I digitized a map of all of the Civil Registry offices as enumerated in 1951. I geolocated this map and include a simple count variable of the number of offices for each contemporary province in the IPUMS sample.¹² In 1945 the French government introduced a fund designed to improve public infrastructure and services, including schools, in the colonies the “Investment Fund for Economic and Social Development” (*Fond d’Investissement pour le Développement Economique et Social*), known by its French acronym (FIDES) (Huillery 2014, 15). To alleviate concerns that the education results are driven by differences in colonial schools, I digitized a comprehensive enumeration of the universe of 977 elementary schools for Muslims in 1952 (Bureau de la Documentation de l’Information et de la Statistique 1952). I was able to geolocate 846 (86%) of these schools to contemporary locations. For each contemporary province I include a simple count of the number of schools, classes, and students, to account for the fact that some schools are larger than others.¹³

¹¹See Section 4 of the Appendix for more elaboration on this point.

¹²Section 3 of the Appendix contains the archival map.

¹³Unfortunately these data do not include the date in which schools or civil registry offices were established.

Because all of the control variables with the exception of gender and ethnicity are measured at the level of the province, the lowest administrative unit available in the IPUMS data and would drop out with the inclusion of province fixed effects, I interact each of these variables with the treatment variables: the post-1950 dummy and the dummy indicating whether any Europeans were enumerated in the 1950 census to ensure that these results are not mechanically driven by the progressive expansion of the Moroccan state over time or higher levels of economic development left by European settlers.

Assumptions

The main assumption of all difference in differences designs is the “parallel trends” assumption. While there can be differences in levels between treated and untreated groups, this assumption requires that these differences be consistent over time prior to the policy reform.

Figure 4 shows the result of an event-study test of this assumption, using the *Honest DiD* package for STATA (Bravo, Mauricio Caceres and Roth, Jonathan and Rambachan, Ashesh 2022).¹⁴ In each specification the reference year, individuals born in 1950 are omitted. We can see there is a significant increase in rates of registration, enrollment in formal schooling, years of formal schooling, and French literacy for cohorts born in 1951, even after controlling for differences between men and women, and differences between speakers of Arabic and Morocco’s Amazigh languages. I interpret the absence of statistically significant differences prior to treatment in 1951 as consistent with the parallel trends assumption.¹⁵

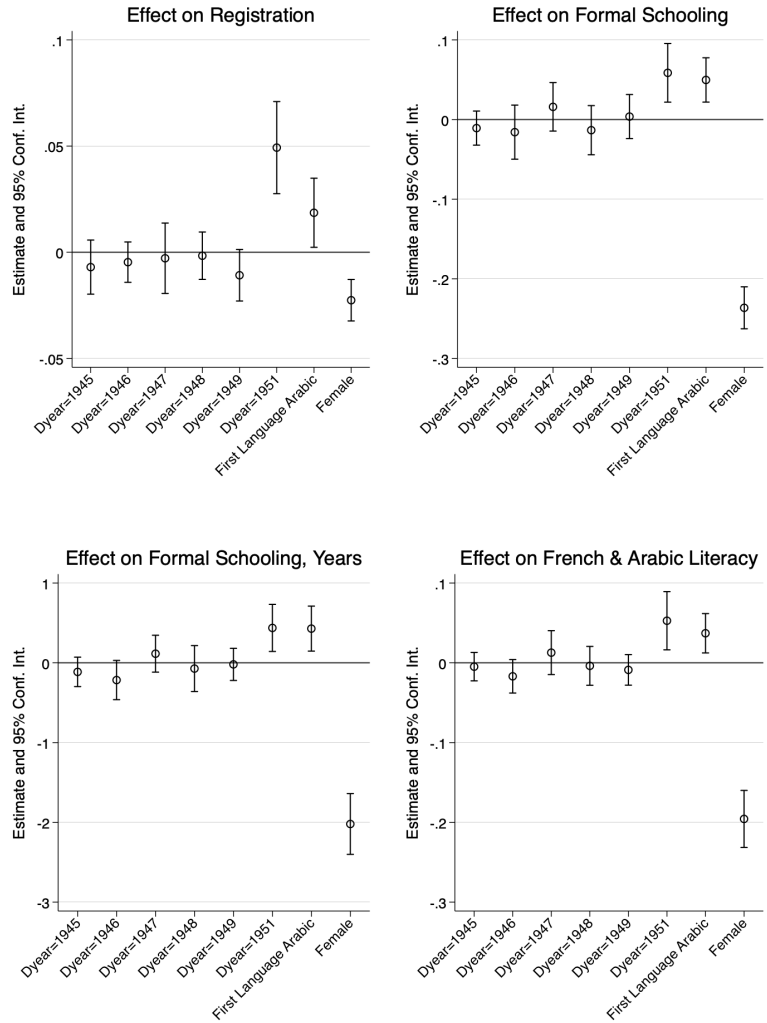
DID Results

The difference in differences estimator measures the average treatment effect on the treated, in this case the difference in registration and compulsory schooling between those

¹⁴Section 7.4 in the Appendix uses a regression based approach for a more conventional visual test.

¹⁵Section 5 employs a “robust inference” approach to sensitivity analysis using the *HonestDiD* package to further defend the validity of the parallel trends assumption.

Figure 4: Honest DiD: Event Study



born before and after the reforms within the same province.

Table 2 presents the results of the difference in differences specification using the micro level data from the 1994 census for four different outcomes: registration, as proxied by whether an individual could document their month of birth (Column 1), formal schooling, as proxied by whether an individual reported ever enrolling in first grade or above (Column 2), Literacy in French and Arabic (Column 3), and Years of Formal Education (Column 4).

These results indicate that being born after the 1950 reform, in a province where Europeans were enumerated in 1951, caused an increase of 2% in birth registration, a 2% increase

Table 2: Effect of Reforms and European Settlement on Registration and Education Outcomes, 1945-1956

	Registration	Formal Schooling	Literacy, Arabic & French	Formal Schooling, Years
	(1)	(2)	(3)	(4)
Difference in Differences	0.019** (0.009)	0.023** (0.009)	0.024*** (0.009)	0.207** (0.081)
Controls	✓	✓	✓	✓
Admin FE	✓	✓	✓	✓
R^2	0.10	0.21	0.17	0.21
N	111451	111451	111451	111451
Dep. Var. Mean	0.089	0.313	0.228	2.409

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
Fixed Effects and Clustered Robust Standard Errors at Province.

in reported enrollment in formal schooling and French literacy, and a .21 increase in reported years of formal schooling. Relative to the average means of the outcome variables, reported at the bottom of the table, these are large and substantive effects. These results are robust to alternative measures of the difference in differences design, distinct subsets of the data, and alternative modeling strategies.¹⁶

The results in Table 2 provide evidence that the 1950 Civil Registry reform had an impact on education outcomes for cohorts born prior to Moroccan independence in 1956. But a central claim of my theory is that enforcement of policies like compulsory education are difficult where rates of registration are low. A testable implication of this argument is that the impact of the civil registration reform should increase following the expansion of compulsory education to cohorts born after 1957.

Table 3 employs the same difference in differences design, but for cohorts born between 1945 and 1963. Being born after the 1950 reform in provinces where Europeans were enumerated in 1951 caused a 3% increase in registration, a 2.7% increase in enrollment in formal schooling, 2% increase in literacy in French and Arabic, and a quarter year increase in formal schooling. With the exception of the literacy outcome, the coefficients reported in Table 3 are larger than those reported in Table 2, albeit “noisier.” I interpret these estimates as

¹⁶See Section 7 in the Appendix for these additional specifications.

Table 3: Effect of Reforms and European Settlement on Registration and Education Outcomes, 1945-1963

	Registration	Formal Schooling	Literacy, Arabic & French	Formal Schooling, Years
	(1)	(2)	(3)	(4)
Difference in Differences	0.034*** (0.012)	0.027** (0.013)	0.020* (0.011)	0.258* (0.129)
Controls	✓	✓	✓	✓
Admin FE	✓	✓	✓	✓
R^2	0.15	0.21	0.16	0.19
N	208562	208562	208562	208562
Dep. Var. Mean	0.151	0.351	0.258	2.840

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
Fixed Effects and Clustered Robust Standard Errors at Province.

consistent with my claim about the *increased* importance of registration for cohorts born after independence, but before the implementation of mandatory civil registration.

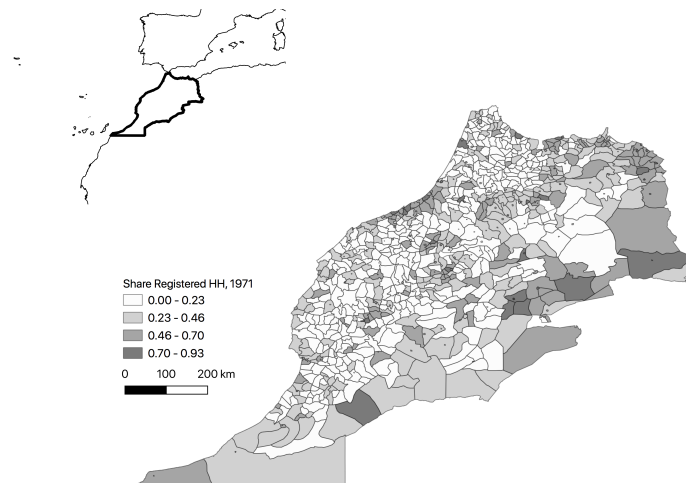
Descriptive Evidence: Registration and Compulsory Schooling

The difference in differences results provides quantitative evidence that the 1950 reform significantly shaped the expansion of public education, especially after the introduction of compulsory education in 1963. But if registration was really an obstacle, we should expect to locate descriptive evidence that Morocco’s bureaucrats actually struggled with the constraints imposed by their limited information capacity. This section draws on archival evidence and a new digitization of the 1971 census to illustrate how low levels of information constrained the expansion of public schools after independence.

Archival Evidence

Variation in the quality and availability of even basic vital statistics inherited from the colonial government presented a significant obstacle for the Moroccan government post-independence, especially in the countryside. In 1971 an economist was commissioned to conduct a study of primary education in Morocco by the Ministry of Regional Planning.

Figure 5: Registration of Moroccan Households, 1971



His suggestions included, “Build more schools in the countryside than in the cities, where the rural population doesn’t justify the creation of a school, mobile schools should be considered... Enforce the compulsory education law by sanctioning parents who don’t send their children to primary school...”

These recommendations assumed a level of information that was simply unavailable to the Moroccan government. In 1963, the same year that it made primary education compulsory, the Moroccan government required for the first time that all births and deaths be registered with local authorities through the civil registry. However, eight years later the 1971 census indicated that the collection of even basic vital statistics was weak outside of major urban centers and large swaths of the population were still unregistered.

Figure 5 provides a visual illustration of just how uneven registration was using aggregated data from the 1971 census, the first to record a household’s registration status (Secretariat d’Etat au Plan et au Developpement Regional 1977).¹⁷ On average only about 35% of Moroccan households were included in the civil registry, but there was significant variation in rates of compliance. Registration tended to be higher in urban areas, particularly the major

¹⁷Unfortunately microdata from the 1971 population census are not publicly available.

coastal cities of Casablanca and Rabat, as well as the former imperial capitals: Marrakesh, Meknes, and Fez, home to the overwhelming majority of Morocco's former colonial settlers, where average rates of registration were close to 65%. Numerous official attempts to formulate multi-year development plans post-independence lamented the weakness of data used to make projections about population growth, rural to urban migration, or even basic fertility statistics. As one observer noted, "Age data necessary for demographic models cannot be accurately collected because many Moroccan respondents neither record their birth dates nor celebrate birthdays" (Quandt 1973, pp.viii-ix).

These challenges appear to have been well understood for some time. An insightful memo written shortly after independence by a local bureaucrat named Ghali Laraki noted that the state had to "start from zero" when implementing mass education in the countryside, he then outlined two possible paths forward, "Should we increase the number of rural schools, to educate the most Moroccans, no matter the cost, rapidly building schools no matter where, even far from roads and outside of still undetermined [population] centers? Or is it preferable to build on existing schools in the population centers of rural communes... From the implemented study and the results obtained so far, it is the second solution that has won all of the votes (Laraki 1961)." The Laraki memo suggests that government officials recognized that need was highest in the countryside, but the cost and logistical obstacles associated with reaching these students was viewed as simply too high for the Moroccan state. Because of its limited reach, rural students would have to come to the Moroccan state, not vice versa.

This policy had direct implications for the expansion of public schooling. In 1976 the Moroccan government conducted the first comprehensive enumeration of public elementary schools in the country post-independence. 35% of localities, mostly rural communes, lacked a public elementary school. Of the 1,547 facilities enumerated by the government, 12% of the schools and 19% of the students were located in the city of Casablanca, home to a plurality of European citizens under colonialism, despite the fact that the municipality accounted for

just 9.2% of all children under fourteen in 1971 (Ministère de l'Enseignement Primaire et Secondaire 1976).

Evidence from the 1971 Population Census and 1975 School Census

A major limitation of the IPUMS dataset is that data are reported at the level of Morocco's 52 provinces in 1994. This means that while the microdata are ideal for exploiting temporal variation while controlling for a host of individual characteristics, the high level of aggregation in the IPUMS data makes it more difficult to test some of the spatial mechanisms underlying my theoretical claims about the linkages between colonialism and rates of registration and education after the 1950 reform.

To address these concerns I bring in data on reported rates of registration from the 1971 census for each of Morocco's 918 communes (Admin-4). This was the first census to record rates of registration at the household level (Secretariat d'Etat au Plan et au Developpement Regional 1977). To account for the difference in population across localities, I create a standardized variable, the share of registered households in each locality. I similarly standardize the reported number of foreigners and male and female students, dividing the reported totals by the total population and the male and female populations between the ages of 6 and 24 respectively. As controls I include the share of modern houses, as a rough proxy for local development, as well as the mean elevation, and estimated measures of the pre-colonial population and crop density as in the main DiD specifications.

As in many former colonies, the foreign population of Morocco fell precipitously following independence. Foreigners went from an estimated 5.7% of the population in 1951, to around 3.4% in 1960 to less than 1% in 1971. Table 4 shows that despite this significant decline, there was still an association between the share of foreigners and the share of registered households in 1971 (Column 1). This is consistent with my argument and previous evidence suggesting that rates of registration were closely tied to proximity of colonial enclaves.

Columns 2 and 3 show that the share of registered households is closely associated with

Table 4: European Settlement, Registration, and Enrollment, 1971

	Registered Households	Enrollment, Men	Enrollment, Women
	(1)	(2)	(3)
Share Foreign Population	0.687* (0.412)	-0.199 (0.455)	0.464 (0.390)
Share Registered Households		0.285*** (0.025)	0.119*** (0.013)
Controls	✓	✓	✓
Admin FE	✓	✓	✓
R^2	0.48	0.72	0.84
N	909	909	909
Dep. Var. Mean	0.330	0.318	0.086

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
Provincial Fixed Effects and Clustered Robust Standard Errors at Locality.

higher rates of enrollment for both boys and girls. Although these are simple associations and should not be interpreted causally, it is interesting to note that the coefficient for male enrollment is more than double that for women, a result consistent with previous research on the pervasive challenges posed by gender inequality in the expansion of mass education in Morocco (Wagner 1993).

Because these are not microdata we might be concerned that these associations are driven by higher rates of education and registration among the last remaining foreigners in Morocco. While I cannot entirely rule this possibility out using the aggregated totals in the 1971 census, it is worth noting that while the share of foreigners is positively associated with registration, the share of the foreign population is not significant for either of the enrollment outcomes. If these results were being driven by higher rates of registration and education among foreigners we would expect to see positive and significant associations between the share of foreigners and all three outcomes.

What about my claim that where registration was lower, planning and enforcement of compulsory education was more difficult? To test these claims, I combine the data on rates of registration with a comprehensive enumeration of every primary school in the country conducted in 1975 (Ministère de l'Enseignement Primaire et Secondaire 1976). To my knowledge, this was the first attempt by the Moroccan government to survey every public school in the country post-independence. The enumeration of public elementary schools provides

data on 1,548 individual facilities across 596 distinct localities. For each facility the report provided data on the number of classes, staff, the total number of students, as well as the total number of students in *Cours Moyen 2* (CM2), the final class prior to middle school. To match these data against the data from the 1971 census I aggregate the average of these reported totals for each school by commune.

Table 5: Registration, Infrastructure, and Quality, 1975

	School (1)	Number of Schools (2)	Share CM2 (3)	Teacher Student Ratio (4)
Share Registered Households	0.742*** (0.100)	0.041 (1.191)	0.065*** (0.013)	1.394 (1.694)
Share Foreign Population	-0.467 (0.897)	34.772 (25.423)	-0.166 (0.103)	-32.803* (18.804)
Controls	✓	✓	✓	✓
Admin FE	✓	✓	✓	✓
R^2	0.22	0.31	0.49	0.39
N	909	909	513	518
Dep. Var. Mean	0.573	1.614	0.150	33.906

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
Provincial Fixed Effects and Clustered Robust Standard Errors at Locality.

A natural first test of my claim is to see whether localities with greater rates of registration were more likely to have a school. Table 5 shows a strong and positive association between the share of registered households in 1970 and whether a locality reported a public elementary school in 1975 (Column 1). There is no association between the share of registered households and the *number* of public elementary schools (Column 2). Consistent with the Laraki memo described in Section , this suggests that registration played a bigger role in deciding where to place an initial school, rather than trying to make a determination about adding additional schools. Interestingly, a higher rate of registration is associated with a greater share of students in CM2 (Column 3), the final year of elementary school. This suggests that not only were higher rates of registration associated with greater rates of enrollment as in Table 4, but greater retention of older students. There is no association between rates of registration and school crowding as proxied by the mean teacher student ratio (Column 4). Overall, I view this evidence as consistent with my theorized claims that the state targeted infrastructure in the areas where it had more information, and as a result was better able to enroll and

retain students than in areas where rates of registration were low.

1 Conclusion

These results have significant theoretical implications for understanding the historical origins of local variation in public education in former colonies, particularly countries like Morocco, where ethnic differences are less politically salient. This article makes three contributions. First, while we have an abundance of evidence that information shapes the provision of public goods, the origins of this variation are often unclear, especially at the local level. This article introduced a new theory that in former colonies, the amount of information that the state inherited at independence were closely associated with colonial policy. Low levels of information capacity inherited from the colonial state inhibited planning and expansion of public goods like compulsory education for decades following independence. Empirically, I provide evidence of how a policy reform under colonialism had an immediate but uneven impact on rates of registration, which subsequently shaped post-independence education outcomes, even after the introduction of compulsory education. Conceptually, I contribute to a growing body of research on the “informational foundations” of the state introducing a micro level measure of registration, the reported presence or absence of a month of birth, that is generalizable to a wide range of countries and contexts, especially in the developing world.

While I tested my theoretical claims about the relationship between historical legacies of colonial settlement and registration in Morocco, insights from this case are generalizable to other contexts. We should anticipate similar disparities in local informational capacity in former settler colonies where colonial policy excluded subjects from the civil registry. In line with a wide range of evidence on the negative impacts of colonialism for economic and political development, this paper suggests that a crucial tool of modern governance: information capacity, was significantly impeded by exclusionary colonial policies. Finally, the theory and evidence presented here strongly suggest the importance of civil registration

for reducing education inequality. In the absence of data about the school-age population in a given locality, policy planning, implementation, and the enforcement of compulsory education are much more difficult.

References

- Acemoglu, Daron, Francisco A. Gallego and James A. Robinson. 2014. “Institutions, Human Capital, and Development.” *Annual Review of Economics* 6(1):875–912.
- A’Hearn, Brian, Jörg Baten and Dorothee Crayen. 2009. “Quantifying Quantitative Literacy: Age Heaping and the History of Human Capital.” *The Journal of Economic History* 69(3):783–808.
URL: https://www.cambridge.org/core/product/identifier/S0022050709001120/type/journal_article
- Amster, Ellen J. 2014. *Medicine and the Saints: Science, Islam, and the Colonial Encounter in Morocco*. Austin: University of Texas Press.
- Angrist, Joshua D. and Jorn-Steffen Pischke. 2009. *Mostly Harmless Econometrics: An Empiricist’s Companion*. Princeton: Princeton University Press.
- Barro, Robert J. and Jong Wha Lee. 2013. “A new data set of educational attainment in the world, 1950-2010.” *Journal of Development Economics* 104:184–198.
- Benavot, Aaron and Phyllis Riddle. 1988. “The Expansion of Primary Education, 1870-1940: Trends and Issues.” *Sociology of Education* 61(3):191.
URL: <https://www.jstor.org/stable/2112627?origin=crossref>
- Bowles, Jeremy. 2023. “Identifying the Rich: Registration, Taxation, and Access to the State in Tanzania.” *American Political Science Review* pp. 1–17.
URL: https://www.cambridge.org/core/product/identifier/S0003055423000394/type/journal_article
- Brambor, Thomas, Agustín Goenaga, Johannes Lindvall and Jan Teorell. 2019. “The Lay of the Land: Information Capacity and the Modern State.” *Comparative Political Studies* .
- Bravo, Mauricio Caceres and Roth, Jonathan and Rambachan, Ashesh. 2022. “HONESTDID: Stata module implementing the HonestDiD R package.”
- Bureau de la Documentation de l’Information et de la Statistique. 1952. *Repertoire des Services et des Etablissements Publics d’Enseignement du Maroc*. Technical report Direction de l’Instruction Publique Rabat: .

- Caplan, Jane and John Torpey, eds. 2001. *Documenting Individual Identity: The Development of State Practices in the Modern World*. Princeton: Princeton University Press.
- Cappelli, Gabriele and Joerg Baten. 2017. “European Trade, Colonialism, and Human Capital Accumulation in Senegal, Gambia and Western Mali, 1770–1900.” *The Journal of Economic History* 77(3):920–951.
URL: https://www.cambridge.org/core/product/identifier/S0022050717000699/type/journal_article
- Cogneau, Denis and Alexander Moradi. 2014. “Borders That Divide: Education and Religion in Ghana and Togo Since Colonial Times.” *The Journal of Economic History* 74(3):694–729.
URL: https://www.cambridge.org/core/product/identifier/S0022050714000576/type/journal_article
- Decroux, Paul. 1950. *L'état civil au Maroc*. Paris: Librairie Larose.
- Decroux, Paul. 1952. “L'Etat Civil et les marocains.” *Revue juridique et politique de l'Union française* 6:1–19.
- Duffo, Esther. 2001. “Schooling and labor market consequences of school construction in Indonesia: evidence from an unusual policy experiment.” *American Economic Review* 91(4):795–814.
- Dupraz, Yannick. 2019. “French and British colonial legacies in education: Evidence from the partition of Cameroon.” *Journal of Economic History* 79(3):628–668.
- Edwards, Linda Nasif. 1978. “An Empirical Analysis of Compulsory Schooling Legislation, 1940–1960.” *The Journal of Law and Economics* 21(1):203–222.
URL: <https://www.journals.uchicago.edu/doi/10.1086/466917>
- Filizzola, Sabine. 1958. *L'organisation de l'état civil au Maroc*. Paris: Librairie generale de droit et de jurisprudence.
- Filmer, Deon and Lant H Pritchett. 2001. “Estimating Wealth Effects Without Expenditure Data—Or Ters: An Application to Educational Enrollments in States of India.” *Demography* 38(1):132.

- 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.
URL: <https://academic.oup.com/ereh/article/16/4/335/468311>
- Gallego, Francisco A. 2010. “Historical Origins of Schooling: The Role of Democracy and Political Decentralization.” *Review of Economics and Statistics* 92(2):228–243.
URL: <https://direct.mit.edu/rest/article/92/2/228-243/58584>
- Gennaioli, Nicola, Florencio Lopez-de Silanes and Andrei Shleifer. 2013. “Human Capital and Regional Development.” *Quarterly Journal of Economics* 128(1):105–164.
- Government of Morocco. 2021. “al-Jarida Rasmiya.”
URL: <http://www.sgg.gov.ma>
- Graetz, Nicholas et al. 2020. “Mapping disparities in education across low- and middle-income countries.” *Nature* 577(7789):235–238.
- Harbers, Imke. 2020. “Gender Inequality in the Timing of Birth Registration in Mexico.” *World Development* 128:1–41.
- Harbers, Imke and Abbey Steele. 2020. “Subnational Variation across States: A Typology and Research Agenda.” *Latin American Politics and Society* 62(3):1–18.
- Hong, Ji Yeon and Christopher Paik. 2018. “Colonization and education: exploring the legacy of local elites in Korea.” *the Economic History Review* 71(3):938–964.
- 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.
- Huillery, Elise. 2014. “The Black Man’s Burden: The Cost of Colonization of French West Africa.” *The Journal of Economic History* 74(01):1–38.
- Hunter, Wendy and Robert Brill. 2016. “”Documents, Please” Advances in Social Protection and Birth Certification in the Developing World.” *World Politics* 68(2):191–228.

- Klein Goldewijk, Kees, Arthur Beusen, Gerard Van Dreht and Martine De Vos. 2011. “The HYDE 3.1 spatially explicit database of human-induced global land-use change over the past 12,000 years.” *Global Ecology and Biogeography* 20(1):73–86.
- Kosack, Stephen. 2014. *The Logic of Pro-Poor Policymaking: Political Entrepreneurship and Mass Education*. Vol. 44. Publication Title: British Journal of Political Science Issue: 2.
- Kramon, Eric and Daniel N. Posner. 2016. “Ethnic favoritism in education in Kenya.” *Quarterly Journal of Political Science* 11(1):1–58.
- Kremer, Michael and Alaka Holla. 2009. “Improving Education in the Developing World: What Have We Learned from Randomized Evaluations?” *Annual Review of Economics* 1(1):513–542.
- Landes, William and Lewis Solmon. 1972. “Compulsory Schooling Legislation: An Economic Analysis of Law and Social Change in the Nineteenth Century.” *The Journal of Economic History* 32(1):54–91.
- Laraki, Ghali. 1961. “L’Enseignement.”. Place: Rabat.
- Lee, Melissa M. and Nan Zhang. 2017. “Legibility and the Informational Foundations of State Capacity.” *The Journal of Politics* 79(1):118–132.
- Loveman, Mara. 2014. *National Colors: Racial Classification And The State In Latin America*. Oxford: Oxford University Press.
- Mann, Michael. 1984. “The Autonomous Power of the State: its Origins, Mechanisms and Results.” *European Journal of Sociology* 25:185–213.
- McMurry, Nina. 2021. “From Recognition to Integration: Indigenous Autonomy, State Authority, and National Identity in the Philippines.” *American Political Science Review* pp. 1–17.
- Ministère de l’Enseignement Primaire et Secondaire. 1976. *Repertoire des Etablissements Scolaires: Enseignement Primaire, Enseignement Secondaire, formation de cadre: 1975-1976*. Technical report Rabat: .

- Minnesota Population Center. 2018. “Integrated Public Use Microdata Series, International.” Place: Minneapolis, MN.
- North, Douglass C. and Robert P. Thomas. 1973. *The Rise of the Western World*. New York: Cambridge University Press.
- Nunn, Nathan. 2010. “Religious conversion in Colonial Africa.” *American Economic Review* 100(2):147–152.
- Nunn, Nathan. 2014. Gender and Missionary Influence in Colonial Africa. In *Africa’s Development in Historical Perspective*.
- Paglayan, Agustina. 2020. “The Non-Democratic Roots of Mass Education: Evidence from 200 Years.” *American Political Science Review* pp. 1–20.
- Paglayan, Agustina S. 2022. “Education or Indoctrination? The Violent Origins of Public School Systems in an Era of State-Building.” *American Political Science Review* 116(4):1242–1257.
URL: https://www.cambridge.org/core/product/identifier/S0003055422000247/type/journal_article
- Platas, Melina R. 2018. “Culture and the Persistence of Educational Inequality: Lessons from the Muslim-Christian Education Gap in Africa.” *Working Paper* (May).
- Pritchett, Lant. 2013. *The Rebirth of Education: Schooling Ain’t Learning*. Center for Global Devevelopment.
- Quandt, Anna Spitzer. 1973. The Social Production of Census Data: Interviews from the 1971 Moroccan Census PhD thesis UCLA.
- Salah, Mhamed Ben, Cédric Chambru and Maleke Fourati. 2022. “The Colonial Legacy of Education: Evidence from Tunisia.” *Working Paper* .
- Saleh, Mohamed. 2016. “Public Mass Modern Education, Religion, and Human Capital in Twentieth-Century Egypt.” *Journal of Economic History* 76(3):697–735.
- Scott, James C. 2009. *The Art of Not Being Governed*. New Haven: Yale University Press.

- Secretariat d'Etat au Plan et au Developpement Regional. 1977. Résultats du recensement General de la Population et de L'Habitat de 1971, Donnees Communales. Technical report Direction de la Statistique Rabat: .
- Segalla, Spencer D. 2009. *the Moroccan Soul: French Education, Colonial Ethnology, and Muslim Resistance, 1912-1956*. Omaha: University of Nebraska Press.
- Service des Statistiques. 1954. *Recensement général de la population en 1951-1952*. Rabat: Impr. Thouret.
- UNESCO. 2020. "World Inequalities Database."
URL: <https://www.education-inequalities.org>
- Valencia Caciado, Felipe. 2019. "The Mission: Human Capital Transmission, Economic Persistence and Culture in South America." *The Quarterly Journal of Economics* pp. 507–556.
- Wagner, Daniel A. 1993. *Literacy, Culture and Development: Becoming Literate in Morocco*. New York: Cambridge University Press.
- Young, Crawford. 1994. *The African Colonial State in Comparative Perspective*. New Haven: Yale University Press.