THE
ECONOMIC HISTORY REVIEW

Economic History Review, 72, 3 (2019), pp. 897–924

Elites and the expansion of education in nineteenth-century Sweden†

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A large literature emphasizes that elite capture of political institutions hampered the spread of mass schooling in the nineteenth and twentieth century. We collect new data on investments in elementary education and the distribution of voting rights for more than 2,000 local governments in nineteenth-century Sweden and document that educational expenditure was *higher* where the distribution of political power was more unequal. In particular, areas governed by local landed elites—even those where a single landowner had *de jure* dictatorial powers—invested substantially more in mass schooling relative to areas where political power was more widely shared, or where it lay in the hands of capitalist elites. Our findings lend quantitative support to an earlier literature produced by economic and social historians which argues that landed elites advanced mass schooling as part of their historical role as patrons of the local community and as a response to the increasing proletarianization of the rural population, while also furthering our understanding of how Sweden maintained a high level of human capital despite its low level of economic development and restricted franchise in the nineteenth century.

The poor man whispers, while the rich man decides.[1]

Universal public schooling spread unevenly throughout the world in the nineteenth century in a process that was deeply intertwined with the onset of modern economic growth.[2] A commonly invoked explanation for the slow 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 education as long as the franchise was limited.[3] 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

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† We are very grateful for comments and suggestions from the editor, three anonymous referees, Martin Andersson, Andreas Bergh, Kerstin Enflo, Christer Gunnarsson, Anders Nilsson, Therese Nilsson, Mats Olsson, Sonja Opper, Paul Sharp, Patrick Svensson, Niko Wolf, and seminar participants at Lund University and the 6th Nordiska Utbildningshistoriska Konferensen in Uppsala, which substantially improved the article. Berger gratefully acknowledges financial support from the Swedish Research Council and the Crafoord Foundation. An earlier version of the article was circulated under the title 'Explaining differences in educational spending in rural Sweden in the 1870s'. All remaining errors are our own.

[1] 'En fattig sate får viska när den rike talar med tordönets avgörande stämma'; cited from Möller, *Svensk*, p. 35 (our translation).

[2] Easterlin, 'World'; Becker, Hornung, and Woessmann, 'Education'.

[3] Engerman, Mariscal, and Sokoloff, 'Persistence of inequality'; Engerman and Sokoloff, 'Factor endowments'; Galor and Moav, 'Human capital'; Acemoglu and Robinson, *Economic origins*; Galor, Moav, and Vollrath, 'Landownership'; Gallego, 'Schooling'.

to consolidate national identity, entrench the power of autocratic rulers, or instil factory discipline in the swelling working classes.[4] Ultimately, whether elites served to advance or obstruct the spread of mass schooling is an empirical question, to which the answer depends on the way in which elites perceived the relative merits of an educated populace.[5]

Our contribution to this debate is to analyse how the distribution of political power in local governments shaped spending on primary schooling (*folkskola*) in Sweden prior to the industrial breakthrough of the last decades of the nineteenth century. While Sweden was an economically backward country, it exhibited a level of human capital and schooling that was out of proportion to its level of economic development, which led Sandberg to term it Europe's 'impoverished sophisticate'.[6] School financing remained a local affair throughout the nineteenth century, which singles out the distribution of political power in local governments as a potentially important determinant of the commitment to mass schooling. Voting rights in local governments were based on the payment of taxes levied on income and landownership that severely restricted the franchise: as few as one in 10 had the right to vote, while the clear majority of the rural masses lacked political voice. Furthermore, an individual voter could hold an unlimited number of votes, as they were awarded in proportion to the amount paid in tax. As a result, local elites often gained a *de jure* control of decision-making processes, not least where a local dictator controlled more than half of all votes; these are manifestations of a system that was 'rigged with unequal representation'.[7] More generally, squaring the unequal distribution of political power with Sweden's early and extensive commitment to elementary education raises the important question: how did investments in mass schooling materialize in the context of a political system that was clearly designed to enable elites to capture local governments and potentially block the provision of public and tax-based education for the masses?

Our analysis uses newly collected data for more than 2,000 rural municipalities and exploits the variation in elite control and voting rights across local governments to identify how the distribution of political power shaped the commitment to mass schooling. As a first step in our analysis, we show that a more unequal distribution of votes in a local government was associated with higher educational expenditure. When decomposing this relationship, we find that the positive link between vote inequality and educational expenditure arises due to the commitment to investing in elementary education among influential landed elites. We find no similar association for capitalist elites and a weak link between various measures of industrial development and educational expenditure, which suggest that the rise of mass schooling prior to the mid-1870s did not reflect a growing demand for human capital. As emphasized by an earlier generation of Swedish historians, we argue instead that the support for mass schooling among landed elites prior to industrialization can be understood as a continuation of their old privileged positions as patrons of the local community, but adapted to new modernizing ideas about nation-building and social control, as well as a response to the increasing

[4] Weber, *Peasants*; Ramirez and Boli, 'Political construction'; Lott, 'Public schooling'; Aghion, Jaravel, Persson, and Rouzet, 'Education and military rivalry'.
[5] Kaestle, 'Scylla'; idem, *Pillars*; Lindert, *Growing public*.
[6] Sandberg, 'Case'.
[7] Lindert, *Growing public*, p. 79.

proletarianization of the rural population. Thus, while our findings highlight the role of landed elites in accounting for the rise of mass schooling in nineteenth-century Sweden, more broadly they also suggest that landed elites were not always a barrier to the diffusion of universal schooling, as sometimes envisaged in the literature.[8]

The rest of the article unfolds as follows. In the next section, we discuss the literature that has examined the role of elites in accounting for the spread of mass schooling in the nineteenth and twentieth century. In section II we provide an overview of the rise of Swedish primary schooling and the institutional structure that governed its provision. Section III describes the construction of our dataset and section IV explores the local determinants of schooling investments and presents the main empirical analysis and results. In section V, we conclude by discussing our findings and potential interpretations of the role of elites in accounting for the spread of mass schooling.

I

Why did some countries begin to provide public and tax-based mass schooling in the nineteenth century, while other countries had not developed anything resembling universal education by the outbreak of the First World War? To account for the uneven spread of mass schooling, Lindert advocates a bottom-up perspective and contends that mass schooling progressed where control over taxes and schooling was decentralized enough to allow advanced regions to forge ahead unfettered from conflicts between national elites, where voting rights were spread to a sufficient share of the population to allow their demand for public schooling to shape policy, and where affordable ways to provide it—that is, teachers on modest wages—were available.[9] Indeed, Go and Lindert claim that the autonomy of local governments, the diffusion of voting rights, and greater affordability can explain why the Northern US surpassed earlier educational leaders such as Prussia and led the world in terms of schooling by the mid-nineteenth century.[10]

A decentralized system of provision, however, also potentially enabled local elites to capture local governments in areas where political voice was more limited. Lindert contends that the way in which elites affect schooling investments can be organized broadly into two competing hypotheses.[11] First, elites may identify the important external benefits of elementary education and promote its diffusion to maintain social order or benefit from the economic returns of an educated workforce. Second, elites 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. Elites may thus either perceive an educated populace as an economic opportunity or as a political threat and would act accordingly, either to support or to oppose investments in mass schooling. An

[8] See, for example, Galor et al., 'Landownership', and the discussion in the next section.

[9] Lindert, *Growing public*.

[10] Go and Lindert, 'Uneven rise'. Other studies have broadly lent support to Lindert's emphasis on political voice, by documenting a negative relationship between the presence of landed elites and local investments in schools in the nineteenth- and twentieth-century US; Galor et al., 'Landownership'; Ramcharan, 'Inequality'; Vollrath, 'Inequality'.

[11] Lindert, *Growing public*.

important lesson emerging from the voluminous literature on this subject, however, is that elite perceptions of the potential benefits of an educated population varied considerably with the historical and institutional context.[12]

A recent body of work documents a negative association between economic or political inequality and the commitment to mass schooling, seemingly lending support to the second hypothesis. In particular, Galor et al. establish, theoretically and empirically, that high levels of land inequality constituted an obstacle to investments in schooling around the turn of the century in the US, and this has been echoed in subsequent work on nineteenth- and twentieth-century China, Korea, India, Prussia, Spain, and the UK.[13] All these contributions are broadly 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 labour force by limiting their outside options.[14]

A more equal distribution of political power did not, however, necessarily promote investments in mass schooling. Cvrcek and Zajicek point out that the expansion of political voice may have ambiguous effects on investments in education, as elites did not always oppose universal education: evidence from the Habsburg Empire shows that the spread of schooling was driven by local elites that subsidized schooling where it aligned with their ethnic preferences.[15] Similarly, in a critique of Lindert's interpretation of the rise of primary schooling in the US, Shammas 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.[16] Although the adverse impacts of economic and political inequality for the advancement of mass schooling remains an influential explanation for its uneven spread, there is mounting evidence that elites often played an important role in promoting universal schooling in less democratic countries ranging from early twentieth-century Argentina and China to Tsarist Russia and Portugal under the dictatorship of the Estado Novo.[17] More broadly, Aghion et al. conclude, on the basis of 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 component in explaining the spread of mass schooling.[18]

[12] Kaestle, 'Scylla'; idem, *Pillars*; Chaudhary, Musacchio, Nafziger, and Yan, 'BRICS'.

[13] Galor et al., 'Landownership'; Chaudhary et al., 'BRICS'; Go and Park, 'Elite-biased growth'; Cinnirella and Hornung, 'Landownership'; Beltrán Tapia and Martínez-Galarraga, 'Land access inequality'; Goñi, 'Landed elites'.

[14] Galor et al., 'Landownership'. 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, Bautista, Querubin, and Robinson, 'Economic and political inequality', have examined 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.

[15] Cvrcek and Zajicek, 'School'.

[16] Shammas, 'Democracy'.

[17] Elis, 'Redistribution'; Gao, 'Uneven rise'; Nafziger, 'Ivan's vote'; Palma and Reis, 'Tale of two regimes'.

[18] Aghion et al., 'Education and military rivalry'. Although Mulligan, Gil, and Sala-i-Martin, 'Democracies', show that there is no relationship between the level of democracy and expenditure on public education in contemporary cross-country data, a recent study by Bursztyn, 'Poverty', nuances these findings by showing that

Against this background, it is difficult to predict a priori how elite control may affect the provision of mass schooling: while economic motives may discourage (landed) elites from investing in schooling, their ideological or social motivations for doing so are a recurring explanation in the history of mass education.[19] In what follows, we outline the expansion of Swedish public mass schooling prior to the industrial breakthrough and then turn to a quantitative examination of the role of elites in accounting for local variations in school spending.

II

II.1

Public mass schooling (*folkskola*) was introduced in Sweden with the passing of the Elementary School Act in 1842.[20] According to the Act, every parish had to have at least one ambulatory (itinerant) or permanent school and minimum knowledge requirements were established related to arithmetic, reading, writing, and Scriptures.[21] As the majority of the peasantry opposed the decision since they feared having to pay higher taxes to finance the reform, the Act of 1842 came with a very limited financial resources from the state.[22] Consequently, school attendance was not made mandatory, no minimum attendance requirement was stipulated, and different forms of schools (such as ambulatory and part-time schools) were allowed.[23] Although the implementation of the reform was slow, enrolment in primary schooling had reached near-universal levels by the 1870s (see figure 1). An important driving force behind increases in enrolment was the development of the minor schools, while the use of fully-fledged fixed primary schools evolved relatively slowly.[24] However, low attendance rates and a short effective school year contributed to a situation where the actual average schooling received by a pupil corresponded to a meagre two years.[25]

Table 1 documents the expansion of resources dedicated to primary education, showing that half of Sweden's parishes were reported as lacking 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 of seven. Teachers' salaries were by far the highest-cost item, even though the share decreased between 1868 and 1876, which was also a period when lower-cost female teachers were introduced. Indeed, teachers seem to have been relatively affordable, which is

there is in fact a *positive* link between democracy and public expenditure in rich countries, which turns *negative* in poor countries.

[19] Easterlin, 'World'.

[20] A large body of work documents the rise of mass schooling in Sweden, such as Aquilonius, *Undervisningsväsendet*; Sörensen, *Svenska folkundervisningsväsendet*; Thunander, *Fattigskola*; Boli, *Citizens*, ch. 10; Richardson, *Svensk utbildningshistoria*.

[21] Sandberg, 'Case'.

[22] Nilsson and Pettersson, 'State'.

[23] Petterson, *Frihet*, p. 312.

[24] Minor schools, which offered only three years of schooling and were usually staffed by less educated female teachers, were introduced in 1858 as a response to demand for more flexible and less costly schooling; Nilsson and Pettersson, 'State', p. 222. Although private schools (*enskilda skolor*) for the emerging middle class and the wealthy existed, only about 1% of pupils in rural areas attended private schools in the mid-1870s; Statistics Sweden, BiSOS P 1882, p. 4.

[25] Ljungberg and Nilsson, 'Human capital', p. 80.

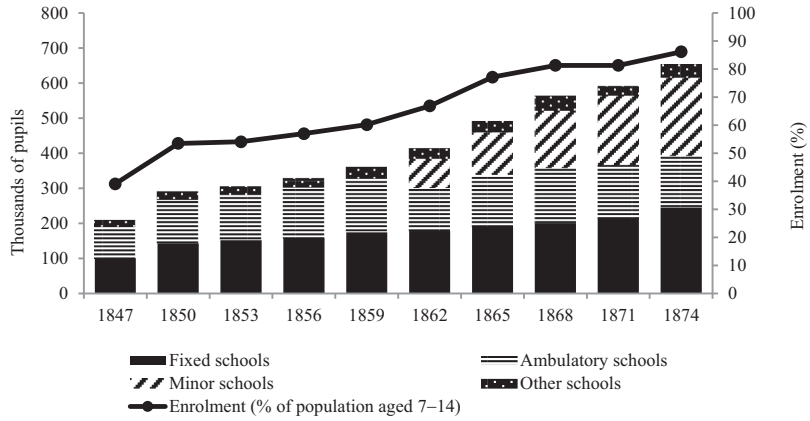


Figure 1. *Expansion of primary schooling, 1847–74*

Notes and sources: The share of school-aged children in each diocese in 1847 is estimated by multiplying the total population of each diocese by the share of school-aged children from 1868 (Statistics Sweden, BiSOS P 1868). The total population of each diocese in 1847 is estimated by multiplying the 1845 data by the national rate of population growth between 1845 and 1847, calculated from the Swedish population for 1847 (Statistics Sweden, BiSOS A 1851/5, p. LVI). Additional enrolment data are drawn from Schelin, *Officiella*, and population data from *Human Mortality Database*.

Table 1. *Primary schools: costs, resources, and revenues, 1839–76*

Year	*1839*	*1868*	*(shares)*	*1876*	*(shares)*
Resources (no.)					
School buildings	1,009	3,976		5,427	
Teachers (primary and minor)	1,040	7,145		9,299	
Revenue (thousands of kronor)					
School districts	-	2,502	72%	6,127	72%
State grants	-	968	28%	2,406	28%
Total	-	3,470	100%	8,533	100%
Costs (thousands of kronor)					
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, 617,000 kronor (in 1914 prices) of local taxes (*folkskoleavgiften*) was counted as a state grant, but was actually paid by the school district. If excluded, the state share corresponded to only 10% that year. In 1876, an additional 2,425 school buildings were rented by school districts. Nominal amounts were transformed into 1914 prices by using the consumer price index for Sweden for the years 1830–2003, published in Statistics Sweden, 'Consumer Price Index'.
Sources: 1839: Statistics Sweden, BiSOS P 1882, p. 5; 1868: idem, BiSOS P 1868, pp. XII, 66, 67; 1876: idem, BiSOS P 1882, tab 1.

consistent with contemporary teachers' accounts which are littered with complaints about low wages: the ratio of wages of primary school teachers in Stockholm relative to common labourers and textile workers, for example, hovered between 1.1 and 1.8.[26] Although international comparisons should be interpreted carefully—not least due to variation in teacher quality—the available evidence suggests that

[26] Bengtsson, 'Löneskillnader'. These calculations are, however, complicated by the extensive use of payments in kind. As stipulated by the Act of 1842, up to 68% of teachers' (minimum) wages could be paid in kind, and according to national statistics for the 1860s more than 40% of a teacher's wage could be constituted by firewood, fodder, and grains; Westberg, *Mass schooling*.

while Swedish primary school teachers were more expensive than their Northern American counterparts, they were relatively cheap from a European perspective.[27]

Primary schools were initially financed by the local population through donations, fees, and local taxes. Local taxes became the most important source of revenue for schooling and were mainly levied on those eligible to pay taxes either from landownership, or from business, capital, or wage income.[28] To support the expansion of schooling, the Act of 1842 created a state school tax by converting an existing state tax (*skyddsavgiften*), which was a flat tax paid by all adults. The school tax was collected through the state tax collection system and was restored to the parishes under the condition that they organized their schooling according to the Act of 1842, in particular by hiring a qualified teacher.[29] From the 1860s onwards, state grants covered around 30 per cent of total costs. 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, which thus made local spending decisions the key factor in explaining regional variation in educational expenditure.[30]

II.2

Local political assemblies governed the provision of elementary education throughout the nineteenth century. After the 1862 municipal reform, the municipal council (*kommunstämma*) was the highest decision-making body in the rural municipality, but somewhat oddly, the responsibility for primary education was given to the ecclesiastical municipalities, not the civil municipalities. Schooling investments were therefore governed by the parish council (*kyrkostämma*), with the same voting rules as the municipal council.[31] Elementary education remained one of the most important services provided by the municipalities, which is evident from the fact that expenditure on primary schools constituted the largest item in local government budgets, accounting for about 30 per cent of total spending.[32]

Voting rights in the local government were distributed in proportion to landownership or income among all juridical persons (that is, including individuals as well as corporations and other organizations), as stipulated by the 1862 municipal reform.[33] Formally, the calculation of voting rights was based on the payment of state taxes, which were set at 3 per cent of the value of agricultural land and 1 per cent of income (see online appendix table S1).[34] In the early 1870s, this

[27] For comparison, in the northern US the ratio of teachers' wages to those of common labourers was 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, 'Uneven rise', tab. 2; Cappelli, 'Escaping', p. 51.

[28] In contrast, school fees charged per pupil seem to have had a limited role in school financing; Wallner, *Folkskolans organisation*, p. 139.

[29] Ibid., p. 148.

[30] Westberg, 'Statsbidragens utveckling'; Wallin, *Forma en skolform*, p. 382.

[31] SFS 1862:15.

[32] Spending on ecclesiastical matters (28.6%) and poor relief (28.5%) constituted the other two large spending categories in rural municipalities in 1874; Statistics Sweden, BiSOS U 1874, p. XIII.

[33] Mellquist, *Rösträtt*.

[34] In practice, however, the way the value of land and income was calculated and how taxation translated into voting rights differed widely between municipalities; Statistics Sweden, BiSOS U 1874, p. x. According

graded voting system gave around 10 per cent of the rural population voting rights, but in many municipalities a few voters could often dominate local politics.[35] A single voter held more than half of all votes in 54 municipalities, which gave them *de jure* dictatorial powers.[36] In more than half of the municipalities, one individual voter controlled more than 10 per cent of the total votes, which is thought to have given significant *de facto* influence on local affairs.[37] An extremely low voter turnout among those with few votes further served to increase the relative power of influential vote holders.[38]

Consequently, the graded voting system led to an 'elitization' of local politics and the dominance of influential capitalist and landowning elites, which is evident from several local studies of municipal governments. Gustafsson's study of six municipalities in the Stockholm area, for example, indicates that elites had the upper hand, while elite influence is also evident in the four municipalities examined by Sjöberg, where the board members were almost exclusively land-owning and relatively well-educated men.[39] More broadly, large landowners dominated politics in parishes where they were present and in particular in areas of interest to them, such as railways, while peasants managed local affairs in parishes dominated by smallholders.[40] A more recent literature has also emphasized how emerging industrial elites intervened in municipal politics and shaped the provision of public goods.[41]

Ultimately, while these case studies provide informative examples of how elites played an active role in local politics, a larger sample of local governments and statistical evidence is required to test the more general hypothesis that an unequal distribution of political power shaped the provision of public goods, such as elementary education. Next we describe the construction of such a dataset and then turn to a quantitative examination of the local determinants of school spending.

III

We construct a new dataset consisting of information on spending on a variety of public goods and the distribution of voting rights for slightly more than 2,000 municipalities, which includes all rural municipalities for which we can identify both the distribution of votes and school spending.[42] The main measure of educational investments is drawn from the first available municipal financial reports

to law, the taxable value of land was meant to be based on quality, output, and price, but actual practice varied between administrative areas (Olsson, *Skatta*, p. 76), and under-taxation—both of income and land—was probably widespread, as the local and central tax authorities had limited means of verification (Hultqvist, *Försvar*, pp. 34–72).

[35] Statistics Sweden, BiSOS R 1871, pp. 7–8.

[36] Ibid., p. x.

[37] Mellquist, *Rösträtt*, p. 127.

[38] Möller, *Godsen*, p. 34, reports a turnout of 10% in local elections at the end of the nineteenth century and around 3% 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.

[39] Gustafsson, *Sockenstugans*, pp. 78–87; Sjöberg, *Framtidens*, pp. 173–7.

[40] Mellquist, *Rösträtt*; Möller, *Godsen*; Tiscornia, *Statens*, pp. 182–3.

[41] Michaëlsson, *Private subsidies*.

[42] We mainly exclude municipalities that shared common school districts where we cannot directly map the distribution of votes to expenditure data. Additionally, we also exclude urban areas from our sample as they were governed by a different political system.

that contain information on expenditure on public primary schooling in each municipality in 1874.[43] School spending consists of three main items: buildings and inventory (24 per cent of total school expenditures at the national level), teachers' wages (63 per cent), and other expenditures (13 per cent). As the main source of financing was derived from taxes levied on those with voting rights, we normalize educational expenditure by the number of taxpayers to reflect the tax effort for public schooling, though we show below that the results remain similar when normalizing by population or when educational expenditure is expressed as a share of total municipal spending. Additionally, from the same sources we also collect data on each municipality's population and spending on the church, communications, health, and poor relief.

Data on voting rights for the closest available year (1871) are reported in BiSOS R 1871, from which we collect the number of inhabitants with voting rights in each municipality.[44] Table 2 shows that about 10 per cent of the population had voting rights in the average municipality in 1871, though the sample ranges from municipalities where less than 1 per cent could vote to those where more than one in four had voting rights. As the voting system was graded, the number of voters that held respectively <2, 2–5, 5–10, 10–25, 25–50, and >50 per cent of all votes is also reported separately for votes derived primarily from (business, capital, and wage) income or landownership.[45] We use these grouped data to calculate Gini coefficients of the distribution of votes among vote holders as our baseline measure of political inequality in local governments.[46] We also calculate analogous measures for the distribution of votes based on income (G^I) and landownership (G^L) respectively, which allows us to measure vote inequality within these two main groups of voters. An important potential drawback of these Gini measures is that they do not account for the fact that the clear majority of the population did not have voting rights. We therefore follow Vollrath and also calculate an adjusted Gini coefficient (G^A) that accounts for differences in the share of the population that lacked the vote; a larger share of the population without voting rights results in a larger adjusted Gini coefficient relative to the baseline.[47] As shown in table 2, the Gini coefficient of vote inequality is 0.26 in the average municipality, while the sample ranges from municipalities where all voters control an approximately equal share of votes to those where the Gini coefficient exceeds 0.72. Although

[43] Statistics Sweden, BiSOS U 1874.

[44] Statistics Sweden, BiSOS R 1871. The voting data have been widely used by Swedish historians (Mellquist, *Rösträtt*, pp. 115–16) and the overall quality is deemed reasonable by contemporaries (Statistics Sweden, BISOS R 1871, p. VI).

[45] More than 81% of the individuals with voting rights were awarded their votes mainly due to landownership, which suggests that landowners were arguably the most important group of voters; Statistics Sweden, BiSOS R 1871, p. IX.

[46] As the vote shares are reported in intervals (for example, the number of voters with 5–10% of the total votes), we assume that each voter holds the midpoint value of each bin; for the top bin, we assume that a voter holds exactly 50% of all votes. We note, however, that the grouped nature of the data will lead us to underestimate vote inequality, mainly because it obscures within-group differences in vote shares and because many voters in the bottom bin held substantially less than 1% of the total votes. Although assuming alternative smaller (higher) values for the bottom (top) bin inflates the Gini measures, we have experimented with a range of values that seemingly do not affect the subsequent analysis in a major way.

[47] Vollrath, 'Inequality', p. 273. Letting G^A denote the Gini that excludes individuals that do not have voting rights from the calculation, the adjusted Gini is calculated as $G^A = sG + (1 - s)$ where s denotes the share of the population with voting rights. Note that in the case where the entire population has voting rights (that is, when $s = 1$) the adjusted and unadjusted Gini are identical.

Table 2. *Summary statistics*

	Panel A. Full sample				*Panel B. Elite*		
	Mean (1)	*Std. dev. (2)*	*Min. (3)*	*Max. (4)*	*Capitalist (5)*	*Landed (6)*	*None (7)*
Political power, 1871							
Gini of vote inequality	0.26	0.17	0.00	0.73	0.30	0.37	0.15
Adjusted Gini (G^A)	0.92	0.04	0.75	1.00	0.93	0.94	0.90
Gini (G^L)	0.22	0.18	0.00	0.74	0.19	0.36	0.13
Gini (G^I)	0.27	0.19	0.00	0.73	0.47	0.25	0.20
Landed elite: >10% of votes (0/1)	0.41	0.49	0.00	1.00	0.28	1.00	0.00
Landed elite: >25% of votes (0/1)	0.11	0.31	0.00	1.00	0.05	0.26	0.00
Landed dictator: >50% of votes (0/1)	0.01	0.10	0.00	1.00	0.00	0.02	0.00
Capitalist elite: >10% of votes (0/1)	0.26	0.44	0.00	1.00	1.00	0.18	0.00
Capitalist elite: >25% of votes (0/1)	0.06	0.23	0.00	1.00	0.22	0.02	0.00
Capitalist dictator: >50% of votes (0/1)	0.01	0.09	0.00	1.00	0.03	0.00	0.00
Voting rights (%)	10.34	3.90	0.84	27.68	10.20	8.82	11.60
Municipal expenditure, 1874							
Church per capita (kronor)	1.30	1.87	0.00	40.50	1.25	1.38	1.29
Communications per capita (kronor)	0.15	0.93	0.00	21.03	0.16	0.11	0.17
Education per taxpayer (kronor)	15.91	18.40	0.27	309.10	16.59	20.78	11.92
Education per capita (kronor)	1.43	1.31	0.02	20.16	1.37	1.61	1.33
Health per capita (kronor)	0.07	0.08	0.00	0.94	0.07	0.07	0.06
Poor relief per capita (kronor)	1.16	0.64	0.00	6.33	1.14	1.23	1.11
Total expenditure per capita (kronor)	4.39	2.85	0.81	43.13	4.29	4.68	4.25
Church (%)	25.17	19.96	0.00	93.90	25.85	23.97	26.15
Communications (%)	2.07	7.50	0.00	77.69	2.47	1.33	2.40
Education (%)	34.10	16.11	0.64	92.09	33.33	36.21	32.68
Health (%)	1.75	2.11	0.00	17.23	1.93	1.75	1.64
Poor relief (%)	30.33	15.48	0.00	81.07	29.52	30.16	30.74
Municipality characteristics							
Agricultural suitability (0-1)	0.26	0.41	0.00	1.00	0.19	0.39	0.18
Distance to Stockholm (km)	298.64	145.84	4.12	934.82	278.42	271.84	331.49
Distance to town (km)	25.12	21.86	0.57	282.24	27.22	18.97	29.10
Employed in industry, 1880 (%)	7.84	5.69	0.00	60.00	9.98	7.81	6.63
Population density, 1874 (/km^2)	28.13	24.41	0.22	361.70	23.65	29.67	29.28
Railway, 1870 (0/1)	0.23	0.42	0.00	1.00	0.18	0.30	0.20
Tax value income per capita, 1874 (thousands of kronor)	0.01	0.02	0.00	0.45	0.03	0.01	0.01
Tax value land per capita, 1874 (thousands of kronor)	0.58	0.28	0.05	1.92	0.53	0.70	0.50
Observations		2,054			530	843	832

Notes: Panel A reports summary statistics for the main variables in the full sample while panel B reports mean outcomes for municipalities where a capitalist or landed elite is present, which is defined as municipalities where at least one voter controls more than 10% of the total votes derived from income and landownership respectively, and non-elite municipalities. Note that the number of municipalities in cols. 5–7 exceeds the total number of municipalities due to some municipalities having both a capitalist and landed elite present.
Source: Authors' calculations based on data described in section III.

comparisons should be made with extreme caution, it is also interesting to note that the average adjusted Gini coefficient (that is, taking into account those without voting rights) of 0.92 closely parallels recent estimates of rural wealth inequality in Sweden that suggest a Gini coefficient of 0.84 in 1850 and 0.93 in 1900.[48]

[48] Bengtsson, Missiaia, Olsson, and Svensson, 'Wealth', tab. 5.

To identify local elites, we isolate municipalities in which individual voters held a disproportionate share of the total votes. More specifically, our preferred measure of elite control is an indicator variable taking a value of 1 if at least one voter controlled more than 10 per cent of the total votes in the local government, the level at which Mellquist argues that a voter gained significant influence over local affairs.[49] According to this definition, 'capitalist' and 'landed' elites—that is, those that derive their votes mainly from income or landownership—were present in 530 and 843 municipalities respectively. Table 2 shows the significant variation in educational expenditure in the sample and documents the higher educational expenditure, in both absolute and relative terms, in municipalities that were dominated by a landed elite (panel B), while figure 2 maps the spatial distribution of capitalist and landed elites included in our sample.

Additional data for our other controls are constructed from a variety of sources. A mechanical link between voting rights and income or landed wealth suggests that both factors are central supply-side variables to include as controls. For each municipality, we collect the taxable value of land and taxable income corresponding to the sum of income from capital, employment, pensions, and business in kronor, extracted from BiSOS U 1874.[50] To account for differences in the quality of land that constitute an important determinant of land values, we calculate the share of land that is suitable for cultivating barley, rye, and wheat based on data from the United Nations' Food and Agriculture Organization's Global Agro-Ecological Zones (FAO-GAEZ) database.[51] We measure differences in occupational structure and potential differences in the industrial demand for education by using the 1880 population census, which has been made available in its entirety through the North Atlantic Population Project, to calculate the share of the labour force employed in industry in each municipality based on HISCO-coded occupational titles.[52] Lastly, we use railroad maps from Berger and Enflo to identify municipalities that were connected to the railroad network in 1870 and use the underlying GIS maps to construct additional variables, such as the distance to the nearest town and to Stockholm, to proxy for differences in access to urban markets.[53]

IV

IV.1

As a starting point for examining the potential link between educational expenditure and vote inequality, figure 3 presents binned scatterplots of spending on elementary education per taxpayer and our baseline Gini coefficient of vote inequality across

[49] Mellquist, *Rösträtt*, p. 127. In our empirical analysis below, we use a variety of different cutoffs to define this indicator (for example, >25 and >50% of all votes) and also show results where we use the distribution of votes across all voting bins available in the data.

[50] Statistics Sweden, BiSOS U 1874.

[51] Food and Agriculture Organization of the United Nations, Global Agro-Ecological Zones, http://gaez.fao.org/Main.html (accessed on 5 Jan. 2015).

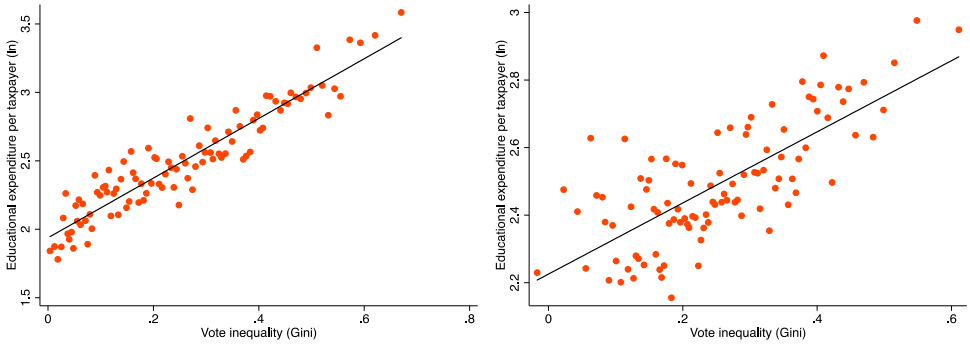
[52] See Integrated Public Use Microdata Series, North Atlantic Population Project, https://www.nappdata.org/ (accessed on 25 Jan. 2015).

[53] Berger and Enflo, 'Locomotives'. Berger, 'Railroads', documents that the expansion of the railroad network led to structural transformation in rural areas over the period studied here, suggesting it is a relevant proxy for industrialization.

Figure 2. *Capitalist and landed elites*

Notes: These maps show the location of capitalist (black triangles) and landed (black circles) elites respectively, defined as municipalities where a single voter holds more than 10% of all votes due to income or landownership.
Source: Authors' calculations based on data described in section III.

municipalities. To construct figure 3a, we sort all municipalities into 100 equal-sized groups and plot the mean educational expenditure versus vote inequality within each bin, which shows that educational expenditure was substantially higher on average in municipalities where the distribution of votes was more unequal. Figure 3b shows that this relationship is similar after absorbing differences in the tax value of income and land per capita, the share of the population with voting rights and its square, as well as a wide set of demand and supply factors that we



a) Unconditional relationship

b) Conditional relationship

Figure 3. *Educational expenditure and vote inequality*
[Colour figure can be viewed at wileyonlinelibrary.com]

Notes: This figure shows binned scatterplots of *ln* educational expenditure per taxpayer in 1874 and vote inequality in 1871 measured as a Gini coefficient based on the distribution of votes across all vote holders. To construct fig. 3a, we sort all observations into 100 equal-sized groups and plot the mean educational expenditure per taxpayer vs. vote inequality within each bin. In fig. 3b, we first absorb differences in access to the railway network, agricultural suitability, *ln* distance to the nearest town and Stockholm, *ln* population density, the *ln* tax value of income and land per capita, the share employed in industry, and the share of the population with the vote and its square. We then plot the residualized educational expenditure vs. the residualized vote inequality within each bin for 100 equal-sized groups. Also shown are fitted OLS regressions based on the underlying (ungrouped) data.
Source: As for fig. 2.

discuss in more detail below.[54] To probe the robustness of this relationship further, we estimate the corresponding ordinary least squares (OLS) regressions:

$$\ln(S_m) = \alpha + \delta G_m + \mathbf{X_m}\beta + \varepsilon_m \quad (1)$$

where S is educational expenditure per taxpayer in municipality m, G is the Gini coefficient of vote inequality, and $\mathbf{X}$ is a vector of controls. While the statistically significant and positive association between vote inequality and educational expenditure reported in table 3, column 1, is suggestive, it may simply arise due to a wide range of potentially omitted factors. In the following columns, we therefore add the full set of controls to account for, among other things, differences in income, landed wealth, and voting rights across municipalities, as well as 24 county (*län*) and 309 district (*härad*) fixed effects respectively. Although smaller in magnitude, the estimates reported in columns 2–4 consistently return a positive and statistically significant link between vote inequality and educational expenditure, which suggests that a one-point increase in the Gini coefficient is associated with a 1.2 per cent (0.012 log points) increase in expenditure (column 4). While these results could potentially be sensitive to our baseline Gini coefficient not reflecting the fact that the majority of the population lacked voting rights, the results using the adjusted Gini coefficient reported in column 5 reassuringly return an even stronger

[54] As shown in fig. S1, the relationship is very similar if we instead focus on educational expenditure per capita, which is underlined further by the results reported in tab. S2, which replicates tab. 3 using per capita spending as the outcome. Note that when we residualize the variables in figs. 3 and S1, we rescale the graphs by adding the sample mean to the residuals before binning and plotting.

Table 3. *Educational expenditure and vote inequality*

	Outcome: educational expenditure per taxpayer (ln)					
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
Gini of vote inequality	2.180***	1.053***	1.074***	1.196***		
	(0.106)	(0.110)	(0.108)	(0.127)		
Adjusted Gini (G^A)					9.553***	
					(1.005)	
Gini (G^L)						1.020***
						(0.102)
Gini (G^I)						−0.108*
						(0.065)
Income and wealth?	No	Yes	Yes	Yes	Yes	Yes
Municipality characteristics?	No	Yes	Yes	Yes	Yes	Yes
Voting rights?	No	Yes	Yes	Yes	Yes	Yes
Fixed effects?	No	No	County	District	No	No
Observations	2,054	2,054	2,054	2,054	2,054	2,054
R^2	0.280	0.424	0.484	0.613	0.424	0.423

Notes: This table reports OLS estimates of equation 1 in section IV.1, where the outcome is *ln* educational expenditure per taxpayer in 1874. Gini coefficients measure the distribution of votes per vote holder in 1871, as described in detail in section III. Income and wealth controls include the *ln* tax value of income and land per capita respectively. Municipality characteristics include access to the railway network, agricultural suitability, the *ln* distance to the nearest town and Stockholm, *ln* population density, and the share employed in industry. Voting rights correspond to the share of the population with the vote and its square. Standard errors clustered at the district level are reported in parentheses and statistical significance is denoted by ***p<0.01, **p<0.05, *p<0.1.
Source: As for tab. 2.

positive link between vote inequality and educational expenditure.[55] Together, these results thus suggest that municipalities where the distribution of votes was more unequal invested substantially more in schooling for the local population.

Although these findings point consistently to a positive link between overall vote inequality and educational expenditure, they do not shed light on whether this relationship is driven by a concentration of votes among a small group of top elite voters, or whether it reflects an uneven diffusion of voting rights among the population. To understand how these factors shape overall vote inequality, next we regress our baseline Gini coefficient of vote inequality (G_m) on variables capturing the presence of local capitalist and landed elites, as well as the share of the population with voting rights:

$$G_m = \alpha + \delta_1 E_m^L + \delta_2 E_m^C + \delta_3 V_m + \varepsilon_m \quad (2)$$

where E^L and E^C are indicator variables taking a value of 1 if at least one voter holds more than a given share of all votes in a municipality due to landownership (L) or income (C), and 0 otherwise, while V corresponds to the percentage of the population with voting rights. In the regression, we will test three different thresholds, 10 per cent, 25 per cent, or 50 per cent. As evident from the OLS estimates reported in table 4, the level of vote inequality is substantially higher in municipalities where more influential capitalist or landowning elites are present;

[55] According to the estimate reported in col. 5, a standard deviation increase in our adjusted Gini (0.04) is associated with a 47% (0.382 log points) increase in expenditure, while a standard deviation increase in our baseline Gini (0.17) is predicted to increase expenditure by 20% (0.179 log points) according to the corresponding estimates reported in col. 2.

Table 4. *Elites, voting rights, and vote inequality*

	Outcome: vote inequality (Gini)		
Elite definition (% of total votes):	*(1) >10*	*(2) >25*	*(3) >50*
Landed elite (=1)	0.176***	0.196***	0.250***
	(0.007)	(0.011)	(0.027)
Capitalist elite (=1)	0.083***	0.078***	0.105***
	(0.008)	(0.015)	(0.024)
% with voting rights	−0.009***	−0.012***	−0.016***
	(0.002)	(0.002)	(0.002)
Observations	2,054	2,054	2,054
R^2	0.407	0.278	0.175

Notes: This table reports OLS estimates of equation 2 in section IV.1, where the outcome is our baseline Gini coefficient of vote inequality in 1871. Elite indicators take the value 1 if at least one voter controls more than the share of total votes in a municipality denoted in the top row and 0 otherwise, where we distinguish between capitalist and landed elites based on whether a voter obtains his votes due to income or landownership. Standard errors clustered at the district level are reported in parentheses and statistical significance is denoted by ***p<0.01, **p<0.05, *p<0.1.
Source: As for tab. 2.

in municipalities where a landed voter controlled more than half of all votes, for example, the Gini coefficient is about 0.250 higher on average (column 3). Overall, vote inequality is higher where landed rather than capitalist elites are present, while there is a strong negative correlation between the share of the population with voting rights and overall vote inequality.[56]

A higher level of vote inequality in municipalities where influential capitalist and landed voters are present would seem to imply that both types of elite dominance might in turn be positively correlated with educational expenditure and partly drive the relationship depicted in figure 3. Yet the estimates reported in the final column (6) of table 3 document an important nuance: while a more unequal distribution of votes among landowners is associated with substantially higher educational expenditure, the association between vote inequality among income earners and expenditure is close to zero in magnitude and not statistically significant. Thus, the fact that the positive link between vote inequality and educational expenditure seemingly arises due to a concentration of votes among landed voters motivates a more detailed examination of the potentially different roles of capitalist and landed elites in explaining the varying commitment to mass schooling across municipalities.

IV.2

As a starting point for understanding how elite control shaped educational expenditure, figure 4 graphs the distribution of expenditure per taxpayer for municipalities dominated by a capitalist and landed elite, as well as for municipalities where no elite was present. A rightward shift of the distribution of school spending in elite-dominated municipalities is indicative of a stronger commitment to mass schooling, which is particularly pronounced in areas governed

[56] All results are similar if we instead use the adjusted Gini of vote inequality as the outcome, or when we condition on the full set of controls and regional fixed effects (not reported).

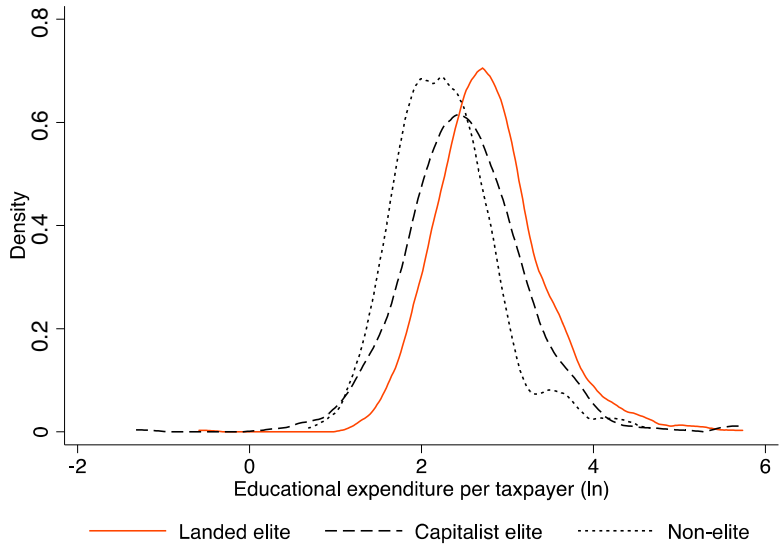


Figure 4. *Educational expenditure in elite and non-elite municipalities [Colour figure can be viewed at wileyonlinelibrary.com]*

Notes: This figure plots kernel density distributions of *ln* educational expenditure per taxpayer in 1874 for municipalities dominated by a capitalist or landed elite and those where no elite was present. Municipalities governed by an elite are defined as those where at least one voter holds more than 10% of all votes in a municipality (where we distinguish between capitalist and landed elites based on whether a voter obtains his votes due to income or landownership respectively), while non-elite municipalities are those that lack such influential vote holders.
Source: As for fig. 2.

by landed elites.[57] To analyse these patterns more systematically, we estimate regressions on the form:

$$\ln(S_m) = \alpha + \delta_1 E_m^L + \delta_2 E_m^C + \mathbf{X_m}\beta + \varepsilon_m \quad (3)$$

where S denotes educational expenditure per taxpayer (or per capita) in municipality m, E^L and E^C are again indicator variables denoting whether a landed or capitalist elite is present in a municipality, and $\mathbf{X}$ is a vector of controls. As shown in table 5, column 1, both types of elite control are significantly and positively correlated with educational expenditure when using our baseline elite definitions (that is, at least one individual holding >10 per cent of all votes) though the association is substantially stronger for landed elites, which is consistent with the patterns depicted in figure 4. An obvious concern, however, is that the positive association between elite control and educational expenditure may simply reflect the higher average level of income and (landed) wealth in these municipalities, or that elite dominance may be mechanically linked to differences in the share of the population with the vote (see table 2, panel B). As a set of baseline controls, we therefore add the tax value of income and land per capita as well

[57] A two-sample Kolmogorov–Smirnov test of the equality of the distributions of educational expenditure in municipalities governed by a landed elite relative to non-elite municipalities and those dominated by capitalist elites suggests that we can clearly reject that the distributions are the same (p-value <0.001).

Table 5. *Elites and educational expenditure*

	Outcome: educational expenditure per taxpayer (ln)						
Elite definition (% of total votes):	*(1) >10*	*(2) >10*	*(3) >25*	*(4) >50*	*(5) >10*	*(6) >10*	*(7) >10*
Landed elite (=1)	0.513***	0.154***	0.144***	0.259**	0.132***	0.102***	0.076***
	(0.035)	(0.029)	(0.039)	(0.122)	(0.028)	(0.028)	(0.029)
Capitalist elite (=1)	0.088**	−0.008	−0.137*	−0.156	−0.009	−0.006	0.003
	(0.035)	(0.034)	(0.071)	(0.148)	(0.034)	(0.032)	(0.034)
% with voting rights		−0.226***	−0.229***	−0.235***	−0.240***	−0.243***	−0.238***
		(0.018)	(0.019)	(0.019)	(0.017)	(0.017)	(0.020)
% with voting rights^2		0.007***	0.007***	0.007***	0.007***	0.007***	0.007***
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Tax value of income per capita (*ln*)		0.061***	0.068***	0.056***	0.057**	0.060***	0.042
		(0.022)	(0.021)	(0.020)	(0.024)	(0.023)	(0.026)
Tax value of land per capita (*ln*)		0.361***	0.399***	0.416***	0.226***	0.160**	0.212***
		(0.057)	(0.054)	(0.053)	(0.064)	(0.063)	(0.079)
Agricultural suitability (0-1)					0.173***	0.130**	0.150**
					(0.057)	(0.059)	(0.067)
Distance to Stockholm (*ln*)					0.017	0.021	−0.066
					(0.027)	(0.058)	(0.124)
Distance to town (*ln*)					−0.049**	−0.069***	−0.046
					(0.025)	(0.024)	(0.032)
% employed in industry					0.004	0.002	0.000
					(0.003)	(0.003)	(0.003)
Population density (*ln*)					0.006	−0.099***	−0.092**
					(0.027)	(0.034)	(0.042)
Railway (=1)					0.099**	0.062	0.063
					(0.042)	(0.042)	(0.049)
Fixed effects?	No	No	No	No	No	County	District
Observations	2,054	2,054	2,054	2,054	2,054	2,054	2,054
R^2	0.135	0.373	0.370	0.365	0.393	0.455	0.583

Notes: This table reports OLS estimates of equation 3 in section IV.2, where the outcome is *ln* educational expenditure per taxpayer in 1874. Elite indicators take the value 1 if at least one voter controls more than the share of total votes in a municipality denoted in the top row and 0 otherwise, where we distinguish between capitalist and landed elites based on whether a voter obtains his votes due to income or landownership. Standard errors clustered at the district level are reported in parentheses and statistical significance is denoted by ***p<0.01, **p<0.05, *p<0.1.
Source: As for tab. 2.

as the share of the population with voting rights and its square (to allow for potentially non-linear effects) in the subsequent columns, which shows that the presence of a landed—but not capitalist—elite remains strongly associated with higher educational expenditure.[58]

Columns 2 and 3 present estimates in which local capitalist and landed elites are defined as those that hold >10 and >25 per cent of the total votes respectively, which document a positive and highly statistically significant association between the presence of a landed elite and educational expenditure that remains broadly similar in size using the alternative cut-offs. Based on our preferred elite definition, the presence of a landed elite is associated with a 17 per cent (0.154 log points) increase in educational expenditure (column 2). Column 4 shows that when we focus on the subset of municipalities that were ruled by a landed dictator, controlling more than half of all votes, expenditure was more than 30 per cent (0.259 log points) higher on average. Virtually all of these local dictatorships are municipalities dominated by large manorial estates—such as Bollerup, Högestad, and Skarhult—and these results thus lend support to the emphasis in prior research on the top landed elite's historical commitment to investing in schools for the local population.[59]

At the same time, there is nothing to suggest that the presence of capitalist elites served to raise school spending: the estimates reported in table 5, columns 2–4, are all negative and not statistically significant.[60] Even in the municipalities where a single capitalist held more than half of all votes—including municipalities such as Forsmark, which was dominated by a major ironworks, and Skultuna, which still houses one of the world's oldest brass factories—there is no evidence that the presence of exceptionally influential capitalists promoted schooling investments (column 4). Additional supporting evidence for the different associations for capitalist and landed voters is provided in online appendix S1, where we present regression results that yield very similar patterns from exploiting the distribution of capitalist/landed voters across the whole vote share distribution (see online appendix figure S2 and table S4). Overall, these results suggest that capitalist elites were not systematically advancing tax-based schooling for the masses prior to the industrial breakthrough, although this does not rule out contributions through private donations emphasized in local studies.[61]

While local elites often dominated municipal governments, it is possible that the right to attend meetings by less influential voters still affected spending decisions. Across all specifications in table 5, there is a negative and statistically significant link between the share of the population with voting rights and school spending, although the quadratic effect suggests that this negative impact attenuates when

[58] As revealed by the estimates in tab. 5, there is a large, positive, and statistically significant elasticity between the tax value of land and schooling investments, which is underlined further by the positive link between agricultural suitability and educational expenditure (cols. 5–7). However, although underlying differences in (landed) wealth are clearly important correlates of educational expenditure, they do not fully account for the link between elite control of local politics and school spending, as discussed further below.

[59] For example, Tiscornia, *Statens*; Sundberg, Germundsson, and Hansen, eds., *Modernisation*, p. 142.

[60] As some municipalities had both capitalist and landed elites present, there might be potential interaction effects when these two elites clashed in local governments. However, examination of the interaction effects between capitalist and landed elites as defined in tab. 5 yields estimates that are relatively small in magnitude and that are never statistically significant (not reported).

[61] Michaëlsson, *Private subsidies*.

a larger share of the population is enfranchised.[62] Overall, evidence that school spending was lower in municipalities with a more broadly diffused political voice suggests that the spread of voting rights did little to increase tax efforts for mass schooling in the context of an overall highly restricted franchise, which further underlines the role of the top elite of landowners in supporting the expansion of education.

IV.3

A first concern is that the higher educational expenditure in areas dominated by landed elites may reflect potentially omitted factors or broader regional differences in the commitment to mass schooling. We address this in two ways. First, we present additional estimates in table 5, columns 5–7, where we control for a wider range of potential determinants of educational expenditure, as well as regional fixed effects, and discuss whether observable characteristics—such as industrialization—can account for the association. Second, we exploit the potential selection on such observable factors to assess whether it is likely that the relationship is driven by unobservable factors that are correlated with both elite control and educational expenditure. Lastly, we examine whether our findings are sensitive to how educational expenditure is defined, or whether our main results simply reflect a greater overall commitment among landed elites to investing in public goods for the local population.

Although our estimates may reflect a higher demand for human capital in areas dominated by landed elites, the demand for elementary education is likely to have been *lower* in areas characterized by agricultural activities, due to the low complementarity between human capital and agricultural work.[63] While the demand for literacy increased among freehold farmers in Sweden during the Enclosure Movement in the early nineteenth century,[64] the returns to education were negligible among the vast masses of agricultural labourers, which is summarized in Sandberg's observation that 'the almost universal literacy of the agricultural proletariat did little to increase their productivity at the time'.[65] Although early industrial advances may have prompted a demand-led expansion of schooling, its role is similarly likely to have been minor for at least three reasons.[66] First, although the share employed in industry was slightly higher in elite-dominated municipalities, its overall share in employment was relatively low (see table 2). Second, while the five additional proxies for local economic development

[62] Interestingly, these results resonate with the cross-country findings of Lindert, *Growing public*, p. 106, that elite democracies in which less than 40% of the population had the vote did not invest more in schooling than non-democratic countries between 1880 and 1930.

[63] Galor et al., 'Landownership'. Although Parman, 'Schools', documents positive returns to human capital among farmers in the early twentieth-century US, these findings remain silent regarding whether educational investments also raised the productivity of agricultural labourers.

[64] For example, Nilsson, Pettersson, and Svensson, 'Agrarian transitions'; Nilsson and Pettersson, 'State'.

[65] Sandberg, 'Case', p. 226.

[66] Child labour 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 potentially positive effect of industrialization on schooling investments. Olsson, *Barn*, for example, reports that children (aged under 14) constituted 5.5% of the industrial workforce in 1875, with a significantly higher share employed in industries such as glass works and match factories. Yet the extensive use of child labour in agriculture as well suggests that the opportunity cost of sending children to school was also substantial in areas characterized by agricultural activities.

and industrialization included in columns 5–7 of table 5 generally have the expected signs, the estimated magnitudes and statistical significance attenuate when county or district fixed effects are included (columns 6 and 7).[67] Third, the relatively minor role of industrial advances in explaining the variation in educational expenditure is further underlined by the substantially smaller elasticity for taxable incomes—a proxy for industrial activity—compared to the tax value of land, as evident throughout table 5. Most importantly, the inclusion of these additional controls does not alter the positive link between the presence of landed elites and educational expenditure: even when conditioning on the full set of controls and only exploiting within-district variation in elite control, the estimate suggests that the presence of a landed elite is associated with an 8 per cent (0.076 log points) increase in expenditure (column 7).

Although the positive link between landed elites and educational expenditure persists when conditioning on a rich set of observable factors, as well as when factoring out regional unobserved heterogeneity, it is still possible that our estimates are biased due to *unobservable* omitted factors. Using the method developed by Altonji et al. and applied by Nunn and Wantchekon, we can assess the role that unobservable factors must play in order to explain away the link between elite control and school spending.[68] By calculating the ratio between an estimate obtained from a regression including a restricted set of controls (δ^R) and the estimate from a specification that includes a richer set of controls (δ^F), we can approximate how large the selection on unobservables has to be *relative* to the selection on these additional observable characteristics to explain away our results as: $\delta^F/(\delta^R - \delta^F)$. Based on the estimates in columns 2 and 5 of table 5, the Altonji et al.-ratio (0.132/(0.154–0.132)) suggests that the selection on unobservables has to be six times larger than the selection on the additional observables—such as the share employed in industry, or railway access—to explain away the result. In our view, this suggests that unobservable factors are unlikely to provide a full explanation for the positive link between the presence of landed elites and educational expenditure.[69]

A second concern is that our results might be sensitive to how we define educational expenditure. Although normalizing expenditure by the number of taxpayers constitutes an appropriate measure of the tax effort among those mainly paying for its provision, it also raises concerns that our results may be an artefact of this normalization. First, we show in table 6 that results are similar when normalizing spending by population rather than the number of taxpayers (column 1), which is unsurprising given the high correlation (0.82) between spending per

[67] Note that a negative link between population density and educational expenditure probably reflects the lower fixed cost of supplying schooling in more densely settled areas. A related line of inquiry is to ask whether landed elites were more responsive to the demand for education as proxied by these factors. As shown in online app. S1, however, there is little to suggest that either capitalist or landed elites favoured greater investments in schooling in areas with, for example, better access to urban markets or with a higher share of their population employed in industry; see online app. tab. S5.

[68] Altonji, Elder, and Taber, 'Selection'; Nunn and Wantchekon, 'Slave trade'.

[69] Even when considering the most restrictive estimates in tab. 5, col. 7, which include district-level fixed effects and the full set of controls, the Altonji et al.-ratio is close to one, suggesting that selection on unobservables must play a similarly large role as the additional factors included to explain away the results.

Table 6. *Alternative definitions of educational expenditure*

	Panel A. Alternative expenditure			*Panel B. Expenditure type*			*Panel C. Excluding outliers*		
	Per capita (1)	*Excl. grants per capita* (2)	*Excl. grants per taxpayer* (3)	*Houses* (4)	*Other* (5)	*Wages* (6)	*<99%* (7)	*<95%* (8)	*<90%* (9)
Landed elite (=1)	0.135***	0.114***	0.110***	0.047	0.072	0.162***	0.131***	0.127***	0.124***
	(0.028)	(0.031)	(0.031)	(0.127)	(0.068)	(0.024)	(0.026)	(0.024)	(0.023)
Capitalist elite (=1)	−0.013	−0.034	−0.031	−0.046	−0.041	0.018	−0.019	0.007	0.014
	(0.033)	(0.038)	(0.039)	(0.144)	(0.063)	(0.028)	(0.031)	(0.029)	(0.028)
Income and wealth?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality characteristics?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Voting rights?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,054	2,053	2,053	2,054	2,054	2,054	2,034	1,951	1,849
R^2	0.215	0.195	0.331	0.081	0.205	0.452	0.391	0.395	0.375

Notes: This table reports OLS estimates of equation 3 in section IV.2, where the outcomes are alternative measures of *ln* educational expenditure. Col. 1 normalizes educational expenditure by population, while cols. 2 and 3 exclude state grants and normalize by population and the number of taxpayers respectively. Cols. 4–6 break down the total educational expenditure into spending on school houses, other expenditure, and teachers' wages per taxpayer respectively. Cols. 7–9 exclude the top 1, 5, and 10% of observations in terms of educational expenditure per taxpayer. Elite indicators take the value 1 if at least one voter controls more than 10% of the total votes in a municipality and 0 otherwise, where we distinguish between capitalist and landed elites based on whether a voter obtains his votes due to income or landownership. Income and wealth controls include the *ln* tax value of income and land per capita respectively. Municipality characteristics include access to the railway network, agricultural suitability, the *ln* distance to the nearest town and Stockholm, *ln* population density, and the share employed in industry. Voting rights correspond to the share of the population with the vote and its square. Standard errors clustered at the district level are reported in parentheses and statistical significance is denoted by ***p<0.01, **p<0.05, *p<0.1.
Source: As for tab. 2.

capita and per taxpayer.[70] Second, columns 2 and 3 use local spending (that is, total spending minus state grants) normalized by population and the number of taxpayers respectively as an outcome.[71] Again, the results are virtually unchanged, which is expected, since local taxes financed most of the expenditure and state grants were matched to local spending (see section II.1). Third, columns 4–6 break down total school spending as spending on buildings, wages, and a residual category, which suggests that the increases in educational expenditure primarily reflected increases in spending on teachers, which constituted the most costly item (see table 1).[72] Finally, while teachers' wages were recurrent costs and did not vary substantially between years, spending on school buildings includes one-off investments in the building stock, which means that there may be great variations between individual years that could affect our results. In the final columns of table 6, we restrict the sample to those municipalities that fall below the 99th, 95th, and 90th percentile of spending per taxpayer respectively to show that the results are not driven by large one-off expenditures. Overall, these results thus show that our main findings remain robust to alternative ways of defining expenditure.

A remaining concern is that landed elites may have favoured an overall higher level of spending on public goods, which could explain the higher expenditure on schooling for the local population. Table 7 presents OLS regression results from estimating equation 3 where we examine the association between the presence of a capitalist and landowning elite respectively and spending per capita on a range of public goods (panel A), as well as spending on each category as a share of total municipal expenditure (panel B). As evident in panel A, the positive link between the presence of a landed elite and the level of spending is uniquely associated with schooling (column 3).[73] Importantly, there is no evidence that landed elites favoured a higher level of total expenditure (column 6), which suggests that our results are not simply reflecting a higher overall commitment to public goods.

Increased educational expenditure was thus seemingly financed by a *relative* shift of spending away from other types of goods. Indeed, as shown in panel B, municipalities dominated by a landed elite on average allocated an additional 3.514 percentage points of total spending to primary schooling (column 9), while reducing the share allocated to poor relief by 1.536 percentage points (column 11). Although these shifts are relatively modest in magnitude, a potential explanation is that the concentration of political power in the hands of a small local elite helped solve a coordination failure, which may have led to a concentration of spending on a smaller set of public goods. To examine this possibility, we calculate a Herfindahl-Hirschman index (HHI) of the distribution of spending across the five

[70] See also online app. tab. S3, which replicates all estimates in tab. 5 using educational expenditure per capita as the outcome instead, showing that the results are very similar.

[71] We lose one observation when excluding state grants in cols. 2 and 3 because one municipality in our sample reported a larger state grant than total spending on elementary education.

[72] We add 1 to all outcomes of table 6, cols. 4–6, and to spending categories of table 7, panel A, to avoid leaving zero spending which would make further elaborations impossible.

[73] Although the estimates suggest lower spending on the church in municipalities dominated by landed elites, this result is sensitive to how the 55 municipalities with zero spending on the church are treated. When excluding these municipalities from the sample, the OLS estimate (standard error) is reduced to −0.055 (0.081) and, moreover, it is reported in Statistics Sweden, BISOS U 1874, pp. IX–XI, that there was significant under-reporting of church-related expenditures, in particular in municipalities dominated by landed elites, while such under-reporting did not occur for school spending.

Table 7. *Elites and the provision of public goods*

	Panel A. Spending per capita (ln)					
	Church (1)	*Communications* (2)	*Education* (3)	*Health* (4)	*Poor relief* (5)	*Total* (6)
Landed elite (=1)	−0.205*	0.102	0.135***	0.032	−0.063*	0.008
	(0.107)	(0.110)	(0.028)	(0.097)	(0.034)	(0.026)
Capitalist elite (=1)	0.025	−0.178	−0.013	−0.389***	−0.059	−0.065**
	(0.101)	(0.139)	(0.033)	(0.119)	(0.047)	(0.029)
Income and wealth?	Yes	Yes	Yes	Yes	Yes	Yes
Municipality characteristics?	Yes	Yes	Yes	Yes	Yes	Yes
Voting rights?	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,054	2,054	2,054	2,054	2,054	2,054
	Panel B. Share of total spending (%)					
	Church (7)	*Communications* (8)	*Education* (9)	*Health* (10)	*Poor relief* (11)	*HHI* (12)
Landed elite (=1)	−1.810	−0.578*	3.514***	−0.068	−1.536**	0.001
	(1.169)	(0.347)	(0.840)	(0.106)	(0.758)	(0.005)
Capitalist elite (=1)	0.889	−1.104**	1.479	−0.146	−0.356	0.010*
	(1.222)	(0.514)	(1.073)	(0.151)	(0.852)	(0.005)
Income and wealth?	Yes	Yes	Yes	Yes	Yes	Yes
Municipality characteristics?	Yes	Yes	Yes	Yes	Yes	Yes
Voting rights?	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,054	2,054	2,054	2,054	2,054	2,054

Notes: This table reports OLS estimates of equation 3 in section IV.2, where the outcome is *ln* spending per capita in panel A and the percentage share of total municipal spending in cols. 7–11 in panel B, while the outcome in col. 12 is a Herfindahl–Hirschman index (HHI) of municipal spending. Elite indicators take the value 1 if at least one voter controls more than 10% of the total votes in a municipality and 0 otherwise, where we distinguish between capitalist and landed elites based on whether a voter obtains his votes due to income or landownership. Income and wealth controls include the *ln* tax value of income and land per capita respectively. Municipality characteristics include access to the railway network, agricultural suitability, the *ln* distance to the nearest town and Stockholm, *ln* population density, and the share employed in industry. Voting rights correspond to the share of the population with the vote and its square. Standard errors clustered at the district level are reported in parentheses and statistical significance is denoted by ***p<0.01, **p<0.05, *p<0.1.
Source: As for tab. 2.

categories included in table 7.[74] As shown in the last column of panel B, the overall distribution of spending did not differ in municipalities dominated by a landed elite, however, which lends no support to the idea that elite domination served to solve a coordination failure that raised educational expenditure.[75] In sum, these findings instead suggest that landed elites had a clear preference for investing in mass schooling for the local population and that this commitment did not reflect an overall higher expenditure on public goods, but rather a relative shift away from other types of redistributive spending such as poor relief.

[74] The HHI is calculated for each municipality as $\sum s_g^2$ where s is the share of spending on good g. A value of 1 corresponds to all spending being allocated to a single good and a more evenly distributed spending across goods is reflected in a smaller index.

[75] Importantly, the fact that Sweden is an extremely homogeneous country in ethnic, linguistic, and religious terms largely reduces concerns that, for example, ethnic fragmentation may have shaped the provision of public goods, as in Alesina, Baqir, and Easterly, 'Public goods', or Cvrcek and Zajicek, 'School'. An alternative indirect test of the coordination failure hypothesis is to examine whether the influence of landed elites differed based on the total population of the municipality, since municipalities that are more populous may be more prone to coordination failures. However, splitting the sample into municipalities that fall above and below the median population yields virtually identical estimated effects of landed elites in both subsamples; see online app. tab. S6.

V

This article has demonstrated that local landed elites were instrumental in promoting investments in primary schooling in rural areas prior to Sweden's industrial breakthrough. This finding constitutes an important element in accounting for how the country managed to maintain a level of human capital and schooling that was out of proportion to its level of economic development. These results depart from the prevailing view in Swedish historiography that has mainly described the rise of mass schooling as a peasant-led process or a religious venture,[76] as well as the recent international literature that has stressed the role of industrialization and the rise of capitalist elites as the key explanation for the expansion of education.[77]

Why did landed elites promote investments in mass schooling? While it is challenging to identify precisely the underlying mechanisms, our findings are consistent with an earlier narrative among Swedish economic and social historians that have emphasized several related explanations to account for the involvement of elites in local schooling. First, landed elites had a long-standing role in caring for the local community and maintaining social balance, which historically included privileges such as nominating the parish priest, but also founding schools.[78] These early schools naturally benefited all inhabitants, as they were open to all children. Second, there were social control motives that became increasingly central as the rural proletariat expanded over the first half of the nineteenth century.[79] Landed elites came to view an expansion of elementary education as a way to reduce social unrest as the landless classes swelled, and this is summarized in Schön's argument that 'large landowners often took such initiatives in order to head off the peril that they perceived in the growth of the proletarised rural lower class'.[80] An important motivation for the expansion of elementary education was also that it was increasingly perceived as a more effective instrument than poor relief to keep poor children off the streets.[81] Third, Swedish local elites historically served as the mediator between the central government and the local community and supported an expansion of education, influenced first by Enlightenment and later by modernistic ideals about the formation of responsible and productive citizens as part of a wider nation-building project.[82] More broadly, these narratives tend to downplay the role of economic mechanisms in favour of social or political motives, which should serve as a reminder that 'the establishment and growth of mass education has often been the product chiefly not of market forces but of political conflict'.[83]

While we do not argue that landed elites necessarily were beacons of modernization, rather than simply acting in their own self-interest to maintain social

[76] Sandberg, 'Case'; Klose, 'Finansiering'; Nilsson, Pettersson, and Svensson, 'Agrarian transition'; Westberg, S*kolväsende*.
[77] Galor et al., 'Landownership'.
[78] For example, Klose, 'Finansiering'; Tiscornia, *Statens*; Englund, *Huset*.
[79] Wohlin, *Jordbruksidkande*; Winberg, *Folkökning*. On the potential links between the proletarianization of the rural classes and increases in poverty, see Lundsjö, *Fattigdomen,* and Söderberg, *Agrar*, which indicate that there was no direct link between proletarianization and pauperization.
[80] Schön, *Sweden's road*, p. 65.
[81] Sandin, *Hemmet*; Klose, 'Finansiering', p. 161.
[82] Tiscornia, *Statens*; Sundberg et al., eds., *Modernisation*.
[83] Easterlin, 'World', p. 11.

order or their standing in the local community, our results challenge the established idea that the elite capture of political institutions by necessity reduces investments in public and tax-based education and that the route to schooling for the masses requires the franchise to be extended to poor households. In contrast, the lower classes in nineteenth-century Sweden typically opposed mass schooling since they did not want to share the expense and were often dependent on the work of their children.[84] Opposition to publicly funded education among financially constrained poor households is also evident in contemporary cross-country comparisons of low-income countries, as well as in experiments showing that the poor typically prefer other types of public investments with more immediate effects on their incomes.[85]

Against that background, our results contribute to showing the extent to which the relationship between the distribution of political voice and the rise of mass schooling is likely to vary both across countries at different income levels and within countries over time as they develop. Our study points to the need for further analysis of the evolution of mass schooling in Sweden between the Act of 1842 and the beginning of the twentieth century, when the school system began to mature against the backdrop of Sweden's rapid industrialization, which increased the political sway of new emerging social groups—including the rising capitalist elite and the growing industrial working class—relative to the old landed aristocracy.[86] Understanding the potentially conflicting motivations of these different social groups, how they may have changed over time, and how they intervened in local decision-making to shape investments in schooling remains an important avenue for future research.

Date submitted *29 August 2016*
Revised version submitted *8 February 2018*
Accepted *12 February 2018*

DOI: 10.1111/ehr.12738

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[84] Sjöberg, *Framtidens*; Nilsson and Pettersson, 'State'.
[85] Burztyn, 'Poverty'.
[86] Interestingly, recent evidence from Hinnerich, Lindgren, and Pettersson-Lidbom, 'Political power', suggests that Swedish local governments controlled by landed elites also invested more heavily in primary schooling after the period that we study, which suggests that our findings remain relevant for the later stages of Sweden's industrial transition when the emerging industrial elites had gained political clout.

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Supporting information

Additional supporting information may be found online in the Supporting Information section at the end of the article.

S1. Supplementary material