# Nation-Building Through Compulsory Schooling During the Age of Mass Migration

Oriana Bandiera, Myra Mohnen, Imran Rasul, Martina Viarengo[¤]

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**Abstract**

By the mid-19th century, America was the most educated nation on Earth: significant financial investments in education were being undertaken and the majority of children *voluntarily* attended public schools. So why did states across America start introducing compulsory schooling laws at this time in history? We provide qualitative and quantitative evidence that states adopted compulsory schooling laws as a *nation-building* tool to instill civic values to the tens of millions of culturally diverse migrants who arrived during the 'Age of Mass Migration' between 1850 and 1914. We show the adoption of state level compulsory schooling laws occurred significantly earlier in states that hosted a subgroup of European migrants with lower exposure to civic values in their home countries. We then use cross-county data to show the same subgroup of European migrants had significantly lower demand for American common schooling pre-compulsion, and so would have been less exposed to the kinds of civic value instilled by the American education system had compulsory schooling not been passed. By studying the link between mass migration and the endogenous policy responses of American-born voters in receiving states, our analysis provides new micro-foundations for compulsory schooling laws, the legislative bedrock on which all future developments of the American schooling system were built. *JEL Codes: D02, F22, I28, O15, P16.*

[¤]Bandiera: LSE (o.bandiera@lse.ac.uk); Mohnen: Essex (myra.mohnen@essex.ac.uk); Rasul: UCL (i.rasul@ucl.ac.uk); Viarengo: The Graduate Institute, Geneva (martina.viarengo@graduateinstitute.ch). We thank Ran Abramitzky, Daron Acemoglu, Toke Aidt, David Atkin, Orley Ashenfelter, Abhijit Banerjee, James Banks, Sandra Black, Richard Blundell, Pedro Carneiro, Kenneth Chay, Ernesto Dal Bo, Angus Deaton, Melissa Dell, John De Quidt, David Donaldson, Christian Dustmann, Henry Farber, Claudio Ferraz, Frederico Finan, Vicky Fouka, Claudia Goldin, Rachel Griffith, Richard Hornbeck, Lakshmi Iyer, Joseph Kaboski, Alex Keyssar, Asim Khwaja, Michael Kremer, Ilyana Kuziemko, Valentino Larcinese, Peter Lindert, Bentley Macleod, Omer Moav, Joel Mokyr, Dilip Mukherjee, Kaivan Munshi, Ben Olken, Suresh Naidu, Nathan Nunn, M.Daniele Paserman, Torsten Persson, Morten Ravn, Bryony Reich, Jake Shapiro, David Stromberg, Fabian Waldinger, Ludger Woessmann, Yoram Weiss, Noam Yuchtman, Ekaterina Zhuravskaya and numerous seminar participants for useful comments. We thank Marleen Marra for excellent research assistance. We are grateful for financial support from the ERC (GA313234) and the ESRC Centre for the Microeconomic Analysis of Public Policy at IFS (grant number RES-544-28-5001). All errors remain our own.

# 1 Introduction

By the mid-19th century Americans were the most educated population in the world: financial investments into education were substantial and voluntary attendance was high [Landes and Solomon 1972, Black and Sokoloff 2006, Goldin and Katz 2008]. Figure 1 illustrates this point with newly assembled panel data on enrolment rates for 5-14 year olds from 1830 through 1890 for the US and similarly developed nations. The figure shows that US enrolment rates were above 50%, trending upwards, and diverging from other countries from 1850 onwards. At the same point in time, US states began introducing compulsory schooling laws. This is puzzling because the laws could not have been binding for the average American child, nor were they binding for the marginal child and thus the driving force behind 'the educated American' [Goldin and Katz 2003, 2008].[1] Nor were they targeting blacks, as legislative caveats often effectively excluded them from schools even post-compulsion [Black and Sokoloff 2006, Collins and Margo 2006].

This paper tests the hypothesis that compulsory schooling laws were introduced to teach the children of migrants who moved to America during the 'Age of Mass Migration' the same civic values taught to American-born children, who were voluntarily attending American common schools in large numbers. Two observations underpin our hypothesis. First, that civic values are at the core of state building as they underpin democratic institutions [Glaeser *et al.* 2007], reduce the costs of social interaction, coordination or information exchange [Bowles and Gintis 1976, Gradstein and Justmann 2002, Helliwell and Putnam 2007] and make individuals more likely to take actions to improve the common welfare of their community [Alesina and Reich 2015]. Second, the idea that schools shape civic values is well established in the social sciences [Almond and Verba 1963, Kamens 1988, Brady *et al.* 1995]. As detailed by Glaeser *et al.* [2007], educationalists themselves often list socialization as a pillar of curriculum design [Dewey 1944, Bourdieu and Paserron 1970, Bowles and Gintis 1976, Gordon and Browne 2004, Driscoll and Nagel 2005]. Indeed, a body of evidence in economics now supports the idea that schools affect individual values via the content of curricula [Algan *et al.* 2013, Clots-Figueras and Masella 2013, Cantoni *et al.* 2015], and that those exposed to compulsory schooling are causally more likely to be registered to vote, to vote, to engage in political discussion with others, to follow political campaigns and attend political meetings, as well as having higher rates of participation in community affairs and trust in government [Dee 2004, Milligan *et al.* 2004].[2]

[1] A body of work has emphasized Americans became educated because of fiscal decentralization, public funding, public provision, separation of church and state, and gender neutrality [Goldin and Katz 2008]. Goldin and Katz [2003] document that compulsion accounts for at most 5% of the increase in high school enrolment over the period 1910-40, when such laws were being fully enforced.

[2] DiPasquale and Glaeser [1999], Glaeser *et al.* [2007] and Glaeser and Sacerdote [2008] document, using evidence

Our research design exploits variation in civic values among European migrants from different countries as a proxy for the need to nation-build. Intuitively, the benefit of introducing compulsory schooling laws to teach civic values is higher where there is a larger population that lacks such values. While we obviously cannot measure the civic values of the migrants directly, we can exploit the fact that European schooling systems themselves developed to instill civic values [Weber 1976, Holmes 1979, Ramirez and Boli 1987, Alesina and Reich 2015], and thus migrants from European countries that had compulsory schooling laws were more likely to have been taught civil values than those from countries without such law. We thus examine how differences in the composition of the European origins of the migrant population, holding constant state characteristics that attract all migrants regardless of the compulsory schooling laws in their country of origin, impact the timing of compulsory schooling laws across US states.[3]

Our analysis proceeds in three stages. The first stage presents *qualitative* evidence to underpin the hypothesis that American society used compulsory schooling as the key policy tool to nation-build in response to mass migration. We show this was driven by the view that exposure to American public schools would instill the desired civic values among migrants, and a recognition that such values could be transmitted from children to their parents.

The second part of the analysis uses a newly assembled data-set on the timing of compulsory schooling laws across European countries and US Census data on state population's by country of origin. Given the multidisciplinary body of work documenting the nation-building motives for the development of compulsory state education systems in Europe [Weber 1976, Holmes 1979, Ramirez and Boli 1987, Aghion *et al.* 2012, Alesina and Reich 2015], we treat Europeans' exposure to such laws as the best available proxy of the civic values held by Europeans. Of course, the exact way in which compulsory state schooling operated would likely differ between each European country. What we emphasize here is the notion that most state education systems generally instill more values that underpin democratic institutions and trust in the state, say, relative to the counterfactual of a non-state provided compulsory education system: in nineteenth century Europe this would have amounted to either attending a private school, a religious school, or not attending school altogether. We then use survival analysis to estimate whether the cross-state timing of compulsory schooling laws is associated with the composition of migrants in the state.

Our central finding is that American-born median voters pass compulsory schooling laws significantly earlier in time in US states with a larger share of migrants from European countries

from the US and elsewhere, a robust correlation between education and civic and political participation.

[3]This logical chain requires two further conditions to hold. The first is that migrants transport their values with them, a hypothesis that has much empirical support [Guinnane *et al.* 2006, Fernandez 2013, Fernandez and Fogli 2009]. The second is that parents transmit civic values, and other preferences, to their children. Again, this condition is also underpinned by a body of empirical work [Bisin and Verdier 2000, Dohmen *et al.* 2012].

without historic exposure to compulsory state schooling in their country of origin: a one standard deviation in the share of these migrants doubles the hazard of compulsory schooling laws being passed in a decade between census years. Naturally, migrants from different countries differ along many dimensions other than civic values. These, however, do not drive our result which is robust to controlling for literacy rates among adult migrants, attendance rates of migrant children to some form of school, religion, and English language proficiency. The central result also holds across US regions, including in Southern and Western states.

The nation-building interpretation hinges on the comparison of the differential impact Europeans with and without historic exposure to compulsory state schooling in their home country have on the timing of such legislation in US states. Unobserved state factors that make a location equally attractive to both migrant groups do not bias this comparison. The chief econometric concern is that the process driving the location choices of migrants differ between these groups of European migrants. To address the endogenous location choices of migrants we present IV estimates using a control function approach in the non-linear survival model, based on a Bartik-Card instrumentation strategy: these further show our main result to be robust to accounting for the endogenous location choices of migrants.

Finally, we set up a horse-race between the nation-building hypothesis and other mechanisms driving compulsory schooling, such as redistributive motives, or due to a complementarity between capital and skilled labor. We find some evidence for these alternatives, so there is no doubt that economic factors also determined the expansion of compulsory schooling. However none of these channels mutes the additional nation-building channel.

The third part of the analysis provides direct evidence on migrants' demand for American public schooling that underpins the nation-building efforts of American-borns. During the study period, many migrant groups faced a choice between sending their children to parochial schools (so based on religion), or to attend an American common school. Only if migrants' demand for American common schools was sufficiently low would compulsory schooling bind and be required to change migrants' civic values. We develop and estimate a probabilistic voting model over schooling provision that allows us to map from the equilibrium provision of common schooling back to the relative demands for such American common schools among various migrant groups, using detailed cross-county data from 1890 on schooling provision and attendance.

The revealed demands for American common schooling across migrant groups match up closely with the cross-state analysis. We find that within European migrants, those from countries without long exposure to compulsory state schooling in their country of origin have significantly lower demand for American common schools relative to European migrants from countries with com-

pulsory schooling. Furthermore, there is a significant convergence in demand for common schools between natives and both groups of European migrants when compulsory schooling laws are introduced. Hence compulsory schooling did lead European migrants to be more exposed to the civic values being taught to American-borns in common schools, and this was especially so for Europeans from countries without historic exposure to compulsory state schooling in their country of origin. This cross-county analysis links tightly with the state-level analysis by establishing the counterfactual of what would have been migrants' exposure to the kinds of civic values instilled through American common schools absent compulsory schooling laws.

Our paper provides quantitative evidence on the hypothesis, put forward by historians, that compulsory schooling was introduced in America to state build [Cubberley 1947, Meyer *et al.* 1979, Engerman and Sokoloff 2005, Brockliss and Sheldon 2012]. It complements work on the economic and cultural assimilation of migrants during the Age of Mass Migration [Abramitzky *et al.* 2014, 2016, Biavaschi *et al.* 2017]. During this historic period a wider set of educational policies collectively known as the *Americanization Movement*, encompassing language requirements in schools and ultimately citizenship classes targeted towards adult migrants and conducted by the US Bureau of Naturalization [Cubberley 1947, Carter 2009], were introduced to assimilate migrants. While other disciplines have recognized periods of American history where the schooling system has been used to inculcate values among the foreign-born [Tyack 1976],[4] our analysis contributes to the literature by showing nation-building motives drove the passage of compulsory schooling laws from the 1850s onwards, the first pillar of the *Americanization Movement*, and the legislative bedrock on which later developments of the American education system have been built.

Most broadly, we contribute to the literature linking the national origins of migrants and institutional change. The seminal work of Acemoglu *et al.* [2001] illustrates how colonial settlers from Europe established institutions that had long lasting impacts on economic development. Our analysis can be seen as 'Acemoglu *et al.* in reverse' as we analyze how the American-born population, from whom the median voter determines state-level policies such as compulsory schooling, best responded in public policy to large migrant flows from a set of culturally diverse countries.

The paper is organized as follows. Section 2 presents qualitative evidence on the use of compulsory schooling as a nation-building tool during the Age of Mass Migration. Section 3 develops a conceptual framework describing how compulsory schooling can be used to nation-build by homogenizing civic values between its native and immigrant members. Section 4 describes the state

[4]For example: (i) Native American children being sent to boarding schools in the early nineteenth century; (ii) the dispatch of American teachers to Puerto Rico and the Philippines after the Spanish-American war; (iii) attempts to democratize Germany and Japan after World War II. In more recent times, Arlington [1991] describes how English became the required language of instruction in Southern US states in 1980s, in response to mass migration from Latin American.

level data and newly assembled database of compulsory state education laws by European country. Section 5 presents evidence linking the composition of migrant groups and the cross-state passage of compulsory schooling. Section 6 develops and tests a model of schooling provision to estimate the relative demand for American common schools across migrant groups using county data. Section 7 concludes. The Appendix provides proofs, data sources and robustness checks.

# 2 Qualitative Evidence

That American society used compulsory schooling as a tool to nation-build during the Age of Mass Migration has been recognized in leading accounts of the development of the American schooling system written by educationalists [Cubberley 1947], sociologists [Meyer *et al.* 1979] and economic historians [Engerman and Sokoloff 2005, Brockliss and Sheldon 2012]. We highlight those pieces of qualitative evidence that inform our research design.

We review how long-standing concerns over migrants' assimilation informed political debate, and how the education system was viewed as the key policy tool to address such concerns. This was driven by the view that exposure to American common schools would instill the desired civic values among migrants, and a recognition that such values could then be transmitted from children to parents. We then provide evidence that nation-building motives informed the architects of the common school movement, both as a general principle to instill civic values among American-born children and to foster the assimilation of migrant children. We conclude by providing evidence of curricula in common schools, as this relates directly to the inculcation of civic values.

## 2.1 Migrants and Compulsory Schooling in the Political Debate

American society's anxieties over immigrant assimilation have been well documented for each wave of large-scale migration. These concerns became politically salient from the 1850s onwards, most famously in 1855 when the *Native American Party* (also referred to as the 'Know Nothing Party') elected six governors and a number of Congressional representatives. The party's core philosophy was one of 'Americanism', consistently communicating the fear of the 'unAmericanness' of immigrants [Higham 1988].

The concerns of American-borns over migrants' assimilation are crystallized in the Dillingham Report, widely regarded as the most comprehensive legislative study on immigration ever conducted. The Report was drafted over 1907-11 by a Commission of senators, members of the House of Representatives and Presidential appointees. The Commission was established in response to concerns over the assimilation of migrants from Southern and Eastern Europe, and produced a 41-

volume report, including a number of volumes solely dedicated to the role of the education system in the assimilation process. The Commission repeatedly highlighted the importance of *American-izing* immigrants. Moreover, the Commission explicitly recognized the role that children played in the wider long run process of inculcating values in the entire migrant population:[5] *"The most potent influence in promoting the assimilation of the family is the children, who, through contact with American life in the schools, almost invariably act as the unconscious agents in the uplift of their parents. Moreover, as the children grow older and become wage earners, they usually enter some higher occupation than that of their fathers, and in such cases the Americanizing influence upon their parents continues until frequently the whole family is gradually led away from the old surroundings and old standards into those more nearly American. This influence of the children is potent among immigrants in the great cities, as well as in the smaller industrial centers."* [p.42, Volume 29].

## 2.2 Nation Building and the American Common School Movement

The key individuals driving the American common school movement were Horace Mann (1796-1859), Henry Barnard (1811-1900) and Calvin Stowe (1806-1882). While each of them certainly discussed the economic benefits of schooling, they were also united in a belief that schooling was the instrument, "*by which the particularities of localism and religious tradition and of national origin would be integrated into a single sustaining identity*" and could foster "*goals of equity, social harmony, and national unity*" [p9, p39, Glenn 2002].

Horace Mann is widely regarded as the most prominent figure of the common school movement, becoming the first secretary of the Massachusetts Board of Education in 1837 (the earliest adopter of compulsory schooling). He believed common schools would, *"promote moral education"* and *"unite the country by teaching common values"* [p147, p150, Jeynes 2007]. Like many advocates for the common school movement, he recurrently emphasized the link between education and the civic virtues necessary for effective participation in a democracy.

Henry Barnard was the secretary of the Connecticut Board of Education, and was very much influenced by what he had seen of the European education system, in its drive to instill civic values among European populations. His motives for building the public school system have been described as follows: *"Despite the challenges that Barnard faced, he, like Mann, was tenacious in maintaining the view that the common school cause was for the good of the country. He believed that democracy and education went together "in the cause of truth, justice, liberty, patriotism,*

[5] This view also matches with historic evidence on the inter-generational transmission of human capital, especially language skills, from children to parents [Ferrie and Kuziemko 2015].

*religion.""* [p154, Jeynes 2007].

Finally, Calvin Stowe was a key driver of the common school movement in the Midwest. Stowe, like Mann, believed moral education was the most important aspect of schooling and was also heavily influenced by what he saw of European education practices, and compulsory schooling being used to inculcate civic values.[6]

It has been argued that all these central figures ultimately saw schools as the *key tool* for social control and assimilation in America. Certainly, advocates of common schools came to emphasize their role as an alternative to families to foster the assimilation of immigrant children. As Tyack [p363, 1976] argues, "*Advocates of compulsory schooling often argued that families–or at least some families–like those of the poor or foreign-born–were failing to carry out their traditional functions of moral and vocational training...reformers used the powers of the state to intervene in families to create alternative institutions of socialization.*"

One of the most noted advocates for common schools in Philadelphia was E.C.Wines best articulated the link between compulsory schooling, immigration and nation-building: *"We refer to that overflowing tide of immigration, which disgorges our shores its annual tens of thousands of Europe's most degraded population–men without knowledge, without virtue, without patriotism, and with nothing to lose in any election..Are these persons fit depositaries of political power? The only practicable antidote to this, the only effectual safe-guard against the other, the only sure palladium of our liberties, is so thorough an education of all our citizens, native and foreign, as shall nullify the dangerous element in immigration."* [p742-3, Wines 1851].

## 2.3 Compulsory Schooling and Civic Values

American educators wanted their schooling system to place relatively more emphasis on the role of schooling in shaping the character, values and loyalties of students as future participants in political and social life. This philosophy is what would have driven the civic values instilled into American-born children voluntarily attending schools in such high numbers (Figure 1) and would drive some of the legislative acts that introduced compulsory schooling, to also make explicit references to

[6]When Calvin Stowe reported back to American education leaders about European practices, he emphasized that "*public education in Europe was having a civilizing effect on that continent because it was bringing Christianity and the teachings of democracy to the most remote parts, where despotism often ruled*" [Jeynes 2007]. Glenn [p100, 2002] writes, *"The influence of foreign models, especially that of Protestant states of the Continent, Prussia and the Netherlands, was of critical importance in shaping the goals and the arguments of he education reformers. It was through the nation-building role of popular schooling in those countries that key ideas of the Enlightenment and the French Revolution of 1789 because central elements of what was virtually a consensus program along elites in the United States throughout the century and a quarter beginning around 1830",* and, *"that the alternative model offered by England, where education remained essentially in the hands of private, ecclesiastical, and charitable enterprise until the 20th century, did not have more appeal suggests how strongly Enlightenment concerns for national unity and uniformity dominated the thinking of the leaders in the common school movement."*

civic values. For example, in Connecticut the law states the curriculum must cover "US history and citizenship", and in Colorado it states that instruction "must cover the constitution".[7] In detailing how compulsory schooling laws were actually implemented, it is important to note that American school districts have always had a high degree of autonomy. This has led to considerable heterogeneity in practices, making it almost impossible to track curriculum changes over time by district [Goldin 1999a]. Subject to this caveat, we highlight the following.

First, the alternative source of education to common schools were parochial and private schools. According to Lindert [2004], 12% of all pupils were enrolled in such schools in 1880. Migrant specific shares are not available but were presumably higher given that the language of instruction in these schools was not necessarily English (and the figure aligns closely with the overall share of migrants in the population). In some cases, compulsory schooling laws required children to be taught in some public school.[8] In other cases, states regulated parochial and private schools by specifying standards they had to comply with to meet compulsory state schooling requirements. For instance, the standards set in Illinois and Wisconsin aroused fierce opposition because of their provisions that private schools teach in the English language and that they be approved by boards of public education [Tyack 1976].

Second, states differed as to whether English should be the main language of instruction. Some states imposed clear English language requirements early on, while in others bilingualism was first accepted and then banned from public schools.[9] Eventually the *Americanization Movement* led to further legislative iterations making language and instruction requirements more explicit [Lleras-

[7] Glaeser *et al.* [2007] note that even today, a 'content standard' listed by California's Department of Education advocates that students, "understand the obligations of civic-mindedness, including voting, being informed on civic issue, volunteering and performing public service, and serving in the military or alternative service".

[8] For example, the Massachusetts law of 1952 states that, *"Every person who shall have any child under his control between the ages of eight and fourteen years, shall send such child to some public school within the town or city in which he resides..."*

[9] For example, a 1919 law in Minnesota reads: *"A school, to satisfy the requirements of compulsory attendance, must be one in which all the common branches are taught in the English language, from textbooks written in the English language and taught by teachers qualified to teach in the English language. A foreign language may be taught when such language is an elective or a prescribed subject of the curriculum, not to exceed one hour each day."* [Minnesota, Laws 1919, Ch. 320, amending Gen. Stat. 1914, sec. 2979 as described in Ruppenthal 1920]. Daniels [pp.159-60, 1990] discusses the variation across states: *"Beginning in 1839 a number of states, starting with Pennsylvania and Ohio, passed laws enabling (or in some cases requiring) instruction in German in the public schools when a number of parents, often but not always 50 percent, requested it, and these laws were copied, with inevitable variations, in most states with large blocs of German settlers. The Ohio law authorized the setting up of exclusively German-language schools. In Cincinnati this option was exercised so fully that there were, in effect, two systems, one English, one German, and, in the 1850s, the school board recognized the right of pupils to receive instruction in either German or English. In Saint Louis, on the other hand, the use of bilingualism was a device to attract German American children to the public schools. In 1860 it is estimated that four of five German American children there went to non-public schools; two decades later the proportions had been reversed. In Saint Louis all advanced subjects were taught in English. So successful was the integration that even before the anti-German hysteria of World War I, German instruction as opposed to instruction in the German language was discontinued."*

Muney and Shertzer 2015]. This was ultimately followed by the introduction of citizenship classes targeted to foreign-born *adults* from 1915-16 onwards, that were in part conducted by the US Bureau of Naturalization [Cubberley 1947]. These classes were designed to, "*imbue the immigrant with American ideals of living...and preparing them for citizenship*" [Carter 2009, p23-4]. In short, it is not that nation-building efforts ignored adult immigrants. Rather, as recognized by the Dillingham Report, policies to target immigrant children were prioritized and attempted earlier.

# 3 Conceptual Framework

To bridge between the qualitative and quantitative evidence, we present a framework to make precise the idea of how a society made up of native and migrant groups, with heterogeneity in values across groups, can use compulsory schooling to nation-build. The framework is closely based on Alesina and Reich [2015]. Consider a state comprised of: (i) American-borns, normalized to mass 1; (ii) newly arrived immigrants of mass $\gamma \cdot \ 1$. Individuals have heterogeneous civic values represented by a point on the real line. Let $f(j)$ be the density of American-borns with values $j \in \mathbb{R}$, and $g(j)$ be the corresponding density among immigrants. Denote by $d_{ij}$ the 'distance' between values $i$ and $j$, $d_{ij} = |i \ j|$, and let $c$ denote private consumption. An American-born individual with values $i \in \mathbb{R}$ is assumed to have utility:

$$u_i = c \ \int_{j\in\mathbb{R}} f(j)d_{ij}dj \ \int_{j\in\mathbb{R}} g(j)d_{ij}dj. \tag{1}$$

The second term on the RHS of (1) measures the difference between her values and those of other American-borns; the third term measures the difference between her values and those of immigrants. American-borns thus prefer to live in a more homogeneous society in which individuals share values. This is an *intrinsic* preference held by natives: homogenizing the population might have other *indirect* benefits, but the underlying nation-building motive of natives is that they prefer to live with others that share their values.

To see how schooling might affect the homogeneity of values in society, assume first that a voluntary schooling system is in place, attended by American-borns (as described in Figure 1). We assume the school curriculum matches the values of the median American, $i_m$. Attending school shifts individual values towards $i_m$ by degree $\lambda$. Schooling can impact a variety of specific values [Lott 1999, Glaeser *et al.* 2007, Alesina and Reich 2015], and contemporary evidence suggests the content of school *curricula* do indeed influence beliefs and values held later in life [Dee 2004, Milligan *et al.* 2004, Algan *et al.* 2013, Clots-Figueras and Masella 2013, Cantoni *et al.* 2015]. The population decides by majority rule whether to make this schooling system compulsory.

In line with our empirical setting, $\gamma$ is sufficiently small so the median voter is an American-born.[10] As American-borns already attend school, the direct effect of implementing compulsory schooling is on the migrant population who are homogenized towards the values of the median American, $i_m$. Assuming a fixed cost of implementing (and enforcing) compulsory schooling, the policy increases the tax burden for all by an amount $T$. Hence the utility of an American with median values, $i^m$, if compulsory schooling were to be introduced is,

$$u_{i^m} = c - \int_{j\in\mathbb{R}} f(j)d_{i^m j}dj - \int_{j\in\mathbb{R}} g(j)(1-\lambda)d_{i^m j}dj - T. \tag{2}$$

**Proposition 1** *Suppose all immigrants have values $j > i^m$ to the left of the median American, then a majority of Americans vote for compulsory schooling if and only if,*

$$\int_{j\in\mathbb{R}} g(j)d_{i^m j}dj \geq T/\lambda. \tag{3}$$

The Proof is in the Appendix.[11]

The framework makes precise that whether a state votes for compulsory schooling depends on: (i) how different the migrant population is from the median American, $d_{i^m j}$; (ii) the size of the migrant group, $g(j)$; (iii) the effectiveness of schooling in shifting preferences, $\lambda$; (iv) the fiscal cost of making schooling compulsory (and its enforcement), $T$.[12]

Section 4 details how we proxy the key measure, $d_{i^m j}$: pre-held civic values among migrants using their historic exposure to compulsory state schooling in Europe. Section 5 takes this to the data to explain the cross-state timing of compulsory schooling in US states. A necessary condition for natives to prefer to make schooling compulsory is because it binds on immigrants and so exposes them to American civic values. This is at the heart of the analysis in Section 6 that estimates the relative demand for American common schooling among immigrants and natives.

[10] Figure A1 uses IPUMS 1880 census data (a 100% sample) to show that while migrants account for a sizeable share of each state's population, they remain a minority in each state. This fact also holds on subsamples that better reflect those eligible to vote, such as the share of men, those in the labor force, and those residing in urban areas. Hence, even if migrants themselves demanded compulsory schooling, they were not pivotal at the state level in determining the passage of such legislation.

[11] The assumption $j > i^m$ simplifies the algebra and best describes our setting. Allowing for overlapping preferences of Americans and migrants implies that if compulsion is introduced, this moves the values of some immigrant *further* from the preferences of some Americans. The condition under which the majority of Americans then vote for compulsory schooling depends on the entire distribution of preferences among them.

[12] The costs of compulsory schooling laws can also be interpreted more broadly. For example, with compulsion, immigrant children would have had to reallocate time away from potentially more productive labor market work, to be exposed to the civic values only the state schooling system could provide *en masse*. Second, and related to the evidence in Section 6, there would be greater class sizes as a result for all children including American-borns.

# 4 Data and Method

The top half of Figure 2 shows the variation we need to explain: the timing of compulsory schooling laws by US state, as coded in Landes and Solomon [1972]. This coding is our preferred source because it covers all states from the 1850s. A prominent alternative coding is that provided by Goldin and Katz [2003] (who extend the coding of Lleras-Muney [2002]). The Goldin and Katz [2003] data only covers the period from 1900 onwards, and so does not provide information on the 33 states that introduced compulsory schooling before 1900. For the 15 states covered by both the Landes and Solomon [1972] and Goldin and Katz [2003] codings, we find the year of passage for compulsory schooling is identical for 13 states, and the differences are minor in the other two cases (Louisiana: 1912 vs. 1910; Tennessee: 1906 vs. 1905). We focus on determining what drove the *adoption* of compulsory schooling across states. It is well understood that such laws were initially imperfectly enforced, but became more effective over time [Clay *et al.* 2012]. The existing literature has focused on measuring the *impacts* of this legislation on various outcomes: a question for which the enforcement of compulsory schooling is more first order.[13]

To operationalize the conceptual framework, we need to identify the key source of *within-migrant* diversity in values to match $d_{i^m j}$, the difference in civic values between Americans and migrants. Obviously, no data set is ever likely to contain information on the actual civic values held by American-borns and migrants, by country of origin. We therefore seek an empirical proxy for the civic values held by migrants. Given the multi-disciplinary body of work documenting nation-building motives for the development of compulsory state education systems in Europe [Weber 1976, Holmes 1979, Ramirez and Boli 1987, Aghion *et al.* 2012, Alesina and Reich 2015], we treat Europeans' exposure to a compulsory state education system in their country of origin as the best available proxy of the civic values held by Europeans. This approach provides a natural distinction between two types of European migrant: Europeans from countries that had compulsory state schooling laws in place before the first US state (Massachusetts in 1852) and were thus more likely to be exposed to such civic values in their country of origin, and European migrants from countries that introduced compulsory state schooling after 1850 and were thus less likely to have been inculcated in civic values related to democracy and trust in the state, that

[13] Clay *et al.* [2012] describe how there were gradual extensions in how compulsory schooling laws operated to cover: (i) the period of compulsory schooling each year; (ii) precise age and poverty requirements for children to attend; (iii) the application of schooling laws to private/parochial schools; (iv) increased requirements of cooperation from schools in enforcement; (v) the appointment of attendance officers, and then the institution of state supervision of local enforcement; (vi) the connection of school-attendance enforcement with the child-labor legislation of States through a system of working permits and state inspection of mills, stores, and factories. Table A1 shows further details on the passage of key child related legislation by state. There is variation across states in the ages for which compulsory school laws were binding: we do not exploit such variation for our analysis.

were held and valued in American society.

To reiterate, the exact way in which compulsory state schooling operated would likely differ between each European country. We leave for future research any attempt to code the specific civic values promoted under each schooling system, but what we want to emphasize here is that, relative to a church- or family-based schooling, state education systems generally instill values more in line with: (i) underpinning democratic institutions [Glaeser *et al.* 2007] because they reduce the costs of social interaction, coordination or information exchange [Bowles and Gintis 1976, Gradstein and Justmann 2002, Helliwell and Putnam 2007]; (ii) making individuals more likely to take actions to improve the common welfare of their community [Alesina and Reich 2015]; (iii) shaping the acceptability of welfare transfers [Lott 1999].

For this purpose of this paper, we have constructed a novel data-set on the timing of compulsory state schooling laws by European country, shown in the bottom half of Figure 2. The Appendix details the data sources underlying this coding. Figure 2 shows the European countries defined to have compulsory schooling in place by 1850 are Austria-Hungary, Denmark, Germany, Greece, Norway, Portugal and Sweden. The adoption of compulsory schooling in Europe is not perfectly predicted by geography, language or religion. In particular, within each group of European countries that adopted compulsory schooling pre and post 1850, there are countries in Northern, Southern and Eastern Europe, and countries where the main religion is Catholicism or Protestantism. This variation enables us to separately identify the impact on the cross-state passage of compulsory schooling of within-migrant diversity in civic values from differences along other dimensions, such as European region of origin, language and religion.[14]

Table A2A also provides the earliest and latest dates by which compulsory schooling might reasonably be argued to have been passed in any country, given the sources cited and ambiguities/regional variations within a country (Table A2B discusses the coding for countries in which there is within-country variation in compulsory schooling). For our main analysis we focus on the dates shown in Figure 2. We later provide robustness checks on our results using these lower and upper bound dates of compulsory schooling.[15]

Finally, Table A3 probes the link between compulsory schooling laws and school enrolment

[14]This variation also ensures that individuals from both sets of countries arrive in each wave of mass migration to the US (starting with the first waves of migration from Northern Europe, followed by later waves of migration from Southern and Eastern Europe [Bandiera *et al.* 2013]. We also note that European countries without compulsory schooling have higher GDP per capita than those with compulsion, consistent with nation-building rather than economic development driving compulsion in Europe [Ramirez and Boli 1987]. The ratio of GDP per capita between the two types of European country remains almost fixed over the entire period.

[15]We define countries using pre-1914 borders, that can be matched into US census place of birth codes. Except for Canada and Japan, we were unable to find detailed sources for all non-European countries to accurately divide them into those with and without historic experience of compulsion.

rates *in Europe*, exploiting five secondary data sources. These data also make clear that even in European countries with compulsion, enrolment rates remained below 100% on average (as with US states). Nevertheless, in each data set, we compare: (i) enrolment rates between countries with and without compulsion in 1850, in years prior to and including 1850 (Columns 1 and 2); (ii) for all countries, enrolment rates in a 30 year window pre- and post-adoption (Columns 3 and 4). Despite these sources differing in their coverage of countries, years, and enrolment measures, we see a consistent pattern of results from both comparisons that show: (i) European countries with compulsion in place in 1850 have higher enrolment rates than countries without compulsion; (ii) the adoption of compulsory schooling laws is associated with higher enrolment rates.

These secondary data sources support the hypothesis that migrants from countries with compulsory state-provided education are more likely to have been instilled with the kinds of civic values related to democracy and trust in the state, than children from countries where education would have been provided by non-state actors: private schools, religious schools or households themselves. Whether these differences in values then translate to differences in values held by Europeans that migrated to the US depends on the nature of migrant selection. The evidence on the selection of migrants based on their human capital, during the Age of Mass Migration, has produced mixed findings on how selection differs across country or origin, and over time.

For example, Abramitzky *et al.* [2012] show that Norwegian immigrants entering the US between 1865 and 1900 were negatively selected: poorer individuals were more likely to migrate and younger brothers in rural areas were more likely to migrate due to primogeniture system in rural areas. Abramitzky *et al.* [2014] study convergence in earnings gaps between migrants from a wide range of countries over the Age of Mass Migration, and the nature of selection of European return migrants. In relation to the differential selection of migrants into the US, they report large differences earnings gaps between countries. For example, Norwegian migrants had among the most negative earnings gap at the time of arrival (in line with Abramitzky *et al.* [2012]). Negative earnings gaps are also found for migrants from Portugal, Belgium, Denmark and Sweden. Positive earnings gaps at time of arrival are documented for British migrants, and those from France and Russia. Earnings gaps differences were close to zero for migrants from Italy and Germany. Wegge [2002] presents estimates for Germany. Comparing migration rates across occupation groups for over 10000 individuals who migrated mostly to the US between 1852 and 1857. She finds that members of the richest and poorest occupations were least likely to migrate, while workers in the mid-skill range, such as machinists, metal workers and brewers, were most likely to do so, that is in line with results reported above of Abramitzky *et al.* [2014].[16]

[16]For the period prior to our study period, Abramtizky and Braggion [2006] study selection on human capital

Our central idea is that European migrants are selected in terms of their civic values. As civic values are instilled by state education systems, if migrants are positively selected, the American median voter should target compulsory schooling in US states towards Europeans from countries without exposure to compulsory schooling at home, as we have emphasized throughout. Of course, if European migrants are negatively selected in terms of their civic values, then American voters should instead target compulsory schooling laws towards those with exposure to compulsory schooling at home. Hence the nature of migrant selection remains an entirely empirical question that we determine below.

## 4.1 Descriptives

We combine US Census data on state population by country of birth with our coding on the timing of compulsory schooling law by European country to compute for each US state-year, the respective population shares of migrants from European countries with and without compulsory schooling before 1850. Data limitations prevent us from dividing non-European migrants between those with and without compulsory schooling at home: they are grouped in one category throughout.

Figure A2 shows the share of the state population in each group (Europeans with and without compulsory state schooling in their country of origin, and non-Europeans), averaged across census years before the passage of compulsory schooling laws in each state. There is considerable variation in the size of the groups across states: the share of Europeans with compulsory schooling ranges from .05% to 18%, the share of Europeans without compulsory schooling from .3% to 29%, the share of non-Europeans from .03% to 32%. Most importantly, the correlation between the migrant shares are positive but not high, allowing us to separately identify the public policy response of American-born median voters to the presence of each group.

Table 1 compares the characteristics of the different migrant groups and Americans in state-census years before compulsory schooling is introduced. The first row describes the relative population share of each group and again highlights the considerable variation in these shares across US states in a given year, and the variation in shares within a state over time. The next two

among indentured servant migrants to the United States in the seventeenth and eighteenth centuries. They find evidence of such migrants to the United States being positively selected. In contemporary data, Dustmann and Glitz [2011] compare the educational attainment of migrants for the 11 largest sending countries within OECD countries to those from their home country. They generally find evidence of migrants being positively selected. However, this is not the case when they consider lower income sending countries, such as Mexico or Turkey, whose migrants tend to come more from the middle of the distribution of educational attainment. Indeed, this view of the changing nature of migrant selection is well summarized in Abramitzky and Boustan [2016]. They review the evidence on migrant selection in the US and conclude that while historically, migrant selection patterns were mixed, with some migrants positively selected and others negatively selected from their home countries on the basis of skill, migrants today are primarily positively selected, at least on observable characteristics.

rows in Panel A highlight differences in human capital across groups. Among adults, the share of illiterates is significantly higher among Europeans from countries without compulsory schooling than among European-born adults from countries with compulsory schooling.[17] These differences are significant even conditioning on state fixed effects (Column 6). This is in line with the 'first stage' evidence provided in Table A3 comparing enrolment rates in Europe among countries with and without compulsory schooling. The next row in Table 1 shows these patterns persist across generations. Comparing enrolment rates in any type of school in the US (public or parochial) for children aged 8-14 in each group (the cohort for whom compulsory schooling was typically related to), these are significantly *lower* among migrants groups from European countries *without* compulsory schooling than for children from European countries with compulsory schooling in place by 1850. As expected both migrant groups trail behind the enrolment rates of American-borns, and enrolment rates of non-Europeans lie somewhere between the levels of the two European groups.

This suggests compulsory schooling laws might have been passed by US states to raise the skills of migrant children, rather than to instill civic values (that could only be acquired through compulsion to attend a common school or requiring other schools to teach elements of the same curriculum). We disentangle these explanations by exploiting variation in enrolment rates within each European group, to see if enrolment rates *per se* drives the passage of compulsion, that would follow from the skills-based rather than values-based nation-building explanation.

The remaining rows of Panel A highlight that the two groups of European migrants do not significantly differ from each other on other characteristics including the share of young people in the group (aged 15 or less), labor force participation rates, the share of the group residing on a farm, and an overall measure of the groups economic standing in the US as proxied by an occupational index score available across US census years.[18]

## 4.2 Empirical Method

We use survival analysis to estimate the cross-state timing of the passage of compulsory schooling. We estimate the hazard rate, $h(t)$, namely, the probability of compulsory schooling law being passed in a time interval from census year $t$ until census year $t + 10$, conditional on compulsory schooling not having been passed in that state up until census year $t$. This approach allows

[17] Illiteracy rates among American-born adults are higher than for any of the migrant groups because migrants are much younger on average. This fact combined with the strong upward time trend over the 19th century in the educational attainment of Americans shown in Figure 1, means that their adult illiteracy rates of natives are higher than for migrants because older cohorts of American-borns are included.

[18] The score is based on the OCCSCORE constructed variable in IPUMS census samples. This assigns each occupation in all years a value representing the median total income (in hundreds of $1950) of all persons with that particular occupation in 1950.

for duration dependence in the passage of legislation by states (so that history matters), and corrects for censoring bias without introducing selection bias. The unit of observation is the state-census year where we use census years from 1850 to 1930. In the survival analysis set-up, 'failure' corresponds to the year of passage of compulsory schooling (an absorbing state). We first estimate the following Cox proportional hazard model:

$$h_s(t|\mathbf{x}_{st}) = h_0(t)\exp(\sum\nolimits_j \beta_j N_{st}^j + \sum\nolimits_j \gamma_j X_{st}^j + \lambda X_{st}), \tag{4}$$

where the baseline hazard $h_0(t)$ is unparameterized, and $t$ corresponds to census year. This model scales the baseline hazard by a function of state covariates. In particular, we consider how the composition of various migrant groups $j$ in the state correlate to the passage of compulsory schooling. The division of population groups $j$ we consider is between European migrants in the state from countries with and without historic exposure to compulsory state-provided education systems, as well as non-European migrants. $N_{st}^j$ is the share of the state population that is in group $j$ in year $t$: this is our key variable of interest; $X_{st}^j$ includes the same group characteristics shown in Table 1. $X_{st}$ includes the total population of the state, and the state's occupational index score, a proxy for the state's economic development.

The coefficient of interest is how changes in the composition of the state population group $j$ affect the hazard of passing compulsory schooling laws, $\widehat{\beta}_j$. As population sizes across groups $j$ differ, we convert all population shares $N_{st}^j$ into effect sizes (calculated from pre-adoption state-census years). $\widehat{\beta}_j$ then corresponds to the impact of a one standard increase in the share of group $j$ in the state on the hazard of passing compulsory schooling law. We test the null that $\beta_j$ is equal to one, so that a hazard significantly greater (less) that one corresponds to the law being passed significantly earlier (later) in time, all else equal.

The nation-building interpretation is based on a comparison of $\widehat{\beta}_j$ between Europeans with and without historic exposure to compulsory state-provided education systems. The maintained hypothesis is that this only picks up differential selection of migrants based on their civic values. We address two broad classes of econometric concern that the measure picks up alternative selection of migrants. In the first, we use multiple strategies to address the issue that the process driving the endogenous location choices of migrants differs between groups (Section 5.4). In the second we address the concern this measure relates to other migrant characteristics by testing whether other forms of within-migrant diversity (such as language and religion) correlate to the passage of compulsory school laws (Section 5.5).

# 5 Results

## 5.1 Baseline Findings

Table 2 presents our baseline results. The first specification pools foreign-borns into one group: we find that a one standard deviation increase in the share of the population that is foreign-born significantly increases the hazard rate of compulsory schooling being passed between two Census dates by 24%. Column 2 splits the foreign-born into European and non-Europeans, and the result suggests the presence of European migrants is significantly associated with the passage of compulsory schooling.

While similar results have been noted in the earlier literature studying the passage of compulsory schooling laws, Column 3 splits European migrants along the key margin relevant for the nation-building hypothesis. We find the presence of European migrants from countries that do *not* have historic experience of compulsory state schooling at home significantly brings *forward* in time the passage of compulsory schooling in US states: a one standard deviation increase in the population share of such Europeans is associated with a 64% higher hazard rate. In contrast, the presence of Europeans with a long history of compulsory schooling at home does not influence when compulsory schooling is passed by states. The effect sizes across these types of European migrant are significantly different to each other, as shown at the foot of the Table [p-value=.005].

Column 4 estimates (4) in full, so $X_{st}^{j}$ further includes the enrolment rates of 8-14 year olds for American and the three migrant groups $j$ (the age group for whom compulsory schooling in US states was most relevant for), and we present the impacts of these human capital related controls (in effect sizes) in addition to the coefficients of interest, $\widehat{\beta}_j$. Two key results emerge. First, the distinction between the types of European migrant is robust to controlling for other dimensions along which they differ [p-value=.004]. The magnitude of the effect remains large: a one standard deviation increase in the population share of Europeans without compulsory state schooling at home doubles the hazard of a US state passing compulsory schooling. Second, enrollment rates of migrants' children in the US have weak impacts on whether American-born voters introduce compulsory schooling. We note that higher enrollment rates among the children of natives speed up the adoption of the laws, as shown first by Landes and Solomon [1972]. This might reflect the natural complementarity between American enrolment rates, namely, the extent to which American children are instilled in certain civic values in school will inevitably increase the returns to also instill the same values in migrant children using the same common schools.

To further document the link between compulsory schooling and the human capital of adult migrants, Table A4 reports the full set of human capital related coefficients from the full specifica-

tion in Column 4 of Table 2, where all covariates are measured in effect sizes. This highlights that higher illiteracy rates among adults in each group are not associated with the earlier passage of compulsory schooling. Indeed, states with less literate adult populations of American-borns and Europeans with exposure to state compulsory state education systems in their country of origin, adopt compulsory schooling significantly *later* in time, all else equal. This runs counter to the idea that the cross-state passage of compulsory schooling was driven predominantly by a desire by American-borns to skill the migrant population.

The nation-building explanation thus remains first order: the conceptual framework highlighted that American-borns have a desire to homogenize those migrants that are more distant from them in values, and the empirical evidence suggests it is the civic values held by migrants, as proxied by their historic exposure to compulsory state-provided education systems at home, rather than migrants' investment in the human capital of their children in the US, or the skills among adults, that largely drives the cross-state passage of compulsory schooling.

Of course, the American median voter *could* have targeted those with compulsory schooling in their country of origin because either: (i) state education systems inculcate country-specific identities that are not transportable across locations, and so those individuals are most in need of being re-indoctrinated with American values, or; (ii) migrants are negatively selected so that those with civic values most similar to Americans are those that migrate from European countries without compulsory schooling in 1850. This is strongly rejected by the data. Rather, we find American-borns target those Europeans without historic experience of compulsory schooling in their country of origin (as well as towards non-Europeans who are also unlikely to have compulsory schooling back home). This is consistent with compulsory schooling being a nation-building tool because of its impact on civic values that were *common and transportable* across Europe and America in the nineteenth century.

Such portability of civic values is in line with arguments given for why governments have incentives to compel citizens to go through the same schooling system. Relative to the counterfactual in which schooling is provided through religious organizations or by households themselves, compulsory state schooling can instill civic values that: (i) underpin democratic institutions [Glaeser *et al.* 2007] because they reduce the costs of social interaction, coordination or information exchange [Bowles and Gintis 1976, Gradstein and Justmann 2002, Helliwell and Putnam 2007]; (ii) make individuals more likely to take actions to improve the common welfare of their community [Alesina and Reich 2015]; (iii) shape the acceptability of welfare transfers [Lott 1999]; (iv) or because state capacity is easier to raise in homogeneous societies in which the common good is easily identifiable and political institutions are inclusive [Besley and Persson 2010].

## 5.2 Robustness Checks

We assess the robustness of our core finding along multiple dimensions, as described in more detail in the Appendix. Specification (4) proxies migrants' civic values held by exploiting cross-country differences in whether migrants' country of origin had compulsory state schooling laws in place in 1850 or not. The first robustness check explores an alternative specification that exploits *within-country* variation over time in exposure to compulsory state schooling. We do so by considering a rolling window of Europeans' exposure to compulsory schooling to examine whether the American median-voter is differentially sensitive to the presence of European migrants that have passed compulsory schooling at least 30 years ago, versus the presence of Europeans from countries that have either never passed compulsory schooling or passed it less than a generation ago. This highlights how American voters react differently over time to migrants from the same country, as that country becomes exposed to compulsory schooling at home. This helps further pin down that when passing compulsory schooling laws, American-born median voters across states are responding to the civic values held by European migrants, rather than some time invariant characteristic of European countries that had compulsion in place in 1850.

The result, in Column 1 of Table A5, demonstrates that with this definition, the sharp contrast between how American-borns react to different types of European migrant becomes even more pronounced: a one standard deviation increase in the population share of European migrants from countries that do *not* have more than a generation of exposure to compulsory schooling at home significantly increases the hazard by 2.31. In contrast, the presence of Europeans with compulsory schooling at home for at least one generation significantly reduces the hazard rate below one. These results highlight how American-born voters appear to react differentially over time to the *same* country of origin as that country's population accumulates experience of compulsory schooling, with their civic values being shaped as a result.

Table A5 then shows the robustness of our main finding to additionally controlling for three classes of variable. First, we control for the passage of other legislation in US states, that might be complementary to, or pre-requisites for, compulsory schooling law. For example, child labor laws and the establishment of a birth registration system have been argued to be interlinked with compulsory schooling [Lleras-Muney 2002, Goldin and Katz 2003]. Second, we show the main result survives controlling for proxies for the states' progressivity. Third, we control for additional types of legislation passed in European countries: in particular we show our main result is robust to controlling for the presence of European migrants from countries with and without child labor laws in 1850, to rule out that such policy preferences drive migrants to sort into locations with like-minded Americans, rather than compulsory schooling being introduced as a nation-building

tool by American-borns.

Table A6 shows our main result continues to hold using: (i) alternative econometric specifications, including imposing parametric structure on the underlying hazard, $h_0(t)$; (ii) alternative classifications of European countries with and without compulsory schooling, using the lower and upper bound limits of when compulsory schooling could have been introduced, shown in Table A2.

## 5.3 Spatial Variation

Figure 2 highlighted a clear spatial pattern across the US in the adoption of compulsory schooling, with Southern and Western states trailing other regions. We next address whether there could be a very different process driving compulsory schooling law in those regions.

Many Western states were admitted to the Union towards the end of the 19th Century, and passed compulsory schooling laws just before gaining entrance. Such states might have introduced compulsory schooling laws in order to enter the Union, rather than because of nation-building motives. On the other hand, the requirements for entering the Union in the US Constitution (Article IV, Section 3) make no explicit reference to any degree of modernization or institutional complexity that candidate states must have reached, and some educationalists have been explicit that the nation-building hypothesis is as relevant in Western states as others [Meyer *et al.* 1979].

In Southern states there was huge resistance to educating black children (before the Civil War it was illegal in many Southern states to teach slaves to read or write) [Margo 1990]. At the same time, caveats were often included in compulsory schooling laws to ensure blacks did not benefit from compulsion, such as exemptions due to poverty or distance from the nearest public school [Lleras-Muney 2002, Black and Sokoloff 2006, Collins and Margo 2006]. A related concern however arises because during our study period, the Great Migration of Blacks occurred from Southern to urban Northern states (hence more closely matching the spatial patterns in Figure 2). However, this is unlikely to be related to the passage of compulsion because the migration of blacks occurred mostly between 1916 and 1930, well after compulsory schooling laws began to be introduced: pre-1910 the net migration of blacks was only .5mn [Collins 1997].[19]

Taking these concerns to data, Column 1 estimates the baseline specification *excluding* Western states: we continue to find the presence of European migrants from countries without a history of compulsory schooling to be significantly related to the cross-state timing of compulsion across states, and there to be a differential impact from Europeans with historic exposure to compulsory schooling at home [p-value=.000]. Estimating the baseline specification excluding Southern states

[19] Chay and Munshi [2013] document that an important pull factor for black migration to start in 1916 was the shutting down of European migration, that left labor supply shortages in Northern states. Prior to 1916 there is little evidence that European and black migration to states was interlinked.

leads to the removal of 17 states and the sample falls to 133. The result in Column 2 shows that the pattern of point estimates on the $\widehat{\beta}_j$'s to be in line with the baseline results, although the estimates are more imprecise in this smaller sample. Nevertheless, we continue to find a significantly differential impact from Europeans with and without historic exposure to compulsory schooling at home [p-value=.024].

To maintain an adequate sample size, Column 3 estimates (4) using only Western and Southern states: even in this subsample the nation-building explanation holds. Even if other factors drove compulsion on those areas – such as the desire to enter the Union or the desire not to educate blacks – it remains the case that in both sets of states, the cross-state timing of compulsion relates to the composition of European migrants present in the same.

Finally, we limit attention to states that are observed in all census years from 1850 to 1930. These comprise long established states in which the desire to nation-build might be stronger than in states that joined the Union more recently. The result, in Column 4 suggests that in long established states, American-born voters remain sensitive to the presence of European migrants from countries without a history of compulsory state schooling.

## 5.4 Endogenous Location Choices of Migrants

As migrants sort into locations, a natural econometric concern is that this process might be driven by unobserved factors that also drive the passage of compulsory schooling laws. Such endogenous location choices can only drive the core result if European migrants without long exposure to compulsory state schooling at home are attracted by unobservable state characteristics correlated with the adoption of schooling laws, while European migrants with long exposure to compulsory schooling at home are not attracted by these same characteristics.

We address the issue instrumenting for the share of the population of group $j$ in state $s$ in census year $t$ using a Bartik-Card strategy, where we use the two-stage residual inclusion (2SRI) method for instrumenting in a non-linear model: as detailed in the Appendix, this method assumes unobservables ($V_{st}$) enter additively in the proportional hazard model and these correlate with the endogenous covariates, $N_{st}^j$. The instrument has been much utilized in the immigration literature and is based on the intuition that migrants tend to locate where there are already members of the same group. To construct the instrument for $N_{st}^j$ we first calculate the nationwide share of migrant group $j$ (so $N_{st}^j$ summed across states $s$ at time $t$) in states that have not adopted, weighted by state $s$'s share of that migrant group $j$ in the previous census period in states that have not adopted compulsory schooling. We measure population shares in effect sizes and so denote the effect size of migrant group $j$ in state $s$ in census year $t$ by $N_{s,t}^{j,E}$. The instrument is then defined

as follows:

$$W_{st}^{j} = \frac{N_{s,t-1}^{j,E}}{\sum_{l \in R(t-1)} N_{l,t-1}^{j,E}} \sum_{k \in R(t)} N_{kt}^{j,E}, \tag{5}$$

where $R(t)$ is the set of states that remain at risk of adopting compulsory schooling law in census period $t$, $K$ is the cardinality of $R(t)$ and $L$ is the cardinality of $R(t-1)$. This instrument can be calculated for all census years except the first.

Table A7 reports the first stage results: for each group $j$, the instruments correlate with migration shares $N_{st}^{j,E}$: all coefficients lie in the range .69 - .90 and all are statistically significant at the 1% level. Column 1 in Table 4 shows the second stage results using the 2SRI method, that controls directly for any endogenous component of migrant population shares not predicted by the instrument, by including the first stage residuals. The point estimates for the $\widehat{\beta}_j$'s remain stable, although each is slightly more imprecise. However, it remains the case that the presence of European migrants from countries that do *not* have historic experience of compulsory state schooling at home significantly brings *forward* in time the passage of compulsory schooling: a one standard deviation increase in the population share of such Europeans is associated with a 65% higher hazard rate. In contrast, the presence of Europeans with a long history of compulsory schooling at home does not influence when compulsory schooling is passed by US states, although the 2SRI estimates are imprecise so we cannot reject the null that these hazards are equal.

To improve precision, Column 2 presents 2SRI estimates assuming the underlying hazard follows a Log logistic distribution. In this specification the coefficients of interest $\widehat{\beta}_j$ are presented in a time ratio format (rather than a hazard). A time ratio *less* than one has the same interpretation as a hazard greater than one, indicating the covariate is associated with the passage of compulsory schooling *earlier* in time. The second stage results closely align with the baseline findings: the presence of European migrants from countries without historic experience of compulsory schooling at home significantly brings *forward* in time the passage of compulsory schooling. In contrast, the presence of Europeans with a long history of compulsory schooling at home does not influence the timing of compulsory schooling law, and these effect sizes across European migrants are significantly different to each other [p-value=.056].

There is no particular reason to think the first stage relationship between $N_{st}^{j}$ and $W_{st}^{j}$ is linear. We therefore consider a non-parametric first stage for $N_{st}^{j}$, $N_{st}^{j} = m(W_{st}^{j}, Z_{st}^{j}) + e_{st}^{j}$,with $m(.)$ unknown.[20] Column 3 shows the result from this more flexible first stage: the passage of compulsory schooling in a state occurs significantly earlier in time in the presence of more European

[20] A consistent estimate of $\hat{e_{st}^{j}}$ is then obtained as the difference between $\hat{m}(W_{st}^{j}, Z_{st}^{j})$ and $N_{st}^{j}$, using local linear regression with Epanechnikov Kernel weights to first obtain $\hat{m}(.)$.

migrants from countries without historic experience of compulsory schooling, and the impacts of the two groups of European migrant are significantly different to each other [p-value=.013].

Finally, Column 4 presents 2SRI estimates from the full model that includes the exogenous variables $Z_{st}^{j} = (X_{st}^{j}, X_{st})$. In the first stage, Columns 4-6 in Table A7 show the instrument continues to be highly significantly associated with all three migrant share groups. In the second stage, Column 4 in Table 4 shows a pattern of impacts very similar to the baseline estimates from the full model: the findings provide strong support for the nation-building hypothesis. The presence of European migrants without historic exposure to compulsory schooling at home significantly brings forward in time the passage of compulsory schooling law; the presence of European migrants with historic exposure to compulsory schooling has no impact on the timing of compulsory schooling law, and these impacts significantly differ from each other [p-value=.011].

The Appendix presents additional evidence on endogenous location choices related to: (i) the internal migration of American-borns, to address the concern the passage of compulsory schooling was used by states to attract Americans (or they took ideas over compulsory schooling with them as they migrated across states); (ii) the internal migration of the foreign-born, to check if migrants chose to endogenously locate into states after compulsory schooling laws were in place (we find no evidence of trend breaks in migrant population shares in states pre- and post-compulsion).

## 5.5 Other Forms of Migrant Diversity

The nation-building explanation implies the key source of within-migrant diversity is in their civic values, as proxied by migrants' historic exposure to compulsory state schooling in their origin country. However, American-born voters might actually be sensitive to other correlated sources of within-migrant diversity. We next establish whether the form of diversity within European migrants we have focused on so far proxies for another dimension of migrant heterogeneity.

The first dimension we consider is religion: during the study period the Catholic church remained the most significant rival to governments in the provision of education [Glenn 2002]. We consider the US as a majority Protestant country, and use the Barro and McCleary [1985] data to group European countries into whether their majority religion is Protestant or Catholic/Other. Column 1 of Table 5 shows the result, where the following points are key: (i) among European migrants from countries that do not have compulsory state education by 1850, the estimated hazards are above one for both religions, although the hazard for migrants from Catholic/Other countries is significantly higher than for migrants from Protestant countries [p-value=.013]; (ii) for Europeans with a long history of compulsory state schooling the hazard rate remains below one again for both groups of migrant by religion, and these hazards are not significantly different from each other

[p-value=.289]; (iv) within European migrants from Protestant countries, there remain significant differences in the hazard between those with and without long exposure to compulsory schooling in their country of origin [p-value=.052]; (v) within European migrants from Catholic/Other countries, exactly the same source of diversity remains significant [p-value=.000]. In short, while there are important differences in how American voters respond to the presence of European migrants of different religions, being especially sensitive to Europeans from Catholic/Other countries, within religion, historic exposure to compulsory state-provided schooling among European migrants in a state remains a key predictor of the timing when such legislation is passed across states.

The Dillingham Report highlighted the divide between 'old' (from Northern Europe and Scandinavia) and 'new' (from Southern and Eastern Europe) immigrants with respect to their skills, economic conditions at arrival and migratory horizon. Hence the second source of within-migrant diversity we consider is European region of origin. We subdivide European migrants with and without historic exposure to compulsory schooling between these from old and new Europe, so defined. Column 2 shows the result: (i) among European migrants from countries without compulsory schooling by 1850, the hazards are above one for both subsets of Europeans; (ii) these hazards are not significantly different from each other [p-value=.269]; (iii) for Europeans with a long established history of compulsory schooling the hazard rates remain below one for both groups of European by region of origin, and again these hazards are not significantly different from each other [p-value=.348]; (iv) within European migrants from Northern Europe/Scandinavia, there remain significant differences in the hazard between those with and without long exposure to compulsory state schooling in their country of origin [p-value=.066]; (v) within European migrants from Southern/Eastern Europe, exactly the same source of diversity remains significant in explaining the cross-state passage of compulsory schooling [p-value=.003]. In short, while American-born voters are sensitive to the region of origin of European migrants, the over-riding source of within-migrant diversity predicting the timing of compulsory schooling laws across states is differences in migrant values as proxied by their exposure to compulsory state education at home.[21]

[21]This result reinforces the earlier finding that the human capital or enrolment rates of migrants were not an important factor driving the cross-state adoption of compulsion, as migrants from Southern/Eastern Europe would have had the lowest levels of human capital accumulation. The differences in migrant characteristics between these European regions of origin might capture a host of other factors including: (i) differential propensities to out-migrate [Abramitzky *et al.* 2012, Bandiera *et al.* 2013]; (ii) ties to second generation immigrants in the US (who are then American-born but with foreign born parents). On the first point, we have also taken implied out-migration rates of nationalities from Bandiera *et al.* [2013] and then created a four way classification of European migrants by their historic exposure to compulsory schooling, and whether they have above/below median out-migration rates. The results confirm that within-migrant diversity in values as captured by historic exposure to compulsion remains the key source of variation across migrants. On the second point, in the Appendix we discuss the robustness of our core result to splitting the American-born population between second generation immigrants and those whose parents are both American-born.

We next consider English language as the key source of within-migrant diversity that American-borns might be responding to when passing compulsory schooling laws. All European migrants from countries with compulsory schooling already in place by 1850 originate from non-English speaking countries. Hence only a three-way division of European migrants is possible when considering English language as the additional source of within-migrant diversity over and above differences in values.

Column 3 shows the result, where the following points are of note: (i) among European migrants from countries that do not have compulsory state schooling in place by 1850, the estimated hazards are above one for both subsets of Europeans; (ii) these hazards are not significantly different from each other [p-value=.555]; (iii) for Europeans with a long established history of compulsory state schooling the hazard rate remains below one; (iv) within European migrants from non-English speaking countries, there remain significant differences in the hazard rate for compulsory schooling between those with and without long exposure to compulsory schooling in their country of origin [p-value=.057]. In short, American-born median voters appear more sensitive to diversity in values among European migrants than diversity in their English speaking abilities. Indeed, the evidence suggests a one standard deviation increase in the population share of English speaking migrants (i.e. British and Irish migrants) significantly increases the hazard of compulsory schooling by 66%, all else equal. As highlighted earlier, this result is most likely picking up the fact that Irish migrants were Catholics, and this was an important divide in values with the median American.

The evidence above, on dimensions of within-migrant diversity such as European region of origin and language, further reinforce the earlier findings that the passage of compulsory schooling laws by American-borns was not simply driven by the desire to skill the migrant population. Rather, all the findings point to the specific targeting of compulsory schooling laws in the US towards European migrants that did not have a set of civic values inculcated to them through a compulsory state education system in their country of origin.

## 5.6 Alternative Mechanisms

Nation-building motives are not the only reason why governments might provide education *en masse*. Normative and positive arguments can be used to justify state provision of education based on efficiency or redistributive concerns, human capital externalities, or complementarity between capital and skilled labor during industrialization. While none of these necessarily require *compulsory* schooling, we now assess whether our core finding is robust to additionally accounting for the basic predictions of some of these alternative mechanisms.

To examine if redistributive motives drive the passage of compulsory schooling, we estimate

(4) and additionally control for the standard deviation in the state occupational income score (the mean occupational income score is already in $X_{st}$). This proxies the redistributive pressures the state faces. Column 1 of Table 6 shows that although there is a positive correlation between inequality so measured and the hazard of passing legislation, the coefficient is not significantly different from one. The point estimates on the population shares of interest remain almost unchanged from the baseline specification, suggesting the presence of migrant groups and economic inequality in a state are uncorrelated.

Column 2 examines the industrialization hypothesis by controlling for the share of workers in the state's labor force working in different occupations: professions, craft and operative. We find that as a greater share of workers are engaged in the middle-skilled craft occupations, the hazard of introducing compulsory schooling significantly increases (the point estimate on the hazard is below one for the least-skilled operative occupations). Hence there is evidence on compulsory schooling being related to industrialization, but this additional mechanism operates over and above the nation-building motives identified in our core result.[22]

Galor *et al.* [2009] make precise how the industrialization process interacts with land inequality in determining the level of state provision of education. They argue there exists a conflict between the entrenched landed elite (who have little incentive to invest in mass schooling) and the emerging capitalist elite, who do have such incentives given the complementarity between capital and skilled labor. To proxy the relative balance of power in this conflict they propose a measure of land inequality, that is the share of land held by the top 20% of all land holdings. In Column 3 of Table 6 we additionally control for this same measure in (4). The result shows that the effect goes in the expected direction but the ratio is not significantly below one. The coefficients relevant for the nation-building hypothesis remain stable, further suggesting the composition of the migrant population is not related to land inequality.[23]

The remaining Columns focus on the explanation that political parties were key to compulsory schooling. Indeed, much has been written about the Republican-Democrat divide over compulsory schooling, with the policy often being seen to be driven by a faction of the Republican party [Provasnik 2006]. In line with this we find that a one standard deviation increase in the vote

[22]This is in line with the evidence presented in Galor and Moav [2006] from England, on how members of Parliament voted for the Balfour Act of 1902, the proposed education reform that created a public secondary schooling system. They find Parliamentarians were more likely to vote for the legislation if they represented more skill intensive constituencies (even accounting for their party affiliation). For the US, Goldin and Katz [2001] argue that over 1890-1999 the contribution of human capital accumulation to the US growth process nearly doubled, and Goldin [1999b] describes how the changing industrial structure of the US economy drove changes in the content of what was needing to be taught in secondary schools.

[23]This land inequality measure is available for 1880, 1900 and 1920: we linearly interpolate it for other state-census years. Galor *et al.* [2009] show that state schooling expenditures are significantly correlated to land inequality.

share for Republicans in Congressional elections significantly increases the hazard rate. Given that significant third parties existed for much of the 19th century, Column 5 repeats the analysis controlling for Democrat party vote shares: as implied by the qualitative evidence, a greater vote share for Democrats does indeed significantly reduce the hazard of passing compulsory schooling law. However, controlling for Republican or Democrat vote shares do not alter the migrant population share coefficients, that remain stable throughout.

# 6 Migrants' Demand for American Common Schooling

The extent to which compulsory schooling exposes migrant children to the civic values that were being taught to American-born children, depends on migrant's underlying demand for American common schooling. Only if their demand for common schooling was sufficiently low would compulsory schooling actually change the kinds of instruction they were exposed to. We now exploit detailed information on locally-financed provision of American common schools in the cross-section of counties in 1890 to pin down the relative demands for American common schools of the different migrant groups.

## 6.1 Conceptual Framework

As migrants can form a significant share of the population in jurisdictions that determine the public provision of common schools, we use a textbook probabilistic voting model [Persson and Tabellini 2000] to derive an empirical specification that allows us to map from the equilibrium provision of common schooling back to the relative demands for such schools among migrant groups.[24] A jurisdiction comprises a continuum of citizens. An individual $i$ belongs to group $j$, where groups are of size $N^j$, $\sum_j N^j = N$. Within a group, individuals have the same income, $y^j$. Individual preferences are quasi-linear,

$$u^j(g) = c^j + \alpha^j(.)H(g), \tag{6}$$

where $c^j$ is the private consumption of a member of group $j$, $H(g)$ is concave in the public good, $g$ (common schools), and is assumed twice-differentiable with $H(0) = 0$. The group valuation

[24]This is in contrast to the earlier conceptual framework in Section 3, where we utilized a median voter model to understand the passage of compulsory schooling law at the state level. The justification is that: (i) at the state level, migrants never form close to the majority of the electorate (as Figure A1 shows) and so the median voter is American-born; (ii) the outcome studies was a discrete choice of whether to introduce compulsory schooling law or not. In contrast, at the county level, migrant shares are larger, and we study a continuous outcome (common school provision) so the probabilistic voting model is more appropriate.

for American common schools is $\alpha^j(\theta^j, 1(HCSL^j))$: $\theta^j$ captures factors that influence the group's demand for common schools (such as the share of young people in the group), and $1(HCSL^j)$ is an indicator for the historic entrenchment of compulsory schooling law (HCSL) in the country of origin for those in migrant group $j$. In line with our context, the local jurisdiction finances common schools by a local income tax rate $\tau$ so individuals face a budget constraint, $c^j = (1 - \tau)y^j$, and no group can be excluded. It is because of this local financing that we can map between observed equilibrium provision of common schools and the underlying demand for those schools.

The probabilistic voting model specifies the following political process determining the equilibrium provision of common schooling: there are two political parties ($A$, $B$), whose only motivation is to hold office. The source of within group heterogeneity is a political bias parameter $\sigma^{ij} \sim U[-\frac{1}{2\phi^j}, \frac{1}{2\phi^j}]$: a positive value of $\sigma^{ij}$ implies that voter $i$ has a bias in favor of party $B$ while voters with $\sigma^{ij} = 0$ are politically neutral. Hence $\phi^j$ measures the political homogeneity of a group $j$. Voter $i$ in group $j$ thus prefers candidate $A$ if $u^j(g_A) > u^j(g_B) + \sigma^{ij}$.

The timing of events is as follows. First, parties $A$ and $B$ simultaneously and non-cooperatively announce electoral platforms: $g_A$, $g_B$. At this stage, they know the distribution from which $\sigma^{ij}$ is drawn, but not realized values across voters. Second, elections are held where citizens vote sincerely for a single party. Voters and parties look no further than the next election. Third, the elected party implements her announced policy platform.

**Proposition 2** *The political equilibrium is $g^* = g_A = g_B$ where $g^*$ is implicitly defined as,*

$$H_g(g^*) = \frac{\theta \sum_j W^j y^j}{(1-\theta)\sum_j W^j \alpha^j(\theta^j, \mathbf{1}(HCSL^j))}. \tag{7}$$

*$W^j = N^j\phi^j$ is group $j$'s 'political weight', and $\theta = \frac{\sum_j \theta^j N^j}{N}$ is the share of young in the population.*

The Proof is in the Appendix.

The group's political weight captures how influential the group is by virtue of its size and how many swing voters are in group $j$. A key feature of the probabilistic voting model is that all groups have some weight in determining the equilibrium provision of common schools $g^*$. The key comparative static we consider is how this provision changes in group-$j$'s size:

$$\frac{\partial H_g(g^*)}{\partial N^j} = \frac{1}{\phi^j}\frac{\partial H_g(g^*)}{\partial W^j} = \frac{\theta y^j}{\phi^j(1-\theta)\left[\sum_j W^j \alpha^j(\theta^j, \mathbf{1}(HCSL^j))\right]^2}\left[\sum_{k \neq j} W^k y^k [\alpha^k - \alpha^j]\right] \tag{8}$$

Hence the larger is $\alpha^j$ relative to other group $\alpha^k$'s, the more likely is it that $\frac{\partial g^*}{\partial N^j} > 0$. The sign of $\frac{\partial g^*}{\partial N^j}$ can then be informative of $sign(\alpha^j$ relative to $\alpha^k)$. We use this intuition to rank the

underlying relative demands for common schools, $\alpha^j(.)$, across the $j$ groups. This dovetails with the earlier analysis of what drove the cross-state timing of adoption of compulsory schooling: our earlier results showed American-born voters were sensitive to the in-state presence of European migrants from countries without historic exposure to compulsory state schooling. Hence they behaved as if,

$$\alpha^j(\theta^j, \mathbf{1}(HCSL^j) = 1) > \alpha^j(\theta^j, \mathbf{1}(HCSL^j) = 0), \tag{9}$$

so that absent compulsory schooling in the US, this specific group of European migrants would have demanded less common schooling, and as a result, those migrant children would have been less exposed to the kinds of instruction shaping the civic values of American-born children. We now recover estimates of this relative ranking to understand whether these beliefs were justified. Unlike the earlier cross-state analysis, here it is important that groups have endogenously sorted into counties and so we can recover the equilibrium provision of American common schools in each jurisdiction, and then back out each group's relative demand for such schools.

## 6.2 Empirical Method

We estimate the model using cross-county data from 1890 that were collected as part of the population census, but were the result of a separate report in which the Census Bureau contacted the superintendents of public education in each state. Superintendents were asked to report the race and sex of teachers and enrolled pupils in each county. The data, documented in Haines [2010], details investments into common schools in over 2400 counties in 45 states. We proxy the equilibrium provision of common schooling, $g^{\text{¤}}$, using the number of common school teachers in the county. These are locally financed and likely comprise the most significant investment into public schooling. As IPUMS 1890 census data is unavailable, we build control variables using 1880 values based on the 100% census sample.[25] The groups considered replicate those in the earlier analysis: the American-born, European migrants from countries with compulsory schooling, European migrants from countries without compulsory schooling and non-European migrants. We then estimate the following OLS specification for county $c$ in state $s$,

$$\ln(teachers)_{cs} = \sum\nolimits_j \alpha^j N_{cs}^j + \sum\nolimits_j \gamma_j X_{cs}^j + \lambda X_c + \delta_s + u_{cs}, \tag{10}$$

where $N_{cs}^j$ is the total population size of group $j$ (again measured as an effect size), and $X_{cs}^j$ includes other characteristics of group $j$ (the share aged 0-15, the labor force participation rate,

[25] While Haines [2010] does provide county level data on populations, this does not allow us to construct the migrant group-level characteristics $X_{cs}^j$ described for our main specification.

the share residing on a farm, and the average occupational income score).[26]

$X_c$ includes the (log) total population of the county aged below 15, and the county's occupational index score. $\delta_s$ is a state fixed effect so the coefficients of interest, $\alpha^j$, are identified from variation in the composition of migrant populations across counties in the same state. Figure A4 illustrates the cross-county variation in migrant group sizes for four states (one from each census region). Panel B of Table 1 provides descriptive evidence on the shares of county populations from each group $j$ and documents the considerable within state variation in these shares. Robust standard errors are reported, and we weight observations by 1880 county population so our coefficients of interest map to the average demand of an individual from group $j$. Mapping the model to the empirical specification makes clear the relative ranking of $\alpha^j(.)$'s across groups (not their levels) can be identified from the ranking of $\widehat{\alpha}^j$'s estimated from (10). As we do not control for the total county population, this allows us to control for the population size and characteristics for *all four* groups $j$ and so measure demands relative to those of the American-born. Importantly, the ranking of $\widehat{\alpha}^j$'s is thus informative of the relative demand for American schooling among the various migrant groups, holding constant the demand among American-borns.[27]

## 6.3 Results

Table 7 presents the results. Column 1 estimates (10) only controlling for the populations of each group $j$. At the foot of the table we report p-values on the equality of these coefficients to establish the ranking of relative demands for common schooling. The results highlight again that a key source of diversity within European migrants in their demand for American common schools is whether they have historic exposure to compulsory state schooling in their country of origin: (i) a one standard deviation increase in the county population of European migrants with long exposure to compulsory state schooling in their country of origin significantly increases the provision of common school teachers by 5.8%; (ii) a one standard deviation increase in the county population of European migrants without exposure to compulsory schooling in their country of origin significantly decreases the provision of common school teachers by 18%; (iii) these impacts across European migrant groups significantly differ from each other [p-value =.000]; (iv) the presence of non-European migrants is associated with significantly higher investments into common

[26] The County Yearbook provides information on public education for black and white populations separately. For our analysis, all schooling related variables (teachers and attending pupils) correspond to whites. However, in some states there is expected to be some small bias here as teachers of all races were pooled together. Moreover, there is an imperfect match between true school jurisdictions and counties, and this attenuates our coefficients of interest, $\alpha_j$.

[27] It is well recognized that compulsory schooling laws necessitated no supply side response, so that the supply of teachers would not have been directly impacted [Margo and Finegan 1996].

school teachers. This ranking of $\widehat{\alpha}^j$'s is robust to including state fixed effects (Column 2), and group and county controls ($X^j_{cs}$, $X_c$) (Column 3).

Mapping the marginal impacts from the specification in Column 3 back to the model then implies the following ranking of quasi-linear demand parameters from (6):

$$\alpha^{Euro}_{\mathbf{1}(HCSL^j)=1} = \alpha^{Am¡\ born} > \alpha^{NonEuro} > \alpha^{Euro}_{\mathbf{1}(HCSL^j)=0}. \tag{11}$$

This links directly to the earlier analysis on how the composition of migrants drove the cross-state timing of compulsory schooling: there we found the American-born median voter was especially sensitive to the presence of migrants from European countries without historic exposure to compulsory schooling. The implied ranking of $\widehat{\alpha}^j$'s across European migrant groups closely matches up across the two sets of analysis, despite them using entirely different data sources, econometric methods and identification strategies. Fundamentally, it suggests European migrants from countries without historic exposure to compulsory schooling would have invested less in American common schools ($\alpha^{Euro}_{\mathbf{1}(HCSL^j)=1} > \alpha^{Euro}_{\mathbf{1}(HCSL^j)=0}$). As such, the American-born median voter held correct beliefs in bringing forward in time compulsory schooling laws in those states where such migrants were more numerous.[28]

Given the provision of common schooling is measured in the cross-section of counties in 1890, half of all states have passed compulsory schooling. We thus estimate a modified version of (10) that allows the demand for common schools to vary within a migrant group depending on whether or not they reside in a state with compulsory schooling. This allows us to establish whether compulsory schooling laws had the intended effect of increasing migrants' exposure to American civic values in common schools. Defining a dummy $D_s$ equal to one if state $s$ has passed compulsory schooling in 1890, we estimate the following specification:

$$\ln(teachers)_{cs} = \sum\nolimits_j \alpha^{j0} N^j_{cs} + \sum\nolimits_j \alpha^{j1} \pounds D_s \pounds\ N^j_{cs} \¤ + \sum\nolimits_j \gamma_j X^j_{cs} + \delta_s + u_{cs}, \tag{12}$$

where $\widehat{\alpha}^{j0}$ and $(\widehat{\alpha}^{j0}+\widehat{\alpha}^{j1})$ map to the relative demand for common schools pre and post-compulsory schooling respectively, for the same migrant group $j$. The corresponding estimates are shown in Figure 3. We focus first on Panel A: the left hand side shows the $\widehat{\alpha}^{j0}$'s for each group $j$ (and their corresponding 95% confidence interval): the y-axis shows the magnitude of each estimate, but as only relative demands for common schools are identified from (12), we centre the point

[28] One disconnect between the cross-state and cross-county evidence relates to non-Europeans. This might stem from American-borns being less informed about the preferences and civic values of non-European migrants. This is plausible given the long history of anti-Chinese discrimination in the US, culminating in the Chinese Exclusion Act of 1882, that banned all immigration of Chinese laborers.

estimates on the value for American-borns. This shows that pre-compulsory schooling, a key source of diversity in values for common schools was between European migrants with and without historic exposure to compulsory state schooling in their country of origin. Indeed, pre-compulsory schooling, European-born migrants from countries with compulsory schooling already in place by 1850 have significantly higher demands for common schooling than other European migrants and the American-born.

The right hand side of Panel A in Figure 3 shows the change in demand for common schooling for each group $j$: these $\widehat{\alpha}^{j1}$ estimates show there is a significant convergence in demands for common schooling with compulsory schooling. The increase in demand for common schools is significantly greater among Europeans without historic exposure to compulsory schooling than among Europeans with such exposure to compulsory state schooling. Hence the introduction of compulsory schooling did lead European migrants to be significantly more exposed to the American common schooling system. Moreover, this was especially so for Europeans from countries without historic exposure to compulsory schooling in their country of origin and hence most distant in terms of their civic values from those being instilled into American-born children.

The data compiled by Superintendents also allows us to re-estimate (12) but considering pupil attendance as a county level outcome, as an alternative proxy for the equilibrium provision of common schools, $g^{\square}$. We thus assess how pupil attendance various with migrant shares in the county, and how this relationship alters under compulsory schooling. The evidence is in Panel B of Figure 3. We see that: (i) pre-compulsory schooling, counties with more migrants from European countries without historic exposure to compulsory schooling in their country of origin, had lower attendance in American common schools; (ii) compulsory schooling led to a significant degree of convergence in demands for American common schools between migrant groups and American-borns; (iii) these impacts on demand were greater among European migrants without historic exposure to compulsory schooling at home.

In line with this set of evidence, Lleras-Muney and Shertzer [2015] show how compulsory schooling laws significantly increased enrolment rates of migrant children by 5%, with smaller impacts on American-born children. Ultimately, this will have impacted the instruction migrant children were exposed to (relative to the counterfactual absent compulsory schooling) and so shaped the civic values that were instilled into them. Our evidence links closely to the findings of Milligan *et al.* [2004], who show using NES and CPS data, that those exposed to compulsory schooling are later in life, significantly more likely to be registered to vote, to vote, to engage in political discussion with others, to follow political campaigns and attend political meetings, as well as having higher rates of participation in community affairs and trust in government. These are

precisely the kinds of changes in civic value emphasized in Glaeser *et al.* [2007] as being inculcated through compulsory schooling. Indeed, our findings and these related papers all suggest that the original architects of the common school system such as Horace Mann, as discussed in Section 2, all of whom linked education with inculcating the civic values necessary for effective participation in American democracy, ultimately achieved their aim.[29]

# 7 Discussion

Many great figures in political and economic history, including Napoleon and Adam Smith, have emphasized the central role of a state's education system in nation-building. In this paper we have examined the hypothesis that nation-building efforts, through compulsory schooling, were part of the policy response of American voters to the large and diverse waves of migrant inflows during the Age of Mass Migration. While other disciplines have recognized periods of American history where the schooling system has been used to inculcate values among the foreign-born [Tyack 1976], our analysis builds on this by showing nation-building motives drove the passage of compulsory schooling laws from the 1850s onwards, the first pillar of the *Americanization Movement*, and the legislative bedrock on which developments of the American education system have been built.

We base our contribution on a combination of qualitative and quantitative evidence. The body of qualitative evidence assembled shows American legislators and educators viewed compulsory schooling as the key policy tool to nation-build in response to mass migration. We show this was driven by the view that exposure to American public schools would instill the desired civic values among migrants, and a recognition that such values could be transmitted from children to their parents. The quantitative evidence base we build utilizes different data sources, research designs and conceptual frameworks. The central measurement challenge we face is that the actual civic values held by migrants and American-borns are not observed. We tackle this by appealing to the multi-disciplinary body of work arguing that European schooling systems developed in order to instill desired civic values into their citizens [Weber 1976, Holmes 1979, Ramirez and Boli 1987, Alesina and Reich 2015]. We thus use migrants' historic exposure to a compulsory state education system in their country of origin to proxy their civic values.

Our central finding is that American-born median voters pass compulsory schooling laws significantly earlier in time in US states with a larger share of migrants from European countries without historic exposure to compulsory state schooling in their country of origin. These are the migrants

[29] Recent evidence also highlights cases in which assimilation policies lead to a backlash among migrants: Fouka [2014] presents evidence showing that Germans that faced restrictions on the use of the German language in primary schools (introduced over the period 1917-23) are less likely to volunteer during the Second World War, more likely to marry within their ethnic group, and be more likely to give German sounding names to their children.

most in need of having their civic values shaped towards what was being taught to American-born children in common schools at the time. We show our core result to be robust to confounding factors: such as compulsory schooling laws being introduced to skill the migrant population, or in response to other forms of migrant diversity (such as language or religion), the endogenous location choices of migrants, and alternative mechanisms driving compulsion, such as redistributive motives, or due to a complementarity between capital and skilled labor. We complement this evidence with cross-county data on the provision of common schools to infer the relative demand for such American schooling among migrant groups. Consistent with the state level analysis, this shows that within European migrants, those from countries without long exposure to compulsory state schooling in their country of origin have significantly lower demand for American common schools relative to European migrants from countries with compulsory schooling. Furthermore, there is a significant convergence in demand for, and pupil attendance at, common schools between natives and both groups of European migrants when compulsory schooling laws are introduced. Hence compulsory schooling did lead European migrants to be more exposed to the civic values being taught in American common schools, and this was especially so for Europeans from countries without historic exposure to compulsory state schooling in their country of origin.

There is existing evidence for schools affecting individual values via the content of curricula [Algan *et al.* 2013, Clots-Figueras and Masella 2013, Cantoni *et al.* 2015], and that those exposed to compulsory schooling are causally more likely to be politically and civically engaged [Dee 2004, Milligan *et al.* 2004]. Our findings thus come full circle back to the qualitative evidence presented, to suggest the original architects of the common school system, all of whom linked education with inculcating the civic values necessary for effective participation in American democracy, ultimately achieved their aim.

Our work adds to the literature emphasizing the national origins of migrants matters [La Porta *et al.* 1998, Acemoglu *et al.* 2001]. We show the importance of national origins for long run outcomes through a new mechanism: the policy response of natives. By studying the link between mass migration and the endogenous policy responses of American-born voters in receiving states, our analysis provides new micro-foundations for compulsory schooling laws. Our findings thus have important implications for the large literature examining the impacts of compulsion on the human capital of American-borns. As summarized in Stephens and Yang [2014], this literature has found rather mixed evidence. Our results suggests this is partly because American-borns were not the intended marginal beneficiary, and that the core purpose of compulsion was to instill civic values among migrant children. Indeed, our findings build on and complement Lleras-Muney and Shertzer [2015] who show that compulsory schooling laws had significant impacts on the enrolment

rates of migrant children, with smaller impacts on native children.

We conclude by highlighting two further directions for research. First, a wide set of public policies might have been impacted by large and diverse inflows during the Age of Mass Migration. The most natural policy dimension to study next would be cross-jurisdiction variations in tax rates used to finance local public goods, but variations observed in the regulation and operation of financial and legal markets, say, might also originate from differences in patterns of mass migration into those states during the 19th century [Burchardi *et al.* 2016, Fulford *et al.* 2015].[30] It also remains important to understand other policies specifically targeted towards immigrants during the study period. For example, during the early 20th century some states introduced citizenship requirements for foreigners to be able to vote.[31] Such policies presumably held back immigrant assimilation and sustained greater heterogeneity in values among the population. Hence there remains a need to understand the political economy trade-offs involved that led to the simultaneous use of both nation-building efforts towards foreigners as well as their political exclusion. A second direction for future research is to combine the ideas underpinning this analysis with earlier work that documented high rates of out-migration from the US by Europeans during the Age of Mass Migration [Bandiera *et al.* 2013]. This opens up an agenda examining whether returning Europeans drove institutional and legal change in their home country after having been exposed to American society.

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[30] This emerging body of work indeed suggests that migration during the Age of Mass migration is causally linked to: (i) FDI sent and received by firms across US counties [Burchardi *et al.* 2016]; (ii) the evolution of county level income for a century later [Fulford *et al.* 2015].

[31] Naidu [2012] documents that between 1870 and 1910, eleven Southern states passed legal restrictions on voting, such as poll taxes and literacy tests, which were aimed at lowering black electoral participation, but also affected poor whites. The details of disenfranchisement varied state to state, with it being enacted by statute in some states, while in others it was enacted via constitutional amendment.

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# A Appendix

## A.1 Proofs

**Proof of Proposition 1:** For any $i \cdot \ i^m$ and for any $j \in \mathbb{R}$ where $j > i^m$ we can rewrite $d_{ij} = d_{ii^m} + d_{i^m j}$. Schooling shifts migrant values towards $i^m$ by $\lambda$. So for $i \cdot \ i^m$, as all migrants have values $j > i^m$ this distance becomes $d_{ij} = d_{ii^m} + (1 \ \lambda) d_{i^m j}$. Introducing compulsory schooling then gives an American-born individual $i \cdot \ i^m$ utility,

$$\begin{aligned} u_{i^m} &= c \ \int_{j\in\mathbb{R}} f(j) d_{i^m j} dj \ \int_{j\in\mathbb{R}} g(j)[d_{ii^m} + (1 \ \lambda) d_{i^m j}] dj \ T \\ &= c \ \int_{j\in\mathbb{R}} f(j) d_{i^m j} dj \ \int_{j\in\mathbb{R}} g(j) d_{ii^m} dj \ \int_{j\in\mathbb{R}} g(j) d_{i^m j} dj + \int_{j\in\mathbb{R}} g(j)\lambda d_{i^m j} dj \ T \\ &= c \ \int_{j\in\mathbb{R}} f(j) d_{i^m j} dj \ \int_{j\in\mathbb{R}} g(j)[d_{ii^m} + d_{i^m j}] dj + \int_{j\in\mathbb{R}} g(j)\lambda d_{i^m j} dj \ T \end{aligned} \tag{13}$$

Hence the American-born individual $i \cdot \ i^m$ votes for compulsory schooling if $\int_{j\in\mathbb{R}} g(j)\lambda d_{i^m j} dj \ , \ T$, that can be re-written as (3). As this inequality is the same for all American-borns with values $i \cdot \ i^m$, a majority of American-borns vote for compulsory schooling if (3) is satisfied and a majority vote against otherwise.¥

**Proof of Proposition 2:** The voter in group $j$ indifferent between voting for party $A$ or $B$ is given by,

$$\sigma^{j\text{¤}} = u^j(g_A) \ u^j(g_B) \tag{14}$$

$$= (g_B \ g_A) \frac{y^j \theta}{\cancel{y}} + \alpha^j(\theta^j, \mathbf{1}(HCSL^j))(H(g_A) \ H(g_B)). \tag{15}$$

All voters $i$ in group $j$ with $\sigma^{ij} \cdot \ \sigma^{j\text{¤}}$ prefer party $A$. Therefore, the share of the electorate that vote for party $A$ is,

$$\pi_A = \sum_j W^j \phi^j (\sigma^{j\text{¤}} + \frac{1}{2\phi^j}) \tag{16}$$

$$= \sum_j W^j ((g_B \ g_A) \frac{y^j \theta}{\cancel{y}} + \alpha^j(\theta^j, \mathbf{1}(HCSL^j))(H(g_A) \ H(g_B)) + \frac{1}{2\phi^j}), \tag{17}$$

where $W^j = N^j \phi^j$ is group $j$'s political weight. Party $A$ wins the election if $\pi_A > 1/2$. As both parties facing the same optimization problem, in equilibrium they announce the same policy. The equilibrium provision of common schooling is then derived by taking the first order condition of $\pi_A$ with respect to $g_A$ and using the fact that $g_A = g_B = g^{\text{¤}}$. Solving gives (7).¥

## A.2 Coding Compulsory Schooling Laws

### A.2.1 US States

The data on the year of enactment of compulsory schooling laws (CSL) across US states was extracted from Landes and Solomon [1972], whose original source was Steinhilber and Sokolowski [1966]. The Landes and Solomon [1972] data has been compared to alternative sources including Katz [1976], Leddon [2010], and the Workers' Compensation Project of Fishback [2000]. Katz [1976] mentions the dates of CSL enactment for a number of states: they are all in accordance with the Landes and Solomon data. Leddon [2010] provides a table with the enactment years of CSL, which correspond exactly to those in Landes and Solomon [1972]. Finally, the Workers Compensation Project Data does not include Alaska and Hawaii, but coincides with Landes and Solomon [1972] for all other available states.

### A.2.2 European Countries

Our coding of the introduction of compulsory state schooling laws across European countries relies on primary sources (original laws were consulted whenever possible) and secondary sources of a scientific and official nature (monographs and papers, mostly written by historians, and information provided by governments or the European Union). We focus on the first establishment of general compulsory education in the respective territory of interest. We do not explicitly differentiate between compulsory school attendance and compulsory education, as some countries allow for home schooling. It should be noted that sources on the history of compulsory education in different countries sometimes contradict each other: this is a particular concern for countries with federal systems (such as Switzerland) and for territories which belonged to different national entities over the 19th and 20th century (such as today's Poland and Germany).

**Albania** Compulsory schooling was introduced when the country became a monarchy in 1928. Article 206 of the Royal Constitution, adopted in 1928, states, "The primary education of all Albanian subjects is obligatory, and the State schools are free" [Hörner *et al.* 2007, Sefa and Lushnje 2012].

**Armenia** Compulsory primary schooling was introduced in 1932 [EFA 2000, Hörner *et al.* 2007].

**Austria-Hungary** As part of a comprehensive schooling reform, Maria Theresia signed the General School Ordinance (Allgemeine Schulordnung) in 1774, which made schooling compulsory for children of both genders between 6 and 12 throughout most of the Austro-Hungarian territory.

Article 12 of the ordinance states, "children of both sexes whose parents or guardians do not have the will or the means to support a tutor should go to school without exception (...) as soon as they have entered their 6th year". In order to be allowed to leave school before the age of 12, children needed to "prove in public exams, and provide a written certificate by the superintendent, that they had learnt all the necessary".[32] The ordinance further stipulates that municipal authorities in the city and teachers in the country should keep a list of children who have to attend school and admonish parents to send their children to school. This regulation did not apply to Hungary, where schooling was however made compulsory in 1777 with the Ratio Educationis [Melton 1988]. The 1774 law could not be fully enforced, such that analphabetism remained a widespread phenomenon in Austria in the 19th century. To increase school attendance, Maria Theresia's son and successor Joseph II established punishments for non-compliance in 1781. In 1869, a comprehensive new schooling law (the Reichsvolksschulgesetz) was enacted. It restated the compulsory character of schooling (Art. II.20) and increased years of compulsory attendance from 6 to 8 (Art II.21) [Slaje 2009, Donnermair 2010].[33,34] According to Schneider [1982], the 1869 Reichsvolksschulgesetz achieved compulsory schooling even in rural areas.

**Belgium** Primary schooling was made compulsory in 1914 with the Loi Poullet [Flora *et al.* 1983, Wielemans 1991, Colle-Michel 2007, Gathmann *et al.* 2012].

**Denmark** Education was first made compulsory in Denmark-Norway in 1739, to prepare children for confirmation. Under those provisions, education consisted of the basics of religion and the reading of familiar texts. In Denmark, writing was added to the curriculum with the 1814 Education Act, when compulsory primary schools were established [Schneider 1982, Flora *et al.* 1983, Simola 2002, Bandle *et al.* 2005, Gathmann *et al.* 2012].

**Finland** Primary schools were established in 1866 and became compulsory in 1921 with the Compulsory School Attendance Act. However, universal primary school attendance was only

[32] "Kinder, beiderlei Geschlechts, deren Ueltern, oder Vormünder in Städten eigene Hauslehrer zu unterhalten nicht den Willen, oder nicht das Vermögen haben, gehören ohne Ausnahme in die Schule, und zwar sobald sie das 6te Jahr angetreten haben, von welchem an sie bis zu vollständiger Erlernung der für ihren künftigen Stand, und Lebensart erforderlichen Gegenstände die deutschen Schulen besuchen müssen; welches sie wohl schwerlich vor dem 12ten Jahr ihres Lebens, wenn sie im 6ten, oder nach dem 6ten angefangen haben, gründlich werden vollbringen können; daher es denn gerne gesehen wird, daß Ueltern ihre Kinder wenigstens durch 6 oder 7 Jahre in den deutschen Schulen liessen (...) Wenn aber einige vor dem 12ten Jahre zu dem Studiren übergehen, oder aus der Schule entlassen sein wollen; so müssen sie in den öffentlichen Prüfungen beweisen, und von dem Schulaufseher ein schriftliches Zeugnis erhalten, daß sie alles Nöthige wohl erlernet haben".

[33] "Die Eltern oder deren Stellvertreter dürfen ihre Kinder oder Pflegebefohlenen nicht ohne den Unterricht lassen, welcher für die öffentlichen Volksschulen vorgeschrieben ist."

[34] "Die Schulpflichtigkeit beginnt mit dem vollendeten sechsten, und dauert bis zum vollendeted vierzehnten Lebensjahre."

achieved at the time of the Second World War [Flora *et al.* 1983, Simola 2002].

**France** In France, law no. 11 696 of March 28, 1882 (Loi Jules Ferry), made primary education compulsory for children of both sexes aged 6-13 years [Cubberley 1920, Schneider 1982, Flora *et al.* 1983, Schriewer 1985]. Its Article 4 states, "primary instruction is compulsory for children of both sexes from 6 to 13 years of age".[35] Children were allowed to leave school at age 11 if they passed the public examination for the "certificate of primary studies". A municipal commission was set up to monitor and encourage school attendance by keeping lists of school-aged children and taking different types of measures in case of non-compliance.

**Germany** Education was made compulsory in Prussia in 1717 with the School Edict (Schuledikt) enacted by Frederick William I, who "made attendance at village schools compulsory for all children not otherwise provided with instruction" [p4, Ramirez and Boli 1987]. According to Stolze, this was the first time Frederick William proclaimed schooling to be compulsory in all Prussian provinces [Stolze 1911]. This regulation was reiterated by his son Frederick II in his 1763 "General Regulations for Village Schools" (General-Landschul-Reglement), which decreed compulsory schooling for the entire Prussian monarchy. Article 1 of the general regulations stipulates that "all subjects sent both their own children and children entrusted to them, boys or girls, from their fifth year of age on, to school".[36] The regulation stated the school fees to be paid. For those too poor to afford them, they should be financed through church or village donations. The responsibility to enforce attendance lay with the local preacher and court authorities, who were able to sanction fines for non-compliance. The General-Landschul-Reglement did not apply to Catholics and urban residents. However, a separate edict was promulgated in 1765 for Silesian Catholic schools. Given widespread opposition, compulsory schooling only became effective over a long period [Ramirez and Boli 1987, Melton 1988]. In the German Empire, education became compulsory upon unification in 1871, but precise regulations differed between states (in Bavaria and Wurtemberg, school was compulsory for children between 7 and 14, whereas in the rest of the Empire, it was for those aged between 6 and 14) [Flora *et al.* 1983]. Not only Prussia, but also most of the other German territories had already introduced compulsory schooling before unification. The first state to do so

[35] "L'instruction primaire est obligatoire pour les enfants des deux sexes âgés des six ans révolus à treize ans révolus."

[36] "Zuvörderst wollen Wir, daß alle Unsere Unterthanen, es mögen denn Eltern, Vormünder oder Herrschaften, denen die Erziehung der Jugend oblieget, ihre eigene sowol als ihrer Pflege anvertraute Kinder, Knaben oder Mädchen, wo nicht eher doch höchstens vom Fünften Jahre ihres Alters in die Schule schicken, auch damit ordentlich bis ins Dreyzehente und Vierzehente Jahr continuiren und sie so lange zur Schule halten sollen, bis sie nicht nur das Nöthigste vom Christenthum gefasset haben und fertig lesen und schreiben, sondern auch von demjenigen Red und Antwort geben können, was ihnen nach den von Unsern Confistoriis verordneten und approbirten Lehrbüchern beygebracht werden soll."

was Palatinate-Zweibrücken in 1592 [Oelkers 2009]. The state of Weimar introduced compulsory education in 1619 according to Ramirez and Boli [1987], and the Kingdom of Bavaria in 1802 according to De Maeyer [2005], a date which is, however, contradicted by other sources.

**Great Britain** In England and Wales, the 1870 Elementary Education Act (Forster's Education Act) established state responsibility for primary education. Schooling was made compulsory for children aged between 5 and 13 ten years later, in the Education Act of 1880 [Flora *et al.* 1983, Ritter 1986]. In Scotland, education became compulsory for all children between 5 and 13 in 1872 with the Education (Scotland) Act [Flora *et al.* 1983, Anderson 1995].

**Greece** Education was made compulsory in a 1834 decree on elementary education, which was part of the so-called "Bavarian Plan", an educational reform which took place under the reign of King Otto, a Prince of Bavaria. [Gkolia and Brundrett 2008, Cowen and Kazamias 2009].

**Ireland** Schooling was made compulsory in 1892 by the Irish Education Act [Akenson 1970, Schneider 1982, Flora *et al.* 1983]. Children were excused from compulsory attendance during harvest and other seasons during which their labor was needed. Furthermore, children aged between 11 and 14 could obtain a work permit if they had a "certificate of proficiency in reading, writing and arithmetic". School attendance committees were in charge of enforcing the legislation, and courts could impose modest fines on parents who refused to comply. Nonetheless, the law appeared to have little impact on school attendance during the 19th century [Akenson 1970].

**Italy** Compulsory schooling in Italy is based on the Legge Casati, enacted in 1859 in the Kingdom of Sardinia. This law defined elementary schooling to consist of two grades, inferior and superior, each of which takes two years. Article 326 states that "[p]arents, and those who act as their substitutes, are obliged to procure, in the way they believe most convenient, to their children of both sexes in the age of attending public elementary school of the inferior grade, the instruction which is given in those".[37] Elementary education was provided free of charge. The law became effective in 1860, and was extended to all Italian provinces upon unification. The legal framework was completed in 1877 with the Legge Coppino, which reiterates the compulsory character of education in its first article: "Boys and girls who have completed the age of six years, and to those parents or those acting as their substitutes have no procured the necessary instruction (...) have

[37] "I padri, e coloro che ne fanno le veci, hanno obbligo di procacciare, nel modo che crederanno più conveniente, ai loro figli dei du sessi in età di frequentare le scuole pubbliche elementari del grado inferiore, l'istruzione che vien data nelle medesime."

to be sent to the local public school".[38] However, it did not result in universal school attendance everywhere. Additional laws were hence enacted in 1904 and 1911, which made more stringent provisions for school attendance and increased state aid for elementary schools [Cubberley 1920, Schneider 1982, Ramirez and Boli 1987].

**Luxembourg** Compulsory schooling was introduced in Luxembourg through the 1881 law on the organisation of primary education [European Commission 2010]. Article 5 of this law states that "every child of either sex, having completed six years of age at the beginning of the school year, has to receive during six consecutive years instruction in the subjects listed...".[39] However, the compulsory character of schooling is reflected in earlier laws as well. Article 23 of the 1843 law on primary instruction (which is bilingual) defines "children of school-age" ("schulpflichtige Kinder" in its German, "enfans susceptibles de fréquenter l'école" in its French version) as those between 6 and 12 years of age.[40] While the French wording is less explicit, the German wording "Schulpflicht" clearly implies an obligation to attend school. Article 56 of the same law even specifies sanctions for non-compliance. For example, "indigent parents who habitually neglect sending their children to school, can be prived from public support."[41,42]

**Netherlands** Compulsory education was introduced in 1900, with "De Leerplichtwet" [Schneider 1982, Flora *et al.* 1983, Gathmann *et al.* 2012].

**Norway** Education was first made compulsory in Denmark-Norway in 1739, to prepare children for confirmation. Under those provisions, education consisted of the basics of religion and the reading of familiar texts. In Norway, writing was added to the curriculum in 1827 with a new primary school law, but children were typically unable to write more than their name and the letters of the alphabet. Several authors regard the 1827 Primary School Act as the first compulsory

[38] "I fanciulli e le fanciulle che abbiano compiuta l'età di sei anni, e ai quali i genitori o quelli che ne tengono il luogo non procaccino la necessaria istruzione (...) dovranno essere inviati alla scuola elementare del comune."

[39] "Tout enfant de l'un ou de l'autre sexe, âgé de six ans révolus au commencement de l'année scolaire, doit recevoir pendant six années consécutives l'instruction dans les matières énumérées (...)" / "Jedes Kind beiderlei Geschlechts, welches bei Beginn des Schuljahres das sechste Lebensjahr zurückgelegt hat, muß während sechs aufeinander folgender Jahre in den (...) angegebenen Lehrgegenständen unterrichtet werden."

[40] Sont considérés comme tels, les enfans qui, á partir du premier octobre de chaque année, ont six ans révolus et moins de douze ans accomplis (...)" / "Als solche werden diejenigen Kinder betrachtet, welche vom 1. October jedes Jahres an sechs Jahre zurückgelegt haben und noch nicht volle 12 Jahre alt sind (...)".

[41] "Les parens indigens qui négligeront habituellement 'envoyer leurs enfans aux écoles, pourront être privés des secours publics." / "Die dürftigen Eltern, die gewohnheitlich unterlassen, ihre Kinder in die Schule zu schicken, können von den öffentlichen Unterstützungen ausgeschlossen werden."

[42] Earlier administrative documents, in particular a circular from 1842 and an ordinance from 1840, refer to a school regulation from 1828. The original text of the 1828 regulation could not be accessed, which is why we could not determine whether schooling was made first made compulsory in 1828 or in 1843.

schooling law of Norway [Hove 1967, Einhorn 2005]. Still in 1857, 80% of rural children only had access to ambulant schooling, as there were no schools in their parishes. This changed after the 1860 School Law, which provided for permanent schools instead [Rust 1990]. In 1889, a stricter compulsory schooling law was enacted, requiring "a more demanding mother tongue subject" and 7 years of primary school attendance [Hove 1967, Bandle *et al.* 2005].

**Poland** During the 19th century Poland was partitioned between Prussia, Russia and Austria-Hungary on three occasions. Education in Poland was, on the one hand, largely determined by the respective occupier, but reflected, on the other hand, the efforts of the Polish to upheld their cultural heritage [Slaje 2009]. In the Prussian part of Poland, compulsory schooling was introduced in 1825 [Biskup 1983]. Sources are contradictory on whether there was corresponding legislation in the Austrian and Russian parts during the partition. Shortly after re-obtaining its independence in 1918, Poland enacted a decree "On Compulsory Schooling" (O obowiazku skolnym) which made school attendance compulsory for children between 7 and 14 in 1919 [Slaje 2009].

**Portugal** Compulsory schooling was first introduced in Portugal in 1835, with the Regulamento Geral da Instrucção Primaria. In Title VII, Article 1, it states that "To the obligation imposed, by the constitution, on the government to provide all citizens with primary education, corresponds the obligation of parents to send their children to public schools, as soon as the pass 7 years (...) if they don't have the means to educate them otherwise".[43] The responsibility for enforcement rested on municipal authorities and priests.[44]

**Russia** Compulsory education for children between 6 and 17 years of age was introduced shortly after the success of the October Revolution, with the Dekret ot "ob Edinoy Trudovoy Shkole Rossiyskoy Sozialisticheskoy Federativnoy Sovetskoy Respubliki (Polojenie)" (Decree on the Unified Labour School of the Russian Soviet Federative Socialist Republic) of October 16, 1918 [Presidential Library 2013].

**Spain** The first law to regulate education in Spain was the 1838 Law of Primary Instruction (Ley de Instrucción Primaria). It was accompanied by a Plan of Primary Instruction (Plan de Instrucción Primaria), which stipulates the obligation of villages and cities to provide primary

[43] "A obrigação imposta, pela Carta Constitucional, ao Governo de proporcionar a todos os Cidadãos a Instrucção Primaria, corresponde a obrigação dos Pais de familia de enviar seus filhos às Escòlas Publicas, logo de passem de 7 annos, (...), se meios não tiverem de o fazer construir de outro modo."

[44] "A's Camaras Municipaes, e aos Parochos incumbe o procurar mover por todos os meios de que poderem usar, os Pais de familia a cumprir com esta importante obrigação..."

schools (Art. 7-10). Furthermore, its Article 26 states that "[a]s it is an obligation of parents to procure for their children, and for guardians to procure for the persons under their responsibility, the amount of instruction which can make them useful for society and for themselves, the local commissions will assure by the means their prudence dictates them to stimulate parents and guardians to comply with this important duty, applying at the same time all their enlightenment and zeal to the removal of obstacles which would impede it,", remaining thus highly vague with respect to the content and form of such an instruction.[45]

Compulsory education was introduced with the Law of Public Instruction of September 9, 1857 [De Maeyer 2005, Gathmann *et al.* 2012]. Article 7 states that "Elementary primary education is compulsory for all Spanish. The parents and guardians must send their children and wards to public schools from the age of six to nine years; unless they provide them sufficiently with this type of instruction in their homes or in private establishments".[46]

**Sweden** Compulsory education was introduced in 1842 with the Folkskolestadgan [Schneider 1982, Soysal and Strang 1989, Simola 2002].

**Switzerland** With the adoption of the Swiss Federal Constitution (Bundesverfassung) of 1874, primary schooling became mandatory in all Swiss cantons [Schweizerische Eidgenossenschaft 1874, Muller 2007]. Article 27.2 states that "Cantons provide sufficient primary education, which shall be exclusively under the control of the state. It is compulsory and, in public schools, free of charge."[47] However, compulsory schooling had been introduced previously by different cantons at different points in time. Sources contradict each other in terms of the dates of introduction. For example, Forster [2008] dates the introduction of compulsory schooling in Geneva in 1536, whereas Muller [2007] sets it at 1872.

## A.3 Robustness Checks

Our first robustness check exploits *within-country* variation over time in exposure to compulsory state schooling. To do so, we consider the impact of a rolling window of Europeans' exposure to

[45] Siendo una obligacion de los padres procurar á sus hijos, y lo mismo los tutores y curadores á las personas confiadas á su cuidado, aquel grado de instruccion que pueda hacerlos útiles á la sociedad y á si mismos, las Comisiones locales procurarán por cuantos medios les dicte su prudencia estimular á los padres y tutores al cumplimiento de este deber importante, aplicando al propio tiempo toda su ilustracion y su celo á la remocion de los obstáculos que lo impidan."

[46] "La primera enseñanza elemental es obligatoria para todos los españoles. Los padres y tutores o encargados enviarán a las Escuelas públicas a sus hijos y pupilos desde la edad de seis años hasta la de nueve; a no ser que les proporcionen suficientemente esta clase de instrucción en sus casas o en establecimiento particular".

[47] "Die Kantone sorgen für genügenden Primarunterricht, welcher ausschliesslich unter staatlicher Leitung stehen soll. Derselbe ist obligatorisch und in den öffentlichen Schulen unentgeltlich."

compulsory schooling and measure whether the American median-voter is differentially sensitive to the presence of European migrants that have passed compulsory schooling at least 30 years earlier. Figure 2 makes clear that using a rolling window for Europeans' exposure to compulsory schooling adds in those countries that pass compulsory schooling between 1850 and 1880 (Spain, Switzerland, Italy and Britain) and so might impact the cross-state passage of compulsory schooling in the US from 1910 onwards. Column 1 of Table A5 shows that with this definition the sharp contrast between how American-borns react to different types of European migrant becomes even more pronounced.

Another way to examine differential responses over time to migrants from the same origin country is to focus in on second generation migrants. They are American-born and coded as such, but the next specification splits American-borns between those with American-born parents and those with at least one foreign-born parent. This latter group of individuals form an additional group $j$ that can then also be controlled for (we then also control for the group characteristics of second generation immigrants in $X_{st}^{j}$). Column 2 in Table A5 shows the result: the passage of compulsory schooling is not significantly impacted by the presence of second generation migrants, rather it is the composition of more *recent* foreign-born migrants that drives the policy response of US states.

### A.3.1 Other Legislation

The next set of robustness checks address concerns our core finding might be spuriously picking up alternative mechanisms by including additional controls in (4). First, we consider the passage of *other* pieces of state legislation, that might be complementary to, or pre-requisites for, the passage of compulsory schooling. For example, the passage of child labor laws and the establishment of a birth registration system have been argued to be interlinked with compulsory schooling [Lleras-Muney 2002, Goldin and Katz 2003]. Column 3 of Table A5 shows the baseline results to be unchanged if we additionally control for whether a state has child labor laws or a system of birth registration. Given the stability of our coefficients of interest, this finding further implies migrant groups were not differentially attracted to states based on these legislative and regulatory characteristics.[48]

A second concern is that some states might be more progressive than others, in that they are more likely to pass compulsory schooling, but also be more likely to universal suffrage or to allow women property rights and over their own earnings. If migrants from European countries are

[48]The coding for child labor laws are extracted from Moehling [1999, Table 1] as these extend back to the mid-1800s (an updating coding is also provided in Lleras-Muney and Shertzer.[2015] for the 1910-39 period); the coding for the introduction of birth registration proofs is extracted from Fagernas [2014].

differentially likely to locate to such progressive states (as a function of their country of origin's own legislative history), our earlier result would be spurious. To check for this we then additionally control for both state characteristics. Column 4 shows that neither having universal suffrage nor property rights for women have significant impacts on the passage of compulsory schooling in the state (neither hazard significantly differs from one). Moreover, the impacts of the presence of different migrant groups replicate the baseline findings.

Finally, we consider additionally controlling for the presence of European migrants from *countries* that have passed other pieces of legislation, apart from compulsory schooling, that might relate to migrant values. For example, we consider whether the American-born median voter responds to the presence of Europeans from countries with child labor laws in place since 1850. Column 5 shows there is no impact of having migrants in the state from European countries with a long history of child labor laws, that might otherwise have reflected the passage of compulsory schooling as being driven by the child-related preferences of migrants (and natives), rather than compulsory schooling being driven by the desire of the American-born median voter to homogenize certain incoming migrants.

### A.3.2 Alternative Econometric Specifications

We next document the robustness of our core finding to using alternative econometric specifications. We impose more parametric structure on the underlying hazard, $h_0(t)$, using a log logistic model. When estimating this model, time ratios are reported.[49] Recall that a time ratio *less* than one has the same interpretation as a hazard greater than one, indicating the covariate is associated with the passage of compulsory schooling *earlier* in time. Column 1 in Table A6 shows that imposing this parametric structure leaves our core findings unchanged: (i) the passage of compulsory schooling occurs significantly earlier in time when a greater share of the population comprises European migrants without historic exposure to compulsory schooling; (ii) the time ratio on Europeans with historic exposure to compulsory schooling is above one and these time ratios are significantly different between the European migrant groups; (iii) compulsory schooling is passed significantly earlier in time when a greater share of the population is non-European born. All these findings to continue to hold when we allow for there to be cross-state heterogeneity in hazard rates as captured by a frailty parameter (Column 2).

We next move away from survival models and use a linear probability regression, following some of the earlier literature examining the passage of compulsory schooling. Such models use

[49] In the log logistic model the hazard rate is characterized as $h(t,X) = \frac{\lambda^{\frac{1}{\gamma}} t^{(\frac{1}{\gamma} - 1)}}{\gamma[1+(\lambda t)^{\frac{1}{\gamma}}]}$, where $\lambda = \exp(X\beta)$. This has two parameters: $\lambda$ is the location parameter and $\gamma$ is the shape parameter, allowing for non-monotonic hazards.

*all* state-years (not just those pre-adoption) to essentially estimate the probability that state $s$ has compulsory schooling in place, and are equivalent to a survival model assuming duration *independence* in the passage of legislation. Column 3 shows the result: using a regression model we find no significant partial correlation between the population shares of either European migrant grouping and the likelihood compulsory schooling is passed, although an increase in the population share of non-Europeans does have a positive and significant impact, consistent with earlier work [Landes and Solomon 1972, Lleras-Muney and Shertzer 2015]. The reason why the OLS and survival results differ is that the assumption of duration *independence* is strongly rejected in our data: history does matter and so the hazard of passing legislation, $h_0(t)$, varies over census years $t$, a result demonstrated in the unparameterized Cox proportional hazard model, and the parametric log logistic specification.

### A.3.3 Alternative Classifications

We now consider alternative ways to group European countries by their exposure to compulsory state schooling. We first regroup countries using the lower and upper bound definitions of the introduction of compulsory schooling (shown in Table A2). The results are in Columns 4 and 5 of Table A6: our core baseline result is robust to using the lower bound definition and so narrowing down the focus on those European countries that have the longest exposure to compulsory schooling at home. Using the upper bound definitions, the results suggest compulsory schooling is significantly less likely to be passed in the presence of European migrants with exposure to compulsory schooling at home, and the hazard of compulsory schooling being passed across US states remains significantly differently related to the two groups of European migrant, with and without compulsory schooling at home [p-value= .005].

## A.4 Internal Migration

### A.4.1 American-borns

If the passage of compulsory schooling was an instrument used by states to attract American migrants (or Americans took ideas over compulsory schooling with them as they migrated across states), and that the location of the foreign-born groups we focus on in Table 2 is interlinked with the internal migration of white American-borns, this would generate a spurious correlation between the presence of these foreign-born groups and the cross-state passage of compulsory schooling. To check for this, we use data on the internal migration of Americans from the 1880 census to plot the cross-state variation in Americans born out-of-state (but in the US) and the foreign-born

population group shares core to our analysis ($N^j_{s,1880}$). Figure A3 shows the result (and line of best fit): we find no significant relationship between the population share of out-of-state American-borns, with the population shares of Europeans with and without long exposure to compulsory schooling at home, or non-Europeans. This suggests our findings are not merely picking up the internal migration of white American-borns.[50]

### A.4.2 Foreign-borns

We can further check whether the passage of compulsory schooling in state $s$ by census year $t$, is associated with subsequent changes in the composition of the migrant population within the state. This sheds light on the narrower issue of whether any process by which natives and migrants sort into states is significantly altered by the introduction of compulsory schooling law. We use two specifications to check for whether population trends shift in response to compulsory schooling:

$$N^j_{st} = \mu \mathbf{1}(CSL_{st} = 1) + \delta_s + \delta_t + \sum\nolimits_t \theta_t (N^j_{s1850}.\delta_t) + u_{st}, \tag{18}$$

$$N^j_{st} = \delta t + \kappa \left[ (t - CSL_{st}) \mathbf{1}(CSL_{st} = 1) \right] + \delta_s + \varepsilon_{st}, \tag{19}$$

where $N^j_{st}$ corresponds to measures of the state-year population, and $1(CSL_{st} = 1)$ is a dummy for whether compulsory schooling law has been adopted in state $s$ by census year $t$. Specification (18) allows for a complete set of state and year fixed effects $(\delta_s, \delta_t)$, and also allows for there to be long run reversion to the mean in populations across states, as captured in the $N^j_{s1850}.\delta_t$ term. Specification (19) is a standard trend break model, that allows for state fixed effects, but assumes population follows a linear time trend ($\delta t$) and then tests for a break in this linear trend in the years after compulsory schooling law has been adopted in state $s$.

Table A8 presents the results: Panel A shows estimates of $\mu$ from (18), and Panel B shows estimates of $\kappa$ and $\delta$ from (19). In Columns 1 to 3 we focus on the partial correlation between the passage of compulsory schooling in a state on the subsequent total state population ($N_{st} = \sum_j N^j_{st}$). Examining Panel A, we see that unconditionally, states with compulsory schooling subsequently have significantly larger populations, but this result is not robust: including state fixed effects reduces the magnitude of the partial correlation by 90%, and allowing for reversion to the mean eliminates any significant correlation between the total population and the earlier passage of compulsory schooling. Columns 4 to 7 focus on the composition of the foreign-born population in the state. We find no evidence that after compulsory schooling laws are passed, the foreign

[50] Rocha *et al.* [2015] provide long run evidence on the economic/industrial development of Brazilian municipalities that explicitly used settlement policies to attract high skilled migrants into them in the late 19th and early 20th century.

born population, European migrants from countries with a long history of compulsory schooling, European migrants from countries without a long history of compulsory schooling, or the ratio of the two groups of European migrant, are significantly different. These results go firmly against the idea that native or migrant population movements are endogenously driven by the earlier passage of compulsory schooling in a state. Equally, the results suggests migrant groups were not resisting the civic values being imparted onto them via compulsory schooling by moving to other states. These conclusions are reinforced if we move to Panel B where (19) is estimated: we again find little evidence of native or migrant populations being responsive to the earlier passage of compulsory schooling ($\widehat{\kappa} = 0$ in five out of six specifications).

## A.5 IV Method

We use a control function (CF) approach to implement an instrumental variables strategy based on a Bartik-Card style instrument for migrant shares. The non-linear hazard model in (4) is a special case of a generalized regression model: $y_i = D.F(x_i\beta, u)$ for $D : \mathbb{R} \rightarrow \mathbb{R}$ a known non-degenerate and monotonic function and $F : \mathbb{R}^2 \rightarrow \mathbb{R}$ monotonic in each variable [Han 1987].[51] To overcome potential endogeneity of one of the regressors in such generalized regression models, the CF approach can be adopted where the unobservable covariate is directly controlled for (rather than instrumenting the endogenous variable as for 2SLS linear models). Terza *et al.* [2008a, 2008b] and Wooldridge [2010] show the consistency of such a two-stage residual inclusion (2SRI) methods for non-linear models.

To make explicit the nature of the endogeneity problem, we first let $Z^j_{st}$ denote the exogenous variables ($X^j_{st}$, $X_{st}$) and add a state-migrant-specific unobservable to the empirical specification in (4), denoted $V^j_{st}$, with $V_{st}$ an $S$ £ $J$ matrix of state-migrant unobservables. These unobservables enter additively in the proportional hazard model, that can be written in the regression form,

$$H(t) = \exp(\text{¡}\ N_{st}\beta \text{¡}\ Z_{st}\psi \text{¡}\ V_{st}) + U, \tag{20}$$

where $H(t) = \int_0^t h(s)ds$ is the integrated hazard function, $U$ » $Exp(1)$, with $U \perp (N_{st}, Z_{st}, V_{st})$, $Z_{st} \perp V_{st}$ but $N_{st} \not\perp V_{st}$. Hence the migrant shares are endogenous in that they correlate with unobservable determinants of compulsory schooling law. The endogenous migration shares $N^j_{st}$ are assumed to relate to some instrument $W^j_{st}$ according to the following parametric model,

$$N^j_{st} = \alpha_j W^j_{st} + \delta_j Z^j_{st} + e^j_{st}, \tag{21}$$

[51] For the Cox proportional hazard model, $y_i = F^{\text{¡}\ 1}(x_i b + u_i)$ with $F(\zeta) = \log \int_0^\zeta h(\tau)d\tau$, and $h$ being the hazard function, $y_i > 0$, $h() > 0$, and $u_i$ » $EV(1)$ [Han 1987].

where $e^j_{st}$ is an error term. We assume the rank condition holds, that the instruments are exogenous ($W^j_{st} \perp e^j_{st}, \epsilon^j_{st}$) and that $\mathbb{E}[e^j_{st}|Z^j_{st}, W^j_{st}] = 0$. The unobserved $V^j_{st}$ component can be decomposed into a term that is potentially correlated with $N^j_{st}$ and a residual,

$$V^j_{st} = e^j_{st}{}'\rho_j + \epsilon^j_{st}, \tag{22}$$

where $\epsilon^j_{st} \perp e^j_{st}$, and wlog, $\mathbb{E}[\exp(\epsilon^j_{st})] = 1$. The key to the CF approach is to obtain the population expectation conditional on $V^j_{st}$, which under the above assumptions is,

$$\mathbb{E}[H(t)|N_{st}, Z_{st}, V_{st}] = \exp(\mathbf{¡}\ N_{st}\beta\ \mathbf{¡}\ \ Z_{st}\psi\ \mathbf{¡}\ \ e_{st}\rho), \tag{23}$$

where $e_{st}$ is a $S$ £ $J$ matrix of residuals from (21). In the first stage, consistent estimates of ($\hat{\alpha_j}$, $\hat{\delta_j}$) are obtained by OLS, and predicted values of the residuals are obtained as $\hat{e}^j_{st} = N^j_{st}\ \mathbf{¡}\ \hat{N^j_{st}}$. In the second stage, $\hat{e}_{st} = (\hat{e}^1_{st}, ..., \hat{e}^J_{st})$ is then included in (23),

$$\mathbb{E}[H(t)|N_{st}, Z_{st}, \hat{e_{st}}] = \exp(\mathbf{¡}\ N_{st}\beta\ \mathbf{¡}\ \ Z_{st}\psi\ \mathbf{¡}\ \ \hat{e}_{st}\rho). \tag{24}$$

If the first stage is correctly specified, estimating this exponential regression model conditioning on $\hat{e_{st}}$ gives consistent estimates of $(\beta, \psi)$ [Wooldridge 2010]. The need to include additional covariates when estimating the second stage equation is demanding given our data dimensions: hence we first present result from the most parsimonious model that excludes the exogenous covariates $Z_{st} = (X^j_{st}, X_{st})$ from both stages.

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**Table 1: Characteristics of American-Borns and Migrant Groups**

**Sample period for State Descriptives: Census years prior to the introduction of compulsory schooling law**
**Sample period for County Descriptives: 1880 (based on 100% census sample)**
**Columns 1 to 4: Mean, overall standard deviation (SD) in parentheses, between SD in brackets, within SD in braces**
**In Columns 5 and 6, p-values on t-tests are reported in brackets**

| | (1) American Born | (2) European Born from Countries that did NOT have CSL in 1850 | (3) European Born from Countries that had CSL in 1850 | (4) Non-European Foreign Born | (5) Test of Equality [Col 2 = Col 3] | (6) Within State Test of Equality [Col 2 = Col 3] |
|---|---|---|---|---|---|---|
| **A. State Level** | | | | | | |
| **Population (10,000s)** | 76.5 | 4.60 | 3.14 | .862 | [.300] | [.333] |
| | (81.8) | (9.91) | (5.89) | (1.75) | | |
| **SD Between States** | [70.3] | [10.4] | [5.36] | [1.38] | | |
| **SD Within State (over census years)** | {45.1} | {2.51} | {2.79} | {1.08} | | |
| **Share of Adults (aged 15+) that are Illiterate** | .204 | .102 | .046 | .166 | [.008] | [.011] |
| | (.350) | (.074) | (.096) | (.225) | | |
| **Enrolment Rate (8-14 year olds)** | .570 | .297 | .441 | .331 | [.011] | [.016] |
| | (.245) | (.326) | (.328) | (.368) | | |
| **Share Aged 0-15** | .445 | .081 | .065 | .156 | [.160] | [.188] |
| | (.097) | (.066) | (.078) | (.162) | | |
| **Share in Labor Force** | .305 | .585 | .609 | .486 | [.345] | [.378] |
| | (.108) | (.156) | (.200) | (.252) | | |
| **Share Residing on a Farm** | .501 | .225 | .243 | .261 | [.215] | [.246] |
| | (.189) | (.180) | (.238) | (.274) | | |
| **Mean Occupational Score** | 18.2 | 21.1 | 22.2 | 19.4 | [.153] | [.180] |
| | (2.94) | (3.90) | (7.14) | (7.36) | | |
| **B. County Level** | | | | | | |
| **Share of County Population** | .894 | .041 | .040 | .025 | [.822] | [.335] |
| | (.136) | (.057) | (.066) | (.072) | | |
| **SD Between States** | [.121] | [.051] | [.049] | [.048] | | |
| **SD Within State (over counties)** | {.085} | {.041} | {.043} | {.061} | | |

**Notes:** In Panel A, the unit of observation is the state-census year. All variables are constructed from the IPUMS-USA census data using individual weights. For each state, the sample period starts from 1850 and covers all census years prior to the introduction of compulsory schooling laws. The year of passage of compulsory school attendance laws is extracted from Landes and Solomon [1972]. In Panel B, the unit of observation is the county in 1880. All variables are constructed from the IPUMS-USA 100% 1880 census sample. County populations are measured in shares. For both Panels, in Column 1, the American born are those whose recorded nativity is native born. In Column 2, the European countries defined to have had compulsory schooling laws in place in 1850 are Austria-Hungary, Denmark, Germany, Greece, Norway, Portugal and Sweden. All other European countries are included in Column 3. In the first row, populations are measured in 10,000s. Adults are defined to be aged 15 and above when defining the share of adults that are illiterate, and enrolment rates for 8-14 year olds are the share of this group that report being in school. The occupational score is a constructed variable from IPUMS-USA that assigns each occupation in all years a value representing the median total income (in hundreds of 1950 dollars) of all persons with that particular occupation in 1950. The occupational score thus provides a continuous measure of occupations, according to the economic rewards enjoyed by people working at them in 1950. Column 5 reports the p-value on a test of the null hypothesis that the values in Columns 2 and 3 are equal – this is derived from an OLS regression allowing standard errors to be clustered by region. Column 6 reports the p-value on the same test where we additionally control for state fixed effects.

## Table 2: The Composition of Migrants and the Passage of Compulsory Schooling Laws

**Non parametric Cox proportional hazard model estimates, hazard rates reported**
**Robust standard errors; Populations shares and enrolment rates measured in effect sizes**

| | (1) Foreign | (2) European | (3) Civic Values | (4) Other Characteristics |
|---|---|---|---|---|
| **Share of the State Population that is:** | | | | |
| **Foreign Born** | 1.24* | | | |
| | (.142) | | | |
| **European Born** | | 1.43** | | |
| | | (.226) | | |
| **From European Countries that did NOT have CSL in 1850** | | | 1.64*** | 2.15*** |
| | | | (.225) | (.509) |
| **From European Countries that had CSL in 1850** | | | .988 | .780 |
| | | | (.122) | (.161) |
| **Non-European Born** | | .998 | .995 | 1.80*** |
| | | (.041) | (.035) | (.409) |
| **Enrolment Rate of American-Borns** | | | | 2.82** |
| | | | | (1.39) |
| **Enrolment Rate of Europeans From Countries that did NOT have CSL in 1850** | | | | .815* |
| | | | | (.094) |
| **Enrolment Rate of Europeans From Countries that had CSL in 1850** | | | | 1.03 |
| | | | | (.153) |
| **Enrolment Rate of Non-European Foreign-Borns** | | | | 1.18 |
| | | | | (.235) |
| **Group Controls** | No | No | No | Yes |
| **State Controls** | No | No | No | Yes |
| **European Groups Equal [p-value]** | | | [.005] | [.004] |
| **Euro Without CSL = Non-Euro [p-value]** | | | [.001] | [.505] |
| **Observations (state-census year)** | 230 | 230 | 230 | 230 |

**Notes:** *** denotes significance at 1%, ** at 5%, and * at 10%. A non-parametric Cox proportional hazard model is estimated, where hazard rates are reported. Hence tests for significance relate to the null that the coefficient is equal to one. The unit of observation is the state-census year, for all census years from 1850. A state drops from the sample once compulsory schooling is passed. The year of passage of compulsory school attendance laws is extracted from Landes and Solomon [1972]. In all Columns population share groupings are defined in effect sizes, where this is calculated using population shares from census-years prior to the introduction of compulsory schooling law. Robust standard errors are reported. The European countries defined to have had compulsory schooling laws in place in 1850 are Austria-Hungary, Denmark, Germany, Greece, Norway, Portugal and Sweden. In Column 4 we control for the following characteristics of each group (American born, non-European, European with and without compulsory schooling laws in 1850): the share aged 0-15, the share of adults (aged 15 and over) that are illiterate, the labor force participation rate, and the share residing on a farm. We also control for the following state characteristics: the total population and the average occupational score of the population. We also control for the enrolment rate of 8-14 year olds among American borns (in effect sizes), and group specific enrolment rates for all European and non-European groups in the state (in effect sizes). At the foot of Column 3 onwards we report the p-value on the null hypothesis that the hazard coefficients are the same for the two European groups, and the p-value that the hazard coefficients are the same for the non-European immigrant groups and European borns from countries that did not have compulsory schooling in place in 1850.

## Table 3: Regional Variation in the Passage of Compulsory Schooling Laws

### Non parametric Cox proportional hazard model estimates, hazard rates reported
### Robust standard errors; Populations shares and enrolment rates measured in effect sizes

| | (1) Exclude Western States | (2) Exclude Southern States | (3) Only Western and Southern States | (4) Established States |
|---|---|---|---|---|
| **Share of the State Population that is:** | | | | |
| **From European Countries that did NOT have CSL in 1850** | 5.55*** | 1.33 | 4.62** | 3.16** |
| | (2.50) | (.388) | (2.94) | (1.64) |
| **From European Countries that had CSL in 1850** | .857 | .710 | .270** | 1.52 |
| | (.197) | (.188) | (.167) | (.506) |
| **Non-European Born** | 1.37 | 1.72 | 1.60 | 1.73*** |
| | (.337) | (.603) | (.512) | (.302) |
| **Group Controls** | Yes | Yes | Yes | Yes |
| **State Controls** | Yes | Yes | Yes | Yes |
| **European Groups Equal [p-value]** | [.000] | [.024] | [.016] | [.094] |
| **Euro Without CSL = Non-Euro [p-value]** | [.004] | [.556] | [.091] | [.201] |
| **Observations (state-census year)** | 186 | 133 | 141 | 187 |

**Notes:** *** denotes significance at 1%, ** at 5%, and * at 10%. A non-parametric Cox proportional hazard model is estimated, where hazard rates are reported. Hence tests for significance relate to the null that the coefficient is equal to one. The unit of observation is the state-census year, for all census years from 1850. A state drops from the sample once compulsory schooling is passed. The year of passage of compulsory school attendance laws is extracted from Landes and Solomon [1972]. Robust standard errors are reported. In Column 4 the 36 states that are observed in all 8 IPUMS census waves from 1850 to 1930 are included in the sample. These states are Alabama, Arkansas, California, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Utah, Vermont, Virginia, West Virginia and Wisconsin. In all Columns population share groupings are defined in effect sizes, where this is calculated using population shares from census-years prior to the introduction of compulsory schooling law. The European countries defined to have had compulsory schooling laws in place in 1850 are Austria-Hungary, Denmark, Germany, Greece, Norway, Portugal and Sweden. In all Columns we control for the following characteristics of each group (American born, non-European, European with and without compulsory schooling laws in 1850): the share aged 0-15, the enrolment rate of 8-14 year olds, the share of adults (aged 15 and over) that are illiterate, the labor force participation rate, and the share residing on a farm. We also control for the following state characteristics: the total population and the average occupational score of the population. At the foot of each Column we report the p-value on the null hypothesis that the hazard coefficients are the same for the two European groups, and the p-value that the hazard coefficients are the same for the non-European immigrant groups and European borns from countries that did not have compulsory schooling in place in 1850.

## Table 4: Endogenous Location Choice of Migrants, Second Stage 2SRI-IV Estimates

### Non parametric Cox proportional and log logistic hazard model estimates

### Robust standard errors; Populations shares and enrolment rates measured in effect sizes

| | (1) NP Cox PH | (2) Log logistic (Time Ratio) | (3) Log logistic (Time Ratio) | (4) Log logistic (Time Ratio) |
|---|---|---|---|---|
| **Share of the State Population that is:** | | | | |
| **From European Countries that did NOT have CSL in 1850** | 1.65** | .920*** | .906*** | .923*** |
| | (.382) | (.022) | (.020) | (.018) |
| **From European Countries that had CSL in 1850** | 1.15 | .098 | .098* | .986 |
| | (.152) | (.012) | (.011) | (.015) |
| **Non-European Born** | .85 | .994 | .990 | .946*** |
| | (.125) | (.014) | (.012) | (.009) |
| **Includes First Stage Residuals [OLS]** | Yes | Yes | No | No |
| **Includes First Stage Residuals [Non-parametric]** | No | No | Yes | Yes |
| **Group Controls** | No | No | No | Yes |
| **State Controls** | No | No | No | Yes |
| **European Groups Equal [p-value]** | [.262] | [.056] | [.013] | [.011] |
| **Euro Without CSL = Non-Euro [p-value]** | [.019] | [.030] | [.006] | [.217] |
| **Gamma Parameter** | | .048*** | .044*** | .017*** |
| | | (.007) | (.007) | (.003) |
| **Observations (state-census year)** | 180 | 180 | 180 | 180 |

**Notes:** *** denotes significance at 1%, ** at 5%, and * at 10%. In Column 1 a non-parametric Cox proportional hazard model is estimated, where hazard rates are reported. In Columns 2 to 4 a log logistic hazard model is estimated where time ratios are reported. In all cases tests for significance relate to the null that the coefficient is equal to one. The unit of observation is the state-census year, for all census years from 1860. A state drops from the sample once compulsory schooling is passed. Robust standard errors are reported. The year of passage of compulsory school attendance laws is extracted from Landes and Solomon [1972]. In all Columns population share groupings are defined in effect sizes, where this is calculated using population shares from census-years prior to the introduction of compulsory schooling law. The European countries defined to have had compulsory schooling laws in place in 1850 are Austria-Hungary, Denmark, Germany, Greece, Norway, Portugal and Sweden. We control for the following characteristics of each group (American born, non-European, European with and without compulsory schooling laws in 1850): the share aged 0-15, the share of adults (aged 15 and over) that are illiterate, the enrolment rate of 8-14 year olds, the labor force participation rate, and the share residing on a farm. We also control for the following state characteristics: the total population and the average occupational score of the population. All Columns control for the first stage residuals in the 2SRI method. At the foot of each Column we report the p-value on the null hypothesis that the coefficients are the same for the two European groups, and the p-value that the coefficients are the same for the non-European immigrant groups and European borns from countries that did not have compulsory schooling in place in 1850. At the foot of Columns 2 to 4 the relevant parameters from the parametric hazard and frailty parameters are reported.

## Table 5: Other Sources of Within-Migrant Diversity

**Non parametric Cox proportional model, hazard rates reported**
**Robust standard errors; Populations shares measured in effect sizes**

| | (1) Religion | (2) European Region | (3) Language |
|---|---|---|---|
| **Share of the State Population that is From:** | | | |
| **Euro Countries that did NOT have CSL in 1850, Protestant** | 1.22 | | |
| | (.234) | | |
| **Euro Countries that did NOT have CSL in 1850, Catholic/Other** | 2.39*** | | |
| | (.596) | | |
| **Euro Countries that had CSL in 1850, Protestant** | .598* | | |
| | (.176) | | |
| **Euro Countries that had CSL in 1850, Catholic/Other** | .840*** | | |
| | (.044) | | |
| **Non-European Born** | 2.29*** | 2.08** | 1.83*** |
| | (.609) | (.639) | (.227) |
| **Euro Countries that did NOT have CSL in 1850, Northern/Scandinavian** | | 1.89 | |
| | | (.837) | |
| **Euro Countries that did NOT have CSL in 1850, Southern/Eastern** | | 1.16* | |
| | | (.099) | |
| **Euro Countries that had CSL in 1850, Northern/Scandinavian** | | .698 | |
| | | (.162) | |
| **Euro Countries that had CSL in 1850, Southern/Eastern** | | .883*** | |
| | | (.038) | |
| **Euro Countries that did NOT have CSL in 1850, English Speaking** | | | 1.66* |
| | | | (.494) |
| **Euro Countries that did NOT have CSL in 1850, Non English Speaking** | | | 1.25 |
| | | | (.311) |
| **Euro Countries that had CSL in 1850 (all Non English Speaking)** | | | .776 |
| | | | (.127) |
| **Group and State Controls** | Yes | Yes | Yes |
| **With CSL = Without CSL, Protestant** | [.052] | | |
| **With CSL = Without CSL, Catholic/Other** | [.000] | | |
| **With CSL = Without CSL, Northern European** | | [.066] | |
| **With CSL = Without CSL, Southern/Eastern European** | | [.003] | |
| **With CSL (All Non English) = Without CSL, Non English** | | | [.057] |
| **Observations (state-census year)** | 230 | 230 | 230 |

**Notes:** *** denotes significance at 1%, ** at 5%, and * at 10%. A non-parametric Cox proportional hazard model is estimated, where hazard rates are reported. Hence tests for significance relate to the null that the coefficient is one. The unit of observation is the state-census year, for all census years from 1850. A state drops from the sample once compulsory schooling is passed. Robust standard errors are reported. The year of passage of compulsory school attendance laws is extracted from Landes and Solomon [1972]. In all Columns population share groupings are defined in effect sizes, where this is calculated using population shares in census-years prior to the introduction of compulsory schooling law. The European countries defined to have had compulsory schooling laws in place in 1850 are Austria-Hungary, Denmark, Germany, Greece, Norway, Portugal and Sweden. In all Columns we control for the following characteristics of each group (American born, non-European, European with and without compulsory schooling laws in 1850, as well as the one additional group defined in each column): the share aged 0-15, the share of adults (aged 15 and over) that are illiterate, the labor force participation rate, the enrolment rate of 8-14 year olds and the share residing on a farm. In all Columns we control for the following state characteristics: the total population, and the average occupational score of the population. In Column 1, we use the Barro and McCleary [1985] data to define country religion. The following European countries are then defined to be Protestant: Britain, Denmark, Finland, Germany, Holland, Norway and Switzerland. In Column 2, Northern Europe/Scandinavian countries are defined to be Belgium, Britain, Denmark, Finland, France, Germany, Holland, Iceland, Ireland, Lichtenstein, Luxembourg, Norway, Sweden and Switzerland. In Column 3, English speaking European countries are Britain and Ireland (both without compulsory schooling in 1850). At the foot of each Column we report the p-value on the null hypothesis that the hazard coefficients are the same between various European groups with and without compulsory schooling in 1850.

## Table 6: Alternative Mechanisms Driving the Passage of Compulsory Schooling

**Non parametric Cox proportional model, hazard rates reported**
**Robust standard errors; Populations shares measured in effect sizes**

| | (1) Redistribution | (2) Industrialization | (3) Land Inequality | (4) Republicans | (5) Democrats |
|---|---|---|---|---|---|
| **Share of the State Population that is From:** | | | | | |
| **European Countries that did NOT have CSL in 1850** | 2.14*** | 2.38*** | 1.84** | 2.62*** | 3.00*** |
| | (.470) | (.520) | (.461) | (.858) | (1.04) |
| **European Countries that had CSL in 1850** | .831 | .819 | .901 | .915 | 1.02 |
| | (.160) | (.148) | (.196) | (.180) | (.170) |
| **Non-European Countries** | 1.82*** | 2.01** | 2.14*** | 1.77** | 1.62* |
| | (.389) | (.554) | (.518) | (.455) | (.459) |
| **SD of Occupational Income Score** | 1.38 | | | | |
| | (.423) | | | | |
| **Share of Labor Force Engaged in Professional Occupations** | | 1.00 | | | |
| | | (.000) | | | |
| **Share of Labor Force Engaged in Craft Occupations** | | 2.51* | | | |
| | | (1.32) | | | |
| **Share of Labor Force Engaged in Operative Occupations** | | .550 | | | |
| | | (.296) | | | |
| **Land Share of Top 20% of Holdings [Galor *et al*. 2009]** | | | .815 | | |
| | | | (.171) | | |
| **Republican Party Vote Share in Congressional Elections** | | | | 1.68* | |
| | | | | (.455) | |
| **Democratic Party Vote Share in Congressional Elections** | | | | | .558*** |
| | | | | | (.105) |
| **Group and State Controls** | Yes | Yes | Yes | Yes | Yes |
| **European Groups Equal (with and without CSL) [p-value]** | [.003] | [.000] | [.025] | [.002] | [.003] |
| **Euro Without CSL = Non-Euro [p-value]** | [.513] | [.549] | [.591] | [.331] | [.135] |
| **Observations (state-census year)** | 230 | 230 | 216 | 148 | 148 |

**Notes:** *** denotes significance at 1%, ** at 5%, and * at 10%. A non-parametric Cox proportional hazard model is estimated, where hazard rates are reported. Hence tests for significance relate to the null that the coefficient is one. The unit of observation is the state-census year, for all census years from 1850. A state drops from the sample once compulsory schooling laws are passed. Robust standard errors are reported. The year of passage of compulsory school attendance laws is extracted from Landes and Solomon [1972]. In all Columns population share groupings are defined in effect sizes, where this is calculated using population shares in census-years prior to the introduction of compulsory schooling law. The European countries defined to have had compulsory schooling laws in place in 1850 are Austria-Hungary, Denmark, Germany, Greece, Norway, Portugal and Sweden. In all Columns we control for the following characteristics of each group (American born, non-European, European with and without compulsory schooling laws in 1850, as well as the one additional group defined in each column): the share aged 0-15, the share of adults (aged 15 and over) that are illiterate, the labor force participation rate, the enrolment rate of 8-14 year olds and the share residing on a farm. In all Columns we control for the following state characteristics: the total population, and the average occupational score of the population. Column 1 controls for the state-year standard deviation in the occupational index score. Column 2 controls for the share of the population defined to be working in craft occupations, and operative occupations (where professional occupations are the omitted category). Column 3 controls for the land share of the largest 20% of farm land holdings, from [Galor *et al*. 2009], to proxy inequality of land holdings. This is available for 1880, 1900 and 1920: we linearly interpolate it for other state-census years. Column 4 (5) controls for the vote share of the Republican (Democratic) party in congressional elections: these are available only in census years from 1860 onwards for a subset of states. At the foot of each Column we report the p-value on the null hypothesis that the hazard coefficients are the same for the two European groups.

## Table 7: The Composition of Migrants and the Provision of Common Schools

**OLS estimates, robust standard errors**

**Dependent variable: Log common school teachers in county**

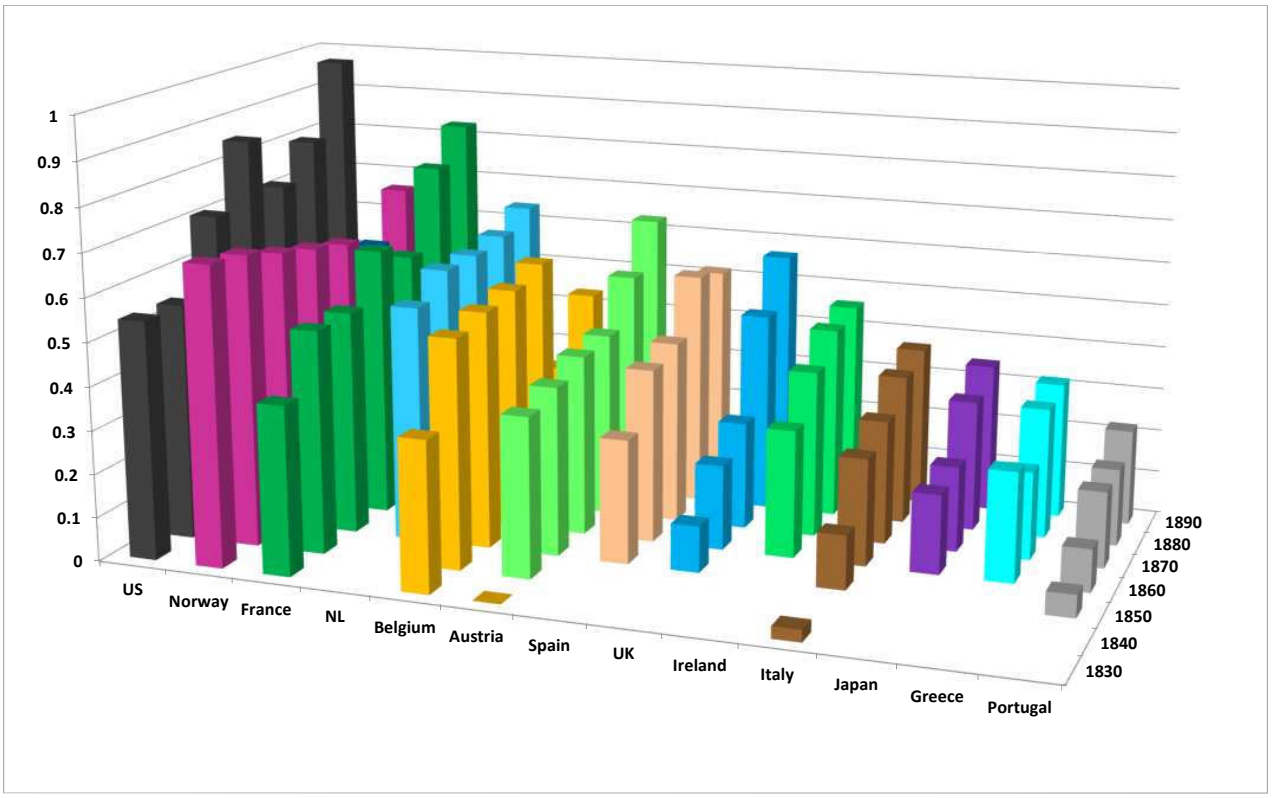
**County populations measured in effect sizes**

| | (1) Migrant Groups | (2) State FE | (3) Controls |
|---|---|---|---|
| **County Population that is:** | | | |
| **American Born** | .298*** | .239*** | .029** |
| | (.060) | (.042) | (.011) |
| **European Born from Countries that did NOT have CSL in 1850** | -.180*** | -.176*** | -.040*** |
| | (.032) | (.024) | (.011) |
| **European Born from Countries that had CSL in 1850** | .058* | .076*** | .036*** |
| | (.034) | (.025) | (.007) |
| **Non-European Born** | .120*** | .078*** | .017*** |
| | (.018) | (.012) | (.005) |
| **Mean of Dependent Variable (in levels)** | | 133 | |
| **State Fixed Effects** | No | Yes | Yes |
| **Group and County Controls** | No | No | Yes |
| **American = European Born without CSL [p-value]** | [.000] | [.000] | [.002] |
| **European Groups Equal (with and without CSL) [p-value]** | [.000] | [.000] | [.000] |
| **Observations (county)** | 2472 | 2472 | 2472 |

**Notes:** *** denotes significance at 1%, ** at 5%, and * at 10%. The unit of observation is a county, and the sample covers counties from 45 states. The dependent variable is the log of the number of white teachers in the county. All outcomes are measured in 1890. All right hand side controls are measured in 1880, and derived from the 100% IPUMS-USA census sample. OLS regression estimates are shown, where robust standard errors are estimated, and observations are weighted by the county population. In all Columns population groupings are all defined in effect sizes, where this is calculated from population numbers in the cross section of counties in 1890. The European countries defined to have had compulsory schooling laws in place in 1850 are Austria-Hungary, Denmark, Germany, Greece, Norway, Portugal and Sweden. Column 2 onwards includes state fixed effects. In Column 3 we control for the following characteristics of each group (American born, non-European, European with and without compulsory schooling laws in 1850): the share aged 0-15, the labor force participation rate, the share residing on a farm, and the average occupational income score. At the foot of each Column we report the p-value on the null hypothesis that the coefficients are the same for various pairs of groups.

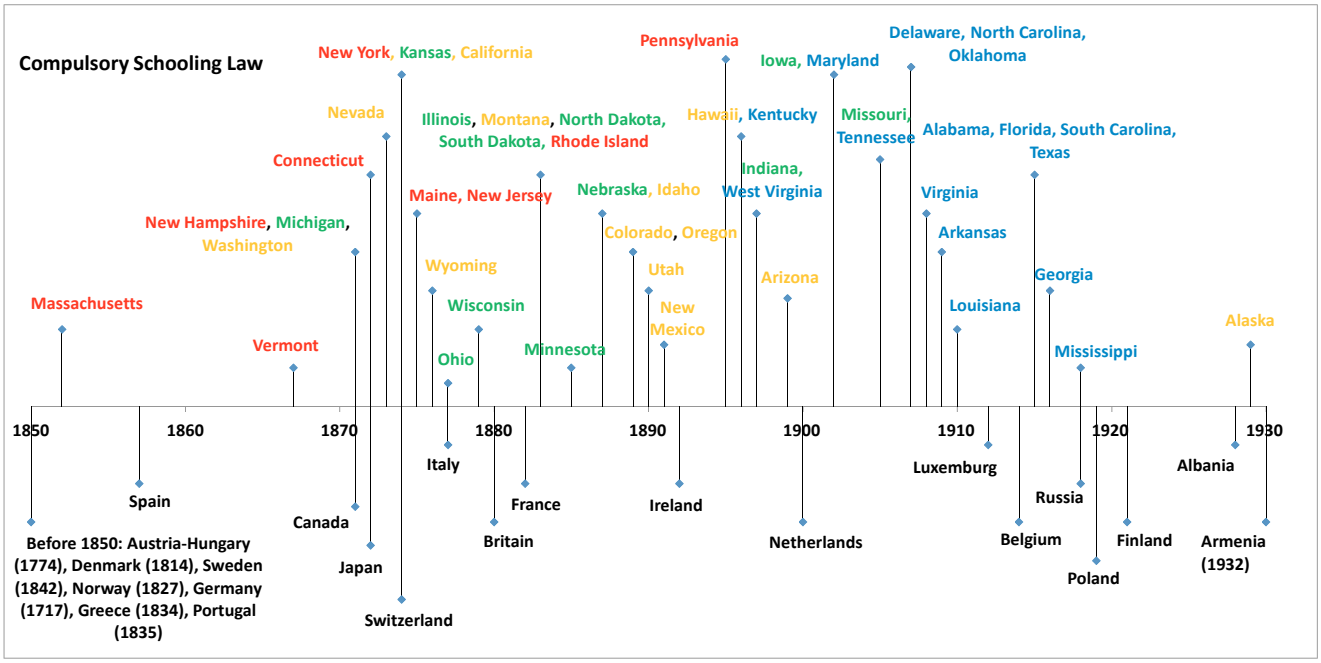
## Figure 1: The Educated American

**Enrolment Rates (5-14 year olds)**



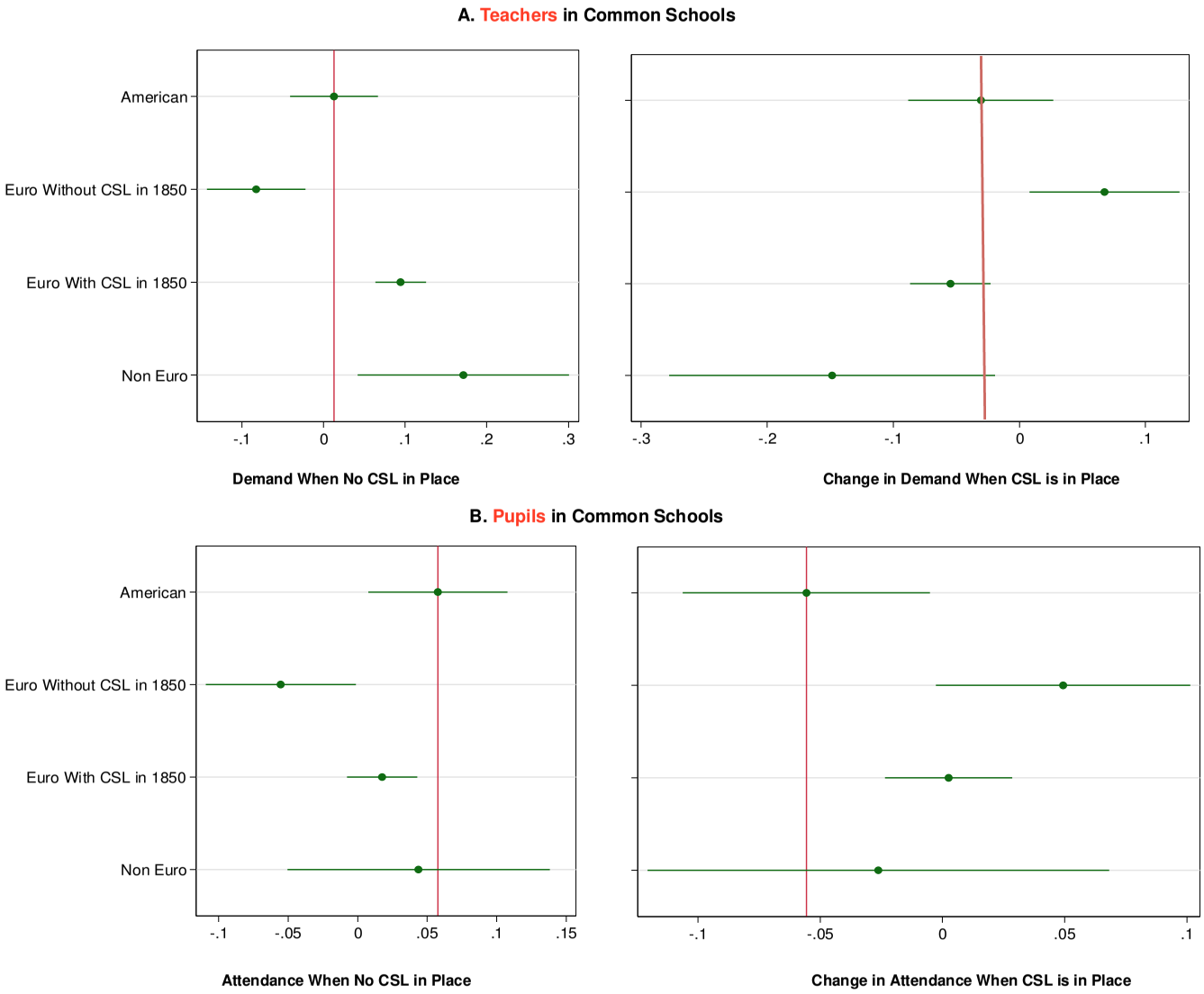

**Notes:** Enrollment rates represent students enrolled in public and/or private schools for children aged 5-14. The enrollment rates are extracted from: (i) Lindert [2004] for Austria (1830-1870); Belgium (1830,1840,1860); France (1830,1840); Greece (1860); Ireland (1860); Italy (1830,1850,1860); Japan (1860); the Netherlands (1850, 1860); Norway (1830-1860,1890); Portugal (1850,1880); Spain (1850,1860,1890); the US (1830,1840) (ii) Flora et al. [1983] for Austria-Hungary (1891); Belgium (1850,1869,1881); Ireland (1890); Italy (1890); Norway (1870,1880); the UK (1850,1870-1890); Prussia (1871,1882,1891) (iii) Benavot and Riddle [1988] for Austria (1880); France (1870,1890); Greece (1870,1880); Ireland (1870,1880); Italy (1870,1880); Japan (1870-1890); the Netherlands (1870-1890); Spain (1870); the US (1870-1890). All other rates were calculated using enrollments from Banks and Wilson [2011] and the total population between 5-14 years old from Mitchell [2007a, 2007b] for France (1851,1861,1881); Greece (1889); Portugal (1864,1875,1890); Spain (1877,1887); the UK (1861); the US (1850,1860).

## Figure 2: Timeline for Passage of Compulsory Schooling, by US State and European Country




RED = Northeast, GREEN= Midwest, YELLOW = West, BLUE = South

## Figure 3: Demand for Common Schooling in 1890, by Population Groups and Compulsory Schooling Law




**Notes:** The Panels show coefficient estimates and robust standard errors from an OLS regression in which the unit of observation is a county, and the sample covers counties from 45 states. The dependent variable in Panel A is the log of the number of white teachers in the county. The dependent variable in Panel B is the log of the number of enrolled white pupils in the county. All outcomes are measured in 1890. All controls in the regressions are measured in 1880, and derived from the 100% IPUMS-USA census sample. Observations are weighted by the county population. In all Panels, the four population groups are controlled for, as well as an interaction between each group and whether compulsory schooling laws are in place in the state prior to and including 1890 (the other controls in each regression are state fixed effects, the average occupational score of the county population, the log of the county population aged 0 to 15, and the following characteristics of each group (American born, non-European, European with and without compulsory schooling laws in 1850): the share aged 0-15, the labor force participation rate, the share residing on a farm, and the average occupational income score). Population groupings are all defined in effect sizes, where this is calculated from population numbers in the cross section of counties in 1890. The European countries defined to have had compulsory schooling laws in place in 1850 are Austria-Hungary, Denmark, Germany, Greece, Norway, Portugal and Sweden. In each Panel, the left hand side figure shows the coefficient on the population grouping in the pre-compulsion period. The right hand side figure shows the coefficient on the interaction between the population grouping and the compulsory schooling law dummy.

## Table A1: Year of Passage of Laws, by US State*

| State | Territory Joined the Union[1] | State Joined the Union[2] | Introduction of Compulsory Schooling[3] | Age Groups Compulsory Schooling Laws Applied to[4] | Introduction of Child Labor Laws[5] | Introduction of Birth Registration Proof[6] |
|---|---|---|---|---|---|---|
| **Alabama** | 1817 | 1819 | 1915 | 8 - 14 | 1910 | 1908 |
| **Alaska** | | 1959 | 1929 | | | |
| **Arizona** | 1863 | 1912 | 1899 | 8 - 14 | after 1910 | 1909 |
| **Arkansas** | 1819 | 1836 | 1909 | 8 - 14 | 1910 | 1914 |
| **California** | | 1850 | 1874 | 8 - 14 | 1890 | 1905 |
| **Colorado** | 1861 | 1876 | 1889 | 8 - 14 | 1890 | 1907 |
| **Connecticut** | | 1788 | 1872 | 7 - 14 | 1890 | 1897 |
| **Delaware** | | 1787 | 1907 | 7 - 14 | after 1910 | 1881 |
| **Florida** | 1822 | 1845 | 1915 | 8 - 12 | 1910 | 1899 |
| **Georgia** | | 1788 | 1916 | 8 - 12 | 1910 | 1919 |
| **Hawaii** | | 1959 | 1896 | | | |
| **Idaho** | 1863 | 1890 | 1887 | 8 - 14 | 1910 | 1911 |
| **Illinois** | 1809 | 1818 | 1883 | 7 - 14 | 1900 | 1916 |
| **Indiana** | 1800 | 1816 | 1897 | 7 - 14 | 1890 | 1908 |
| **Iowa** | 1838 | 1846 | 1902 | 7 - 14 | 1910 | 1880 |
| **Kansas** | 1854 | 1861 | 1874 | 8 - 14 | 1910 | 1911 |
| **Kentucky** | | 1792 | 1896 | 7 - 14 | 1910 | 1911 |
| **Louisiana** | 1804 | 1812 | 1910 | - 14 | 1890 | 1918 |
| **Maine** | | 1820 | 1875 | 7 - 14 | 1890 | 1892 |
| **Maryland** | | 1788 | 1902 | 8 - 12 | 1900 | 1898 |
| **Massachusetts** | | 1788 | 1852 | 7 - 14 | before 1880 | 1841 |
| **Michigan** | 1805 | 1837 | 1871 | 7 - 14 | 1890 | 1906 |
| **Minnesota** | | 1858 | 1885 | 8 - 14 | 1900 | 1872 |
| **Mississippi** | 1798 | 1817 | 1918 | 7 - 12 | 1910 | 1912 |
| **Missouri** | | 1821 | 1905 | 8 - 14 | 1900 | 1910 |
| **Montana** | 1864 | 1889 | 1883 | 8 - 14 | 1910 | 1907 |
| **Nebraska** | | 1867 | 1887 | 7 - 14 | 1890 | 1904 |
| **Nevada** | 1861 | 1864 | 1873 | 8 - 14 | after 1910 | 1911 |
| **New Hampshire** | | 1788 | 1871 | 8 - 14 | before 1880 | 1883 |
| **New Jersey** | | 1787 | 1875 | 7 - 14 | before 1880 | 1878 |
| **New Mexico** | 1850 | 1912 | 1891 | 7 - | after 1910 | 1920 |
| **New York** | | 1788 | 1874 | 7 - 14 | 1890 | 1880 |
| **North Carolina** | | 1789 | 1907 | 8 - 12 | 1910 | 1914 |
| **North Dakota** | 1861 | 1889 | 1883 | 8 - 14 | 1900 | 1907 |
| **Ohio** | | 1803 | 1877 | 8 - 14 | 1890 | 1909 |
| **Oklahoma** | 1890 | 1907 | 1907 | 8 - 14 | 1910 | 1917 |
| **Oregon** | 1848 | 1859 | 1889 | 9 - 14 | 1910 | 1903 |
| **Pennsylvania** | | 1787 | 1895 | 8 - 14 | before 1880 | 1906 |
| **Rhode Island** | | 1790 | 1883 | 7 - 14 | before 1880 | 1896 |
| **South Carolina** | | 1788 | 1915 | 8 - 14 | 1910 | 1915 |
| **South Dakota** | 1861 | 1889 | 1883 | 8 - 14 | 1910 | 1905 |
| **Tennessee** | 1790 | 1796 | 1905 | 8 - 14 | 1900 | 1914 |
| **Texas** | | 1845 | 1915 | 8 - 12 | 1910 | 1903 |
| **Utah** | 1850 | 1896 | 1890 | 8 - | after 1910 | 1905 |
| **Vermont** | | 1791 | 1867 | 8 - 12 | before 1880 | |
| **Virginia** | | 1788 | 1908 | 8 - 12 | 1910 | 1912 |
| **Washington** | 1853 | 1889 | 1871 | 8 - 14 | 1910 | 1907 |
| **West Virginia** | | 1863 | 1897 | 8 - 12 | 1900 | 1925 |
| **Wisconsin** | 1836 | 1848 | 1879 | 7 - 12 | before 1880 | 1908 |
| **Wyoming** | 1868 | 1890 | 1876 | 7 - | after 1910 | 1909 |

**Notes and Sources:**
* The District of Columbia is not included as it is a federal district.
[1] Year when the territory joined the Union [extracted from Braun and Kvasnicka 2013]
[2] Year when the state joined the Union [extracted from US Census Office]
[3] Year of introduction of compulsory school attendance laws [extracted from Landes and Solomon 1972]
[4] Year of introduction of child labor laws for manufacturing employment [extracted from Moehling 1999]
[5] Age groups that compulsory schooling laws applied to when the laws were introduced (i.e., the closest year available) [extracted from Lleras-Muney and Shertzer 2015]
[6] Year of introduction of birth certificate as official proof of a child's age [extracted from Fagernäs 2014]

## Table A2A: Compulsory Schooling Laws, by Country

| Country | Introduction of CSL: Preferred Year | Lower Bound | Upper Bound | Sources | Legislation Introducing Compulsory Schooling | Notes |
|---|---|---|---|---|---|---|
| **Albania** | 1928 | 1928 | 1928 | Hörner et al. (2007), Sefa and Lushnje (2012) | Fundamental Statute of the Kingdom of Albania (Constitution) | |
| **Armenia** | 1932 | 1932 | 1932 | Hörner et al. (2007), EFA (2000) | | |
| **Austria-Hungary** | **1774** | **1774** | 1869 | Melton (1988), Slaje (2009), Schneider (1982), Donnermair (2010), Fort (2006), Ramirez and Boli (1987), Flora et al. (1983), Cohen (1996) | | In Austria, the principle of compulsory education was introduced in 1774 by Joseph II but met with opposition (Flora et al. (1983), p.555). Six years of compulsory schooling were introduced in 1774 together with state-controlled public schools (Fort (2006), p.20). Maria Theresa and Joseph II reformed the education the education system in pursuit of pragmatic goals for the state. In 1781 Joseph II established the principle of mandatory primary education for all children aged 6-12, although in practice it took decades to realize this in many crown lands (Cohen (1996), p.15). As attendance was still not satisfactory a century later, the law was re-iterated with the 1869 Reichsvolksschulgesetz. Complete separation of schools from the Church was achieved in 1868 (Ramirez and Boli 1987, p.5). In Hungary, compulsory schooling was introduced in 1777 with the "Ratio Educationis". The 1869 Reichsvolksschulgesetz (the upper bound) applied to all the countries of the Empire |
| **Belgium** | 1914 | 1914 | 1914 | Wielemans (1991), Gathmann et al. (2012), Flora et al. (1983), Colle-Michel (2007), Ramirez and Boli (1987) | Loi Poullet (Loi du 19 mai 1914) | Compulsory education was introduced in 1914 but implemented only after World War I (Flora et al. (1983), p.561) |
| **Britain** | 1880 | 1872 | 1880 | Soysal and Strang (1989), Flora et al. (1983), Ritter (1986), Salimova and Dodde (eds.) (2000), Anderson (1995) | | Compulsory education of eight years was introduced with exceptions in England and Wales in 1880 (Flora et al. (1983), p.623). School became compulsory in 1881 and free in 1891. However, the legislation was not implemented in the same way in every community. That is, some communities continued to depend on voluntary schooling or under the control of religious groups (Salimova and Dodde (eds.) (2000), p.108). In Scotland, compulsory schooling was already introduced in 1872 (lower bound) with the "Education (Scotland) Act" |
| **Canada** | 1871 | 1871 | 1943 | Oreopoulos (2005) | | In the case of Canada, schooling was made compulsory at different points in time in different Canadian states. The first state to introduce a CSL was Ontario (1871), the last one was Quebec (1943) (Oreopoulos 2005). The first date (1871) was chosen as the CSL enactment date for Canada |
| **Denmark** | **1814** | **1739** | **1814** | Bandle et al. (2005), Gathmann et al. (2012), Simola (2002), Schneider (1982), Flora et al. (1983) | Education Act | Compulsory education was first enacted in 1739, but consisted only of religious education and the reading of certain familiar texts. In 1814, writing was added to the curriculum. Compulsory education covered only three days a week. Starting from 1869 compulsory education was extended to cover six days a week (Flora et al. (1983), p.567) |
| **Finland** | 1921 | 1921 | 1921 | Hörner et al. (2007), Simola (2002), Flora et al. (1983), Salimova and Dodde (eds.) (2000) | Compulsory School Attendance Act | Finland became an independent state in 1917; the primary school institution was established in 1866, but only became compulsory in 1921 (Simola 2002, p.212) with the introduction of eight years of compulsory schooling (Flora et al. (1983), p.572). The Parliament passed the law on compulsory education in 1921. The law entitled everyone to receive education free of charge, regardless of sex, language, or class. [...] Towns were given five years to enforce the law and rural municipalities fifteen. In other words, the elementary schools were not functioning properly until the late 1930s (Salimova and Dodde (eds.) (2000), p.136) |
| **France** | 1882 | 1882 | 1882 | Soysal and Strang (1989), Cubberley (1920), Schriewer (1985), Schneider (1982), Flora et al. (1983), Salimova and Dodde (eds.) (2000) | Lois Jules Ferry (Loi n° 11 696 du 28 Mars 1882 (Article 4)) | The Jules Ferry Laws established free education (1881) and laic and compulsory education (1882) (Garnier et al. 1989, p.291) |
| **Germany** | **1717** | **1592** | 1871 | Ramirez and Boli (1987), Stolze (1911), Salimova and Dodde (eds.) (2000), Flora et al. (1983), Oelkers (2009) | | The first German state to introduce compulsory schooling was Palatinate-Zweibrücken in 1592. In Prussia, compulsory schooling was introduced by Frederick William in 1717, and reiterated by Frederick II in 1763. The general law of the land (Allgemeines Landrecht) of 1794 makes instruction - as opposed to attendance - mandatory, a fact that had consequences for school attendance and organization. In this system the state only regulates the minimum for those parents who cannot provide for their children's attendance. [...] Elementarschulen became unavoidable but actually only for the poorer classes of the population, who could not afford a better form of education (Salimova and Dodde (eds.) (2000), pp.179-180). Upon unification of the German Empire in 1871, compulsory schooling (which existed in Prussia) was extended to all states. Eight years of compulsory education were introduced in the German Empire with the exception of Wurtemberg and Bavaria where only seven years were introduced (Flora et al. (1983), p.584). Most states already had compulsory schooling before 1871 (detailed information on all states was not available). As Prussia was the largest and dominant state at the time of unification, we use the date of its first CSL enactment (1717) as the reference date for Germany |
| **Greece** | **1834** | **1834** | **1834** | Gkolia and Brundrett (2008), Cowen and Kazamias (2009), Salimova and Dodde (eds.) (2000) | Bavarian Plan (Decree of 1834) | With the arrival of the Bavarians [i.e., 1833], the formal education in Greece included three levels: the primary, the secondary, and the higher education. The compulsory schooling was seven years. This educational system was established by laws relating to the primary schools in 1834 (Salimova and Dodde (eds.) (2000), p.232) |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Ireland** | 1892 | 1892 | 1898 | Schneider (1982), Flora et al. (1983), O Buachalla (1988) | Irish Education Act | The 1892 Irish Education Act introduced free primary compulsory schooling (O Buachalla 1988, p.21). Compulsory education was introduced only in towns in 1892 (with the requirement of minimum attendance of 75 days per year), and extended to rural areas in 1898 (Flora et al. (1983), p.593) |
| **Italy** | 1877 | 1859 | 1877 | Cubberley (1920), Schneider (1982), Ramirez and Boli (1987) | | In the Kingdom of Sardinia, compulsory education was introduced in 1859 (2 years in all communes, 4 years in communes over 4,000 population) (Flora et al. (1983), p.598). Upon unification, compulsory school attendance was extended to all Italian provinces. This process was completed in 1877. The education system was quite effective in some of the Northern regions by 1880 and in Southern regions by 1900 (Ramirez and Boli 1987, p.7) |
| **Japan** | 1872 | 1872 | 1872 | Duke (2009), Loomis (1962), Burnett and Wada (2007), Salimova and Dodde (eds.) (2000) | Gakusei (Fundamental Code of Education) | The Fundamental Code of Education - the Gakusei - was announced in 1872. […] They declared their intention to spread education and mentioned that educational opportunity should be available for all people […] they emphasized parents' responsibility for education, every guardian shall bring up his children with tender care, never failing to have them attend school (Salimova and Dodde (eds.) (2000), p.275) |
| **Luxembourg** | 1912 | 1912 | 1912 | Soysal and Strang (1989), UNESCO (2007), European Commission (2010) | Loi du 10 août 1912 sur l'organisation de l'enseignement primaire | |
| **Netherlands** | 1900 | 1900 | 1900 | Soysal and Strang (1989), Gathmann et al. (2012), Schneider (1982), Flora et al. (1986), Salimova and Dodde (eds.) (2000) | De Leerplichtwet (July 7, 1900, Staatsblad No. 111) | Introduction of six years of compulsory education (Flora et al. (1983), p.603). When compulsory education was introduced in 1900, about 90% of children was already attending a primary school (Salimova and Dodde (eds.) (2000), p.315) |
| **Norway** | **1827** | **1739** | 1860 | Soysal and Strang (1989), Bandle et al. (2005), Hove (1967), Einhorn (2005), Rust (1990) | Primary School Act | |
| **Poland** | 1919 | **1825** | 1919 | Karsten and Majoor (1994), Slaje (2009), Biskup (1983), Salimova and Dodde (eds.) (2000) | Decree On Compulsory Schooling (O obowiazku skolnym) (February 7, 1919) | In the Prussian part of partitioned Poland, compulsory schooling was introduced in 1825. Shortly after the reunification, compulsory schooling was extended to the entire country in 1919. School systems inherited from Russia, Prussia and Austria were different and school traditions varied […] the young country's most important task in the field of education policy was to adopt a uniform school system (Salimova and Dodde (eds.) (2000), p.340) […] The Constitution of 1921 failed to provide the rural population with guarantees of any rights to education of the same quality as that provided to urban areas (Salimova and Dodde (eds.) (2000), p.341) |
| **Portugal** | **1835** | **1835** | **1835** | Ministro dos Negocios do Reino (1835) | Regulamento Geral Da Instrucção Primaria | |
| **Russia** | 1918 | 1918 | 1918 | Decree of October 16, 1918, on the Comprehensive Labor School of the Russian Socialist Federative Soviet Republic | Decree of October 16, 1918, on the Comprehensive Labor School of the Russian Socialist Federative Soviet Republic | |
| **Spain** | 1857 | 1857 | 1857 | Gathmann et al. (2012), De Maeyer et al. (2005), Ministerio de Fomento (1857) | Ley Moyano de Instrucción Pública de 1857 | |
| **Sweden** | **1842** | **1842** | **1842** | Soysal and Strang (1989), Simola (2002), Schneider (1982) | Folkskolestadgan (SFS 1842:19) | The 1842 law was followed in later decades by other bills that made the system entirely universal (Ramirez and Boli 1987, p.6) |
| **Switzerland** | 1874 | 1874 | 1874 | Bundesverfassung (Federal Constitution) | Bundesverfassung (Federal Constitution) | Sources contradict each other with respect to introduction of compulsory schooling in different cantons. After the constitutional change of 1874, age of entry still varied according to cantonal law which also governed the duration of the primary school course (Flora et al. (1983), p.618). It was the radical new arrangement of society that made first attempt in 1798, but in a permanent manner only in the 19th century led to the establishment of the compulsory state school (Salimova and Dodde (eds.) (2000), p.433) |

## Table A2B: Compulsory Schooling Laws, for European Countries With Potential for Within-Country Regional Variation

| Country | Region | Year of Introduction of Compulsory Schooling | Lower Bound | Upper Bound | Sources | Legislation Introducing Compulsory Schooling | Notes |
|---|---|---|---|---|---|---|---|
| **Austria-Hungary** | **Austria** | 1774 | 1774 | 1869 | Melton (1988), Slaje (2009), Schneider (1982), Donnermair (2010), Fort (2006), Ramirez and Boli (1987), Flora et al. (1983), Cohen (1996) | Allgemeine Schulordnung für die deutschen Normal-, Haupt- und Trivialschulen in sämmtlichen Kaiserlich-Königlichen Erbländern (General School Ordinance) | In Austria, the principle of compulsory education was introduced in 1774 by Joseph II but met with opposition (Flora et al. (1983), p.555). Six years of compulsory schooling were introduced in 1774 together with state-controlled public schools (Fort (2006), p.20). Maria Theresa and Joseph II reformed the education the education system in pursuit of pragmatic goals for the state. In 1781 Joseph II established the principle of mandatory primary education for all children aged 6-12, although in practice it took decades to realize this in many crown lands (Cohen (1996), p.15). As attendance was still not satisfactory a century later, the law was re-iterated with the 1869 Reichsvolksschulgesetz. Complete separation of schools from the Church was achieved in 1868 (Ramirez and Boli 1987, p.5). In Hungary, compulsory schooling was introduced in 1777 with the "Ratio Educationis". The 1869 Reichsvolksschulgesetz (the upper bound) applied to all the countries of the Empire. |
| | **Hungary** | 1777 | 1777 | 1869 | | Ratio Educationis | |
| **Britain** | **England** | 1880 | 1880 | 1880 | Soysal and Strang (1989), Flora et al. (1983), Ritter (1986), Salimova and Dodde (eds.) (2000), Anderson (1995) | Elementary Education Act 1870 | Compulsory education of eight years was introduced with exceptions in England and Wales in 1880 (Flora et al. (1983), p.623). School became compulsory in 1881 and free in 1891. However, the legislation was not implemented in the same way in every community. That is, some communities continued to depend on voluntary schooling or under the control of religious groups (Salimova and Dodde (eds.) (2000), p.108). In Scotland, compulsory schooling was already introduced in 1872 (lower bound) with the "Education (Scotland) Act". |
| | **Scotland** | 1872 | 1872 | 1872 | | Education (Scotland) Act | |
| | **Wales** | 1880 | 1880 | 1880 | | Elementary Education Act 1870 | |
| **Germany*** | **Prussia** | 1717 | 1717 | 1763 | Ramirez and Boli (1987), Stolze (1911), Salimova and Dodde (eds.) (2000), Flora et al. (1983), Oelkers (2009) | Schuledikt (Schools Edict, September 28, 1717) | The first German state to introduce compulsory schooling was Palatinate-Zweibrücken in 1592. In Prussia, compulsory schooling was introduced by Frederick William in 1717, and reiterated by Frederick II in 1763. The general law of the land (Allgemeines Landrecht) of 1794 makes instruction - as opposed to attendance - mandatory, a fact that had consequences for school attendance and organization. In this system the state only regulates the minimum for those parents who cannot provide for their children's attendance. [...] Elementarschulen became unavoidable but actually only for the poorer classes of the population, who could not afford a better form of education (Salimova and Dodde (eds.) (2000), pp.179-180). Upon unification of the German Empire in 1871, compulsory schooling (which existed in Prussia) was extended to all states. Eight years of compulsory education were introduced in the German Empire with the exception of Wurtemberg and Bavaria where only seven years were introduced (Flora et al. (1983), p.584). Most states already had compulsory schooling before 1871 (detailed information on all states was not available) |
| | **Palatinate-Zweibrücken** | 1592 | 1592 | 1592 | | | |
| | **German Empire** | 1871 | 1871 | 1871 | | | |
| **Italy** | **Kingdom of Sardinia** | 1859 | 1859 | 1859 | Cubberley (1920), Schneider (1982), Ramirez and Boli (1987) | Legge Casati | In the Kingdom of Sardinia, compulsory education was introduced in 1859 (2 years in all communes, 4 years in communes over 4,000 population) (Flora et al. (1983), p.598). Upon unification, compulsory school attendance was extended to all Italian provinces. This process was completed in 1877. The education system was quite effective in some of the Northern regions by 1880 and in Southern regions by 1900 (Ramirez and Boli 1987, p.7) |
| | **Kingdom of Italy** | 1877 | 1877 | 1877 | | Legge Coppino | |

**Notes:** ** The data for Germany is not exhaustive as we were unable to locate information for all regions. Only Prussia (the largest state) and Palatinate-Zweibrücken (the earliest state to enact compulsory schooling) are included here.

# Table A3: Compulsory Schooling Laws and European Enrolment Rates

| Country Sample: | Adopted CSL pre-1850 | Adopted CSL post-1850 | All Countries | | | |
|---|---|---|---|---|---|---|
| **Enrolment Rate Reported:** | **Enrolment in 1850 and Earlier** | | **30 years pre-CSL adoption** | **30 years post-CSL adoption** | **Countries** | **Years** |
| **Data Source and Definiton of Enrolment** | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** |
| **Flora et al. [1983]: Primary enrolment rate, 5-14 year** | | | | | | |
| | 62.1$^{\overline{\top}}$ | 53.1$^{\overline{\top}}$ | 59.9 | 74.3 | Austria, Belgium, Denmark, England and Wales, Finland, France, Germany, Ireland, Italy, Netherlands, Norway, Prussia, Scotland, Sweden, Switzerland | 1840-1940 |
| **Mitchell [2007]: Primary enrolment rate, 5-14 year** | | | | | | |
| | n.a. | 53.1$^{\overline{\top}}$ | 58.2 | 70.5 | Austria, Belgium, Denmark, England and Wales, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Poland, Scotland, Spain, Sweden, Switzerland | 1846-1941 |
| **Lindert [2004]: Primary enrolment rate, 5-14 year olds** | | | | | | |
| Public+private | 37.8$^{\overline{\top}}$ | 40.4 | 56.5 | 70.7 | Austria, Belgium, England and Wales, Finland, France, Ireland, Italy, Netherlands, Norway, Scotland | |
| Public | 51.2 | 43.9 | 52.8 | 68.8 | Austria, Belgium, Canada, Finland, France, Germany, Ireland, Italy, Netherlands, Norway, Portugal, Scotland, Sweden, Switzerland | 1830-1932 |
| Not specified | n.a. | n.a. | 35.2 | 53.3 | Denmark, Greece, Japan, Russia, Spain | |
| **Banks and Wilson [2012], CNTS: Number of 5-14** | | | | | | |
| Primary | 14.9 | 2.20 | 8.17 | 11.3 | Albania, Austria (Austria-Hungary until 1913), Belgium, Canada, Denmark, Finland, France, Germany (Prussia until 1866), Greece, Ireland, Italy, Japan, Luxembourg, Netherlands, Norway, Poland, Portugal, USSR (Russia until 1913), Spain, Sweden, Switzerland, United Kingdom. | 1815-1939 |
| Secondary | 0.18 | 0.05 | 0.49 | 0.73 | | |
| Primary + secondary | 14.9 | 2.24 | 8.92 | 12.1 | | |
| **Benavot and Riddle [1988]: Primary enrolment rate, 5-14 year olds, by decade** | | | | | | |
| | n.a. | n.a. | 44.5 | 57.8 | Austria, Belgium, Canada, Denmark, England and Wales, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, Russia, Scotland, Spain, Sweden, Switzerland | 1870-1940 |

**Notes:** $\overline{\top}$ indicates those statistics that are calculated from two or fewer country-year observations. No statistics can be calculated in Columns 1 and 2 from the Benavot and Riddle [1988] data as that starts in 1870. The data from Lindert [2004] (lindert.econ.ucdavis.edu), is based on Flora et al. [1983] and Mitchell [2007]. He discusses problems with these data and provides alternative estimates based on educational censuses, inspections data and school attendance rates. The exact measure of enrolment in Lindert's data differs between countries: for some, he provides public plus private enrollments, for others, only public enrollments; and for others, the exact measure is unspecified. Comparisons are made between countries for which a common measure is available. Our dataset compiled from Lindert's contains 250 observations from 20 countries. Out of these, 84 from 10 countries are used in the public plus private comparison, 111 from 14 countries in the public comparison, and 30 from 5 countries in the not specified comparison. Mitchell [2007] compiles data from official publications of European governments. He provides yearly data on the number of pupils in primary and secondary school and the size of certain age groups in the population. Age groups provided are not uniform across countries, and population data only exists for few years (while enrollment numbers are very complete). The data exhibits a number of breaks, at which enrollment "jumps" due to changes in measurement or the school system. Our dataset compiled from Mitchell contains 1274 observations from 19 countries (20 after the partition of Ireland in 1921). Of these, 98 from 17 countries can be used in comparisons as data on the age group 5-14 in the population is available. The data from Banks and Wilson [2012] is available on the CNTS website (http://www.databanksinternational.com/71.html). They adopt the UNESCO definitions of primary and secondary schooling: "First level: Education whose main function is to provide basic instruction in the tools of learning (e.g., at elementary school, primary school). Its length may vary from 4 to 9 years, depending on the organization of the school system in each country; Secondary level: Education based upon at least four years of previous instruction at the first level, and providing general or specialized instruction, or both (e.g., at middle school, secondary school, high school…)". They aim to omit "data on preprimary, vocational or technical, part-time, and adult education students". Their main data sources are The Statesman's Yearbook and Zapf and Flora [1973]. They also use a number of official national government sources and own estimates. Enrolment rates are measured in terms of the entire population. Our dataset compiled from CNTS et al. contains 2061 observations from 22 countries. Of these, 1522 are used in the primary, 1456 in the secondary, and 1455 in the primary plus secondary comparison test. Flora et al. [1983] use data from the Western European Data Archive, which contains yearly data on primary and secondary school enrollment. For primary school enrollment, data on the total number of pupils and on their percentage in the 5-14 age group is provided, both for public plus private enrollment and for public enrollment only. For secondary school enrollment, the data is more complex, reflecting the diversity of schooling systems across countries. Variables comprise total enrollments in post-primary schools, lower-secondary schools, general higher secondary schools (public plus private and public only), all higher secondary schools. For some of these school categories, enrollment is also provided as a percentage of a certain age group. However, the age group over which it is measured is not consistent across countries. Our dataset compiled from Flora et al. contains 295 observations, of which 135 contained all the information necessary. Benavot and Riddle [1988] provide primary enrollment rates for age groups 5-14. The data is per decade and spans from 1870 to 1940. It is compiled from several sources, the main source for Western Europe being Flora et al. [1983]. Our initial dataset compiled from Benavot and Riddle contains 176 observations from 21 countries. In the comparison table, 154 observations are used and no country has to be dropped entirely.

## Table A4: Baseline Specification, Enrolment and Illiteracy Coefficients Shown

**Non parametric Cox proportional hazard model estimates, hazard rates reported**
**Robust standard errors; All covariates measured in effect sizes**

| | Full Specification |
|---|---|
| **Share of the State Population that is:** | |
| **From European Countries that did NOT have CSL in 1850** | 2.15*** |
| | (.509) |
| **From European Countries that had CSL in 1850** | .780 |
| | (.161) |
| **Non-European Born** | 1.80*** |
| | (.409) |
| **Enrolment Rate of American-Borns** | 2.82** |
| | (1.39) |
| **Enrolment Rate of Europeans From Countries that did NOT have CSL in 1850** | .815* |
| | (.094) |
| **Enrolment Rate of Europeans From Countries that had CSL in 1850** | 1.03 |
| | (.153) |
| **Enrolment Rate of Migrants From Non-European Countries** | 1.18 |
| | (.235) |
| **Illiteracy Rate of Adult American-Borns** | .155** |
| | (.134) |
| **Illiteracy Rate of Adult Europeans From Countries that did NOT have CSL in 1850** | 1.12 |
| | (.197) |
| **Illiteracy Rate of Adult Europeans From Countries that had CSL in 1850** | .256*** |
| | (.088) |
| **Illiteracy Rate of Adult Migrants From Non-European Countries** | .753 |
| | (.186) |
| **Group Controls** | Yes |
| **State Controls** | Yes |
| **European Groups Equal [p-value]** | [.004] |
| **Euro Without CSL = Non-Euro [p-value]** | [.505] |
| **Observations (state-census year)** | 230 |

**Notes:** *** denotes significance at 1%, ** at 5%, and * at 10%. A non-parametric Cox proportional hazard model is estimated, where hazard rates are reported. Hence tests for significance relate to the null that the coefficient is equal to one. The unit of observation is the state-census year, for all census years from 1850. A state drops from the sample once compulsory schooling is passed. Robust standard errors are reported. The year of passage of compulsory school attendance laws is extracted from Landes and Solomon [1972]. All coefficients are defined in effect sizes, where this is calculated using census-years prior to the introduction of compulsory schooling law. The European countries defined to have had compulsory schooling laws in place in 1850 are Austria-Hungary, Denmark, Germany, Greece, Norway, Portugal and Sweden. We control for the following characteristics of each group (American born, non-European, European with and without compulsory schooling laws in 1850): the share aged 0-15, the enrolment rate of 8-14 year olds, the share of adults (aged 15 and over) that are illiterate, the labor force participation rate, and the share residing on a farm. We also control for the following state characteristics: the total population and the average occupational score of the population. At the foot of the Column we report the p-value on the null hypothesis that the hazard coefficients are the same for the two European groups, and the p-value that the hazard coefficients are the same for the non-European immigrant groups and European borns from countries that did not have compulsory schooling in place in 1850.

## Table A5: Robustness Checks

**Non parametric Cox proportional model, hazard rates reported**
**Robust standard errors; Populations shares measured in effect sizes**

| | (1) Rolling Window of Civic Values | (2) Americans | (3) Child Labor and Birth Registration Laws in Place | (4) Universal Suffrage and Women's Property Rights | (5) European Child Labor Laws |
|---|---|---|---|---|---|
| **Share of the State Population that is From:** | | | | | |
| **European Countries that did NOT have CSL introduced in** | 2.31* | | | | |
| **the past 30 years** | (.995) | | | | |
| **European Countries that had CSL introduced sometime in** | .628* | | | | |
| **the past 30 years** | (.170) | | | | |
| **American-Born, Second Generation** | | .777 | | | |
| | | (.213) | | | |
| **European Countries that did NOT have CSL in 1850** | | 1.62* | 2.22*** | 2.20*** | 2.58*** |
| | | (.447) | (.533) | (.528) | (.851) |
| **European Countries that had CSL in 1850** | | 1.07 | .836 | .819 | .856 |
| | | (.244) | (.195) | (.198) | (.161) |
| **Non-European Countries** | 1.08 | 1.56** | 1.77*** | 1.76*** | 1.85*** |
| | (.262) | (.304) | (.377) | (.386) | (.434) |
| **European Countries that had Child Labor Law in 1850** | | | | | .693 |
| | | | | | (.317) |
| **Child Labor Laws in Place** | | | 1.19 | 1.19 | |
| | | | (.366) | (.360) | |
| **Birth Registration Law in Place** | | | .707 | .716 | |
| | | | (.283) | (.293) | |
| **Universal Suffrage for Men and Women** | | | | .904 | |
| | | | | (.199) | |
| **Women Have Right to Property and their Own Earnings** | | | | 1.15 | |
| | | | | (.356) | |
| **Group and State Controls** | Yes | Yes | Yes | Yes | Yes |
| **European Groups Equal (with and without CSL) [p-value]** | [.049] | [.241] | [.005] | [.004] | [.004] |
| **Euro Without CSL = Non-Euro [p-value]** | [.218] | [.894] | [.386] | [.382] | [.316] |
| **Observations (state-census year)** | 230 | 230 | 230 | 230 | 230 |

**Notes:** *** denotes significance at 1%, ** at 5%, and * at 10%. A non-parametric Cox proportional hazard model is estimated, where hazard rates are reported. Hence tests for significance relate to the null that the coefficient is one. The unit of observation is the state-census year, for all census years from 1850. A state drops from the sample once compulsory schooling laws are passed. Robust standard errors are reported. The year of passage of compulsory school attendance laws is extracted from Landes and Solomon [1972]. In all Columns population share groupings are defined in effect sizes, where this is calculated using population shares in census-years prior to the introduction of compulsory schooling law. From Columns 3 onwards, the European countries defined to have had compulsory schooling laws in place in 1850 are Austria-Hungary, Denmark, Germany, Greece, Norway, Portugal and Sweden. In all Columns we control for the following characteristics of each group (American born, non-European, European with and without compulsory schooling laws in 1850, as well as the one additional group defined in each column): the share aged 0-15, the share of adults (aged 15 and over) that are illiterate, the labor force participation rate, the enrolment rate of 8-14 year olds and the share residing on a farm. In all Columns we control for the following state characteristics: the total population, and the average occupational score of the population. In Column 2 we split the American-born population into those with and without foreign-born parents. In Column 3, the child labor laws are derived from Moehling [1999, Table 1], and the year of introduction of birth certificate as official proof of a child's age is extracted from Fagernäs [2014]. In Column 4 the coding for whether the US state has universal suffrage for men is derived from multiple sources, and the state coding for whether women have the right to property and their own earnings is extracted from Geddes *et al.* [2012]. In Column 5 the following European countries are defined to have child labor laws in place in 1850: Britain, France, Germany and Switzerland. At the foot of each Column we report the p-value on the null hypothesis that the hazard coefficients are the same for the two European groups, and the p-value that the hazard coefficients are the same for the non-European immigrant groups and European borns from countries that did not have CSL in place in 1850.

## Table A6: Alternative Estimation Methods and Alternative Coding of Compulsory Schooling Law in Europe

**Robust standard errors; Populations shares measured in effect sizes**

| Estimation Method: | Parametric: Log Logistic | | OLS | Non Parametric: Cox Proportional | |
|---|---|---|---|---|---|
| Coefficients Reported: | Time Ratio | | LPM | Hazard Rate | |
| | (1) Log Logistic Time Ratio | (2) Log Logistic Time Ratio and Frailty Parameter | (3) OLS | (4) Lower Bound Definition of CSL | (5) Upper Bound Definition of CSL |
| **Share of the State Population that is From:** | | | | | |
| **European Countries that did NOT have CSL in 1850** | .940*** | .944** | .019 | 1.59** | 1.20 |
| | (.020) | (.021) | (.036) | (.343) | (.257) |
| **European Countries that had CSL in 1850** | 1.02 | 1.01 | .017 | .821 | .759*** |
| | (.026) | (.015) | (.042) | (.151) | (.076) |
| **Non-European Born Country** | .953*** | .970* | .050* | 2.08*** | 1.73** |
| | (.017) | (.016) | (.030) | (.478) | (.433) |
| **State and Group Controls** | Yes | Yes | Yes + State and Year FE | Yes | Yes |
| **European Groups Equal [p-value]** | [.012] | [.006] | [.967] | [.004] | [.005] |
| **Euro Without CSL = Non-Euro [p-value]** | [.520] | [.078] | [.543] | [.332] | [.251] |
| **Gamma Parameter** | .025*** | .016*** | | | |
| | (.004) | (.005) | | | |
| **Theta Parameter** | | .324 | | | |
| | | (.270) | | | |
| **Observations (state-census year)** | 230 | 230 | 371 | 230 | 230 |

**Notes:** *** denotes significance at 1%, ** at 5%, and * at 10%. In Columns 1 to 5 a non-parametric Cox proportional hazard model is estimated, where hazard rates are reported. robust standard errors are reported. In Columns 1 and 2 a parametric hazard model is estimated, where the baseline hazard is assumed to follow a log logistic distribution: the time to failure is then reported, and in Column 2 we also allow for a frailty parameter to be estimated. At the foot of Columns 1 and 2 the relevant parameters from the parametric hazard and frailty parameters are reported. In all Columns except 3 tests for coefficient significance relate to the null that the coefficient is one. The unit of observation is the state-census year, for all census years from 1850. A state drops from the sample once compulsory schooling laws are passed. In Column 3 an OLS panel data model is estimated (controlling for state and year fixed effects) where the dependent variable is equal to one if compulsory schooling laws are in place. The year of passage of compulsory school attendance laws is extracted from Landes and Solomon [1972]. In all Columns population share groupings are defined in effect sizes, where this is calculated using population shares in census-years prior to the introduction of compulsory schooling law. The European countries defined to have had compulsory schooling laws in place in 1850 are Austria-Hungary, Denmark, Germany, Greece, Norway, Portugal and Sweden. In all Columns we control for the following characteristics of each group (American born, non-European, European with and without compulsory schooling laws in 1850): the share aged 0-15, the share of adults (aged 15 and over) that are illiterate, the labor force participation rate, the enrolment rate of 8-14 year olds and the share residing on a farm. In all Columns we control for the following state characteristics: the total population, and the average occupational score of the population.

## Table A7: First Stage Estimates for 2SRI Instrumental Variables Method

### OLS and Nonparametric First Stage Estimates

### Standard errors clustered by state in Columns 1 to 3

| | Share of the State Population that is: | | | | | |
|---|---|---|---|---|---|---|
| | (1) From European Countries that did NOT have CSL in 1850 | (2) From European Countries that had CSL in 1850 | (3) Non-European Born | (4) From European Countries that did NOT have CSL in 1850 | (5) From European Countries that had CSL in 1850 | (6) Non-European Born |
| **Bartik-Card Instrument** | .807*** | .898*** | .687*** | .484*** | .708*** | .564*** |
| | (.050) | (.072) | (.151) | (.057) | (.078) | (.160) |
| **Group Controls** | No | No | No | Yes | Yes | Yes |
| **State Controls** | No | No | No | Yes | Yes | Yes |
| **Observations (state-census year)** | 180 | 180 | 180 | 180 | 180 | 180 |

**Notes:** *** denotes significance at 1%, ** at 5%, and * at 10%. In Columns 1 to 3 an OLS regression model is used. In Columns 3 to 6 a local linear regression is estimated with Epanechnikov Kernel weights and (constant) optimal cross-validated bandwidth selection based on the leave-one-out Kernel. The outcome variable is the share of state s's population from each migrant group (measured as an effect size). The unit of observation is the state-census year, for all census years from 1860 (the first census year in 1850 is dropped because the Bartik-Card Instrument cannot be constructed for that first period). Standard errors are clustered by state in the OLS specifications in Columns 1 to 3. The European countries defined to have had compulsory schooling laws in place in 1850 are Austria-Hungary, Denmark, Germany, Greece, Norway, Portugal and Sweden. In Column 4 onwards we control for the following characteristics of each group (American born, non-European, European with and without compulsory schooling laws in 1850): the share aged 0-15, the share of adults (aged 15 and over) that are illiterate, the enrolment rate of 8-14 year olds, the labor force participation rate, and the share residing on a farm. We also control for the following state characteristics: the total population and the average occupational score of the population.

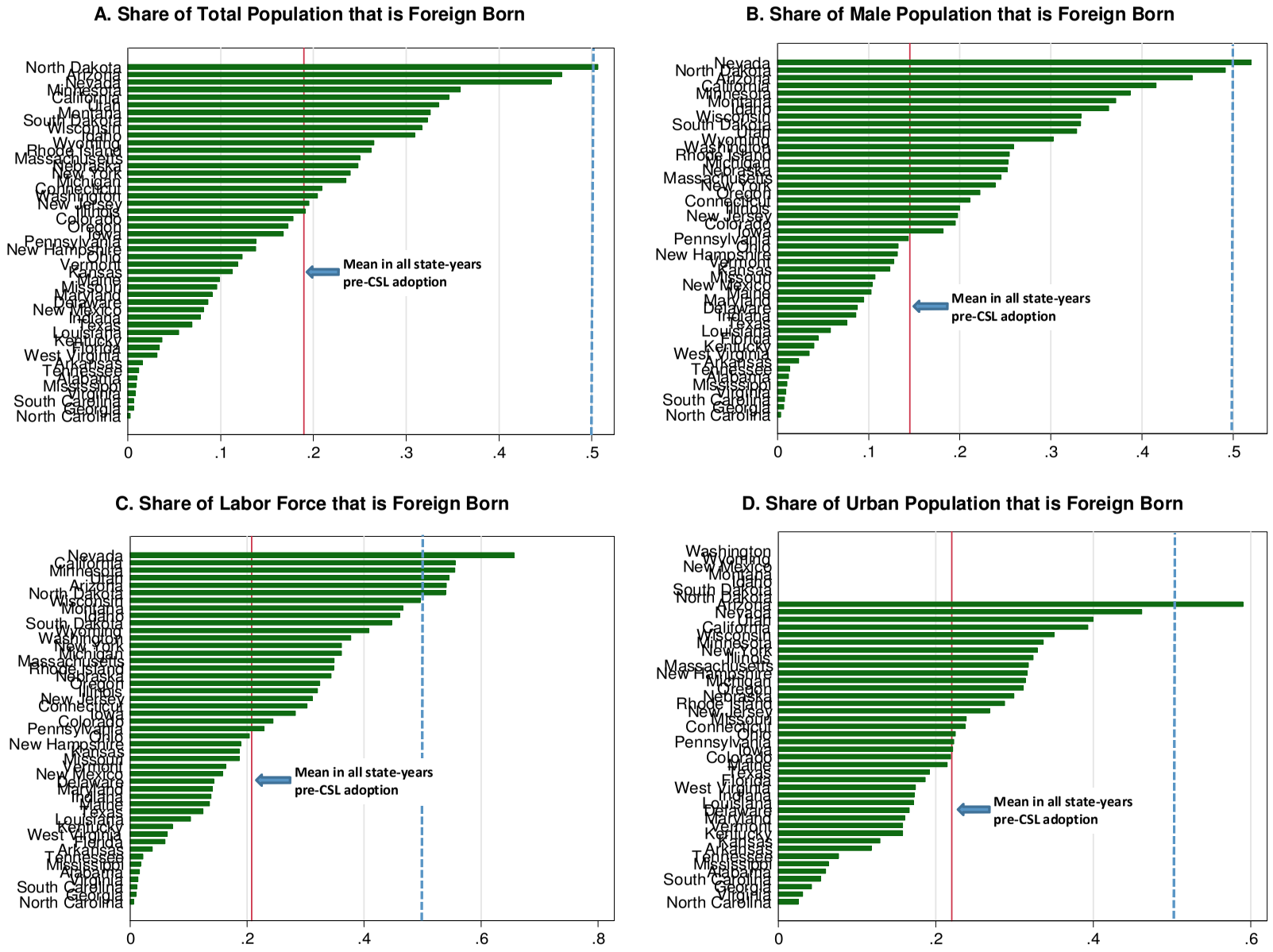
## Table A8: Population and the Passage of Compulsory Schooling Laws by US State

**OLS estimates, standard errors clustered by region**

| | Log (State Population) | | | Foreign Born Population | | | |
|---|---|---|---|---|---|---|---|
| | (1) Unconditional | (2) Fixed Effects | (3) Mean Reversion | (4) Foreign Born Population | (5) European Born from Countries that had CSL in 1850 | (6) European Born from Countries that did NOT have CSL in 1850 | (7) Ratio of Europeans from Countries without CSL in 1850 to Those that had CSL in 1850 |
| **A. Mean Reversion Model** | | | | | | | |
| **CSL Passed [yes=1]** | 1.04*** | -.112* | -.074 | .113 | .098 | .063 | -2.96 |
| | (.174) | (.056) | (.062) | (.078) | (.106) | (.103) | (2.43) |
| **State Fixed Effects** | No | Yes | Yes | Yes | Yes | Yes | Yes |
| **Year Fixed Effects** | No | Yes | Yes | Yes | Yes | Yes | Yes |
| **Census Year x 1850 Population Interactions** | No | No | Yes | Yes | Yes | Yes | Yes |
| **Census Year x 1850 Occ Score Interactions** | No | No | No | No | No | No | No |
| **Observations (state-census year)** | 288 | 288 | 288 | 288 | 286 | 288 | 286 |
| **B. Trend Break Model** | | | | | | | |
| **Post CSL Passage Trend Break** | -.003 | -.013* | - | -.001 | .008 | .001 | -.251 |
| | (.009) | (.016) | - | (.005) | (.005) | (.004) | (.216) |
| **1850-1930 Trend** | .025*** | .030*** | - | .020*** | .017*** | .018*** | -.032 |
| | (.004) | (.004) | - | (.005) | (.003) | (.003) | (.040) |
| **State Fixed Effects** | No | Yes | - | Yes | Yes | Yes | Yes |
| **Observations (state-census year)** | 288 | 288 | - | 288 | 286 | 288 | 286 |

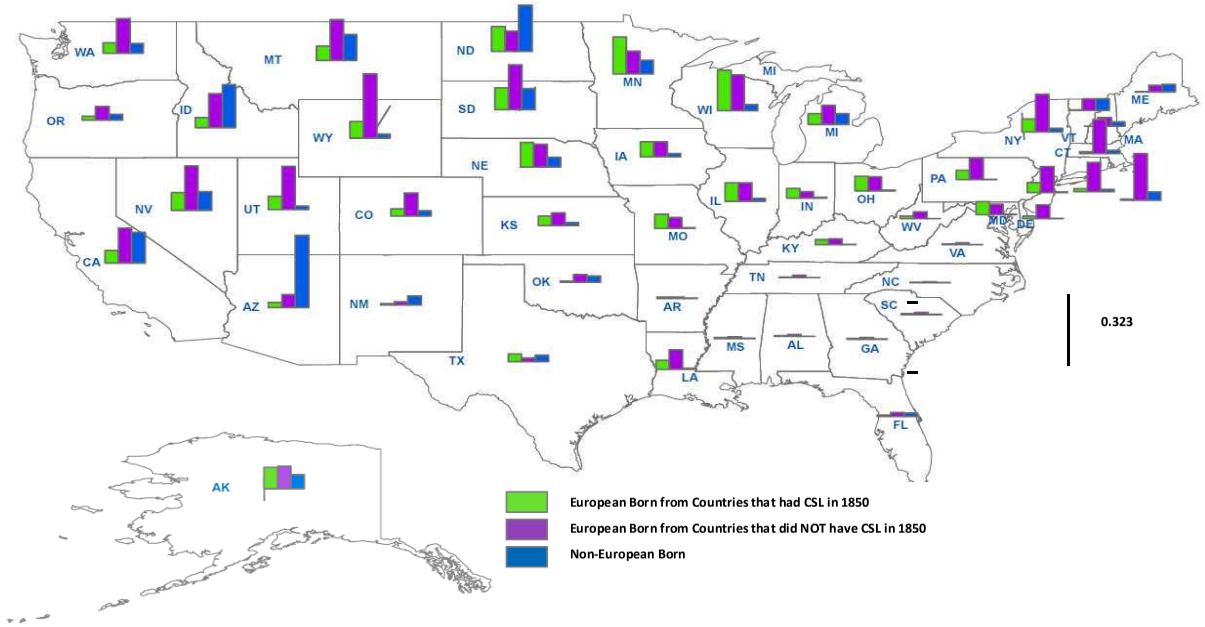
**Notes:** *** denotes significance at 1%, ** at 5%, and * at 10%. The unit of observation is a state-census year from 1850 to 1930. The dependent variable varies across columns: in Columns 1 to 3 it is the log of the total state population, and in Columns 4 to 7 it relates to various migrant populations. All variables are derived from the IPUMS-USA census samples. OLS regression estimates are shown with standard errors clustered by census region. In Panel A, a mean reversion model is estimated (allowing for state and year effects, as well as a linear time effect of the outcome in 1850) and in Panel B a trend break model is estimated (including state fixed effects and a linear time trend). The European countries defined to have had compulsory schooling laws in place in 1850 are Austria-Hungary, Denmark, Germany, Greece, Norway, Portugal and Sweden.

# Figure A1: Foreign Population by US State, 1880



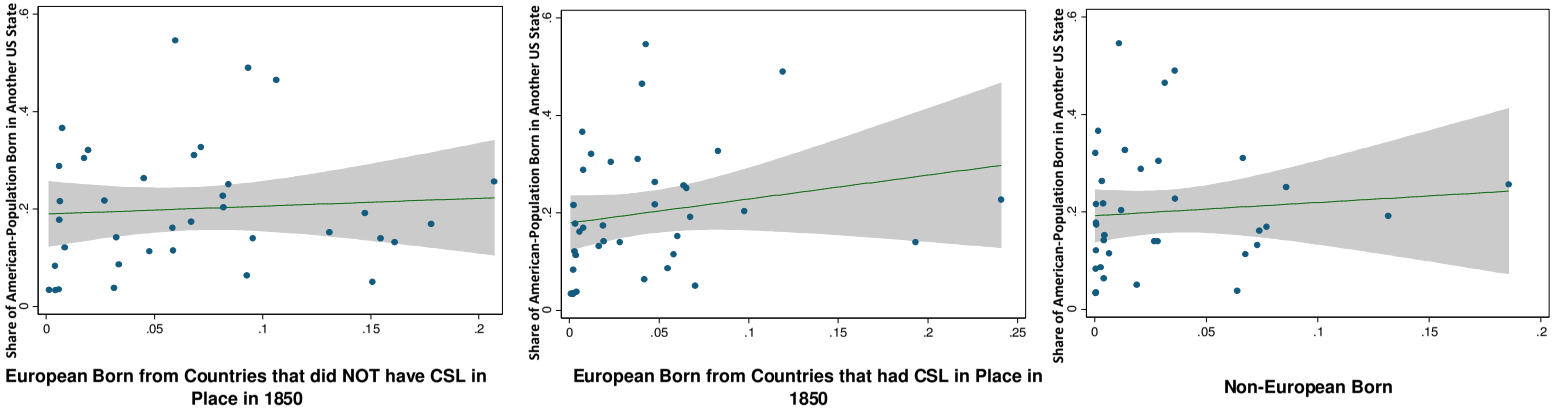

**Notes:** All variables are derived from the 100% IPUMS-USA 1880 census sample. In Figure D, there are some states in which none of the foreign-born population resides in urban areas. The solid line shows the mean of each variable in all state-census years prior to the adoption of compulsory schooling laws. The dashed line shows the .5 population share.

## Figure A2: Migrant Groups Population Shares, Averaged Across pre-Compulsory Schooling Census Years




**Notes:** The bars represents the mean population share of immigrants by group for each US state prior to the passage of compulsory schooling laws in the state. The year of passage of compulsory school attendance laws are extracted from Landes and Solomon [1972]. The European countries defined to have had compulsory schooling laws in place in 1850 are Austria-Hungary, Denmark, Germany, Greece, Norway, Portugal and Sweden.

## Figure A3: Internal Migration by American-Borns and Migrant Groups




**Notes:** Each graph shows a scatter plot, by state, of the population share of various migrant groups against the share of American-borns resident in the state that were born outside of the state (and in another US state). The data on American-born internal migration is obtained from the 1880 census. On each scatter plot we superimpose the line of best fit and a confidence interval of the prediction.

## Figure A4: Foreign Population by US County, 1880