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2016

*Document Version:*

Publisher's PDF, also known as Version of record

[Link to publication](#)

*Citation for published version (APA):*

Andersson, J., & Berger, T. (2016). *Elites and the Expansion of Education in 19th-century Sweden*. (Lund Papers in Economic History: Education and the Labour Market; No. 149). Department of Economic History, Lund University.

*Total number of authors:*

2

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# Lund Papers in Economic History



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No. 149, 2016

*Education and the Labour Market*

## Elites and the Expansion of Education in 19th-century Sweden

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**Lund Papers in Economic History**  
ISRN LUSADG-SAEH-P--16/149--SE+32

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# Elites and the Expansion of Education in 19th-century Sweden<sup>1</sup>

*Jens Andersson      Thor Berger*

## Abstract

Did economic and political inequality hamper the spread of mass schooling in the 19<sup>th</sup> century? This paper analyzes the link between investments in primary schooling and the spread of voting rights in 19<sup>th</sup>-century Sweden using newly collected data on educational expenditure and the distribution of voting rights in local governments. We find that municipalities governed by local elites spent substantially more on primary schooling relative to those that were more egalitarian. This empirical result is robust to using matching estimators, comparing municipalities located within the same county or district, and using differences in agricultural suitability as an instrument for the presence of local landed elites. Broadly, these findings suggest that elites were historically not always a barrier to the diffusion of elementary education and further our understanding of how Sweden managed to maintain a high level of human capital despite its low level of economic development and restricted franchise in the 19<sup>th</sup> century.

**Keywords:** Democratization; elites; human capital development

**JEL:** I21, I24, N33

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*”En fattig sate får viska när den rike talar  
med tordönets avgörande stämman.”<sup>2</sup>*

## 1. Introduction

Universal public schooling spread unevenly throughout the world in the 19<sup>th</sup> century in a process that was deeply intertwined with the onset of modern economic growth (Easterlin, 1981). A central explanation for the uneven diffusion of mass schooling is that an unequal distribution of economic and political power enabled elites to block the introduction of public and tax-based schooling as long as the franchise was limited (Engerman et al., 1997; Engerman and Sokoloff, 2002; Galor and Moav, 2004; Acemoglu and Robinson, 2005; Galor et al., 2009; Gallego, 2010). However, the advent of universal schooling clearly preceded that of a widely spread franchise in many countries, which has led others to emphasize the role of powerful elites in promoting investments in schooling to consolidate national identity, entrench the power of autocratic rulers, or to instill “factory discipline” in the swelling working classes (Weber, 1979; Ramirez and Boli, 1987; Lott, 1999; Aghion et al., 2015). Ultimately, whether elites served to advance or obstruct the spread of mass schooling is an empirical question, to which the answer likely depends on whether elites perceived an educated population as an economic opportunity or political threat (Kaestle, 1976, 1983; Lindert, 2004).

Our contribution to this debate is to analyze how the distribution of political power in Swedish municipal governments shaped spending patterns on primary schooling (*folkskola*) prior to the industrial breakthrough in the 1870s. Swedish municipalities lend themselves to study this question for a variety of reasons. Although Sweden was an economically backward country, it exhibited a level of human capital and schooling wildly out of proportion to its level of economic development that led Sandberg (1979) to term it Europe’s “impoverished sophisticate”. As a highly homogenous country in ethnic, linguistic, and religious terms it further provides a useful historical setting to isolate the role of political power in accounting for investments in schooling, since divisions along these lines is unlikely to influence the provision of public goods such as education (Alesina et al., 1999). Moreover, while state support for primary schooling was introduced after the Elementary School Act of 1842, decisions over school financing remained a local affair thus making the distribution of political power in local governments a potentially important determinant of the spread of schooling. Voting rights were awarded based on income and property requirements, which meant that an unequal distribution of income and landed wealth directly shaped the distribution of political power. As few as one in ten had the right to vote, while the vast majority of the rural masses lacked political voice. Votes were furthermore graded in proportion to income and wealth, which often gave local elites a *de jure* control of decision-making processes. Squaring the unequal distribution of political power with Sweden’s early and extensive commitment to elementary education raises the important question: how did mass schooling spread despite a political system that was clearly designed to enable local elites to capture local governments and thus block the provision of public schooling?

[FIGURE 1 HERE]

Our quantitative analysis uses newly collected data for 1,150 rural municipalities and exploits the variation in elite control and the spread of voting rights across local governments to analyze its relationship with school spending in the early 1870s. As the data is cross-sectional in nature it thus reflects long-run differences in the commitment to elementary education prior to Sweden’s industrial breakthrough. Figure 1 illustrates our key result showing that expenditure on primary schooling was substantially higher in municipalities where political power was concentrated in the hands of a small elite.<sup>3</sup> Although these results are suggestive of different spending patterns in elite and non-elite

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2 Cited from Möller (2010, p. 35). (Our translation: “The poor man whispers, while the rich man decides”.)

3 As we describe in more detail below, elite municipalities are defined as those where a single voter controls at least 10 percent of the total votes—the level at which individual voters are considered to gain significant sway over local political affairs (Mellquist, 1974). A Kolmogorov-Smirnov test of the equality of the distributions lends further support to the

municipalities, an obvious concern is that municipalities that were governed by elites also differed in other dimensions such as income, land values, or population, which may suggest that these observed differences reflect omitted factors. A positive link between elite control and school spending persists, however, when controlling for a range of alternative demand and supply factors that may affect investments in schooling, using matching and fixed effects estimators, and when using alternative definitions of educational expenditure as well as elites. Furthermore, using geographical variation in agricultural suitability as an instrument for the presence of local elites in the spirit of Engerman and Sokoloff (2012) we find further support for the idea that political inequality fostered investments in schooling.

Our analysis also shows that a more widely spread political voice was seemingly ineffective in raising educational expenditure: where a larger share of the population had voting rights, spending was typically lower than in areas with a more restricted franchise, which is seemingly inconsistent with the voluminous literature that has emphasized the role of the franchise in accounting for the spread of mass schooling. Moreover, the positive influence of elites on schooling was much weaker in municipalities where a larger share of the population was enfranchised, suggesting that elites and voters had different preferences regarding the appropriate level of expenditure on elementary education and that educational expenditure consequently decreased where elites were challenged by large groups of voters. Together, these results assign a critical role to local elites in accounting for the expansion of elementary education in Sweden prior to the industrial breakthrough and more broadly suggest that elites did not always constitute a barrier to the spread of schooling for the masses.

The rest of the paper unfolds as follows. In the next section, we discuss the related literature that examines the spread of mass schooling in the 19<sup>th</sup> century. In section three we provide an overview of the rise of Swedish primary schooling and describe the institutional structure that governed its provision. Section four then turns to exploring the local determinants of schooling investments and provides the main empirical analysis. In section five, we conclude by discussing our results and potential interpretations of the role of elites in accounting for the spread of mass schooling.

## 2. Explaining the rise of mass schooling: related literature

Why did some countries begin to provide public and tax-based schooling for their populations in the 19<sup>th</sup> century, while others did not see anything resembling universal schooling by the outbreak of World War I? To account for the uneven spread of schooling, Lindert (2004) advocates a bottom-up perspective and contends that three factors allowed countries to develop mass schooling: (i) decentralized control over taxes and schooling, which permitted regions that demanded education to forge ahead unfettered from conflicts between national elites; (ii) widely spread voting rights, which allowed local demand for schooling to be met with investments; and (iii) affordable ways to provide schooling, which particularly required the availability of teachers at modest wages. Indeed, Go and Lindert (2010) show that the autonomy of local governments, the diffusion of voting rights, and greater affordability can explain why the Northern United States surpassed earlier educational leaders such as Prussia and led the world in terms of schooling by the mid-19<sup>th</sup> century.<sup>4</sup>

A decentralized system of provision, however, also potentially enabled local elites to capture local governments in areas where political voice was more limited. Broadly, how elites may affect schooling investments can be organized into two competing hypotheses (Lindert, 2004, pp.100-101). First, elites

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interpretation that the distribution of spending differed, suggesting that we can reject the null of equal distributions at the 1-percent level.

4 Other studies of local schooling in the 19<sup>th</sup>- and 20<sup>th</sup>-century United States have broadly lent support to their emphasis on political voice, by documenting a negative relationship between the presence of landed elites and local investments in schools. In particular, Galor et al. (2009) show that the presence of a landowning elite slowed down the expansion of education during the United States' high school movement, Ramcharan (2010) documents the negative impact of land inequality on redistributive spending on schooling between 1890 and 1930, while Vollrath (2013) confirms a negative relationship between land inequality and schooling investments in 1890.



may realize that educating the masses may make it harder to control the rural populace, raise the demand for political voice, and put financial pressure on elites to fund schools. Secondly, elites may identify the important external benefits of elementary education thus promoting its spread in order to maintain social order or to realize the economic returns of an educated workforce. Elites may thus either perceive an educated populace as an economic opportunity or as a political threat and would thus act accordingly to either support or oppose investments in mass schooling. An important lesson coming out of the voluminous literature on this subject, however, is that elites' perception of the potential benefits of an educated population varied with the historical and institutional context (Kaestle, 1976, 1983).

Nevertheless, a recent body of work documents a negative association between economic or political inequality and schooling outcomes, seemingly lending support to the first hypothesis. Cinnirella and Hornung (2016), for example, document a fading negative relationship between land inequality and enrollment rates over the 19<sup>th</sup> century in Prussia, though they do not find any link between the presence of landed elites and the supply of schools or teachers. Beltran Tapia and Martínez-Galarraga (2015) similarly find that literacy rates were lower in mid-19<sup>th</sup> century Spain in areas where access to land was more unequal. Go and Park (2012) argue that local elites in colonial Korea resisted funding elementary education for the masses and Goñi (2016) documents how the concentration of land in the hands of a small group of peers hampered the provision of schooling in the United Kingdom after the passage of *Forster's Education Act* in 1870.<sup>5</sup> All these contributions are firmly rooted in the argument that landed elites used their political influence to block the spread of mass schooling due to a low complementarity between agricultural work and education, or as a way to reduce the mobility of the rural labor force by limiting their outside options (Galor et al., 2009).<sup>6</sup>

A more equal distribution of political power did not, however, necessarily promote investments in mass schooling. Cvrcek and Zajicek (2013), for example, point out that the expansion of political voice may have ambiguous effects on investments in education, as elites did not always oppose universal education. Drawing on evidence from the Habsburg Empire, they show that the spread of schooling rather was driven by local elites that subsidized schooling where it aligned with their ethnic preferences. Similarly, in a critique of Lindert's interpretation of the rise of primary schooling in the United States, Shammass (2015) argues that primary schooling expanded in areas where Whig sympathizers and moral reform partisans were dominant, which suggests that local elites motivated by the external benefits of schooling were more important than a widely spread franchise in accounting for the United States' lead in education. Elites were seemingly important in explaining investments in universal schooling also in less democratic countries. Elis (2011), for example, shows that the expansion of public primary schools in Argentina was driven by the oligarchy that targeted investments in poor and rural provinces, a process that curiously came to an end as the country transitioned into an electoral democracy in the early 20<sup>th</sup> century.<sup>7</sup> More broadly, Aghion et al. (2015) conclude based on 150 years of data on European countries that democracies tend to invest *less* in elementary education than autocracies, which suggests that elite support both at the national and local level may be a crucial

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5 Social structure does not, however, seem to explain the variation in literacy in rural England during the first half of the 19th century. Instead, cultural factors in the form of proximity to areas with well-developed education such as Scotland were seemingly more important (Clark and Gray, 2014).

6 As the franchise was commonly restricted by property requirements this literature is typically unable to separate the respective roles of economic and political inequality. However, Acemoglu et al. (2007) examines the differential roles of economic and political inequality drawing on historical evidence from the state of Cundinamarca, Colombia, emphasizing the role of the distribution of political rather than economic power in accounting for investments in schooling and differences in long-term development patterns.

7 Similarly, Palma and Reis (2012) provide evidence from Portugal that suggests that the pro-poor policies of the corporatist dictatorship of the Estado Novo led to lower illiteracy rates relative to the preceding democratic regime, while Gao (2015) documents the central role of the gentry, a small social elite group that comprised less than one percent of the population, in accounting for the expansion of primary education in China in the early 20th century.

component in explaining the spread of mass schooling thus lending broad support to the second hypothesis.<sup>8</sup>

Against that background, it is hard a priori to predict how elite control of governments may affect the provision of education, which ultimately remains an empirical question. In what follows, we outline the expansion of Swedish primary schooling up until the industrial breakthrough in the 1870s and then turn to a quantitative examination of the respective role of elites and the spread of the vote to account for the varying commitment to elementary education.

### 3. Historical background

#### 3.1 The rise of Swedish primary schooling: quantitative patterns

Primary schools emerged in Sweden in the late-16<sup>th</sup> century and by the end of the 17<sup>th</sup> century some 40-50 schools were in operation, financed by donations or church and state taxes (BiSOS P 1882, p. 2).<sup>9</sup> At the same time, home instruction was promoted by the Church Law of 1686, which required catechetical household examinations (Sjöberg, 1996, p. 6). As a result, the ability to read religious texts was widespread by the late-18<sup>th</sup> century, though not necessarily the ability to write and read unknown texts (Nilsson and Pettersson, 2008). Continuous discussions on how to improve education for the masses led to a first official commission for education being established in 1768 (Klose, 1992/2010, p. 57). Nevertheless, education was considered a parental and local responsibility and no system of state support was established until the mid-19<sup>th</sup> century. Meanwhile, an educational system continued to develop from below and by the late 1830s, half of all municipalities are reported to have had at least one school (Sjöberg, 1996, p.7).<sup>10</sup>

[FIGURE 2 HERE]

Public mass schooling (*folkskola*) was introduced in Sweden with the passing of the Elementary School Act in 1842. According to the Act, every parish should have at least one ambulatory or permanent school and minimum knowledge requirements related to arithmetic, reading, writing, and the Scripture were established (Sandberg, 1979). As the majority of the peasantry opposed the decision since they feared having to pay higher taxes to finance the reform (Nilsson and Pettersson 2008), the Act of 1842 came with a minimal financial envelope from the state. Consequently, school attendance was not made mandatory, no minimum requirement of attendance was stipulated, and different forms of schools such as ambulatory and part-time schools were allowed (Pettersson 1992, p. 312). It was up to the local school districts to fund their schools, which led to substantial regional differences in the commitment to primary schooling. The end result was that implementation of the reform was slow and that poor children were sent to school as little as possible, which was addressed through subsequent parliamentary decisions that added important elements to the initial reform. By the 1870s, the spread of schooling had reached near-universal levels: Figure 2 shows that enrollment rose steadily from below 40 percent in 1847 to near 90 percent in 1874. An important driving force for increases in enrollment was the development of the minor schools, while the use of fully-fledged fixed primary schools evolved relatively slowly.<sup>11</sup> Yet, low attendance rates and a short effective school year contributed to a

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8 Mulligan et al. (2004) further document in a contemporary cross-country setting that there is no statistically significant link between democracy and expenditure on public education.

9 A large body of work documents the rise of mass schooling in Sweden such as Aquilonius (1942), Sörensen (1942), Thunander (1946), Boli (1989, ch. 10), and Richardson (2010).

10 However, only one out of seven children is estimated to have attended a school in that year with substantial regional variations and the existing schools were moreover short of resources as facilities, teachers, teaching material, and money were commonly lacking (Aquilonius, 1942, p. 268; Schelin, 1978, p. 7).

11 Minor schools, which were based on only three years of schooling usually staffed by less educated female teachers, were introduced in 1858 as a response to demands for more flexible and less burdensome schooling (Nilsson and Pettersson, 2008, p. 222).

situation where the actual average schooling received by a pupil corresponded to a meager two years (Ljungberg and Nilsson 2009, p. 80).

[TABLE 1 HERE]

Table 1 documents the expansion of resources dedicated to primary education showing that half of the parishes are reported to lack schools prior to the Act of 1842. Thirty years later, the number of school buildings had quadrupled, while the number of teachers had increased by a factor seven. Teacher salaries were by far the highest cost item, even though the share decreased between 1868 and 1876. However, teachers seem to have been relatively affordable, which is consistent with contemporary teacher's accounts that are littered with complaints about low wages (Bengtsson, 2015): wages of primary school teachers in Stockholm relative to common laborers and textile workers, for example, hovered between 1.1-1.8 (see Figure A3), though these calculations are complicated by the extensive use of in kind payments.<sup>12</sup> Although international comparisons should be interpreted carefully, not least due to variation in teacher quality, the available evidence suggest that while Swedish primary school teachers were more expensive than their Northern American counterparts, they were relatively cheap in a European comparison.<sup>13</sup>

Primary schools were mainly financed by the local population through fees, donations, and local taxes, the latter being by far the most important source of revenue. At around 30 percent of total spending, expenditure on elementary education constituted the largest item in local government budgets.<sup>14</sup> State grants emerged slowly and covered around 30 percent of total costs from the 1860s and onwards (Westberg, 2011). In 1871, the state grant system was streamlined by merging various grants into a single budgetary item to be allocated proportional to the number of teachers employed in each school district (Wallin 1978, p. 382), which served to amplify rather than reduce regional differences thus making local decisions the key factor to explain the regional variation in educational expenditure.

### ***3.2 Educational expenditure, local political institutions, and the vote***

Schooling investments remained a local affair throughout the 19<sup>th</sup> century (Möller 2010, pp. 18-21). After the 1862 municipal reform, the municipal council (*kommunstämma*) was the highest decision-making body in the rural municipality. Somewhat oddly, the 1862 reform gave responsibility for primary education to the ecclesiastical municipalities, not the civil municipalities. Schooling investments were therefore governed by a parish council (*kyrkostämman*), with the same voting rights as the municipal council (SFS 1862:15). Parish councils were responsible for auditing school accounts, teachers and their wages, maintaining school buildings, and school fees with the council's decisions being implemented by the school board (*skolråd*). Yet, the board typically met less than twice a year and focused mainly on school buildings and maintenance, which indicates that the parish council was more important than the school board in deciding over local investments.

Local decision-making was traditionally based on majority voting and the one-man, one-vote principle for male land-owning individuals, yet graded voting where the number of votes were proportional to each voters' income or landownership gradually became the established way to distribute voting rights (Mellquist 1974, pp.17-21,36). After the 1862 municipal reforms, around 10 percent of the rural population were awarded voting rights according to the restrictive income and property requirements

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12 As stipulated by the Act of 1842, up to 68 percent of teachers' wages could be paid in kind and according to national statistics for the 1860s more than 40 percent of a teacher's wage could be constituted of firewood, fodder, and grains (Westlund, 2016).

13 For comparison, in the Northern United States relative wages for teachers to common laborers were about 0.9 in the early 1860s; data from 116 common boys' schools in 1830s Manchester and the Staffordshire and Warwickshire Charity Schools in the 1860s suggest a ratio of teachers' to industrial wages of 2.1; and Italian primary school teachers earned on average 1.8 times as much per year as a textile worker around 1870 (Go and Lindert, 2010, Table 2; Capelli, 2015, p.51).

14 Spending on ecclesiastical matters (28.6 percent) and poor relief (29.6) constituted the other two large spending categories in rural municipalities in the 1870s (BiSOS U, 1874, p.XIII).

outlined in Table A1 (BiSOS R 1871, pp. 7-8).<sup>15</sup> Yet, the graded voting system created a situation where a few individuals or corporations could often dominate local politics. In the early 1870s, for example, some 54 municipal councils were governed by a single voter that held more than half of all votes in the municipality thus allowing them to yield dictatorial powers (BiSOS R, 1871, p.x). In more than half of the municipalities, one individual voter controlled more than 10 percent of the total votes, which is considered to have given considerable influence on local affairs (Mellquist 1974, p. 127). However, the formal rules are only one side of the story as voter turnout in both national and local elections was low.<sup>16</sup>

A graded voting system seemingly enabled industrial and landowning elites to dominate local politics. From the surviving protocols from the municipal councils it is clear that titles such as ‘estate owner’ and ‘landlord’ became increasingly common among the participants (Andersson and Gunnarson, 2006, p.33), which is consistent with the observation that the “old patriarchal gentry [...] gradually were replaced by a new gentry of agrarian capitalists [who] employed new ways of conducting politics in the local community” (Malmström, 2006).<sup>17</sup> A study of six parishes in the Stockholm area, for example, indeed indicates that elites had the upper hand (Gustafsson, 1989, pp. 78-87), while elite influence is also evident in the four parishes examined by Sjöberg (1996, pp. 173-177) where the board members were almost exclusively land-owning and relatively well-educated men. More broadly, large landowners dominated politics in parishes where they were present, thanks to their heavy voting rights, while peasants managed local affairs in parishes dominated by smallholders.<sup>18</sup> Tiscornia (1992, p.182f) further underlines the fact that despite the reforms in 1862, the manorial estates continued to exert a disproportionate control of municipal governments throughout the 19<sup>th</sup> century due to the graded voting system. Tiscornia (1992, p.96ff) also emphasizes that while the manorial estates supported educational investments, municipalities where peasants were more prevalent often opposed an expansion of schooling suggesting that a more evenly spread political voice did not necessarily translate into higher investments in schooling.

A central purpose for elite involvement in schooling seems to have been related to humanism and social control motives. At the Svaneholm manor, for example, Rutger Macklean pioneered investments in the education of peasants and their children, motivated by enlightenment ideals (Sundberg, 2004, p.142). More broadly, Schön (2010, p.65) explains the expansion of primary schools by noting that “large landowners often took such initiatives in order to head off the peril that they perceived in the growth of the proletarianised rural lower class” that is consistent with the broader objective of using schooling as an instrument to “shape the minds of the masses” (Sandin, 1986). Although most votes accrued to land ownership, emerging industrial elites were seemingly also important in supporting the expansion of elementary education motivated by the willingness to maintain a good reputation in the local community, while they also viewed schooling as an instrument to control and discipline workers’ children (Michaëlsson, 2016).

Ultimately, how the distribution of political power in local governments shaped educational investments and whether the graded voting system that placed disproportionate power in the hands of a

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15 Only males aged above 21 were eligible to obtain voting rights, which means that calculated as a share of this group the level of enfranchisement was higher. In 1870, the number of Swedish males aged above 20 was 1.02 million out of a total population of 4.16 million (Statistiska Centralbyrån, 1969, Table 18), which implies that roughly 40 percent of the potentially eligible population had voting rights.

16 Möller (2010, p.34) reports a turnout of 10 percent in local elections at the end of the 19th century and around three percent in some municipalities in the 1860s. A low level of political participation is attributed to an “apolitical” culture, a lack of knowledge of political rights, and the disincentives for individuals with few votes to participate when other voters controlled hundreds or thousands of votes.

17 *Svensk Lokalhistorisk Databas* (<http://www.lokalhistoria.nu>) has digitized the protocols from the municipal and parish council meetings in the 19th century for all municipalities in six counties. Unfortunately, these protocols rarely provide insight into how decisions were taken or how individual council members influenced decision-making processes, though it is clear that issues relating to the financing and maintenance of primary schools were regularly debated.

18 Financing of the railroads was one issue where large corporations and landowners used their voting power to impose their will on the majority with fewer votes. Möller (1989), for example, highlights the role of the manorial estates in Scania regarding the expansion of the railroad network in the southernmost parts of the country.

small elite allowed them to block expenditure on education, or whether such a concentration of power allowed them to forge ahead remains an empirical question. To explore this question, we proceed in the next section to empirically examine the local determinants of school spending.

## 4. What determined investments in primary schooling?

### 4.1 Data on educational expenditure and voting rights

Our dataset consists of information on investments in primary schooling and the distribution of voting rights for 1,150 rural municipalities in 10 counties: Blekinge, Elfsborg, Göteborgs och Bohus, Halland, Jönköping, Kalmar, Kristianstad, Kronoberg, Malmöhus, and Östergötland (see Figure A1).<sup>19</sup> Importantly, while this area demonstrates substantial variation in terms of geography and level of development, it excludes areas of considerably different character such as the metropolitan Stockholm area and the sparsely populated north. We further restrict our sample to rural municipalities, since towns and townships had different characteristics in terms of administration, school spending, and voting patterns.

Our main measure of educational investments is drawn from the first available municipal financial reports that include information on local spending on public primary schooling in each municipality (BiSOS U, 1874). Spending on primary schooling consists of three main items: school buildings and inventory (24 per cent of total school expenditures at national level), teachers' wages (63 percent) and other expenditures (13 percent). We normalize spending on primary schooling by the number of taxpayers in each municipality, though we show in the Appendix that results are very similar when normalizing by population or using alternative outcomes such as teacher's wages.<sup>20</sup> Although spending has not been corrected for differences in cost of living, we show below that estimates that include county- and district fixed effects respectively yield similar results, which mitigates concerns that our results are driven by nominal differences in price levels across municipalities. Table 2 shows the significant variation in educational expenditure that exists across the municipalities in the sample; those at the 90<sup>th</sup> percentile of school spending, for example, spent more than eight times as much as the municipalities at the 10<sup>th</sup> percentile, while spending was substantially higher on average in elite municipalities (panel B).

[TABLE 2 HERE]

Voting rights are reported in BiSOS R (1871), from which we collect the number of inhabitants with voting rights in each municipality. Table 2 shows that about 10 percent of the population had voting rights in the average municipality, though the sample spans municipalities where less than one percent was allowed to vote to those where more than one in four had voting rights.<sup>21</sup> To measure the distribution of political power among vote holders, we use the fact that each municipality also reported the number of voters that held respectively 5-10, 10-25, and >25 percent of all votes.<sup>22</sup> To define local elites we identify municipalities in which individual voters held a disproportionate share of a municipality's total votes. More specifically, our main measure of a local elite is an indicator variable

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19 Our sample includes slightly more than half of all Swedish municipalities at the time. 115 municipalities are excluded from the sample because they share common school districts, which mean that we cannot identify the distribution of voting rights. One additional municipality is excluded because it implicitly reported negative spending on primary schooling due to the state grant being larger than total municipal spending on schooling.

20 A particularly relevant outcome would be school spending per child in school age, which would require information on the age distribution of the municipal population. Unfortunately, that kind of demographic data is not readily available.

21 To calculate educational expenditure per taxpayer and the share of the population with voting rights we use population data published in BiSOS R (1871) and BiSOS U (1874) respectively.

22 Unfortunately, the data does not distinguish between voters that obtained their voting rights due to income or ownership of land, thus making it impossible to separately identify capital owners, corporations, and land owners in the data. However, more than 68 percent of the votes were awarded due to landownership in the mid-1870s, which suggest that landowners were the most important group of voters.

taking the value 1 if at least one voter controlled more than 10 percent of the total votes in the local government, the level at which Mellquist (1974, p. 127) argues that a voter gained significant influence over local affairs. According to this definition, about half of the municipalities had an elite present (see Table 2). Although there are a number of alternative ways to measure the concentration of political power, we show in the Appendix that such measures yield similar results.

Our other covariates aim to control for alternative demand and supply factors that may influence investments in primary schooling. Voting rights were based on stipulated income or wealth requirements, which implies that income and landed wealth are two central supply-side variables to include as controls. For each municipality, we collect the taxable value of land (*taxeringsvärdet å fast egendom*) in *kronor* in 1873 and taxable income (*beskattningsbar inkomst*) corresponding to the sum of income from capital, employment, pensions, and business in *kronor* extracted from BiSOS U (1874).<sup>23</sup> Additional covariates are drawn from a variety of sources that are described in more detail when introduced in the analysis.

#### 4.2 Local determinants of investments in schooling

To examine the link between investments in primary schooling and the distribution of political power, we estimate OLS regressions where the outcome is *ln* local spending on primary schooling per taxpayer (*S*) in each municipality *m*:

$$S_m = \alpha + \delta E_m + \theta_1 V_m + \theta_2 V_m^2 + X_m \beta + \varepsilon_m \quad (1)$$

and *E* is an indicator variable taking the value 1 if a municipality is ruled by an elite and 0 otherwise, *V* is the percentage share of the population with voting rights, and *X* is a vector of controls. To account for the potentially non-linear relationship between school spending and voting rights, we also include the square of the share with voting rights.<sup>24</sup> As the share of the population that was entitled to vote is mechanically linked to the level and distribution of income and landed wealth, our baseline set of controls include both the tax value of income and land.<sup>25</sup> Moreover, we also control for the population density of each municipality, which is meant to account for economies of scale in schooling provision as educational investments involved large fixed costs in school buildings (see Table 1). Throughout the analysis, we conservatively cluster standard errors at the district level.

[TABLE 3 HERE]

Table 3, column 1 reports estimates showing that a municipality where a local elite was present spent on average 43 percent (0.36 log points) more on primary schooling per taxpayer relative to other municipalities, an estimate that is highly statistically significant. Estimates decline in magnitude when controlling for the tax value of income and land (column 3), which suggests that part of the raw difference in spending patterns between elite and non-elite municipalities reflect that the former are wealthier on average. Yet, there exist a positive and statistically significant effect of elite-control of local governments on educational expenditure when controlling for local economic factors, the spread of voting rights, and potential demand shifters such as the county-level employment in manufacturing (columns 2-5). A positive link between elite control and school spending thus lends support to the notion that local elites supported investments in education for the local population.

23 According to law, taxable value of land should be based on quality, output and price, but actual practice varied between administrative areas (Olsson 2005, p. 76). Again, the use of regional fixed effects largely mitigates concerns that our results are driven by differences in tax assessment across municipalities. Based on the registers of tax payers held at the Regional State Archives in Lund, typical examples of groups that paid income taxes include blacksmiths, carpenters, parish priests, school teachers, inspectors, gamekeepers and train station masters.

24 Including higher-order terms (e.g., a cubic or quartic) always yield statistically insignificant results for the additional terms and do not affect the results in a meaningful way. As shown in Figure 3, the relationship between school spending and the share with voting rights is approximately quadratic.

25 Assuming that wealth influences spending in a (log) linear way may be restrictive. Including up to a fourth-degree polynomial in the tax value of income and land respectively, however, does not influence our results in a meaningful way.

[FIGURE 3 HERE]

Did a more diffused political voice contribute to higher school spending? Figure 3 graphs the relationship between local school spending and the share of the population in each municipality with voting rights to examine whether the spread of the franchise was associated with higher educational expenditure. Evidently, spending decreased as the vote spread through the top decile of the population, whereas the spread into the lower ranks seemingly was not associated with any changes in educational expenditure. According to the estimates reported in Table 3, columns 2-5, a larger share of the population with voting rights was associated with considerably *lower* levels of spending on primary schooling.<sup>26</sup> Taken together, evidence that school spending was lower in municipalities with a more broadly diffused political voice suggest that the spread of voting rights as an explanation for the spread of mass schooling is a poor fit for the Swedish case.

Although the rise of Swedish primary schooling clearly preceded the country's economic take-off in the latter half of the 19<sup>th</sup> century, there is clear evidence that economic factors were important determinants of educational expenditure. Table 3, column 3 shows that landed wealth is a key predictor of schooling investments, plausibly as the broader tax based allowed wealthier municipalities to mobilize funds for primary schooling. Landed wealth was seemingly more important than income taxes with an estimated elasticity that is roughly four times larger, which suggest that a relative shift towards non-agricultural activities did little to raise investments in schooling in the beginning of the 1870s. Secondly, there is a positive and statistically significant link between population density and school spending per capita, which is seemingly inconsistent with the argument of lower fixed costs per pupil in more densely settled areas. More likely, a positive link between population density and school spending reflects some form of (unobserved) economic development that translated into higher schooling investments that is not accounted for by the tax values of income and land. Finally, in the last column of Table 3, we include three county-level controls reflecting the sectorial composition of employment and poverty rates.<sup>27</sup> A non-statistically significant but positive association between school spending and the share employed in manufacturing exist, while there seems to be no relationship between expenditure and the share employed in agriculture.<sup>28</sup> In poorer regions, spending on primary schooling was considerably lower thus reinforcing a positive link between economic development and schooling investments.

Evidence that municipalities that were governed by elites spent more on primary schooling raises the question: did elites respond to a higher demand for education? While our analysis mainly focuses on the supply-side of schooling investments, demand factors may have been important and potentially correlated with the distribution of voting rights. However, although the demand for education increased among freehold farmers during the Enclosure Movement in the early 19th century (Nilsson et al., 1999; Nilsson and Pettersson, 2008), the demand for education was likely to be negligible among the vast masses of agricultural laborers.<sup>29</sup> Similarly, while differences in industrialization may have contributed to a demand-driven expansion of schooling, it is important to note that its role was likely minor given

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26 However, when interpreting these results it is important to recall that on average only one in ten had the right to vote, which implies that the positive impact of a broadened political voice reflect the preferences of individuals in the upper tail of the income or wealth distribution—whether the poor would have demanded higher levels of school spending had they been enfranchised is a purely hypothetical question given the highly restricted franchise. Moreover, the fact that attendance rates at council meetings were extremely low and that votes were graded according to income implies that these estimates cannot be interpreted as reflecting the preferences of a simple median voter (Meltzer and Richards, 1981).

27 Additional county-level data on the share of the population employed in agriculture and industry are based on Enflo et al. (2014) and the share of the rural population that received poor relief is drawn from BISOS U (1874).

28 Child labor was still prevalent in many manufacturing industries in the 1870s, which may have served to increase the opportunity costs of sending children to school thus dampening a positive effect of industrialization on schooling investments. Olsson (1980), for example, reports that children (aged below 14) constituted 5.5 percent of the industrial workforce in 1875, with a significantly higher share employed in industries such as glass works and match factories.

29 Sandberg (1979, p.226), for example, argues that “the almost universal literacy of the agricultural proletariat did little to increase their productivity at the time” and while Parman (2012) documents positive returns to education among farmers in the early-20th century United States, these findings remain silent regarding whether an education also raised the productivity of agricultural laborers.

that less than 7 percent of the population was employed in industry and the fact that there is at best a weak link between taxable incomes, manufacturing employment, and school spending (see Table 3, column 5). As shown in the Appendix, there is furthermore little to suggest that elites were more responsive in areas where the demand for and returns to education were higher: the positive effect of elites on educational expenditure was if anything lower in more industrial areas. Together, these results make it less plausible that elites responded to economic motives such as higher demand for human capital, which instead suggesting that non-economic motives were important.

#### 4.2.1 Robustness: Fixed effects, matching, and IV estimators

Although the results suggest that local elites supported investments in schooling for the local population there are at least three concerns regarding the validity of this result. First, if there is an unobserved factor that is correlated both with the distribution of political power and educational expenditure our estimates may wrongly attribute higher schooling investments to the presence of local elites. Second, there may be reverse causality issues if higher historical investments in public education increased the probability that a local elite is present. Third, the results may be sensitive to how elites are defined. We address these issues in four ways using (i) matching estimators; (ii) regional fixed effects; (iii) an IV strategy; and (iv) by using alternative definitions of local elites.

First, we use matching estimators to compare elite municipalities to nearly identical non-elite municipalities in terms of the tax value of land, income, and the spread of voting rights, with the main idea being that observable and unobservable differences are likely to be smaller in a comparison of municipalities that are similar in these respects. Table 4 reports estimates that compare each elite municipality to exactly one neighbor with similar propensity score values based on the individual matching variable (columns 1-3) and when matching on all three variables simultaneously (column 4). Consistently, these results suggest that elite municipalities spent considerably more on primary schooling per taxpayer.

[TABLE 4 HERE]

Secondly, to assess the role of potentially omitted regional factors, the estimates reported in Table 5 include 10 county (*län*) and 123 district (*härad*) fixed effects respectively.<sup>30</sup> While regional fixed effects capture differences in schooling investments across counties and districts, they also absorb time-invariant characteristics such as differences in local culture, geography, and a wide range of unobservable factors that may influence school spending. As evident, the results remain qualitatively similar although estimated magnitudes decline somewhat when only using cross-municipality variation in the distribution of political power within larger regions.

[TABLE 5 HERE]

A third approach is to use variation in agricultural suitability to identify the distribution of local elites. Although votes were awarded both due to income and land, the latter was by far the most important with almost 70 percent of the total votes accruing from land ownership in the 1870s. An influential body of work summarized in Engerman and Sokoloff (2012) argues that differences in agricultural endowments indirectly shaped investments in schooling in the Americas by determining the structure of land holdings and political power.<sup>31</sup> Our instruments similarly rely on the idea that in areas that had more ample land for agricultural production, land was historically more likely to have become concentrated in larger landholdings. A link between favorable land endowments and the structure of landholdings is clearly evident in that larger estates and farms that specialized in large-scale grain

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30 Each county (*län*) contains on average 115 municipalities, whereas each district (*härad*) contains on average 9 municipalities.

31 Also see Easterly (2007) who uses cross-country data and variation in the suitability for cultivating wheat relative to sugarcane to show that agricultural endowments shaped institutional development and investments in schooling. Other examples of using agricultural suitability as an instrument for the structure of landholdings include Clark and Grey (2014) and Cinnirella and Hornung (2016).



production were chiefly located in the southern and eastern parts of the country with an abundance of fertile land, whereas larger or even medium-sized farms were far less numerous in the interior and the north with poorer soils (Bagge et al., 1935, p.186). To measure agricultural suitability we use GIS data from the United Nations' Food and Agriculture Organization's Global Agro-Ecological Zones (FAO-GAEZ) database that reports the suitability for cultivating barley, rye, and wheat based on information on climate constraints, soil quality, and terrain slopes, which allows us to calculate the share of municipality's land that is suitable for cultivating each crop respectively.<sup>32</sup>

[TABLE 6 HERE]

Table 6 reports the 2SLS estimates where we use the share of land that is suitable for cultivating each of the three main crops in the first-stage to predict elite control. Agricultural suitability is a strong predictor of the presence of local elites, which is reflected in the relatively large F-statistics in the first-stage that suggest that the IV estimates are unlikely to be biased due to problems of weak instruments.<sup>33</sup> A strong first stage relationship reflect the fact that land ownership was more likely to be concentrated in fewer hands in areas with highly suitable land: for example, in the county with most suitable land (*Malmöhus*) more than two-thirds of the local governments had a local elite present. Using the variation in elite control stemming from these differences in agricultural suitability results in IV estimates that are substantially larger than the corresponding OLS estimates and that are also highly statistically significant. Although these estimates should be interpreted with care given that it cannot be ruled out that differences in agricultural suitability affected the demand and supply for schooling through other channels than the distribution of political power, which would violate the exclusion restriction, they are informative since they rely on a potential long-run determinant of the presence of local elites thus reducing the threat of omitted factors that may simultaneously affect both educational expenditure and the distribution of voting power.

A final cause of concern relates to the definition of local elites and that the results may be sensitive to alternative ways to measure political inequality. Additional robustness checks presented in the Appendix, however, further show that the main results are robust to using both alternative ways to define local elites and alternative measures of school spending.<sup>34</sup> Together, the results presented in this section thus provide robust evidence that elite control of municipal governments led to significantly higher spending on schooling.

#### 4.2.3 *Elites vs. voters*

Our results point to both the presence of local elites and the spread of the vote being important factors to account for differences in educational expenditure, though they suggest that elites and other voters had different preferences over the appropriate level of investment. As investments in schooling reflect the outcome of a process in which elites and voters potentially clashed over spending decisions, there may be heterogeneity in the influence of elites based on the share of the population with political voice: while elites may have been able to completely dictate educational policies in local governments in which a small share of the population was enfranchised, the decisive voter in an elite municipality

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32 See <http://www.fao.org/nr/gaez/en/> and Berger (2016) for more information on the sources and methodologies used to construct this data. We define the instrument as  $\ln 0.01 +$  the share of land that is classified in the FAO-GAEZ data as "very suitable" to cultivate each respective crop.

33 As the Kleibergen-Paap F-statistics exceed 20 in all specifications we can reject a 10 percent maximal IV bias (Stock and Yogo, 2005).

34 More specifically, we show that the results are similar when using alternative vote share cutoffs to define local elites or when using a continuous measure of the concentration of votes. As one concern is that spending per tax payer may mechanically lead to higher spending in elite municipalities we show that results are similar when instead using spending normalized by population, including state grants, or using teacher's wages as alternative outcomes.

where a larger share of artisans, peasants, and white collar workers had the vote may have been found further down in the income or property ranks.<sup>35</sup>

[TABLE 7 HERE]

To explore this idea, Table 7 shows that the positive influence of local elites on school spending was weakened in municipalities where a larger share of the population had voting rights, by including an interaction between the presence of a local elite and the percentage of the population that is enfranchised. Columns 2 and 3 add county- and district fixed effects respectively, which shows that a similar pattern is evident when factoring out potential regional confounders. According to these estimates, the positive effect of an elite vanished in municipalities where more than a tenth of the population had voting rights. Together, these results suggest that where local elites were challenged by a larger group of voters spending on primary schooling per taxpayer was lower, which further underlines the finding that elite control of local politics was seemingly crucial to raise investments in schooling.

## 5. Concluding discussion

This paper demonstrates that local elites were instrumental in promoting investments in primary schooling in rural areas prior to Sweden's industrial breakthrough in the late-19<sup>th</sup> century. Economic and political elites thus constitute an important element in accounting for how Sweden managed to maintain a level of human capital and schooling that was wildly out of proportion to the country's level of economic development, which constitute a departure from the earlier literature that has mainly emphasized the role of culture, religion, and the expansion of elementary education as a peasant-led process (Sandberg, 1979; Klose, 1992; Nilsson et al., 1999; Westberg, 2014). A lack of evidence suggesting that elites favored schooling particularly where the demand and returns to skill was high is consistent with the argument that elites advanced elementary education to stave off the political threat of the swelling rural lower classes or as an instrument of political socialization to entrench their power in the local community rather than for pure economic gain. More broadly, this reminds us that "the establishment and growth of mass education has often been the product chiefly not of market forces but of political conflict" (Easterlin, 1981, p.11).

An important implication of our findings for the study of the emergence of mass schooling is that the relationship between democracy and schooling is likely to vary both across countries and within countries over time. This points to the need to study the evolution of mass schooling in Sweden between the 1842 reform and the beginning of the 20<sup>th</sup> century when the mass school system began to mature and when the political sway of the emerging capitalist elite increased relative to the old landed aristocracy. Indeed, an important limitation of our study is that we cannot separately identify capitalists, corporations, and large landowners, which means that we cannot identify within-elite differences regarding the preferences for public schooling. Understanding the potentially conflicting motivations of these local elites, how they may have changed over time, and how different elite groups intervened in local decision-making to shape investments in schooling remains an important avenue for future research.

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35 Mellquist (1974) indeed argues that influential vote holders could pressure voters in subordinate positions to vote for them, which constituted a power that likely diminished with the share of the population that was enfranchised.

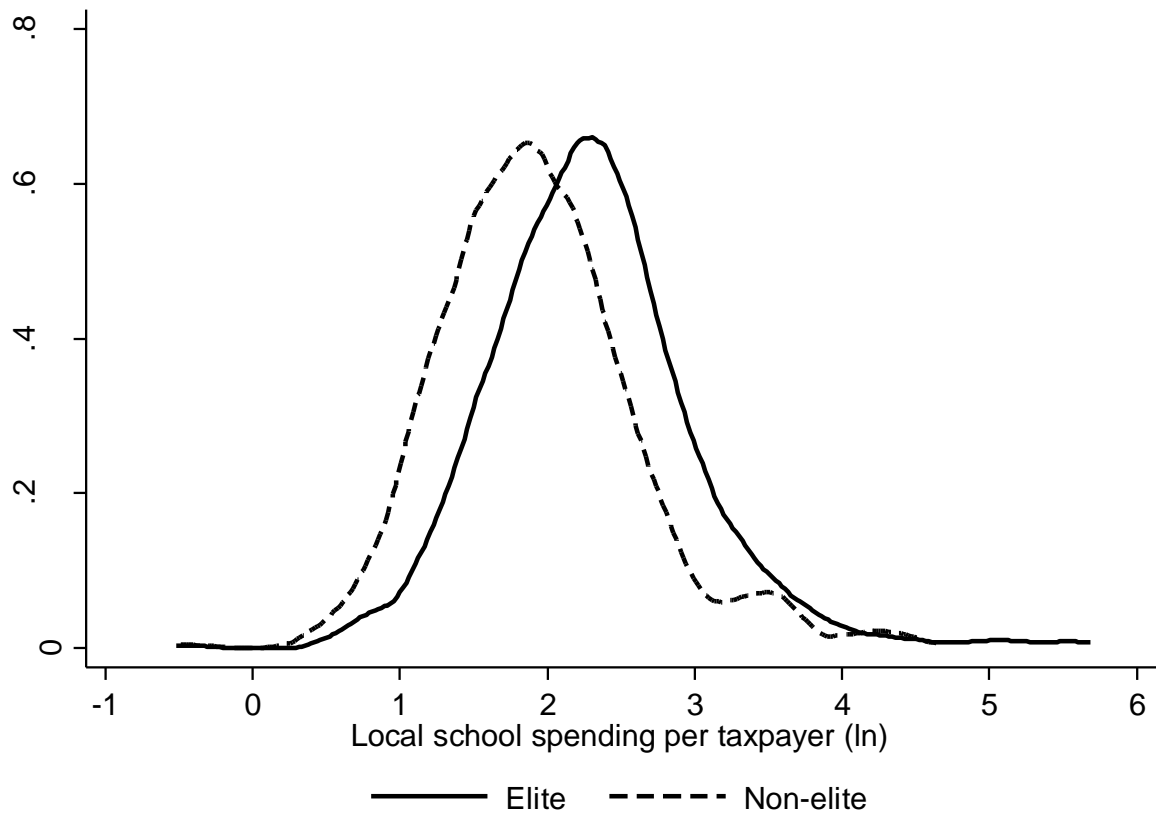
## 6. References

- Acemoglu, D., and Robinson, J. A. (2005). *Economic origins of dictatorship and democracy*. Cambridge University Press.
- Acemoglu, D., Bautista, M. A., Querubin, P., and Robinson, J. A. (2007). Economic and political inequality in development: the case of Cundinamarca, Colombia. NBER Working Paper No. 13208.
- Aghion, P., Jaravel, X., Persson, T., and Rouzet, D. (2015). Education and military rivalry. Mimeo.
- Alesina, A., Baqir, R. and Easterly, W. (1999). Public goods and ethnic divisions. *Quarterly Journal of Economics*, 114(4), 1243-1284.
- Andersson, M., and Gunnarsson, C. (2006). Egalitarianism in the process of Modern Economic Growth: The case of Sweden. Background paper for World Development Report.
- Aquilonius, K. (1942). *Det svenska undervisningsväsendet 1809-1860*. Stockholm: Albert Bonniers Förlag.
- Bagge, G., Lundberg, E., and Sventnilson, I. (1935). *Wages in Sweden 1860-1930 Part II*. London: P.S King and Son, Ltd.
- Beltran Tapia, F. J., and Martínez-Galarraga, J. (2015). Land access inequality and education in pre-industrial Spain. Oxford Economic and Social History Working Papers No. 137.
- Bengtsson, E. (2015). Löneskillnader under ”borgerlighetens århundrade”: Medelklass och arbetarklass i Stockholm 1833–1905. Mimeo.
- Berger, T. (2016). Geography and Growth: Evidence from the Introduction of the Potato in Pre-Industrial Sweden. Mimeo.
- BiSOS A (1851/55). *Bidrag till Sveriges officiella statistik. A, Befolkningsstatistik*. Stockholm: P. A. Norstedt and söner.
- BiSOS P (1868). *Bidrag till Sveriges officiella statistik. P, Folkundervisningen*. Stockholm: P. A. Norstedt and söner.
- BiSOS P (1882). *Bidrag till Sveriges officiella statistik. P, Undervisningsväsendet*. Stockholm: P. A. Norstedt and söner.
- BiSOS R (1871). *Bidrag till Sveriges officiella statistik. R, Valstatistik*. Stockholm: P. A. Norstedt and söner.
- BiSOS U (1874). *Bidrag till Sveriges officiella statistik. U, Kommunernas fattigvård och finanser*. Stockholm: P. A. Norstedt and söner.
- Boli, J. (1989). *New citizens for a new society. The institutional origins of mass schooling in Sweden*. London: Pergamon Press.
- Cappelli, G. (2015). Escaping from a human capital trap? Italy's regions and the move to centralized primary schooling, 1861–1936. *European Review of Economic History*.
- Cinnirella, F., and Hornung, E. (2016). Landownership concentration and the expansion of education. *Journal of Development Economics*, 121, 135-152.
- Clark, G., and Gray, R. (2014). Geography is not destiny: Geography, institutions and literacy in England, 1837–63. *Oxford Economic Papers*, 66(4), 1042-1069.
- Cvrcek, T., and Zajicek, M. (2013). School, what is it good for? Useful human capital and the history of public education in Central Europe. NBER Working Paper No. 19690.
- Easterlin, R. A. (1981). Why isn't the whole world developed?. *The Journal of Economic History*, 41(1), 1-17.
- Easterly, W. (2007). Inequality does cause underdevelopment: Insights from a new instrument. *Journal of Development Economics*, 84(2), 755-776.
- Elis, R. (2011). *Redistribution under oligarchy: Trade, regional inequality and the origins of public schooling in Argentina, 1862-1912*. Ph. D. Dissertation, Department of Political Science, Stanford University.
- Enflo, K., Henning, M., and Schön, L. (2014). Swedish regional GDP 1855-2000: estimations and general trends in the Swedish regional system. *Research in Economic History*, 30, 47-89.
- Engerman, S., Mariscal, E., and Sokoloff, K. (1997). The persistence of inequality in the Americas: Schooling and suffrage, 1800-1945. Manuscript, UCLA.

- Engerman, S., and Sokoloff, K. (2002). Factor endowments, inequality, and paths of development among New World economies. NBER Working Paper No. 9259.
- Engerman, S., and Sokoloff, K. (2012). *Economic Development in the Americas since 1500. Endowments and Institutions*. Cambridge University Press, Cambridge.
- Gallego, F. A. (2010). Historical origins of schooling: The role of democracy and political decentralization. *The Review of Economics and Statistics*, 92(2), 228-243.
- Galor, O., and Moav, O. (2004). From physical to human capital accumulation: Inequality and the process of development. *The Review of Economic Studies*, 71(4), 1001-1026.
- Galor, O., Moav, O., and Vollrath, D. (2009). Inequality in landownership, the emergence of human-capital promoting institutions, and the great divergence. *The Review of Economic Studies*, 76(1), 143-179.
- Gao, P. (2015). The uneven rise of modern education in China in the early 20th century. Mimeo.
- Go, S., and Lindert, P. (2010). The uneven rise of American public schools to 1850. *The Journal of Economic History*, 70(1), 1-26.
- Go, S., and Park, K. J. (2012). The elite-biased growth of elementary schooling in colonial Korea. Mimeo.
- Goldin, C. D., and Katz, L. F. (2008). *The race between education and technology*. Harvard University Press.
- Goñi, M. (2016). Landed elites and education provision in England and Wales. Evidence from School Boards, 1870-99. Mimeo.
- Gustafsson, H. (1989). *Sockenstugans politiska kultur*. Studier i stads- och kommunalhistoria, Stadshistoriska Institutet.
- Kaestle, C. F. (1976). Between the Scylla of brutal ignorance and the Charybdis of a literary education: Elite attitudes toward mass schooling in early industrial England and America. In Stone, L. (ed.) *Schooling and society: studies in the history of education*, 177-191. Johns Hopkins University Press
- Kaestle, C. F. (1983). *Pillars of the republic: Common schools and American society, 1780-1860*. New York: Hill & Wang.
- Klose, G. (1992). *Folkundervisningens finansiering före 1842*. Utbildningshistoriska meddelanden 2, E. Larsson and J. Westberg, 2011.
- Lindert, P. H. (2004). *Growing public: Social spending and economic growth since the eighteenth century (Vol. 1)*. Cambridge University Press.
- Ljungberg, J., and Nilsson, A. (2009). Human capital and economic growth: Sweden 1870–2000. *Cliometrica*, 3(1), 71-95.
- Lott, J. R. Jr. (1999). Public schooling, indoctrination, and totalitarianism. *The Journal of Political Economy*, 107(6), 127-157.
- Lundh, C., Schön, L., and Svensson, L. (2004). Regional wages in Sweden 1860-1914. In Lundh, C., Olofsson, J., Schön, L., and Svensson, L. (eds.) *Wage Formation, Labour Market Institutions and Economic Transformation in Sweden 1860-2000*. Lund.
- Malmström, J. (2006). *Herrskapen och den lokala politiken: Eds socken, ca 1650–1900*. Doctoral dissertation, Uppsala University.
- Mellquist, E. D. (1974). *Rösträtt efter förtjänst? Riksdagsdebatten om den kommunala rösträtten i Sverige 1862-1900*. Stockholm, Stadshistoriska Institutet.
- Meltzer, A. H., and Richard, S. F. (1981). A rational theory of the size of government. *The Journal of Political Economy*, 89(5), 914-927.
- Michaëlsson, M. (2016). *Private subsidies to elementary schools : The ironworks' contributions to the Swedish elementary school system, 1850–1930*. Doctoral thesis, Uppsala Universitet.
- Möller, J. (1989). *Godsen och den agrara revolutionen. Arbetsorganisation, domänstruktur och kulturlandskap på skånska gods under 1800-talet*. Lund University Press.
- Möller, T. (2010). *Svensk politisk historia. Strid och samverkan under tvåhundra år*. Lund, Studentlitteratur.
- Mulligan, C. B., Gil, R., and Sala-i-Martin, X. (2004). Do democracies have different public policies than nondemocracies?. *The Journal of Economic Perspectives*, 18(1), 51-74.

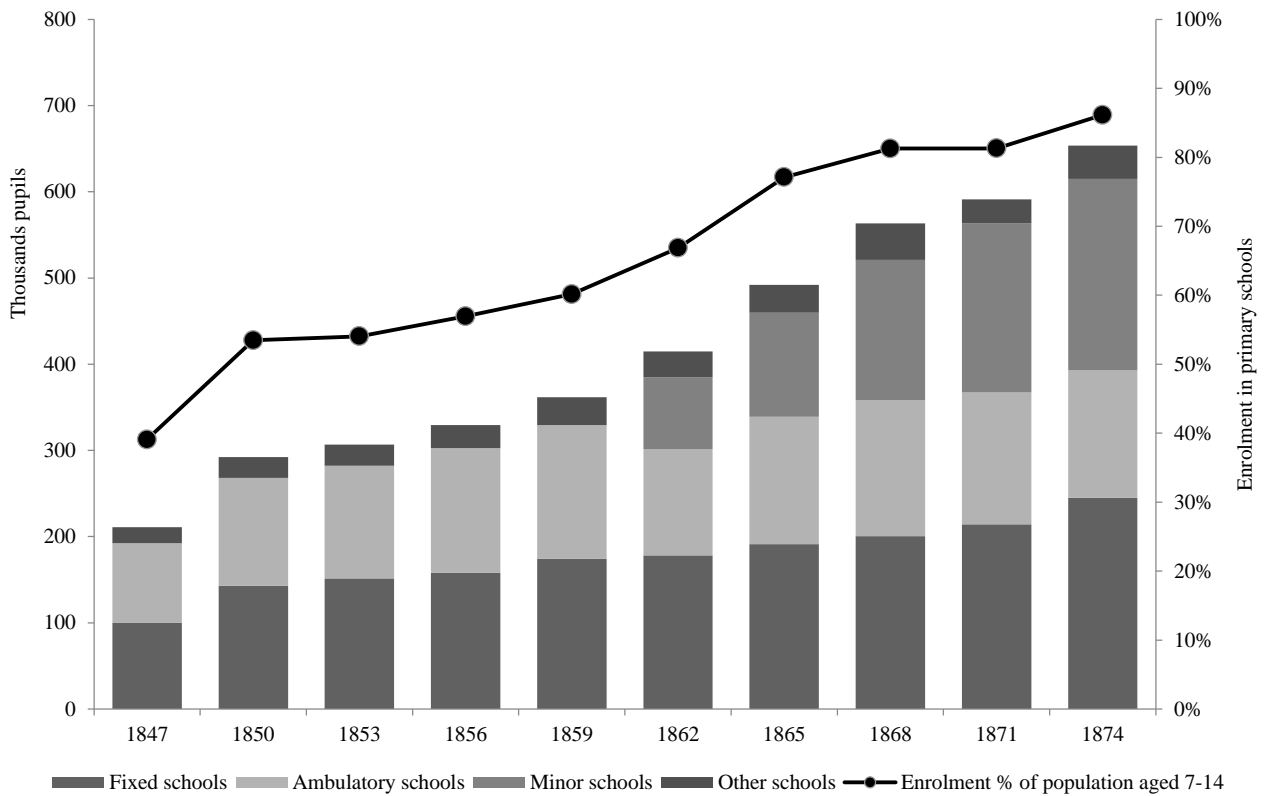
- Nilsson, A. and Pettersson, L. (2008). The state of the people? Government policies and population movements in education and training in 19th century Swedish agriculture. In Vivier, N. (ed.), *The State and Rural Societies Policy and Education in Europe 1750-2000*. Brepols: Turnhout.
- Nilsson, A., Pettersson, L., and Svensson, P. (1999). Agrarian transition and literacy: The case of nineteenth century Sweden. *European Review of Economic History*, 3(1), 79-96.
- Olsson, L. (1980). *Då barn var lönsamma*. Tidens förlag, Stockholm.
- Olsson, M. (2005). *Skatta dig lycklig. Jordränta och jordbruk i Skåne 1660-1900*. Södertälje, Gidlunds förlag.
- Palma, N and Reis, J. (2012). A tale of two regimes: Educational achievement and institutions in Portugal, 1910-1950. Mimeo.
- Parman, J. (2012). Good schools make good neighbors: Human capital spillovers in early 20th century agriculture. *Explorations in Economic History*, 49(3), 316-334.
- Petterson, L. (1992). Frihet, jämlikhet, egendom och Bentham. Utvecklingslinjer i svensk folkundervisning mellan feodalism och kapitalism, 1809-1860. Uppsala, Acta universitatis Upsaliensis.
- Ramirez, F.O., and Boli, J. (1987). The political construction of mass schooling: European origins and worldwide institutionalization. *Sociology of Education*, 60(1), 2-17.
- Ramcharan, R. (2010). Inequality and redistribution: Evidence from US counties and states, 1890-1930. *The Review of Economics and Statistics*, 92(4), 729-744.
- Richardson, G. (2010). *Svensk utbildningshistoria: Skola och samhälle förr och nu*. Lund: Studentlitteratur.
- Sandberg, L.G. (1979). The case of the Impoverished Sophisticate: human capital and Swedish economic growth before World War I. *The Journal of Economic History*, 39(1), 225-241.
- Sandin, B. (1986). *Hemmet, gatan, fabriken eller skolan: folkundervisning och barnuppfostran i svenska städer: 1600-1850*. Volym 22 av Arkiv avhandlingsserie, Lund.
- Schelin, M. (1978). *Den officiella skolstatistiken i Sverige åren 1947-1881*. Pedagogiska monografier. Umeå, Umeå universitet.
- Schön, L. (2010). *Sweden's road to modernity: an economic history*. SNS Förlag: Stockholm.
- SFS (1862:15). Förordningen om kyrkostämman samt om kyrkoråd och skolråd.
- Shammas, C. (2015). Did democracy give the United States an edge in primary schooling?. *Social Science History*, 39(3), 315-338.
- Sjöberg, M. (1996). *Att säkra framtidens skördar. Barndom, skola och arbete i agrar miljö: Bolstad pastorat 1860-1930*. Linköping, Tema Barn, Linköpings universitet.
- Sörensen, A. (1942). *Det svenska folkundervisningsväsendet 1860-1900*. Stockholm, Albert Bonniers boktryckeri.
- Statistics Sweden (2004). Consumer Price Index 1830-2003. Statistiska meddelanden. PR 15 SM 0401.
- Statistiska Centralbyrån (1969). *Historisk statistik för Sverige: Del I. Befolkning. Andra upplagan. 1720-1967*. Allmänna Förlaget.
- Stock, J. H., and Yogo, M. (2005). Testing for weak instruments in linear IV regression. In *Identification and Inference for Econometric Models: Essays in Honor of Thomas Rothenberg*, Andrews, D. W. K., and Stock, J. H. (eds.). Cambridge: Cambridge University Press, 80-108.
- Stoddard, C. (2009). *Why did education become publicly funded? Evidence from the nineteenth-century growth of public primary schooling in the United States*. Cambridge University Press.
- Sundberg, K. (2004). *Modernisation and tradition: European local and manorial societies 1500-1900 (Vol. 2)*. Nordic Academic Press.
- Thunander, G. (1946). *Fattigskola-Medborgarskola. Studier i den svenska folkskolans historia med särskild hänsyn till Malmö*. Malmö.
- Tiscornia, A. (1992). *Statens, godsens eller böndernas socknar? Den sockenkommunala självstyrelsens utveckling i Västerfärnebo, Stora Malm och Jäder 1800-1880*. Doctoral dissertation, Uppsala University.
- Vollrath, D. (2013). Inequality and school funding in the rural United States, 1890. *Explorations in Economic History*, 50(2), 267-284.

- Wallin, B. (1978). *Att forma en skolform. Svensk folkskolepolitik vid mitten av 1800-talet. Ideologi och socialpolitik i 1800-talets Sverige. Fyra studier*. Uppsala, Alqvist and Wiksell International.
- Weber, E. (1979). *Peasants into Frenchmen: The Modernization of Rural France, 1870-1914*. Chatto and Windus.
- Westberg, J. (2011). Statsbidragens utveckling och konsekvenser under 1800-talet. Bidrag till Historikermötet i Göteborg 2011.
- Westberg, J. (2014). *Att bygga ett skolväsende: Folkskolans förutsättningar och framväxt 1840-1900*. Lund: Nordic Academic Press.
- Westberg, J. (2016). Making mass schooling affordable: in-kind taxation and the establishment of an elementary school system in Sweden, 1840–1870. *Paedagogica Historica*, 1-15.
- Wilmoth, J. R. and Shkolnikov, V. (2011). The Human Mortality Database. Available at: <http://www.mortality.org/>.



*Notes:* This figure plots kernel density distributions of  $\ln$  local school spending on primary schooling per taxpayer in 1874 for elite (solid line) and non-elite (dashed) municipalities. Elite municipalities are those where at least one voter held more than 10 percent of the total votes in 1871 and non-elite municipalities are all other municipalities that lacked influential voters.

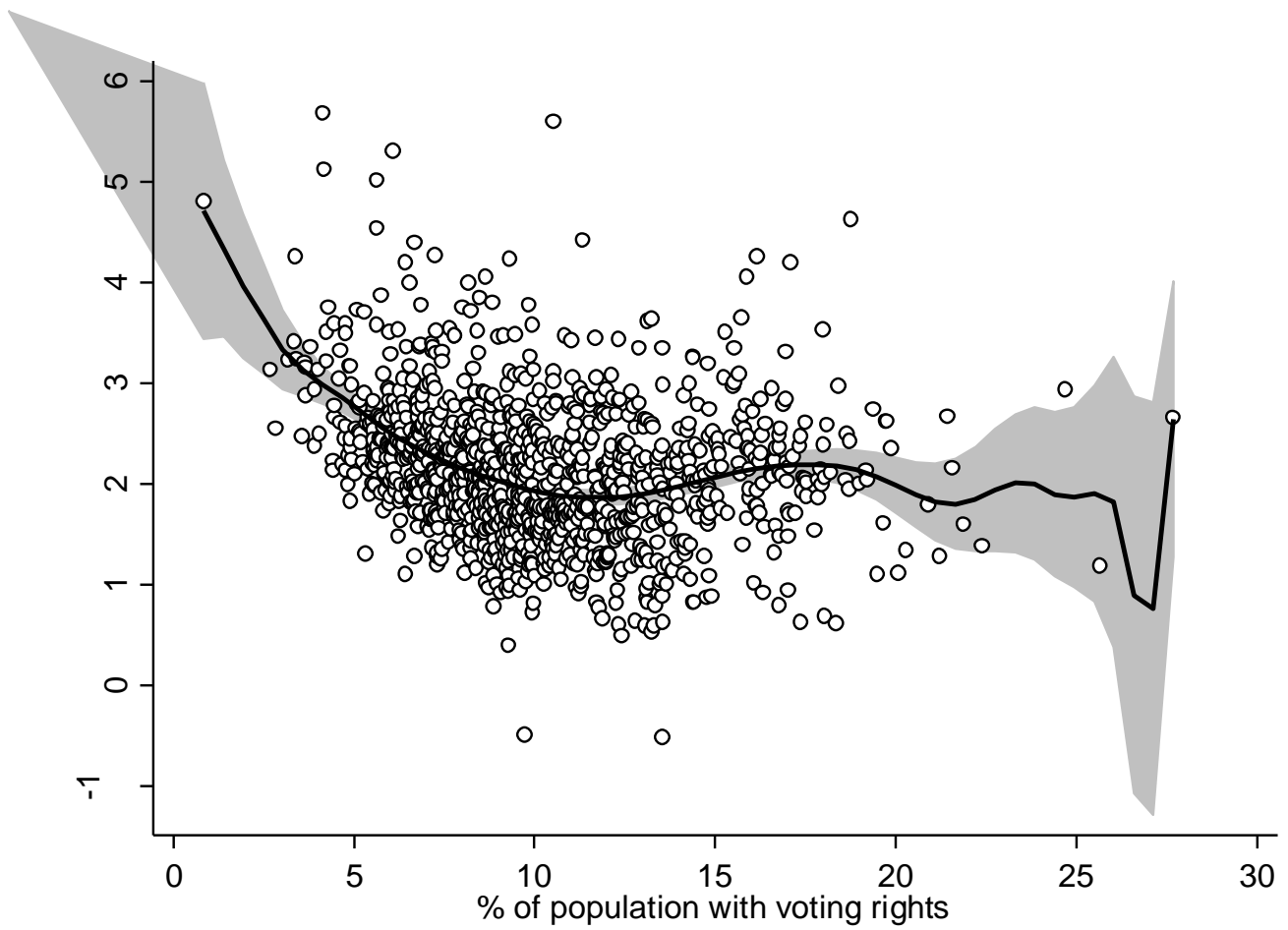
Figure 1. Educational expenditure in “elite” and “non-elite” municipalities.



*Notes:* The share of children in school age in each diocese in 1847 is estimated by multiplying the total population of each diocese by the share of children in school age from 1868 (BiSOS P, 1868). The total population of each diocese in 1847 is estimated by multiplying the 1845 data with the national rate of population growth between 1845 and 1847 calculated from the Swedish population for 1847 (BiSOS A, 1851/55, p. LVI). Additional enrollment data is drawn from Schelin (1978) and population data from Wilmoth and Shkolnikov (2011).

Figure 2. Expansion of primary schooling, 1847-1874.





*Notes:* This figure plots  $\ln$  local school spending per taxpayer in 1874 against the percentage of the population that has voting rights in 1871 across 1,150 municipalities. Also shown is a fitted local polynomial regression estimate with a 95-percent confidence interval shaded in grey.

Figure 3. Educational expenditure and the spread of the vote.

	1839	1868	%	1876	%
<b>Resources (#)</b>					
School buildings	1 009	3 976		5 427	
Teachers (primary and minor)	1 040	7 145		9 299	
<b>Revenue (1000s kronor)</b>					
School districts	-	2 502	72%	6 127	72%
State grants	-	968	28%	2 406	28%
Total	-	3 470	100%	8 533	100%
<b>Costs (1000s kronor)</b>					
Teachers	-	2 979	86%	5 676	67%
Buildings and facilities	-	329	9%	1 831	21%
Other	-	163	5%	1 026	12%
Total	-	3 470	100%	8 533	100%

*Notes:* In 1868, 617 thousand SEK (in 1914 prices) of local taxes (*Folkskoleavgiften*) was counted as state grant, but was actually paid by the school district. If excluded, the state share corresponded to only 10 per cent that year. In 1876 and 1881, an additional 2,425 and 2,508 school buildings were rented by school districts. Nominal amounts were transformed into 1914 prices by using the consumer price index of Sweden for the years 1830-2003 published in Statistics Sweden (2004). *Sources:* 1839 - BiSOS P 1882, p. 5; 1868 - BiSOS P 1868, p. XII, 66 and 67; 1876 and 1881 - BiSOS P 1882, Tab 1.

Table 1 Primary schools: costs, resources, and revenues, 1839-1876.

	Panel A. Descriptives				Panel B. Elite?	
	Mean	S.D.	Min	Max	Yes	No
	(1)	(2)	(3)	(4)	(5)	(6)
<hr/>						
<b>Political power</b>						
<hr/>						
Elite (0/1)	0.53	0.50	0	1	1	0
% with voting rights	10.26	3.63	0.84	27.68	9.50	11.13
<b>School spending per taxpayer, 1874</b>						
<hr/>						
Total spending (SEK)	15.67	19.00	2.60	309.10	18.62	12.31
State grants (SEK)	4.01	2.74	0.70	61.00	4.74	3.18
Local spending (SEK)	11.66	17.61	0.60	295.38	13.88	9.13
<b>Economic characteristics</b>						
<hr/>						
Tax value land (1000s SEK)	819.53	557.68	25.00	4838.00	790.57	852.71
Tax income (1000s SEK)	16.29	37.79	0.10	695.04	17.91	14.41
Population, 1871	1548	1086	133	8827	1310	1822
Population density, 1871 (/sqkm)	37.71	65.24	5.79	1667.50	36.62	38.96
Agri. empl share (%)	26.65	3.37	21.77	31.04	26.65	26.65
Mfg. empl share (%)	6.56	2.46	3.13	10.69	6.78	6.31
Poor relief (%)	4.30	0.79	3.34	5.89	4.20	4.42
<i>Observations</i>	1,150	1,150	1,150	1,150	614	536

*Notes:* Panel A reports summary statistics for the whole sample while Panel B reports average outcomes for elite and non-elite municipalities respectively. As described further in the main text, elite municipalities are defined as those in which at least one single voter controls more than 10 percent of the total votes.

Table 2. Summary statistics.

	(1)	(2)	(3)	(4)	(5)
Elite (=1)	0.361*** (0.047)	0.269*** (0.045)	0.106*** (0.039)	0.109*** (0.038)	0.089** (0.038)
% with voting rights		-0.249*** (0.036)	-0.208*** (0.032)	-0.215*** (0.027)	-0.212*** (0.027)
% with voting rights <sup>2</sup>		0.009*** (0.001)	0.007*** (0.001)	0.007*** (0.001)	0.006*** (0.001)
% employed in agriculture					0.002 (0.014)
% employed in manufacturing					0.023 (0.019)
% receiving poor relief					-0.132*** (0.037)
Tax value land (ln)			0.435*** (0.083)	0.369*** (0.073)	0.267*** (0.089)
Tax value income (ln)			0.059** (0.029)	0.025 (0.022)	0.043* (0.023)
Population density (ln)				0.226*** (0.043)	0.164*** (0.048)
Observations	1,150	1,150	1,150	1,150	1,150
R-squared	0.064	0.153	0.265	0.295	0.311

Notes: This table reports OLS estimates of equation (1) in the main text where the outcome is  $\ln$  local school spending per taxpayer and Elite is an indicator variable taking the value 1 if a single voter held more than 10 percent of the total votes in a municipality and 0 otherwise. Statistical significance based on standard errors clustered at the district-level is denoted by: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table 3. Local determinants of educational expenditure: OLS estimates.

	(1)	(2)	(3)	(4)
Elite (=1)	0.253*** (0.055)	0.236*** (0.056)	0.239*** (0.058)	0.154*** (0.059)
<b>Matching variables</b>				
Land tax	Yes	No	No	Yes
Income tax	No	Yes	No	Yes
Voting rights	No	No	Yes	Yes
Support (treat/untreat)	614/536	613/536	612/536	601/536

*Notes:* This table reports differences in  $\ln$  local school spending per taxpayer on primary education in elite municipalities compared to one neighboring non-elite municipality identified based on propensity score matching. Matching is performed based on the  $\ln$  tax value of land and income, and a quadratic of the share of the population with voting rights respectively. Statistical significance based on unadjusted standard errors is denoted by: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table 4. Elites and educational expenditure: matching estimators.

	(1)	(2)	(3)
Elite (=1)	0.113*** (0.038)	0.081** (0.039)	0.068* (0.041)
Controls?	Yes	Yes	Yes
County FE?	No	Yes	No
District FE?	No	No	Yes
Observations	1,150	1,150	1,150
R-squared	0.266	0.313	0.455

*Notes:* This table reports OLS estimates of equation (1) in the main text where the outcome is  $\ln$  local school spending per taxpayer. Controls include the share of the population with voting rights, the  $\ln$  tax value of income and land, and the population density of each municipality. Statistical significance based on standard errors clustered at the district-level is denoted by: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table 5. Elites and educational expenditure: FE estimators.

	(1)	(2)	(3)	(4)
Elite (=1)	1.024** (0.448)	0.983** (0.432)	1.037** (0.449)	0.844** (0.377)
Controls?	Yes	Yes	Yes	Yes
Instrument	Barley	Rye	Wheat	All
Observations	1,150	1,150	1,150	1,150
Kleibergen-Paap F-stat (1 <sup>st</sup> stage)	20.7	21.6	20.6	28.9

*Notes:* This table reports 2SLS estimates of equation (1) in the main text where the outcome is  $\ln$  local school spending per taxpayer. Each column reports second-stage estimates from using the share of each municipality's land that is at least "very suitable" to cultivate barley, rye, and wheat respectively based on the FAO-GAEZ database to instrument for elite control in municipal governments. Controls include the share of the population with voting rights, the  $\ln$  tax value of income and land, and the population density of each municipality. Statistical significance based on standard errors clustered at the district-level is denoted by: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table 6. Elites and educational expenditure: IV estimates.

	(1)	(2)	(3)
Elite (=1)	0.486*** (0.106)	0.518*** (0.109)	0.491*** (0.119)
% with voting rights	-0.045*** (0.009)	-0.055*** (0.009)	-0.060*** (0.010)
Elite (=1) * % with voting rights	-0.036*** (0.009)	-0.042*** (0.009)	-0.040*** (0.010)
Controls?	Yes	Yes	Yes
County FE?	No	Yes	No
District FE?	No	No	Yes
Observations	1,150	1,150	1,150
R-squared	0.266	0.314	0.453

*Notes:* This table reports OLS estimates of equation (1) in the main text where the outcome is  $\ln$  local school spending per taxpayer. Controls include the  $\ln$  tax value of income and land and the population density of each municipality. Statistical significance based on standard errors clustered at the district-level is denoted by: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table 7. Elites vs. voters.



## Appendix

This Appendix contains additional figures and results referred to in the paper *Elites and the Expansion of Education in 19th-Century Sweden*.

Figure A1 provides a map of the historical Swedish county division. The sample of municipalities included in the analysis is drawn from 10 counties: Blekinge, Elfsborg, Göteborgs och Bohus, Halland, Jönköping, Kalmar, Kristianstad, Kronoberg, Malmöhus, and Östergötland.

Figure A2 shows the estimated probability that a municipality is governed by an elite based on the share of the population with voting rights, which shows that elites were less like to control municipal governments in areas where a larger share of the population had the vote.

Figure A3 shows relative wages for primary school teachers and common laborers and textile workers respectively in Stockholm based on data reported in Bengtsson (2015).

Table A1 presents the income and property restrictions according to which voting rights were allocated.

Table A2 shows interactions between the elite indicator and different proxies for the demand for skills. Column 1 includes an interaction between the county-level manufacturing share of employment and our elite indicator. Column 2 instead proxies for the demand by using county-level (ln) industrial wages drawn from Lundh et al. (2004). In the last column, we measure the importance of industry in each municipality through the relative importance of taxable income and land by defining an indicator for “industrial” municipalities.<sup>36</sup> Overall, there is no evidence that elites preferred differentially higher investments in schooling in more industrial areas since the interactions are all negative and not statistically significant.

Table A3 examines alternative definitions of local elites, where each individual cell reported in the table corresponds to an individual regression. First, we show that results are similar when using a higher cutoff (>25 percent) to define the elite indicator used in the paper. Second, instead defining local elites using a continuous measure either as the share of each municipality’s voters or population that control more than 5, 10, or 25 percent of the total votes respectively yields qualitatively similar results: in municipalities where political power was more concentrated, spending on primary schooling was higher.

Table A4 uses alternative definitions of educational expenditure to show that the main results are not driven by normalizing spending by the number of taxpayers in each municipality. First, we show that results are similar when normalizing local spending by population rather than the number of taxpayers (column 1). Second, although local taxes financed most of the spending on schooling, grants from the central government constituted an important source of school financing (see Table 1), although it is important to note that these grants matched local spending on teachers. Column 2 uses total spending (i.e., local spending plus state grants) as the outcome, which shows that including state grants in our measure of spending yields very similar results. Third, column 3 uses information on spending on teacher’s wages for a smaller number of municipalities, which yields similar results to those reported in the main paper. Fourth, while teacher’s wages were recurrent costs and did not vary substantially between years, spending on school buildings include one-off investments in the building stock, which means that there may be great variations between individual years. In the last columns of Table A3 we restrict the sample to those municipalities that fall below the 99<sup>th</sup>, 95<sup>th</sup>, and 90<sup>th</sup> percentile of spending respectively in order to show that the results are not driven by large one-off expenditure on, for example, school buildings.

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<sup>36</sup> We define “industrial” municipalities as those with a tax value of income/tax value of land ratio above the median across all municipalities.

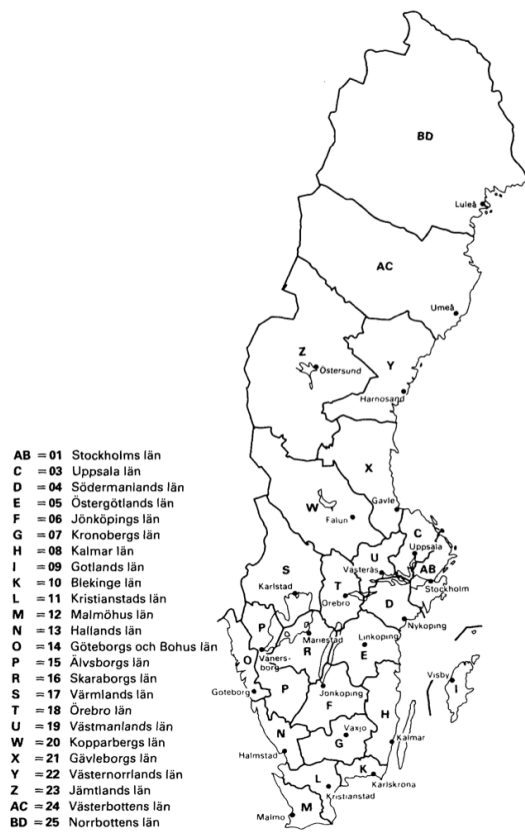
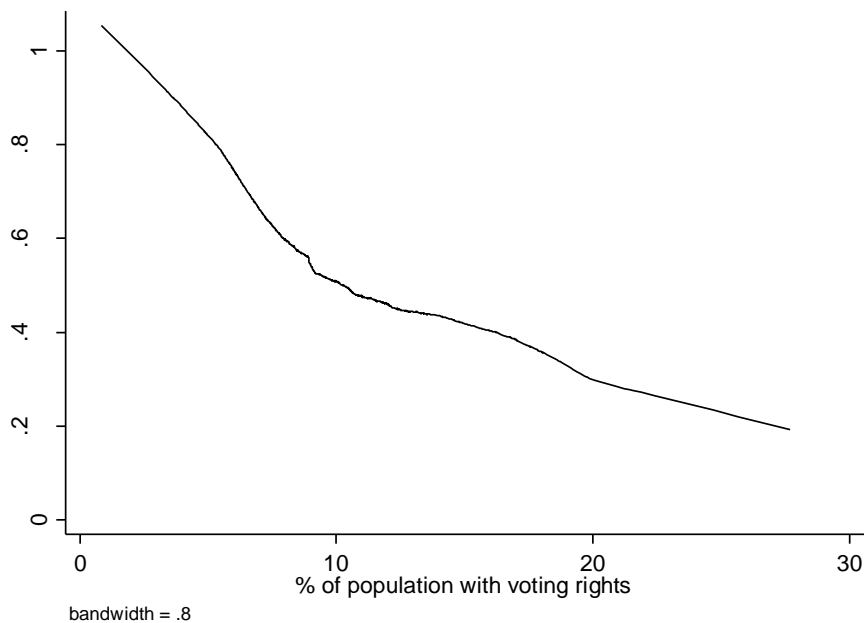
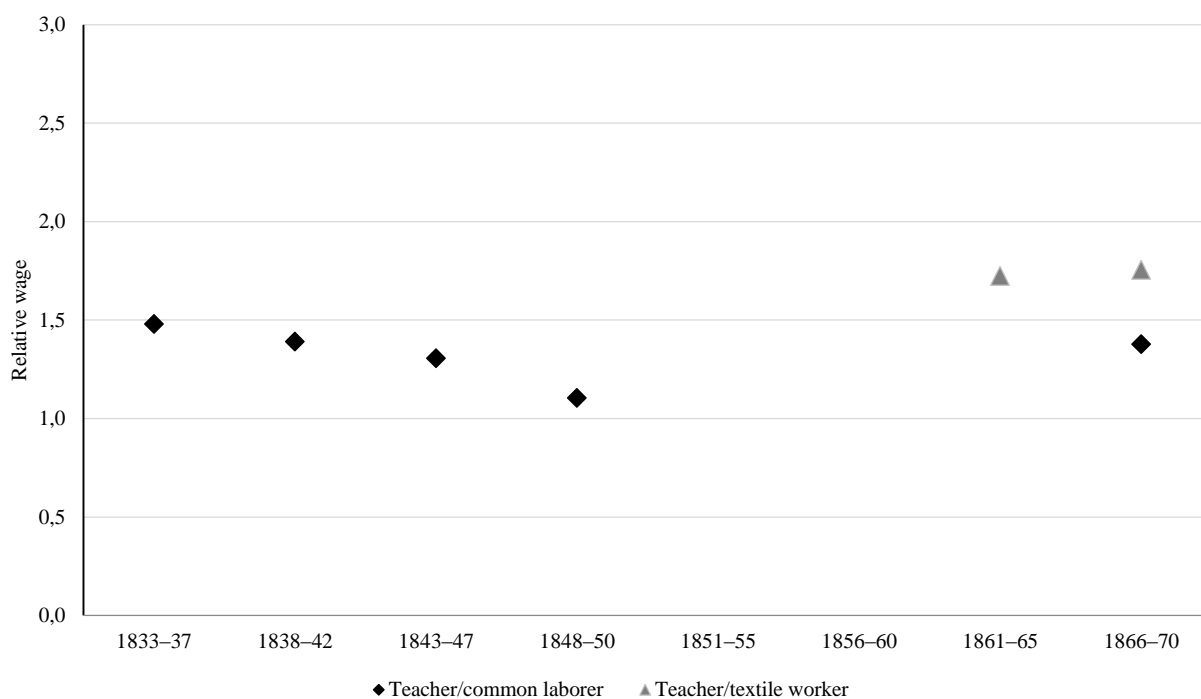


Figure A1. Swedish county division.



Notes: This figure shows the probability that a municipality has an elite present based on a loess regression of the presence of a local elite against the percentage share of the population with voting rights.

Figure A2. Elites and voters.



Source: This figure shows relative wages for primary school teachers in Stockholm relative to common laborers and textile workers respectively based on data in Bengtsson (2015).

Figure A3. Relative wages for teachers in Stockholm, 1833-1870.

- 
- Only men above the age of 21 had the right to vote.
  - The number of votes of an individual was based on land and income. Each unit of owned land (*mantal*) corresponded to 100 voting units (*fyrk*). Each *fyrk* represented one vote. The voting value of income was calculated based on the taxes paid. Income that required payment of taxes equal to the average amount of taxes paid on one *mantal* in the municipality was given 100 *fyrk*.
  - There was a minimum requirement of 10 *fyrk* to be allowed to vote. There was no maximum number of votes.
  - In addition, according to the tax laws no taxes were paid on income below 400 rd and on land valued to less than 100 rd, which implied a loss of voting rights below these levels.
  - The right to vote was extended to all tenant farmers without restriction.
  - Corporations were given the right to vote.
  - There were some geographical exceptions. In *Kopparberg* county the voting rights were based on monetary units instead of the *fyrk*, while earlier rules were maintained in the *Jämtland*, *Västerbotten* and *Norrbottnen* counties.
- 

Source: Mellquist (1974, pp. 49-52, 114)

Table A1. Voting rules for rural municipalities introduced in 1862.

	% empl. in mfg (1)	<i>ln</i> mfg. wage (2)	Ind. municipalities (=1) (3)
Elite (=1)	0.121 (0.105)	0.296 (0.180)	0.122** (0.053)
Factor in top row	0.010 (0.013)	0.084 (0.254)	-0.067 (0.067)
Elite (=1) * factor in top row	-0.001 (0.015)	-0.349 (0.328)	-0.027 (0.073)
Controls?	Yes	Yes	Yes
Observations	1,150	1,150	1,150
R-squared	0.266	0.314	0.453

*Notes:* This table reports OLS estimates of equation (1) in the main text where the outcome is *ln* local school spending per taxpayer. Controls include the *ln* tax value of income and land, the population density of each municipality, and the share of the population with voting rights and its square. Statistical significance is denoted by: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table A2. Elites, education, and the demand for skill.

Elite cutoff (Z):	>5% (1)	>10% (2)	>25% (3)
Elite (1(>Z))	0.080 (0.057)	0.109*** (0.039)	0.120** (0.057)
% of voters with >Z of votes	0.025*** (0.004)	0.060*** (0.010)	0.061*** (0.021)
% of pop. with >Z of votes	0.225*** (0.036)	0.690*** (0.127)	0.832** (0.382)
Controls?	Yes	Yes	Yes
Observations	1,150	1,150	1,150

*Notes:* This table reports OLS estimates of equation (1) in the main text where the outcome is *ln* local school spending per taxpayer. Each cell corresponds to an individual regression. Controls include the *ln* tax value of income and land, the share of the population with voting rights and its square, and the population density of each municipality. Statistical significance is denoted by: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table A3. Alternative definitions of local elites.

	Spend p.c. (1)	Tot. Spend (2)	Teacher's wages (3)	<99% (4)	<95% (5)	<90% (6)
Elite (=1)	0.114*** (0.039)	0.135*** (0.028)	0.137*** (0.026)	0.109*** (0.036)	0.130*** (0.031)	0.105*** (0.030)
Controls?	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,150	1,150	825	1,138	1,093	1,035
R-squared	0.267	0.314	0.443	0.297	0.343	0.325

*Notes:* This table reports OLS estimates of equation (1) in the main text where the outcome is alternative measures of educational expenditure. Controls include the  $\ln$  tax value of income and land, the share of the population with voting rights and its square, and the population density of each municipality. Statistical significance is denoted by: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table A4. Alternative definitions of educational expenditure.