

Gao, Pei

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## Risen from Chaos: What drove the spread of Mass Education in the early 20th century China

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Risen from Chaos: What drove the spread of Mass  
Education in the early 20th century China

Pei Gao  
London School of Economics

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### Abstract

This paper uses the Chinese historical path to mass education in the early 20th century to tackle one hotly debated question – what factors explain the rise of mass schooling? Given China's political turmoil and economic backwardness through the early 20<sup>th</sup> century, the expansion of mass education that was mainly driven by increasing public efforts seems puzzling. Based on a newly assembled dataset, we find that economic factors had little explanatory power in the rise of mass schooling. In contrast, both regional political stability and informal governance imposed by gentry (one important elite group in Chinese history) presented their critical importance. In particular, first we find that counties where previously had more traditional gentry (degree holders via the civil service exam system) provided significantly more public primary schools under the new education system, therefore had higher primary enrolment ratios. This finding is robust to various checks, including adopting an IV strategy. Secondly, the positive effect of local gentry on mass education development were larger in regions where suffered higher level of administrative instability. The explanation this paper proposes is that the near collapse of formal institution through this political chaotic historical period allowed gentry members, as traditional elites in local communities, seized administrative responsibilities, and deliberately supported the mass education development due to their private interests in modern schooling as a potential way to preserve their elites statues.

JEL classification:

Keywords:

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\*Pei Gao, London School of Economics, E-mail.:

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# 1. Introduction

Universal access to education that at least partly provided by the state is a social policy established in Europe and North America from the early 19th century onward. It marks the beginning of modern education, which is widely considered to be an institutionalised model of national development around the globe.<sup>1</sup> A long-standing research topic in economics and social science is centred on the question of what are the driving forces of the rise of mass education. In China, the attempt to provide mass schooling came relatively late, and was one part of a greater agenda — replacing the traditional Confucian teaching system with a fully Western-inspired one at the dawn of the 20th century. Mass education system is usually an outcome of a strong modern state.<sup>2</sup> Given China’s political turmoil and economic backwardness through the early 20th century, the successful expansion of modern primary schooling that was mainly driven by increasing public efforts seems puzzling. In this paper, we focus on the origin of the mass education system in China, and examines its driving forces; in particular tries to understand why and how did mass schooling in China spread successfully through such chaotic period of time?

Even though education is determined by both supply and demand, publicly supplied education can reduce the cost of education to such an extent that receiving it becomes affordable for the first time to most of the population. Therefore, to understand the rise of mass education, explaining what drove up the increasing public education provision is vitally important.<sup>3</sup>

There is a large literature on the determinants of education provision, most of which target on OECD countries. These studies show that apart from the obvious predictor—economic prosperity,<sup>4</sup> two factors stand out as the main determinants of the schooling provision: political participation and decentralized design in educational system (Boli, Ramirez and Meyer, 1985;Lindert, 2004a;Goldin and Katz, 2008;Lindert and Go, 2010; Gallego, 2010; Musacchio, Fritscher and Viarengo, 2014).<sup>5</sup> Firstly,it is widely agreed that broad-franchise

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<sup>1</sup>The phrase ‘modern education system’in this study requires clear definition. The purpose of the term ‘modern education system’is to contrast with the traditional and indigenou one that provided Confucian classic education in Imperial China (221BC –AD1911). Education systems developed in Europe, the US and Japan are distinctly different in many ways, but fundamentally they are similar with several core characteristics: universal, mandatory, secular and academic. Thus, the term ‘modern education system’in this study refers to an education system, which possesses the above critical features.

<sup>2</sup>As stated by Green,”mass schooling did not arise spontaneously from popular demand or from the action of market forces alone. It was to a large degree organized from above by the state”(Green, 1990, p. 297).

<sup>3</sup>The principal reasn why a government starts to provide schooling is because people consider education as an oveal befeit to a scoiety as whole(Freire, 1976; West, 1965)

<sup>4</sup>Cross-sectional studies show that public efforts in mass schooling provision increase with the level of economic development , because economic prosperity generates higher tax revenue for the government and wealth for households, both of which are positively associated with schooling provision and enrolment ratios.

<sup>5</sup>The decentralization of education does not stand by itself as a predictor of whether it facilitates or

democracies tend to provide more public education than elite-franchise democracies.<sup>6</sup> Moreover, decentralized education system amplifies such advantages, because when educational decisions are delegated to local residents, voters tend to raise funds by taxing themselves to provide public education of their own children (Campante and Chor, 2012; Cappeli, 2014; Goldin and Katz, 2008; Lindert and Go, 2010).

Unfortunately, we know very little about what drives the rise of mass education in other societies where economy are backward and formal political institutions are much weaker. Under such political systems, the decision-making process is not determined by the popular wills of local residents, but rather by the political dynamics – the equilibrium achieved among the preferences of various veto interest groups. Recent studies focusing on Brazil, South Korea and etc. all point to one direction that the nature and preference of political elites present special importance in explaining education provision (Chaudhary, 2009; Chaudhary, Musacchio, Nafziger and Yan, 2012; Musacchio et al., 2014; Go and Park, 2012). Following the same line, this paper looks into the key interest groups in Chinese local politics, and tries to pin down the real decision maker who was responsible for the successful expansion of mass education in China through such a chaotic period.

To empirically assess the determinants of mass education provision encounter some difficulties. One reason is that even though education supply has its dominant effect, education demand always interact with supply. This makes identifying factors only associated with education supply extremely challenging. The unusual set-up of China's experience to mass education at the turn of the 20th century can facilitate us to address to this problem. A distinctive new education system was suddenly established in 1905, leading to a substantial change in the quality and quantity of education.<sup>7</sup> The number of primary schools was only 173 in 1902, but grew by 1850-fold in the next few decades, to 320,086 in 1936. At the same time, the 'quality' of education also changed radically, from Confucius classics to western style curriculum. Such a dramatic sudden in education within a short-term window can be seen as an exogenous supply shock.

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suppresses the development of education. There are several advantages of a decentralized education system, the two essential ones lying in the improvement of financial and administrative efficiency, which could lead to the same level of resources being allocated to higher education (Goldin, 1998; Lindert, 2004a; Mitch, 2013). For instance, limited revenues could be spent more wisely and monitored more closely; however, regional attainment levels could vary substantially under such a regime.

<sup>6</sup>Because universal education is essential for keeping the election procedure in operation, allowing the poor to be more politically active and enhancing the capacity of citizens to make good 'electoral decisions' (Castelló-Climent, 2008; Freire, 1976; West, 1965, pp 40-49).

<sup>7</sup>Here, 'quality of education' does not indicate the teacher-student ratio or school improvements in facilities; rather it refers mainly to the fact that the content of education went through radical change during this period. Whether the change of curriculum was good or bad is not the central focus of this paper, but at least it is clear that the content of education changed dramatically.

This paper views the infant stage of China’s mass education system as an educational supply shock, and based on a newly assembled county-level dataset this paper tries to sort out the main driving force of the successful expansion of mass education through the early 20th century. After carefully studying historical narratives, we argue that the key interest group that involved and largely controlled educational decisions at local level was a elite group called gentry. Distinctively differently from the meaning in European context, gentry members in China are traditional scholars who passed the civil service examination with a degree. The abrupt abolishment of civil service examination<sup>8</sup> in 1905 officially marked the starting point of the new and modern education system; at the same time it ironically altered criteria of being Chinese elites profoundly. Such drastic change on elites’ selection standard not only largely demised the legitimacy of traditional gentry as social elite, but also caused gentry to lose advantage in many high-end job markets. To adapt quickly to the new order, this declining elite class were pushed to find new career advancement and any possible way to maintain their elite statues in localities(Bai and Jia, 2014; Bai, 2014b); and involving in local primary education circle became one of the few potential ways. Thanks to the administrative vacuum at local level due to political confusion, gentry members assumed local administrative responsibility over educational decision, and deliberately supported the expansion of modern education not only because of their enduring moral responsibility towards local affairs, but more due to their private interest in modern schooling as a potential way to preserve their elites statues.

One feature that facilitates our empirical analysis of local gentry’s effect on primary education is that the number of gentry in each locality is fairly easy to be identified in Chinese context, which was governed by a long-standing quota system. This paper employs the quota for lower degree holders in civil service exam as a proxy for the number of local gentry within a given county. Our baseline results show that regions with more gentry (higher quota for lower degree holders under the civil service exam system) had more modern primary schools built under the new education system, and higher primary ratios. To address to the potential endogeneity issues associated with the quota system and other economic indicators, we construct an instrumental variable based on sudden increase in regional quotas of lower degree holders (*Shengyuan*) triggered by the Taiping Rebellion (1850-1864). The county level quotas for the lowest level scholars (*Shengyuan*) remained very stable for most of

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<sup>8</sup>The civil service examination is a system that the Chinese court used to recruit state bureaucrats and a much larger corpus of non-official gentry(Elman, 2000;Chang, 1962). The systme functioned admirably for more than 1300 years, and created strong upward social mobility in Chinese socitey. Due to the narrow focus of tis curriculum, the private provision of basic schooling, and toher drawbacks, the tradtioal exam system was considered by many intellectuals to be one of the roots of China’s underdevelopment. Therefore, to fully modernize China, the civil service exam was ended offically on 1905.

the time during the Qing period, and the figures increased substantially only because of the outbreak of the Taiping Rebellion. More quotas were granted to disruptive regions as an incentive to extract taxes from localities; or extra quotas were allocated as rewards to the hometowns of those magistrates who successfully organised military forces against rebels during the Taiping Rebellion (Chang, 1955, pp. 83-92; Kun, 1899). Our falsification tests prove that our instrument is not correlated with factors that may be related to local economic prosperities (e.g., population density, modern industrial location, land tax quota and ect.). The instrumented results find that the effect of local gentry on mass education remains significantly positive and with a sizeable magnitude.

Equally important, by exploring the variation of local administrative stability, which is measured by the average tenure of county magistrate in office, we find heterogeneity in gentry's effect on the spread of mass education. The more frequent turnover of county leader enlarges the positive effect of gentry on mass schooling. Firstly, Mancur Olson's story of the roving bandit is applicable in the context of China, in that we find the pattern of political instability bred worse governance, in our case — less schooling provision (Olson, 1993). Through the first few decades of 20th century China, abnormally frequent reshuffle of local leaders caused by fierce regional political conflict and confusion made functioning governance at local level impossible. However, this local power vacuum allowed gentry class to assume administrative responsibility, and became the real decision maker at grass roots. Therefore the positive effect of the local gentry on schooling provision was more notable in regions exposed to more unstable politics.

Even though we find a significantly positive relationship between local gentry and mass education development, there is a possibility that such positive impact is through a cultural persistence channel, but not the private incentive mechanism that we propose above. To address to this question, we construct a ratio that is equivalent to a graduation ratio in civil service examination to measure the cultural valuation of education in a given county. Adding it to the baseline specification, the results presents no significant effect on the primary enrolment ratio nor school density. Along with other tests, it confirms that regions where the residents used to 'excel' traditional education were not necessarily the ones where modern primary schooling was successfully diffused. Therefore, the positive effect of gentry to mass education development is not simply a matter of cultural persistence; it is rather an outcome from rational conduct of gentry members because of their private incentives.

The findings of this paper are exceptionally important to Chinese economic history. As the local gentry's status was granted via traditional education, this finding confirms the historical legacy of education development, which has been neglected in the literature. This study is not relevant to Chinese educational history alone; it also provides empirical evidence

on the notable importance of the gentry in local governance. Despite the large literature claiming the vital role of the local gentry in Chinese history, there are very few rigorous studies that examine its direct impact on spheres of governance, and even fewer mentioning how the gentry's role changed in the dynamic of the radical social transformation at the dawn of the 20th century, when the institution that had granted legitimacy to the gentry as an elite was removed.

In addition, this paper has broader implication beyond Chinese context. To begin with, it notes an interesting contrast with the early stages of educational development in Europe, where the landholding elites were seen as the main interest group blocking the provision of education to people of lower rank (Kaestle, 1976; Cressy, 2006; Lindert, 2004a pp.100-104). Also, China's experience to mass education enriches our understanding on the route to mass schooling in developing countries where economy are more backward and formal political institution are much weaker. It also sheds lights on a growing literature stressing the importance of informal institution in providing public goods, especially in non-democratic societies (Acemoglu, 2013; Helmke and Levitsky, 2004; Sklar, 2004; Tsai, 2007; Xu and Yao, 2015).

The rest of paper is organized as follows. A brief introduction of the first modern primary education system in China is set out in Section 2; followed by Section 3 providing a conceptual framework to explain the regional variations in mass education development, in which the incentives and preferences of gentry, as a key interest group in local politics, are identified. Then, a newly assembled data is used to conduct empirical analysis. Finally, conclusion and implications of this paper will be drawn.

## 2. Historical Background

The first modern education model was founded in China through a time of turbulence. Western imperialism and the rise of Japan affected China profoundly from the late 19th century onwards, leading to a series of Western-influenced economic, political and social reforms. The remarkable educational movement was one of the many institutional responses to the wide-ranging changes, in particular the newly emerging ideological and political demands, but it was rooted in a fragmented, if not chaotic, political environment and a largely agrarian economy. The remodelling of the education system in China was a long journey, through which many plans were drawn up and a number of regulations were established. By the end of the Republican era, the key elements of the modern education system were largely in place.

In order to look into the determinants of the rise of mass education in the early 20th



century China, this paper focuses only on primary education for three reasons. First, universal education targeted primary schooling alone at its early stage.<sup>9</sup> Second, the average years of schooling of the Chinese workforce in the 1940s reached only around two years, with almost all its education throughout this period received from attending primary schools. Last but not least, the rates of return in late industrial nations are generally believed to be higher for primary schooling than for further education (Psacharopoulos and Patrinos, 2004). Therefore, the rest of this section will focus on primary schooling specifically. The two major features of the primary school system are the dominance of public over private schools and the highly decentralized design. The following sections will elaborate on these two features in terms of administrative control and education finance separately.

### *2.1. A public and decentralized Primary education system*

Both the declining Qing Court and its successors showed a marked intention to pursue the development of a public education system, with particular focus on the primary school sector.<sup>10</sup> As illustrated in figure 2, the proportion of public primary school that were recorded under the category of public school” rose from 75% in 1910s to 95% in 1940s.<sup>11</sup>

The second important feature of the modern primary education system lay in its highly decentralized design – the decision-making authority was delegated to government at the county level.<sup>12</sup> The first Education Act of 1904 had outlined clear regulations regarding the allocation of responsibility for each level of education: central government undertook to deliver tertiary education; secondary schooling was delegated to provincial governments; and primary schooling to county and sub-county authorities (Li, 1997, pp. 533-538). In this

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<sup>9</sup>The Education Act (1904) referred to primary education as mass schooling, and in 1915, the state officially made lower-primary schooling compulsory (Wang, 1994, pp460-468). However, the requirement of providing compulsory lower-primary schooling was without doubt too ambitious in China’s economic and political circumstances, so the actual implementation of such legislation was never wholly successful.

<sup>10</sup>Many types of educational institution coexisted in China and delivered similar primary education to children throughout this period. They are broadly categorized as public primary schools, registered private primary schools, non-registered private schools, missionary primary schools, and traditional primary schools – *Sishu*. Because this research focuses on the rise of modern schooling, the *Sishu*, as part of traditional education, lies beyond its scope. Unregistered private schools and missionary schools are also excluded, since the former hold no statistical history, and the success of the latter cannot be attributed to the efforts of the Chinese state. Thus, the data under discussion include only public and registered private primary schools, which, as is shown below, accounted for the majority of educational institutions in the category of modern primary schooling.

<sup>11</sup>The classifications of different types of primary schools are according to the authority in administrative control, but not to sources of revenue. For instance, ‘public school’ refers to schools that are publicly provided, but not necessarily fully reliant on public funding. Similarly, to put a school in the provincial category does not necessarily indicate that it was entirely financed by the provincial budget. It might have been subsidized by the central government and private donations.

<sup>12</sup>The term ‘local government’ in this research refers to county government and sub-county governing bodies.

new system, accordingly, as the degree of decentralization increased downwards through the schooling levels, primary education was the most decentralized. As shown in table 1 and 2, throughout the whole period, the percentage of national and provincially administered primary schools never reached more than 1 percent of the total of primary schools, which reflects the marginal role that central and provincial governments played in the spread of such schooling.<sup>13</sup> In contrast, the share of local primary schools (under the control of county and sub-county government) stood at about 75% in 1930, and the figure continued to increase over time, reaching 94.1% in 1946. This breakdown of data is consistent with the educational regulation that the task of diffusing modern primary education should fall mainly on local governments.

## *2.2. Financing primary schools: publica money and local deicions*

The classifications of different types of primary schools are according to the authority in administrative control, but not to sources of revenue. Therefore, public schools in table 1 and 2 refer to schools that publicly provided for sure, but not necessarily fully relied on public funding. In order to better understand how local primary schools raised funds, more than 400 available county government balance sheets on educational finance in the 1930s were drawn on for this research. As Table 4 shows, we are abundantly sure for two things. First, the majority part of the educational funds came from public efforts—tax money and revenues earned from collective endowment. Secondly, all the funds were organized and collected at local level.

Given the economic underdevelopment, local primary schools often faced severe fiscal constraints. Their budgets could not draw on one revenue source alone; instead they had to be met through a combination of funds from various sources: local surtaxes, rent from public land, and donations from local wealthy residents, as well as parental contributions (tuition fees) (Chauncey, 1992; VanderVen, 2005). Local primary schools were modestly built that they often lacked on-site toilets (Liao, 1936, p. 69).<sup>14</sup> On average, local primary school could only accommodate about 50 pupils.<sup>15</sup> In line with such austerity, local primary

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<sup>13</sup>The only exception is the province of Hubei, which in 1931 reported 204 provincial primary schools, accounting for 5 percent of the total number, which is much higher than the national average. The abnormally high involvement in primary education of the Hubei provincial government is not only the legacy of the personal commitment to modern education of the former Viceroy of Huguang, Zhang Zhidong; it is also because in 1928, Hankou's 'Special Municipality' status was removed, leading to its merger under Hubei province. The Hubei provincial government took over all the primary schools in Hankou city originally founded by the municipality, and these were counted as provincial primary schools.

<sup>14</sup>This adverse condition directly led to reluctance among female students to attend primary schools, which severely affected the enrolment ratios for girls.

<sup>15</sup>In contrast, provincial primary schools faced better fiscal condition. The provincial department of education managed the funding for a handful of provincial primary schools directly from provincial budgets.

schools are often recorded as occupying the older property of a traditional academy that was renovated to form a new schoolhouse. Sometimes Buddhist temples and traditional Tangs, where local people worshipped their ancestors, were confiscated and furnished as modern primary schools (Gamble and Burgess, 1921, p. 130).

### 2.2.1. *Non-statutory tax revenue: surcharges*

Tax revenues were the main source of the funding for setting up and maintaining the public primary schools. Table 4 shows that revenues from various types of surcharges accounted for more than 60% of the budget, constituting the leading element in the county budget for education. However, county governments had no official fiscal capacity to retain such high level of tax revenues for local use;<sup>16</sup> thus these surtaxes, that local governments relied on to fund modern primary schools, can be regarded as non-statutory revenues.

There are many historical narratives that echo with our findings in county balance sheets that fiscally stressed local governments resorted to informal practices to raise funds throughout early 20th century (Chauncey, 1992; Liu, 1935; Remick, 2004, pp.37-39; Sun, 1935; Wang, 1973). It is abundantly clear that local governments levied various surtaxes and other forms of commercial fees to fund local projects, including primary schools, despite their lack of legally fiscal capacity to do so.<sup>17</sup>

The central state made great efforts<sup>18</sup> to consolidate the excessive local taxes after the col-

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These schools were few, accounting for less than 1 percent of the primary schools in this period. In fact, most were higher-primary schools attached to provincial secondary schools, and located in the provincial capitals or prefecture seats. They enjoyed more adequate and stable sources of revenue, and were well built and better equipped, which allowed them to accommodate a large number of students; some of whom may have had to travel some distance.

<sup>16</sup>Regarding the fiscal system of China through this period, county government only worked as a state agent in tax collection, and have to remit most of the tax revenues back to the central. They were only allowed to retain a small proportion for standard local administrative expenditure, including wages for officials and necessary expenditure on ritual ceremonies (Marianne, 1985; Remick, 2004, pp.32-34; Zelin, 1984, pp.26-62). Entering the Republican era, there was still no separate source of tax revenue below provincial level (Li, 1922, pp.701-791), and consequently, no fundamental improvement could be made in the counties' fiscal capacity (Li, 1922, pp.701-791; Remick, 2004, pp.35-39). Because of the way that tax revenues were divided, county governments were habitually strapped for cash.

<sup>17</sup>For instance, the surcharges on land tax increased by 86 times in Hubei in 1934 comparing the level before the Qing's collapse, 9.5 times in Jiangxi, and occasionally three times higher than the base tax in Sichuan and Jiangsu (Sheridan, 1977, pp.203-205). Not only had the amount of surcharging skyrocketed, but also their variety had increased substantially. In Jiangsu province, more than 147 kinds of surcharge were enforced on the base tax for local use between 1912 and the 1930s.

<sup>18</sup>For instance, the Beiyang government strictly stipulated that land surcharges had to be lower than 30% of the base tax (Sun, 1935, p.187). Similarly, the Nanjing government continued to launch edicts, and specified that the total amount of surcharges must not exceed the base tax (Sun, 1935, p.124). A specific effort to regulate tax revenues for primary schooling was to grant local governments the authority to institute 'educational launches'. This term refers to tax revenues that were reserved by government regulations for the support of schooling. However, the edicts on educational launches differed significantly between provinces;

lapse of the Qing dynasty. However, in practice taxation was well beyond control. Throughout the first few decades of the 20th century, increasing varieties of surcharges on land tax were enforced, and the tax rates of these newly issued items skyrocketed, far exceeding what the state regulated. According to contemporary documentation, as many as 673 new items were taxed, which made the systematic management of land tax an impossibility (Liu, 1935, p.187; Sun, 1935, pp.213-217).<sup>19</sup>

### *2.2.2. Revenue from collective endowment — school land*

Apart from tax revenues, another important contribution to public primary school financing were the rents earned from community-owned school land.<sup>20</sup> In Table 4, our sample shows that 17.8% of educational expenditure in the 1930s came from the rents of endowed school land. In the same vein, a micro-study of Ding county during the Republican era finds that the operations of 47% of the county's primary schools depended to some extent on rents from school-owned land (Gamble, 1954, pp.200-201).

Under Imperial rule, endowed school lands were owned by traditional academies—publicly-provided higher education institutions for prospective examination candidates.<sup>21</sup> When the schoolhouses of traditional academies were converted to modern primary schools, these emerging new schools also inherited their long-lasting source of revenue, i.e. endowed school land. The amount of school land was largely associated with the size of the county/prefecture academy, which was determined by a quota system regulating the number of successful candidates who could pass the first level of the exam (the licensing exam).<sup>22</sup> Therefore, localities which provided outstanding candidates in the Civil Service Examination were equipped with larger and more traditional academies, resulting in certain advantages in their modern re-

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the launches mostly failed after a very short period of relief for local government (Du and Yang, 1934).

<sup>19</sup> For instance in Jiangsu, before 1913, salt (lijin) and transportation surcharges were reserved by law for educational expenditure. Later, an animal slaughter tax, a brokerage tax, and surcharges on rice, were set aside as educational launches (Du and Yang, 1934). In Shaanxi province, such launches included a slaughter tax and a cotton tax. In Yunnan province, the tobacco tax revenue was devoted to education (Yunnan, 1933, p. 42).

<sup>20</sup> The system of endowed school land (学田) emerged very early during the Northern Song period (960–1127), and matured in the Qing dynasty. In general, endowed school land was land bestowed by the Court or donated by local elites, and used exclusively to support traditional academies, including county academies and prefecture academies.

<sup>21</sup> The academies under the traditional education system were by modern standards equivalent to public higher education institutions. They enrolled students, only if they had already passed the first level of the Imperial Examination, the prefecture-level examination (乡试), to further their studies for the next level. These traditional academies existed mainly in three forms: the Imperial Academy (国子监), prefecture school (府学) and county school (县学) (Chang, 1955, pp.21-43; Rawski, 1979, pp.24-36).

<sup>22</sup> As an institutional means of controlling and regulating the power of local elites, a set number of candidates were assigned to each county and prefectural academy; the actual quota depended on the importance of each administrative unit. This quota system is further detailed in the data analysis section.

placements, in that they inherited better revenue-generating channels.

In summary, a highly decentralized and public primary education system was established at the turn of the 20th century, and it quickly diffused across the country. Such successful expansion of the primary education was dominantly driven by public efforts—tax revenue and collective endowment, which were decided at local level.

### 3. Conceptual framework: Local elite’s assumption power in educational decision

In theory, mass schooling system is largely an outcome of government. However, in the early 20th century China, the decline of central control and the fierce conflicts among provincial governments lead to a power vacuum at the county level; and the remarkable expansion of modern primary education throughout this period was implemented and supported by local elites who assumed administrative responsibility at the local level.

#### 3.1. *Administration vacuum at the county level government*

As emphasized, nearly all educational decisions on primary schooling were delegated to county level. Were local officials the ones who rigorously supported primary schooling expansion? After carefully looking into historical details, we find that local government had no time, no incentives and no capacity to be the contributor of the spread of primary education.

##### 1).No Time:

To begin with, local politics in early 20th century China failed to meet one necessary condition for delivering functioning governance — political stability. Olson sketches a pattern under which greater government accountability emerges in places with higher political stability (Olson, 1993). Accordingly, it is only in politically stable conditions that a government can have an effective long-term horizon in which to function. If the political future is unpredictable, a government has very little incentive to provide public goods, such as education, which generate no short-term benefits. Many historical narratives portray China from the late 19th century as undergoing political turmoil at national level; however, ascertaining the extent of political instability at the county unit is a much more challenging task. Here, we exploit the frequency in the turnover of county magistrates to reveal a general picture of the political stability of different localities. We collected more than 500 county gazetteers containing relevant information on magistrates.<sup>23</sup> As Table 5 shows, throughout the Republican

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<sup>23</sup>County gazetteers (县志), sometimes translated as chorography. In Chinese history, every county

era the average time that a county magistrate was in office was notably short.<sup>24</sup> The data suggest an exceptionally high frequency of reshuffles of local officials, with more than half of the counties' magistrates serving only from six to twelve months.<sup>25</sup> To provide a comparable reference to the figure, under Qing's rule the term of a magistrate in office was at least 3 years (Qu, 2003, p. 60).<sup>26</sup> In short, the frequent reshuffles in office created a remarkably unstable local political and administrative climate.

## 2). No Incentive:

Even if there were sufficient time for county magistrates to put their policies into practice, they had no clear political incentive to provide public goods. Without the local election, local authorities were not accountable to the people. In theory, under authoritarian regimes, one way to enhance the effectiveness and accountability of local officials were through the a merit-based promotion mechanism, using which local officials were strongly incentivized to attain the goals set by their superiors in order to advance their political career.<sup>27</sup> However, the personnel system in China through this trying period had very vague targets on specific responsibilities of county magistrates should achieve,<sup>28</sup> and placed far more emphasis on political conformity than on governing performance.<sup>29</sup> In other words, displaying political loyalty to a provincial leader or a certain faction played a dominant role in local

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compiled gazetteers to record the geographic, political, social and economic contents of the locality. Under a new regime, new content would be added, but the old records were not replaced. For this study we collected more than 500 county gazetteers published in the 1990s, which contained information on magistrates in its locality for the whole Republican period.

<sup>24</sup>For instance, all counties experienced a very fast turnover of magistrates around 1927, because after the success of the northern expedition, the Nanjing government attempted to integrate various regional powers under its control

<sup>25</sup>Instability and confusion was similarly server at upper level of government. There were 24 cabinet reshuffles, and for the post of prime minister alone, there were people held the office between 1916 and 1928 (Chi, 1976, p. 2).

<sup>26</sup>Under the rule of Qing, after each three-year evaluation, the magistrate would be allowed to stay, relocated, or advanced in office (Qu, 2003, p. 60). Comparatively, the tenure time for magistrates throughout the Republican era seem considerably reduced.

<sup>27</sup>A target-setting framework contributed substantially to China's economic development after 1978. Even though officials faced no pressure from local elections, the Communist Party tightly controlled the appointment system of local officials over a wide range of targets. The targets are usually easily measurable ones, for instance GDP growth.

<sup>28</sup>What specific activities a county magistrate should undertake had never been made very explicit in Chinese history (Chien, 1950, pp. 43-45; Qu, 2003, pp. 29-34). The relevant regulations stayed similarly vague in the Republican period.

<sup>29</sup>Even though there was a new recruitment process set up to replace civil service exam to recruit magistrates and other civil servants, which combined recommendation by high officials, a review by the Ministry of the Interior, and a newly designed magistrates' examination (Wou, 1974); in practice, the actual appointment was often handled on an informal basis, and, because of the lucrateness of those posts, they were usually assigned by the regional leaders as an important forms of leverage for establishing their own local patronage networks.

officials' careers and their advancement (Chauncey, 1992; McDonald, 1978).<sup>30</sup>

Furthermore, supervision from the provincial and central governments was so weak that even if governing performance were considered an important criterion for a local official's future prospects, it would be highly unlikely for upper level government to receive an accurate and timely account of performance. Taking education as an example, throughout the Republican era very few local educational inspections were held, and detailed education records were available for very few years; thus evaluating one magistrate's governing performance on the basis of educational development was ruled out.

### **3).No Fisical Capacity:**

Lastly, even if they had the full intention to support public primary education, the local government actually was equipped with no legitimate fiscal tool to do so. Local government was supposed to function only as a state agency for collecting tax revenues on behalf of the central state<sup>31</sup>; apart from a minimal amount retained to support basic government operations, most of the tax revenue was remitted to the provincial level and then to central government (Marianne, 1985; Zelin, 1984, pp. 26-62). Therefore, the profiling surtaxes and commercial taxes levied by county and sub-county governments for local purposes, in our case spending on local education, was actually falling into a legally grey area(Chauncey, 1992; Li, 1922; Remick, 2004, pp. 33-35).

With such minimum political incentives, why did local officials take huge political risks by levying non-statutory surcharges against central government's regulation to build up primary schools? Did they do it for the purpose of corruption? The eroded state capacity did in fact enable local governments to increase their fiscal capacity, if not autonomy, and such liberty paved the way for local exploitation. There is no denying that some exploitative and

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<sup>30</sup>Local officials's eagerness towards the agenda of 'promoting mass schooling'largely depended on their provincial leaders' attitudes. The fact is that provincial powers responded very differently towards the modern education system. Given the weakening central control, not all the provincial leaders were prepared to bend over backwards to achieve the top-down targets set by the central government. To generalize, people who aligned themselves closely with the central state would have much more incentive to carry out this education reform, as a sign of political conformity. But those who counted themselves as opposing powers, or those who engaged in political and military struggles might have had little interest in implementing 'expensive' ventures in national education. Apart from regional politics, provincial leaders'personal preferences may also have mattered. A few cases emerged where provincial leaders zealously promoted modern public schooling within their territories as a sign of their passionate personal commitment to education, rather than of their sense of political responsibility for attaining the central government's target.

<sup>31</sup>The most striking feature of central-local fiscal relations during the Qing and early Republican era was the absence of a clear separation of sources of revenue between different levels of the administration and the 'communist' attitude to finance between various governments in China. Such implicit regulation attracted heated contention over the vertical division of tax revenues. There were many attempts to streamline the tax division among different tiers of government after the late Qing. Beginning with the fiscal reform in 1909 and through successive legislations, the government did specify distinct sources for central government and provincial government revenues.<sup>100</sup> However, the source of revenue for county and sub-county government remained unclear (Duara, 1988, p. 66; Li, 1922, pp. 701-791).

extractive governance was observed in some regions. Starting from the late 19th century, the great increase in the number of new local levies caused an outbreak of anti-tax riots, some of which even developed into significant rebellions against the government (Zhang and Ding, 1982). However, no large-scale predatory behaviour towards local residents was recorded, and the extent of the disruption to local governments' day-to-day operations was less than expected (Mccord, 1993, pp. 81-118; Wang, 2000). Moreover, for schooling in particular, the tax revenue collected was indeed directed to the increasing number of modern primary schools.

In conclusion, an examination of the incentive structure and fiscal capacity of local government raises a puzzle. Facing no institutional checks, clear political incentives or even legitimate fiscal tools, we see local governments making non-obligatory efforts to collect non-statutory surtax, not for purposes of corruption and predation, but for increasing the provision of local public goods. Why?

### *3.2. The real decision maker: local gentry*

Equivalently discussed by many scholars, there had been a power sharing between officials and other elite groups at local level through Chinese history (Chang, 1955, pp.51-70; Deng, 2011, p.26; Qu, 2003, p.31; Remick, 2004), and the seizing of local power by elite groups was enhanced through the late 19th century and early 20th century due to the higher level of political confusions (Keenan, 1994; Lary, 2007, pp.50-51; Mccord, 1993, pp.81-118; Sheridan, 1977). Therefore, all the relevant educational decisions regarding mass schooling was not determined solely by local officials. Instead, it was an outcome affected by the dynamics of vested interest groups within local politics, and gentry constituted the most important one.

To begin with, defining the so-called gentry in China is worth careful explanation. The term 'gentry' in China refers to people who had obtained their prestigious status from success in the civil service examination and who as a result could hold office.<sup>32</sup> Their rank could not be inherited. The gentry members, who can be equated to degree holders, constitute the most important social elite group in Chinese history, and only comprise the top 0.5 per cent of the whole Chinese population (Chang, 1955, p. 102; Ni and Van, 2006).

Throughout the crisis-ridden final ages of Qing and the chaotic first few decades of the 20th century, there was an expansion of gentry management in local communities. It has been widely observed that local elites stepped in to ensure the continuation of order in local

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<sup>32</sup>The term 'gentry' (士绅 or 缙绅) has no full equivalent in English. Sometimes people translate 士绅 into 'elites', but in most cases, the term 'gentry' is used as a widely acceptable translation. Gentry in Europe are usually associated with large land-holdings and aristocracy, both of which are inheritable. Therefore, the term has a distinctively different meaning in the Chinese context.



civil administration. Drawing evidence from historical narratives, the gradual assumption of authority over taxation and appropriation of public facilities after the late Qing period became common (Chauncey, 1992; Dennerline, 1975; Keenan, 1994, pp.125-141; Mccord, 1993, pp.81-118; McDonald, 1978; Remick, 2004; Sheridan, 1977; Wakeman and Grant, 1975, pp.1-25). Therefore, it is not an overstatement that when it came to decisions about local public school the real decision makers were not local officials, but the local gentry.

Surprisingly, few researchers have thought to connect local gentry to modern schooling. The few studies that are based on micro-historical evidence vividly illustrate how closely members of the local gentry were involved in urging the development of modern schooling throughout this period (Chauncey, 1992; Keenan, 1994; Liao, 1936; McDonald, 1978; Wen, 2002; Zhang and Qin, 2001). Owing to the inseparable link between the gentry and education, it is difficult to neglect their intentions and interests in furthering the agenda of modern education. This section surveys the political and economic relevance of the local gentry to gauge their power and predict their preferences in the rise of modern education.

### *3.2.1. The structure of local gentry*

In order to understand the interests and preferences of the gentry, we begin by noting that the gentry were a far from homogenous group of people, who enjoyed similar social prestige and sources of income; on the contrary, its membership can be divided into two opposing tiers, with different career paths, economic bases and social status (Chang, 1955, pp. 6-8; Ho, 1962, pp. 17-41; Elman, 2000).

The top tier of the gentry included bureaucrats already in office and high (middle) degree holders who were qualified for official appointments. To be eligible as an official, holders of at least the degree of *Jinshi*, *Juren* and *Gongsheng* could be selected for the Imperial Academy as students. According to Figure 2, all the top three types of degree holder were higher tier gentry, who were eligible to hold a government post.

The lowest tier of gentry consisted of the lowest degree holders called *Shengyuan* or *Xiucai* who had passed the licensing examination (院考) in a prefectural capital or had purchased an equivalent degree. In most cases, success in this level of the Civil Service Examination brought only the title of gentleman, exemption from corporal punishment and corvée (labour service), special arrangement regarding tax payments and entitlement to wear a scholar's robes, but not a guarantee of entering the civil service and becoming a bureaucrat (Chang, 1955, pp. 32-43; Ho, 1962). In fact, only less than 3 percent of *Shengyuan* had the chance of attaining office, leaving most holders of their rank gentry ignored by officialdom (Chang, 1955, p. 118). These Lower degree holders (*Shengyuan*) who were ineligible to hold office, usually remained in their home localities, and constituted a large proportion of the

educated elite class outside the bureaucratic system in rural China.

The importance of the gentry, mainly the lower ranks, in governing local affairs was not novel in Chinese history. It is understood to have shaped the political fabric and social structure of local society in various forms. On the one hand, regulations forbade county-level officials to have come from the locality where they served; therefore, they possessed very limited knowledge and information about local conditions. To cope with their uphill task, they relied heavily on cooperation and assistance from the local elites, including members of the gentry (Qu, 2003, p. 31; Remick, 2004). On the other hand, given that direct state control never penetrated beyond county level (Deng, 2011, p. 26; Qu, 2003, p. 5), the daily life of rural people was organized in the village as a unit, which was based entirely on a foundation of local gentry.<sup>33</sup> As a literate body and social elite, the gentry filled most of the influential and lucrative posts, including village heads, relief managers, tax agents for the local tax bureau, clerks for magistrates and, of course, school managers and teachers (Chang, 1962; Duara, 1988, p.159; Wakeman and Grant, 1975, p.4). Through such activities, they provided local communities with their personal leadership, and inspiration, as well as their knowledge. The vital function served by the gentry in local management was further enhanced during the early 20th century due to the political confusion and new demands for public services created by a wave of urbanization and modernization.<sup>34</sup>

### *3.2.2. Motivation of local gentry in modern education*

Intuitively, a social elite class bears little incentive to allow education to be provided to lower rank of people. What were the specific interests of the traditional gentry in promoting public primary schooling to the people?

First of all, gentry's private economic interests shaped their main motivation for engaging in public education, because involving in primary education was one of the few available ways

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<sup>33</sup>A village was not state administrative unit; therefore the head of a village was not a state official either. When a village attempted to elect its own head, the village council, which normally consisted of the local elites, usually chose a candidate from its own circle. Thus, the local administration was largely in the hands of local elites.

<sup>34</sup>The increasing activities of local gentry in the public domain were various; here, we mainly emphasize their determination and efforts to expand education. Another crucial example of local elites' increasingly important role lay in the *lijin* tax collection. The collection of this main source of tax revenue was quasi-official in practice, and even further empowered the local elite's legitimacy in local public affairs (Xu, 2009). Since the gentry took extensive responsibility for local management, there were even some attempts to institutionalize the role of the gentry into formal politics by absorbing gentry members into the local assemblies or establishing an elective Council, which would exist for 2 years only before being abolished (? , p. 138). For instance, the founding of the county assembly, composed of local elites, was originally part of the Qing Court's preparation for the constitution in rural areas. Interrupted by the 1911 Revolution, county assemblies still became the principal voice on community matters ranging from annual tax rates to the provision of public goods (Zhang, 2000, p. 49).

for gentry members to preserve their statuses as educated elites and to secure their financial means (Wakeman and Grant, 1975, p. 4). Given the close link between gentry status and the Civil Service Examination, the discontinuation of the exam in 1905 had a devastating effect on their legitimacy as social elites (Elman, 2000; Esherick, 1990, pp.294-296). With this system gone, the old selection criteria of elites and the patronage networks were torn down (Keenan, 1994, pp.131-132). Eventually, as a declining elite group, the traditional gentry not only lost legitimacy as elites in society, and held no more advantage in many high-end job markets than did the newly emerging elites, including new scholars, national capitalists and state technocrats, most of whom were equipped with a modern education and were concentrated in the big metropolitan centres or treaty ports (Li and Zhou, 2005, pp.33-41). More and more posts in the public sphere ceased to prefer traditional degree holders; on the contrary, a modern education background became an advantage.<sup>35</sup> For instance, more than half of the cabinet ministers from 1920 to 1928 had received a modern education or had even been educated abroad. The impetus to preserve their statuses as educated elites and also earn a living became increasingly important, not to say urgent, for gentry members in a period when their potential job market was shrinking. People who had studied abroad dominated the tertiary education sector, and secondary schools were full of people who had received at least some modern education. For traditional gentry members, a job in primary education stood as one of the few available routes to career advancement and a secure financial future. Therefore, We widely observe that gentry members took jobs in supervising the construction of schools, managing school operations and teaching (Keenan, 1994, pp.1-5).

Moreover, the gentry's active role in the administration of local education was organized as a government-delegated authority, which was endorsed, if not encouraged, by the state during the first half of the 20th century. Looking at the task of primary education in particular, the Education Act of 1904 specifically notes that "Local officials may select gentry members . . . and charge them with responsibility for the management of modern educational affairs" (Wang, 1994). Accordingly, the chief officers and staff of county education bureaus were all appointed from the local gentry, and not from state officials (Chauncey, 1992; Keenan, 1994, p. 111).<sup>36</sup> On the same lines, the gentry's predominant responsibility in

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<sup>35</sup>Modern education became an advantage in the job market during the early 20th century, in particular for the public sector. This implies that modern education had become a very important selection criterion for the new bureaucrats after the civil service was dismantled. The education background of Cabinet Ministers between 1920 and 1928 shows that less than half of ministers received traditional education.

<sup>36</sup>The chief officers and volunteer officials of the education exhortation bureaus (renamed to county educational bureau later) were filled by highly respected local people, gentry members in most cases. After 1922, when the Education Bureau replaced the exhortation bureaus, its function in practice did not change. The director of the Educational Bureau and four educational committee members were all leading gentry

the education sector held good down to the grass-roots level (villages and districts). The state specifically outlined three criteria for a director of a school district, one being the need to have obtained at least *Shengyuan* status (Keenan, 1994, p. 126).<sup>37</sup> At village level, all schools had a board which was responsible for the primary school's operations, the members of which, as well as other village leaders, also had to be local gentry.

Lastly, a sense of moral obligation toward local affairs is another obvious incentive that cannot be neglected. The gentry, with their prestigious status from the state-sanctioned examination, had a long history of showing moral responsibility in local management and public goods provision. Numerous records document local gentry's superintending public works to maintain bridges, ferries, walls and temples, sponsoring and printing local gazetteers, participating in local sacrifices and Confucian rituals, and organizing relief for refugees (Chang, 1955, pp.51-70; Qu, 2003, pp.282-330). In the same vein, the gentry's active engagement in local schooling had long existed, and they provided financial means and personal leadership in building up organizations to help local young talent obtain better education.<sup>38</sup>

In conclusion, by exploring the preferences and intentions of gentry, the key interest group in the local educational circle, we find a paradox: weak local government officials seek to collaborate with traditional gentry (lower degree holders) who themselves have been rejected by Chinese Imperial officialdom. A further decline in status with the abolition of the civil service exam made local gentry particularly proactive in the sector of primary education, thanks both to their long-standing public moral obligation and the private economic interests associated with the spread of schooling. They engaged in primary school circle in many possible ways, arranging from organizing education committees to supervise newly built schools, working as tax runner to collect new surcharges for modern education, filling up the role of school administrators, to simply becoming primary school teachers.

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as well. Another purely civil organization emerged, the Educational Administrative Committee, comprising nine members; all of whom supposedly served without payment. They consulted with the head of the education bureau (Gamble, 1954, p. 189).

<sup>37</sup>The other two criteria were first, that the director should be from the locality; and second, that he should have some experience of background working in education.

<sup>38</sup>For instance, Juying hui (聚英会) and Zhuying hui (助英会), as Chinese names, literally indicate that they had the function of specifically 'helping young talent'. Later, in the Republican era, they transformed themselves into Education Associations, the most influential local civic organizations, but their essential structure and purpose remained.

## 4. Data

To empirically test the hypothesis outlined above, I assembled a new county-level data-set for most of the provinces in China Proper<sup>39</sup> so as to explore the spatial variations in the diffusion of primary education in China for the period 1907–1933, and further pin down what factors accounted for its regional dispersion. Most of the dataset relies primarily on digitizing contemporary sources, covering about 1,000 counties, occupying 20% of the whole territory but 80% of the population in the Qing period.

In order to identify the driving forces of China’s development of schooling in the period of interest, two key variables are examined. One focus of this paper is to test whether the strength of the local social institution, the gentry class, was important in deciding modern education. The other is to measure the political stability across counties in China. Apart from these two key variables, we also collect rich information for measuring primary schooling expansion, together with a great many potential indicators of economic development at the county unit level. In the following sections, we define the variables and provide a basic summary of the statistics for the empirical analysis.

### *4.1. Measuring the rise of primary schooling*

The dependent variables are educational indicators in three benchmark years: 1907, 1916 and 1932. The educational provision is measured as school density over 10,000 people and primary education expenditure per ca pita. The schooling outcome is measured as the primary enrolment ratio. For some regions and years, we also construct a teacher-student ratio as a proxy for education quality.

**1). Primary school density:** the number of primary schools normalized by both population (per 1,000 people) and land area (per 1,000  $km^2$ ) to reflect the supply of primary schooling. School density is an indicator of schooling accessibility, which is an essential predictor of schooling outcomes. It may be particularly important when society face sharp contrasts in terms of transportation.

**2). Primary schooling expenditure per capita:** this is a widely used indicator of schooling provision, which directly measures the level of investment in maintaining and expanding schooling.

**3). Primary enrolment ratio:** this is one of the most standardized measurements of schooling outcome.

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<sup>39</sup>We exclude Manchuria and Tibet, Xinjiang and Qinghai, other peripheral provinces, both due to the inaccessibility OF data and the different schooling systems operating in these regions. Inside China Proper, moreover, we have no data for Sichuan province.

**4). Student-teacher ratio:** this is a commonly used proxy for education quality, where the higher the student-teacher ratio, the lower the quality of schooling.

Our data show that in 1907 there were on average only 1.34 primary schools for every 10,000 people, resulted in primary enrolment ratios barely standing at 1.9 %. Primary schooling experienced such extensive expansion that by 1916 primary school density had risen by more than 3 times, reaching a figure of 9 primary schools for every 10,000 people; similarly, primary enrolment ratio soared to 9.4%. In 1933, with a slightly smaller sample, the primary school density had almost doubled, reaching 8.9, while the primary enrolment ratio had risen to 22.7%.

## 4.2. *Measuring Gentry*

As discussed earlier, in certain political conditions, the local gentry had an incentive to step in and contribute formally or informally to the rise of primary education in their own communities. Therefore, one focus of this paper is to test the role of the gentry in explaining the successful spread of primary education. The great challenge facing this study is how to quantify the power of the gentry. Given the difficulty of measuring the strength across counties of the local elites in the early 20th century, this research exploits the size of the gentry population to measure their power in different places. As pointed out in section 3.2.2, the degree holders constitute the local gentry. Data on the number of different levels of degree holders in Qing dynasty is used as a proxy for the strength of the local gentry during the period under review.

### 1). *The number of lower tier gentry*

As noted earlier that the number of *Shengyuan*, who were the scholars passed the first-level exam (licensing exam), was under control by a quota system.<sup>40</sup> The quotas on *Shengyuan* are illustrated in Figure 4.3, which shows that the quotas varied widely across counties. The different quotas for *Shengyuan* each time the exam was held accumulated throughout the Qing dynasty, leading us to assume that places with higher quotas would

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<sup>40</sup>The Qing state followed the regulations through from the Ming dynasty to impose a strict quota system on the number of candidates who could succeed at every administrative level of the Civil Service Examination. The system controlled the distribution across regions of the opportunity to join the gentry. It was used as an institutional means to confine and regulate the size of the population of gentry (Bai, 2014a; Elman, 2000, p.140). For higher degree candidates, such as *Jinshi* and *Juren*, who were required to pass the provincial-level exam, the quota was allocated at the provincial level. For lower degree holders, the quota system was assigned to prefectural and county levels. One feature of the quota system was that regional quotas remained stable through the Qing dynasty; only after the Taiping Rebellion, in order to encourage and reward the local contribution to the quelling of the rebellion, did a substantial increase occur for many places, notably the Lower Yangzi delta.

generate more lower degree holders (*Shengyuan*).

The Imperially Established Institutes and Laws of the Great Qing Dynasty (大清会典) carefully documented the quota system across counties through the Qing period (Kun, 1899). Although the quota system remained stable between 1644 and 1851, because of the outbreak of the Taiping Rebellion (1850-1864), the Qing government increased the quotas for many regions in order to strengthen its alliances among the local gentry against rebel forces (Chang, 1955, pp.83-92; Ho, 1962, pp.181-183; Kun, 1899). After the war, the revised quota assigned in 1873 persisted until the abolition of the exam. Figure 4 shows that originally the most commonly assigned numbers were at first 8, 12, 14 and 20, but that the expansion of quotas after the Taiping Rebellion increased the variation between quotas significantly. In this paper, data from both periods are analyzed. Our main analysis uses quota figures from the latter period, but the results are robust if quotas in the early period are used.

According to Table 7, the number of gentry occupied only a small proportion of the population. The average quota was only 13 per county through the most of the Qing period, but, after the quota expansion during the Taiping Rebellion, the average quota increased to 19 per county. Normalized by the 1910 population, on average there were only 1.58 *Shengyuan* over every 10,000 people.

## ***2).The number of top tier gentry:Jinshi***

As displayed in Figure 1, *Jinshi* is highest rank of scholar under the traditional education system. *Jinshi* did not count as local gentry in most cases, but we can use the number of higher degree holders as a robustness check. There was no quota system imposed on *Jinshi* numbers at county level; therefore the regional variation in numbers is more likely to be a merit-based result. For the top scholars under the traditional education system who obtained the title of *Jinshi*, both the Ming and Qing dynasties kept detailed personal records (Jiang, 2007). We collect the accumulated numbers at the county unit level of people who attained this rank as a measurement of the size of the foremost gentry.

### *4.3. Measuring political stability*

In order to measure the political stability at the county level, which is the main administrative unit that accounted for spread of education across China, we use the frequency of turnover of county magistrates.

There are many studies on the effect of the term limits. Length of term may influence incumbents' accountability, including the tendency to provide public goods in democratic societies (Besley and Case, 1995). Does a leader's length of stay in societies such as China, without the pressure of local elections, impact on his commitment to providing public goods?

Even without direct evidence for the period under discussion, the literature on communist China after 1978, when a decentralised and authoritarian political system prevailed, confirms that county heads' tenure has an inverse U-shaped relationship with school infrastructure spending, reaching its peak in their third or fourth year in office (Lv and Liu, 2013).

More than 500 surviving county gazetteers were gathered to gain relevant information on county magistrates. In order to match the two benchmark years for schooling, we used the average length of time that each county magistrate served in office for two time windows: 1911-1917 and 1917-1933.<sup>41</sup> The average length of time that a magistrate remained in office was about 1.22 years for the first period, and 1.13 for the second period, suggesting that, if we draw references from contemporary China, the average number is far from reaching a tipping point whereby an inverse-U starts to fall (Lv and Liu, 2013).

In theory, one potential weakness in employing figures of magistrate turnover to measure political stability is the problem of endogeneity. Is it possible that a magistrate who provided better education would stay in office longer because of his better performance? This concern is valid in most cases, but cannot be applied in China in the historical period under study. The appointment and replacement of county magistrates was closely associated with the dynamics of local politics or the struggles in the upper levels, but not with individual achievement (Wang, 2000; Zhang, 1999).<sup>42</sup> In short, given the particular context of the period under discussion, it is reasonable to assume that the length of one magistrate in office was not endogenously decided by his performance in providing public goods.

#### *4.4. County characteristics*

In order to measure the effect of factors associated with economic development on schooling provision and primary enrolment ratios, we need information on the regional distribution of economic prosperity across China between the late Qing period and the Republican era. Unfortunately, data such as household income, industry structure and GDP per ca pita are not available. As a substitute, a long list of alternative proxies for economic development is adopted in this study.

##### ***1). Agricultural production capacity***

Given that China was an agrarian economy through the first half of the 20th century, the strength of the agricultural sector reflected overall economic prosperity. The importance of

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<sup>41</sup>In order to avoid the problem of counting data in further regression studies, the turnover times of county magistrates are converted to figures for average tenure in office.

<sup>42</sup>For instance, all the counties experienced very frequent turnovers in magistrates around 1927, because the Nanjing government, after the success of the northern expedition, tried to integrate the various regional powers under its control.



agriculture is enhanced by the fact that land tax was for a very long time the main source of tax revenues for the Chinese state. This would suggest that the state's capacity should have been higher in regions with better agricultural production.

Soil quality is one partial determinant of a locality's agriculture production. Given the lack of historical data on agricultural production, we construct a cross-sectional variation in the suitability of the soil for growing rice and wheat in 1960. If we assume that the distribution of soil quality did not change systematically over time, it could be a proxy for potential agricultural production capacity across counties in the early 20th century. This information comes from the Global Agro-Ecological Zones (GAEZ) database compiled by the Food and Agriculture Organisation (FAO). The database divides the entire globe into 2.2 million grid cells, with each cell covering around 50 square kilometres. Most Chinese counties cover 6 to 98 cells. Figure 3 illustrates the distribution of suitability for rice and wheat, with darker areas more suitable for agricultural production.

To ensure that soil suitability is a sound proxy for historical agricultural development, we also, as an alternative measure, exploit land tax quotas, which are closely associated with agricultural yields. The latest systematic surviving records on land tax per prefecture through the Qing dynasty were documented in 1820; therefore, this measurement loses variation across counties within the same prefecture. Additionally, this land tax quota remained unchanged for the previous almost 100 years, implying that it is not time-sensitive, either, to the changes in agricultural production.

## ***2). Modern Industry***

The effect of modern industry on schooling diffusion requires special attention. According to global evidence, manufacturing has created a demand for child labour, because the nature of the work does not require high physical capacity. For China during the period under discussion, the biggest sector in modern industry was manufacturing, and testing whether its presence tended to slow education progress is especially important. The ideal measurement of modern industry strength would be the exact composition figures of shares of employment in the manufacturing sector across counties; however, the relevant data is not available. As a substitute, the cumulative number of domestic modern firms between 1841 and 1915 is adopted as a proxy to reflect the strength of modern industry (Chang, 1989). Second, aware that modern domestic industries were sparsely scattered across China, we construct a dummy variable for whether modern industry operated in a given county.

## ***3). Western Penetration***

Western influence penetrated many dimensions of Chinese life from the 1840s onwards,

and foreign ideals deeply affected the expansion of modern schooling. The influence as a whole can be divided into two channels. First, from an ideological perspective, the new education system was modelled on the Western practice, which was completely different from the traditional Confucian teaching and de-legitimised the long-standing literati-bureaucrat system in China. More exposure to Western ideas may have encouraged people to be more receptive to modern ideas, including a new education system. In addition, from a ‘learning by doing’ point of view, missionary schooling, as a pioneer in China, was the best model for local governments to follow; accordingly, places with more missionary schooling may be expected to provide better primary schooling performance.

To model Western penetration, we construct three variables. First, a treaty port dummy: port cities that were open to foreign trade under unequal treaties. These cities were often equipped with foreign legal institutions and enjoyed more access to foreign trade and investment.<sup>43</sup> (treaty port=1, otherwise=0) (Yan, 1955, pp. 42-56). Second, we use as indicators the number of communicants per 10,000 people and the enrolment ratios for missionary primary schools to capture the penetration of missionary work. The third proxy is the distance to its nearest telegraph station. The telegraph was first introduced in China in 1871. Until 1911, only 18.76% of the counties had an established telegraph station (Bol and Ge, 2007; Qing, 2199). The telegraph allowed outside information and foreign ideas to flow. We use distance to the nearest telegraph station as a proxy for the level of access to distant information.

#### ***4). Urbanization***

Given that many scholars exploit urbanisation as proxy for economic development (Acemoglu, Johnson and Robinson, 2001; Bai and Kung, 2014), even though we do not have exact urbanisation data, we construct, according to Rozman’s classic classification of Chinese cities, a categorical variable for the size of cities as an alternative, to capture the level of urbanization. Big cities are defined as those with a population of more than 300,000, that of middle cities lies between 70,000 and 300,000, and that of small cities falls between 30,000 and 70,000 (Rozman, 1973).

#### ***5). Political importance***

Many writers indicate that the locality’s distance from the political centre influences its governance. Counties where the prefectural governments are located in or very near the

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<sup>43</sup>Unequal is a term commonly used by historians to refer to a series of treaties signed by China and certain Western powers during the 19th and early 20th centuries after suffering military defeat. Following the Nanjing treaty, at least 20 unequal treaties in succession were signed, resulting in more ports being designated treaty ports.

prefectural seat, may be more prosperous, and tend to conform to the supervision from upper levels of government. Therefore, we add some geographical variables from China’s Historical GIS Data to control for the political importance of a given county, including the distance from the prefectural seat, distance from the provincial capital, and two dummy variables: coastal and Yangtze (Bol and Ge, 2007).

**6).Local protests** As discussed in section 4.2.1, the non-obligatory efforts of local government on education progress might be incentivised by corruption. Here, we also include one measurement on the count of local protests as a proxy for local predatory behaviour.<sup>44</sup>

**7).Demographic Contorls**

We also add the size of a county, plus population density, which is a potential and widely accepted proxy for initial economic development.<sup>45</sup>

## 5. Empirical results

Guided by the previous analysis, this section empirically investigates the driving forces of mass schooling from two perspectives. First, did the strength of the local gentry contribute to the spread of primary education? Second, to what extent did the political turmoil mitigate or increase the effect of the local gentry?

### 5.1. Local gentry and the expansion of schooling

OLS Baseline results. Given the difficulty in measuring the variations of the local gentry’s strength at county level over time, in this study, the number of local gentry is a cross-sectional variable. Therefore, we first examine the cross-sectional correlations as follows:

$$Schooling_i = \alpha + \gamma Gentry_i + X_i'\theta + \varepsilon \tag{1}$$

In Equation 1,  $i$  represents county;  $schooling_i$  is a set of variables capturing education development (school density and enrolment ratio);  $Gentry_i$  is the variable of interest: the number of local gentry (measured by *Shengyuan* quota, *Shengyuan* quota per capita and

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<sup>44</sup>The number of protests comes from data transcribed from newspapers; naturally, the special nature of the data source presents quite a high degree of bias, because whether a protest could be reported in the newspapers entirely depended on the information transparency in the given locality.

<sup>45</sup>Much of the literature shows that during Qing China, the population density was still closely associated with the fertility of soil in its locality, which implies that China still remained an agrarian economy, and the development of the agriculture sector held a crucial role.

*Jinshi* per capita);  $X_i'$  indicates economic and geographic controls included; and,  $\varepsilon_i$  is the error term.

Table 10 features the influences of local gentry on primary schooling provision, which is measured by two variables — primary school density and nominal primary education expenditure per capita. The baseline results show that there is a significant and positive relationship between the quota density of the *Shengyuan* (lower degree holders) and modern primary school provision through the early 20th century.

For instance, Columns (1), (3) and (5) show that a county with a higher quota per capita in the Qing dynasty enjoyed significantly better primary school density after controlling for only certain basic county characteristics, including population density, county size and provincial dummies. Adding more control variables to do with county economic characteristics and political importance does not alter the results in the three benchmark years.

Concerning magnitude, presented in Column (2), Column (4) and Column (6), the effects of gentry are noticeable. In 1907, one standard deviation increase (1.58) in the quota density in the Qing raises the number of primary schools for 10,000 people by 0.91 ( $1.58 \times 0.58$ ) data points. Given that the mean of primary school density in 1907 was 1.34, this effect of the gentry quota alone accounts for 68% ( $0.91/1.34$ ) of the average primary school density. Similarly, in 1916, one standard deviation increase in quota density is associated with a 23.54% increase in primary school density, when evaluated at the mean ( $1.15/4.9$ ); and the effect drops to 11% of the overall primary school density in 1933 ( $0.97/8.9$ ).

When employing expenditure per capita as the indicator for primary schooling provision, Columns (7) –(10) show results that are consistent with the findings above. The nature of the gentry's effect on primary education expenditure is far from trivial. In 1916, the gentry quota density could explain 10% of the expenditure that was spent on primary schooling per capita, evaluated at the mean; similarly, the gentry's effect explains 18% of the primary schooling expenditure in 1933.

Table 11 shifts our attention to the effect of local gentry on enrolment ratios. Consistent with the results on educational provision, we find that there is a significant and positive relationship between the quota density of lower degree holders and the primary enrolment ratio; adding a list of more control variables on economic development does not change the qualitative conclusion. In terms of magnitude, Columns (2), (4) and (6) show that one standard deviation increase in quota per capita (1.58) in the Qing period for a given county was associated in 1907 with a 0.88 percentage points increase in the primary enrolment ratio ( $1.58 \times 0.56$ ), and this effect accounts for 47% of the average primary enrolment ratios ( $0.88/1.9$ ) in the same year. The magnitude of the gentry's impact on enrolment dropped

to 11% in 1916; while for the year 1933 the gentry's effect is no longer significant. As discussed, the schooling outcome is decided by both demand and supply; more importantly, they interact with each other, making it difficult to disentangle the separate effects. When schooling provision increases rapidly within a short period as a supply shock, we can assume that the educational outcome is largely determined by the factors that influence education supply. This is why, in the first few decades after modern schooling was promoted, the role of the gentry, which helps explain schooling provision, also explains the enrolment ratio. But after almost four decades of public modern primary schooling provision, the school density had passed the tipping point where it no longer represented an exogenous supply shock. This means that demand side factors, such as economic structure, begin to play a stronger role in determining schooling attainment, once the primary schooling expansion was self-sustaining.

If we pool the three cross-sections together, we can also examine how the gentry's effect on schooling changed over time. The specification is as follows:

$$Schooling_i = \alpha + \gamma Gentry_i + \beta Time_t + \delta Gentry_i \dot{Time}_t + X_i' \theta + \varepsilon \quad (2)$$

where the year 1907 is left for comparison.

Overall, the results in Table 12 also confirm the positive correlation between the role of the gentry (the *Shengyuan* quota) and primary schooling development through the early 20th century. As expected, the spread of schools per capita and the outcomes are largely explained by time dummies, given the Chinese education system was as its infant stage. More importantly, consistent with previous cross sectional results, it is clear that the impact of the gentry declines markedly over time.

In summary, the baseline cross-sectional results and pooled estimations both show that counties used to have a higher quota density tend to provide more public primary education and have better schooling outcomes. Two important implications can be drawn from the results. First, the gentry mattered more in the early stages, when the primary schools were very scarce; once schooling expansion was more self-sustaining, the role of the gentry declined. Furthermore, the gentry presented a much stronger effect on the schooling provision than on the enrolment ratios, which also corresponds with our previous analysis that the gentry actively engaged in the decision making process regarding schooling provision, whereas how enthusiastically the populace responded to the increasing number of modern primary schools was associated with many other factors.

## 5.2. Instrumented evidence: the gentry's effect on primary schooling

However, the persistently positive correlation between local gentry and primary schooling displayed in the previous section cannot be interpreted as causal, for several reasons. First, the quota numbers for *Shengyuan* were not randomly assigned across regions. The figure is believed to be closely associated with the size of the county and its economic importance (Chang, 1955, pp. 77-79); and many omitted variables associated with economic prosperity are correlated in history with the number of local gentry. For this reason, the gentry's influence on primary schooling captured in the simple OLS estimations could be due to the channel of unobserved economic performance, rather than the reasons we proposed previously. Another potential problem lies in the measurement error in the proxy for gentry power. This is because instead of the actual number of gentry members in the period we use the quota numbers assigned in the late Qing period as a proxy for the local gentry's power in the Republican era. To address these concerns, and to rigorously test the gentry's causal effect on primary education expansion, an instrument variable strategy is applied in this section. Such an instrument must be an important factor in accounting for the gentry (*Shengyuan*'s quota) number variation, but must have no direct association with economic performance.

In this section, we employ the sudden increase in regional quotas of lower degree holders (*Shengyuan*) triggered by the Taiping Rebellion (1850-1864) as an instrumental variable for quota density. The county level quotas for the lowest level scholars (*Shengyuan*) remained very stable for most of the time during the Qing period, and the figures increased substantially only because of the outbreak of the Taiping Rebellion. The magnitude of the increase in the quota was associated neither with the original quota number nor the level of economic development. According to the Imperially Established Institutes and Laws of the Great Qing Dynasty (大清会典), larger quotas were granted to disruptive regions as an incentive to extract taxes from localities; or extra quotas were allocated as rewards to the hometowns of those magistrates who successfully organised military forces against rebels during the Taiping Rebellion (Chang, 1955, pp. 83-92; Kun, 1899).<sup>46</sup>

### 5.2.1. Falsification tests:

Even though extra quotas were set at times of political disruption rather than as economic rewards, the regions most affected during the Taiping Rebellion were located in the most prosperous South East of China (P. A. Kuhn, 1978). Therefore, the exclusion restriction is

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<sup>46</sup>Larger quotas were granted to the hometown of the magistrate instead of the locality of his service, which makes the increase in quotas across regions more random.

likely to hold. In order to confirm our instrument variable as valid, several falsification tests were performed. To do so, we needed to prove that the instrument variable should not affect the indicators of economic development.

In Table 13, we present the effects of our instrument variable on indicators for economic characteristics. The results consistently show that the sudden change in quota number was not statistically correlated with these economic variables. Furthermore, the effect of a sudden change in quota on the final quota density is strongly significant.

The falsification tests displayed in Table 13 suggest that the sudden change in quotas of Shengyun owing to the Taiping Rebellion is a plausible instrument for quota density. Moreover, by employing this identification strategy, we can establish the causal links between the strength of the local gentry and the expansion of primary schooling through the early 20th century.

### 5.2.2. Results from Instrumental Variable:

To further identify the causal effect of gentry strength on primary schooling, Table 14 presents the two-stage least-squares estimates. Columns (7)-(12) display 2SLS estimates of the coefficient of interest, with and without controls, and Columns (1)-(6) present corresponding first stage results. To begin with, Columns (1)-(6) display the close first-stage relationship between change of the *Shengyuan* quota and the quota numbers in the late Qing period. The corresponding 2SLS estimates of the impact of the gentry on school density and enrolment ratios are significantly positive across years, which is consistent with our baseline results in the previous section. However, unlike the findings in Tables 10 and 11 that the coefficients of the local gentry decrease substantially after adding in the control variables, in the IV results, the coefficients stay quite stable after controlling for other economic indicators; with the exception of 1930s, when the independent variable is primary school density. These are encouraging results, implying that the instrumented local gentry density remains stable with the inclusion of other potential co-determinants of primary schooling expansion.

Concerning school provision, first, the IV coefficients for the variable of interest are only slightly smaller than the results from baseline regressions. For instance, one standard deviation increase in quota density in the Qing period causes primary school density to increase by 0.37 data points ( $1.58 \times 0.24$ ); evaluated at the mean, this effect accounts for 29.16% ( $0.38 / 1.3$ ) of overall density in 1907. The effects for 1916 and 1933 are 15.1% and 6.56% respectively. Comparing these results with those in Table 10 (68% in 1907, 23.54% in 1916, 11% in 1933), the IV estimates suggest the possibility that the baseline estimators are subject to an upward bias.

When we change our independent variable to the primary enrolment ratio, the estimates

show consistent results. A standard deviation increase in quota density raises primary enrolment ratios by 1.01 percentage points ( $0.0053 \times 1.58$ ); given that the mean of primary enrolment ratio in 1907 is 1.9%, this effect explains 44.07% of the primary enrolment ratios in China ( $0.83/1.9$ ). Consistently, the explanatory effect of the gentry's role on primary enrolment ratios declines to 23.9% in 1916 ( $0.014 \times 1.58/0.094$ ), and reaches 30.8% in 1933. Again, comparing these results with those in Table 11 (46.5% in 1907, 10.6% in 1916; no effect in 1933), it is apparent that, for the latter time periods, 1916 and 1933, the IV result is considerably larger than the baseline result. This pattern suggests that the bias of OLS estimates is at a late stage of educational development when the economic characteristics, which are also correlated with the quota numbers of *Shengyuan* in the late Qing, had stronger effects on the level of schooling.

One of the main potential weaknesses of our estimates lies in the crude nature of the control variables for economic performance. The validity of our IV results depends on the assumption that the changes of quota due to the Taiping Rebellion have no direct effect on economic performance. While falsification tests using a list of economic indicators support this assumption, many other economic conditions cannot be examined, due to the lack of available data. Therefore, we shrink our sample to only one province—Shanxi (94 counties), where detailed relevant statistics are available, thanks to several social surveys that were carried out under the rule of Yan (Shanxisheng Dijiuji Jingji Tongji Zhengji (The economic survey of Shanxi Province 9th), 1927). These variables include actual agricultural output, living expenses, etc. The positive correlation between the *Shengyuan* quota and primary schooling variables stands after more control variables are added in.

In addition, to minimize measurement error, we employed different indicators as proxies for the number of local gentry as a robustness check. For instance, we used the absolute quota figure through the late Qing period, the quota number normalized by county size, *Jinshi* (the higher degree holder's number), and *Jinshi* density. With all indicators providing strikingly similar results, showing a significantly positive relationship between the local gentry in the Qing era and primary schooling through the Republican era.

### 5.3. *Political instability and the role of the gentry*

Our previous specification only considers the role of local gentry; now, we turn to examine whether the correlation between local gentry and mass education development is different for politically stable and for chaotic regions.

The main challenge is in constructing a valid measure for the strength of political instability in a county. Information on county magistrate turnover is used, and is calculated on



the average length of a magistrate’s tenure in office for a given county. As such information is not available in all counties’gazetteers, the sample shrinks considerably after adding this variable to our specification.

$$Schooling_i = \alpha + \gamma Gentry_i + \beta P_i + \delta Gentry_i \dot{P}_i + X_i' \theta + \varepsilon \quad (3)$$

In Equation 3,  $i$  represents county, and  $P_i$  is the key variable of interest, political stability;  $Gentry_i$  is the strength of the local gentry during the Qing dynasty; then we also include their interaction term, economic and geographic controls  $X_i'$  and  $\varepsilon_i$  which is the error term.

The main results are presented in Table 17. All estimations include all the control variables used in the previous specifications. Simple OLS and IV estimates show that the effect of the length of a magistrate’s tenure is positive, and interacting it with gentry density results in a significant and positive impact on the primary schooling enrolment ratio (0.075-0.029\*1.22=0.039). It confirms the assumption that political stability results in higher accountability. For instance, the primary enrolment ratio rises by 0.039 data points, when the tenure of a magistrate increases by one year (0.075-1.22\*0.029). Evaluated at the mean, it accounts for 51.45 % of the enrolment ratio in 1916.

In addition, the effect of the density of the local gentry remains positive and significant, after interacting with the tenure as magistrate. Moreover, if we calculate the coefficient for such density, the result is 0.058-0.029\*1.03=0.028. This is an encouraging result, which is quite consistent with those in Table 11.

The interaction term has a negative coefficient, which means that tenure as magistrate has a mitigating effect on the role of the gentry. It appears that the local gentry had a smaller impact on promoting primary schooling in counties with a relatively higher level of political stability. This negative interaction effect echoes historical narratives, whereby local gentry tended to assume local power to administer the provision of public goods in regions where formal governance was on the verge of collapse. The nature of the mitigating effect of the length of magistrate tenure is not trivial. Our calculations show that, evaluated by the mean, each extra year that a magistrate served in office mitigated the effect of quota density on primary enrolment ratio by 37.6 % (0.029\*1.22/0.094). In a nutshell, better administrative/ political stability brought better mass schooling, and the role of gentry was enlarged in counties with a more frequent turnover of magistrates.

#### 5.4. *What do we know about economic outcomes and schooling development?*

Apart from adding the role of the local gentry, this section seeks to provide some quantitative clues to the ambiguous relationship between educational development and economic

prosperity.

We include all the control variables  $X'_i$  and their interactions with time dummies in Table 18. With all the above combinations, the effect of the local gentry remains positive and significant; while the interaction effects with economic factors have quite diverse results.

First, population density has a negative association with primary schooling outcomes; this negative impact increased over time. It is an unexpected result. If we interpret population density as a proxy for commercialization and urbanization levels, it implies that a higher level of urbanization did not bring any positive effect on mass education; instead, rural and remote regions may have performed better as regards primary schooling. Potential agricultural output measured by soil suitability for rice and wheat cultivation presents similar positive correlations with primary schooling. These two results suggest that in terms of primary education rich agricultural regions rose first.

This conjecture can further confirm the finding that the land tax quota in the late Qing period had its own positive influence on primary education. Land taxes had long been the chief tax revenue for the Chinese state, suggesting that the land tax quota in the late Qing was a good proxy for fiscal capacity, but should also correlate with the economic weight of agriculture in each region. Land taxes at first show no significant effects on schooling development in 1907, but this changed under the new education system for the latter two benchmark years.

Similar advantages in schooling outcomes in rural and economic backward areas have been observed in early 19th century Meiji Japan and the USA, but the underlying reasons are likely to have been quite different in the Chinese context. The main revenue sources for the county budgets were surtaxes on land tax, while the lucrative Likin – a tax levied as an internal tariff and also on shops – was in the grip of the provincial treasury. The main funding body of primary education was the county government, which had no authority to lay hands on the Likin. It meant that highly commercialized regions could contribute to provincial treasuries, but not to county budgets; on the contrary, regions with a prosperous agriculture sector enabled county governments to mobilize more potential tax revenues for primary education.

The effect of the penetration of Western ideas on education development is explored through a series of indicators. First, regions with treaty port status tend to have much better primary schooling, but over time the advantages of being a treaty port declined. This implies that exposure to Western ideas and information was more important for the residents' acceptance of modern schooling during the early phase of development than later. Consistent with the results for the treaty ports, we find that greater distance to the nearest telegraph station for a given county with less exposure to the outside world meant less

primary education. The importance of this variable also declined through time.

For Christian activities, another proxy for the penetration of Western ideas, when it is measured by the ratio of enrolment in missionary primary schools, it shows a significant and positive effect on primary schooling expansion; while the number of communicants per 10,000 people has no statistical impact on primary schooling. This pattern indicates that Christianity mattered mainly through its ‘learning effect’, consistent with Kung and Bai’s recent study (Bai and Kung, 2014).

Geographical controls show some interesting results; for instance, distance from the regional political centre, say, a prefectural seat, hindered the development of primary education.

In sum, owing to the crudeness of the demand-side control variables, it is difficult to generalize any conclusive claims, but several points from the above results are worth stressing. First, the influence of economic prosperity on the rise of primary schooling changed over time. In the early stages, it seems that the factors that affected people’s acceptance – for instance, exposure to Western ideas and openness – played a more vital role. In contrast, when people began to adapt to the idea of modern education, the county’s economic performance, in particular the strength of agriculture and fiscal capacity, mattered more. Agricultural regions did not hold any disadvantages in terms of primary schooling development; on the contrary, the rich, stable and agrarian counties were the front runners in terms of the expansion of education.

### *5.5. Understanding Mechanism: Private Incentive or Scholar Culture?*

In previous sections, a causal link was established between the quotas (of lower degree holders) in the Qing dynasty, and primary schooling development through the early 20th century. To interpret the gentry’s effect, our argument proposed previously emphasized gentry’s strong incentive to promote modern education due to their own private interests. This statement is hinged on gentry’s view of the primary education sector as their potential job market and a potential way to stay as educated elites after civil service examination was abolished. Therefore, it was the object of the local gentry to deliberately promote and support the expansion of primary schooling across China, when local governments had no capacity or incentive to do so.

However, there are many possible mechanisms through which the gentry, as a outcome of traditional education could have affected modern schooling. The most likely channel being clear from a cultural perspective. There are places where people always perform better in education, no matter what kind of education, Western or Confucian. Global evidence shows

that education performance tends to have a high degree of persistence across regions and over time. The inertia of educational attainment may be genetic, but is more likely to be deeply rooted in culture. In the context of China, through the long history of the civil service exam, counties with a higher quota density may have generated a higher cultural respect for the value of education among its people, which facilitated the successful spread of modern education. To test whether this alternative explanation is valid, we perform two tests on the effect of the ‘scholar culture’ on modern schooling expansion.

To begin with, a logistic regression was run to test the effect of quota density on the higher level of schooling; namely, secondary education. If the channel of influence of the gentry is a cultural legacy, the effect should not be limited to primary education alone. The estimates show that the coefficients are not significant across the three benchmark years. Results in Table 19 show that the number of local gentry specifically contributed to the expansion of primary education, but showed no regard for higher levels of schooling. As discussed earlier, since secondary schooling was dominated by people with a modern education background, and tertiary schooling was mainly a job market for people who had studied abroad the local gentry had limited incentive to support secondary schools.

As a further measurement check, we constructed an indicator to proxy the literary ethos or what we might refer to as the ‘scholar culture’. As emphasised, regional variation in the quota numbers of *Shengyuan* was not determined by the educational performance or the scholar culture under the traditional education system, since it was fixed by the Qing court. However, the number of *Jinshi* (the number of top scholars who passed the palace exam) could have reflected the education performance across counties within one province, because the quota for *Jinshi* were allocated at the provincial level (C. Chang, 1955, pp. 122-123). Accordingly, we constructed a ratio that reflects ‘scholar culture’, which is very similar to a graduation rate —  $Jinshi_i/Shengyuan_i$ .

Given the same number of quotas of *Shengyuan*, the number of *Jinshi* that could be cultivated at the county level reflects the education quality in a given county. It is reasonable to assume that in regions where education was perceived as more honoured and culturally encouraged, its inhabitants tended to have a higher incentives to study diligently, thus generating better educational performance.

We use this ratio to measure the cultural valuation of education in a given county. Adding it to the baseline specification, the results in Table 19 show no significant effect on the primary enrolment ratio or primary school density. Both the tests used confirm that regions where the residents used to be ‘good at’ traditional education were not necessarily the ones where modern primary schooling was successfully diffused. Therefore, the legacy of traditional education cannot present its role in promoting modern schooling simply as a matter of

cultural persistence.

Both the tests used confirm that regions where residents had previously thrived in traditional education were not necessarily the ones where modern primary schooling was successfully diffused. Thereby, the legacy of traditional education does not influence modern schooling simply and solely as a matter of cultural persistence.

## 6. Conclusion

The mass education system in China was established relatively late, at the turn of the 20th century, when the civil service examination came to a sudden end. In the following few decades, mass schooling spread quickly in China, despite the political chaos. To unveil the driving forces of mass schooling, this paper uses newly assembled data from archival sources, and empirical analysis find that counties with more traditional lower degree holders – gentry, provided more public primary schools in its early stage, and had better schooling outcomes. Moreover, the story of the ‘roving bandit’ is also applicable to the Chinese context, in that it exemplifies the importance of administrative/political stability; more importantly, this finding also suggests that the gentry’s positive effect on schooling was larger in regions suffering higher levels of political instability.

The findings of this paper review the critical role of one elite group — gentry in the successful rise of mass education in China through its early stage. The discontinuity of the old education system demised gentry’s legitimacy as elites and lead to their disadvantage in many high-end job markets. Viewing local primary education sector as one of the few available job markets and potential ways to preserve their status as educated elites, traditional gentry actively supported the spread of modern public primary education.

In terms of contribution and implications, to begin with, unlike existing empirical studies on China covering the same period, this study compiles a county-level dataset. Substantial historical narratives indicate that, due to China’s sheer size and distinctive diverse economic and social conditions, using prefectural or even provincial level data to explain socio-economic variations in China loses much of the essential dispersion and many important underlying patterns. Further more, the findings of this paper are exceptionally important to Chinese economic history. As the local gentry’s status was granted via traditional education, this finding confirms the historical legacy of education development, which has been neglected in the literature. This study is not relevant to Chinese educational history alone; it also provides empirical evidence on the notable importance of the gentry in local governance. Despite the large literature claiming the vital role of the local gentry in Chinese history, there are very few rigorous studies that examine its direct impact on spheres of

governance, and even fewer mentioning how the gentry's role changed in the dynamic of the radical social transformation at the dawn of the 20th century, when the institution that had granted legitimacy to the gentry as an elite was removed.

Moreover, this thesis has broader general implications that go beyond the Chinese context. First, it sheds light on the determinants of education in societies equipped with different political institutions and a very backward economy, in the eyes of the developed world. The literature targeting the OECE countries emphasized the role of decentralization and local democracy as main engines for schooling expansion; this study adds to these the part played by local administrative stability and the benign nature of social elites in explaining schooling outcomes in societies where a decentralized structure meets local authoritarian politics. Second, this study makes a sharp contrast with the literature that argues that social elites always formed the main interest groups that sets out to block public schooling to the masses (as it did in many European countries). Finally, because mass education can be seen as one of the most widely influential public goods, this study may apply to the much broader question of understanding the provision of public goods in the developing world. Our main finding – the beneficent role of a certain elite group – adds evidence to a recently growing body of literature stressing the importance of informal institutions enforced by social groups in providing public goods in non-democratic societies.

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## Appendix A. Figures

Fig. 1. The structure of gentry & levels of the Civil Service Exam

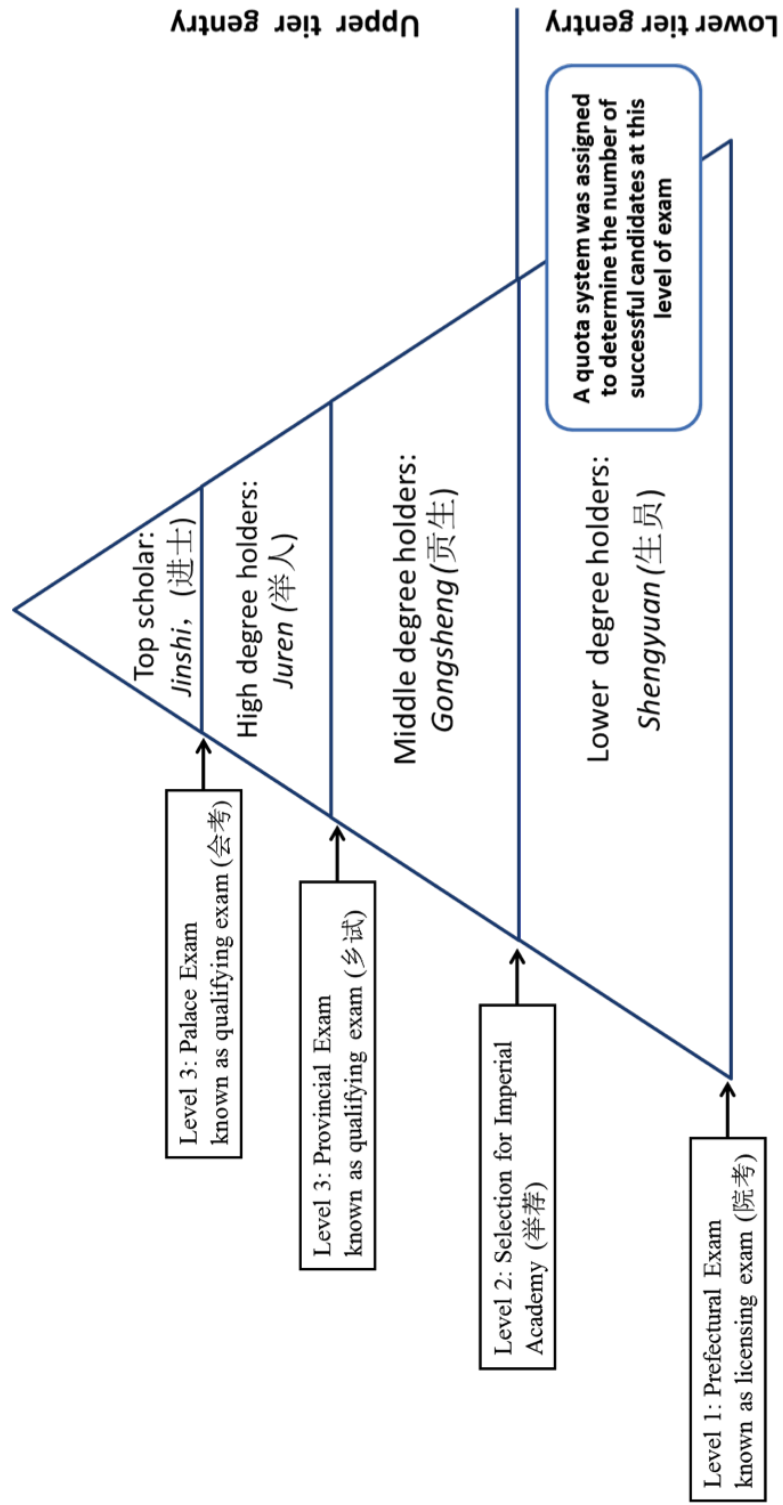
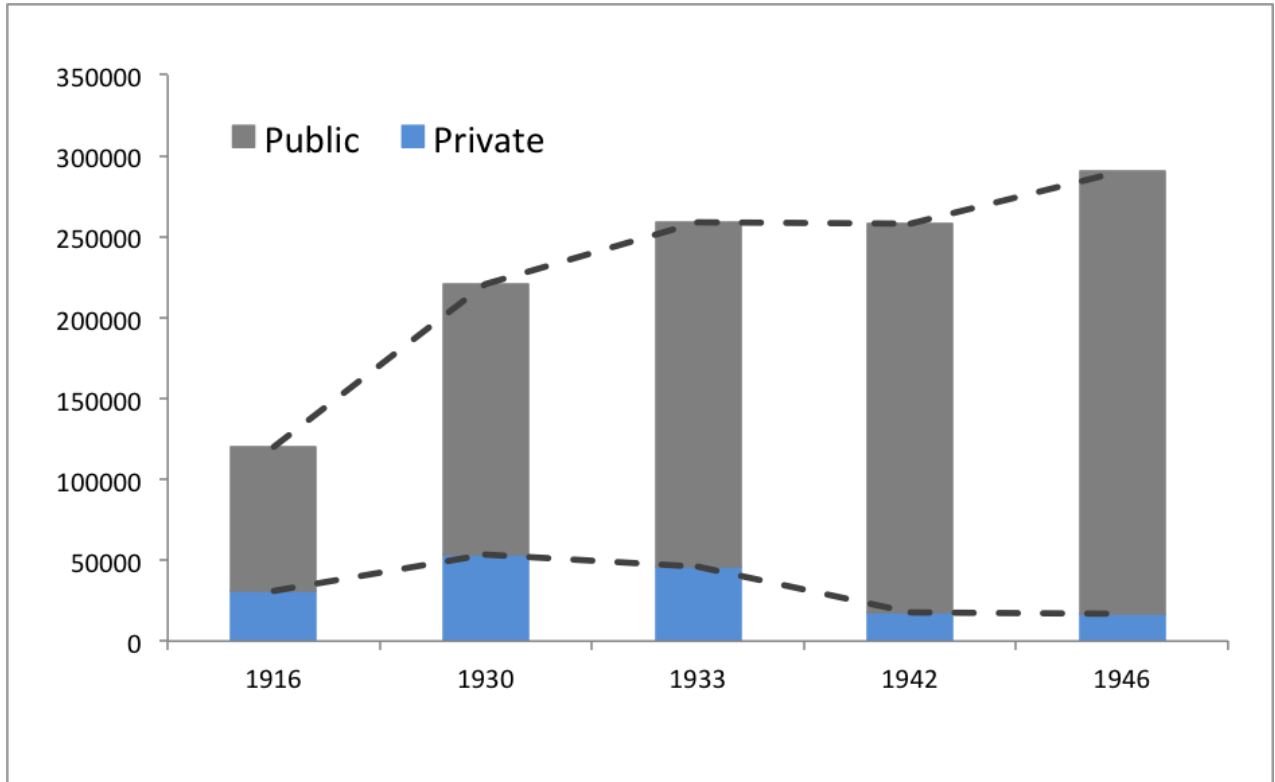


Fig. 2. Composition of primary schools (public vs private)



\*Sources:

- (i). Zhonghua minguo jiaoyu tongji tubiao (The education statistic report for Republic of China, fifth), 1916
- (ii). Quanguo Chudeng Jiaoyu Tongji (The statistic report on primary education), 1930
- (iii). Quanguo Chudeng Jiaoyu Tongji (The Statistic Report on Primary Education in 1933), 1937)
- (iv). Zhu, J. (Ed.). (1948). Dierci Jiaoyu Nianjian ( The Second Education Report) (Vol. 15). Shanghai Shangwu Press.

Fig. 3. Geographical Data Coverage (China proper)



Panel A: Data coverage in 1907



Panel B: Data coverage in 1916



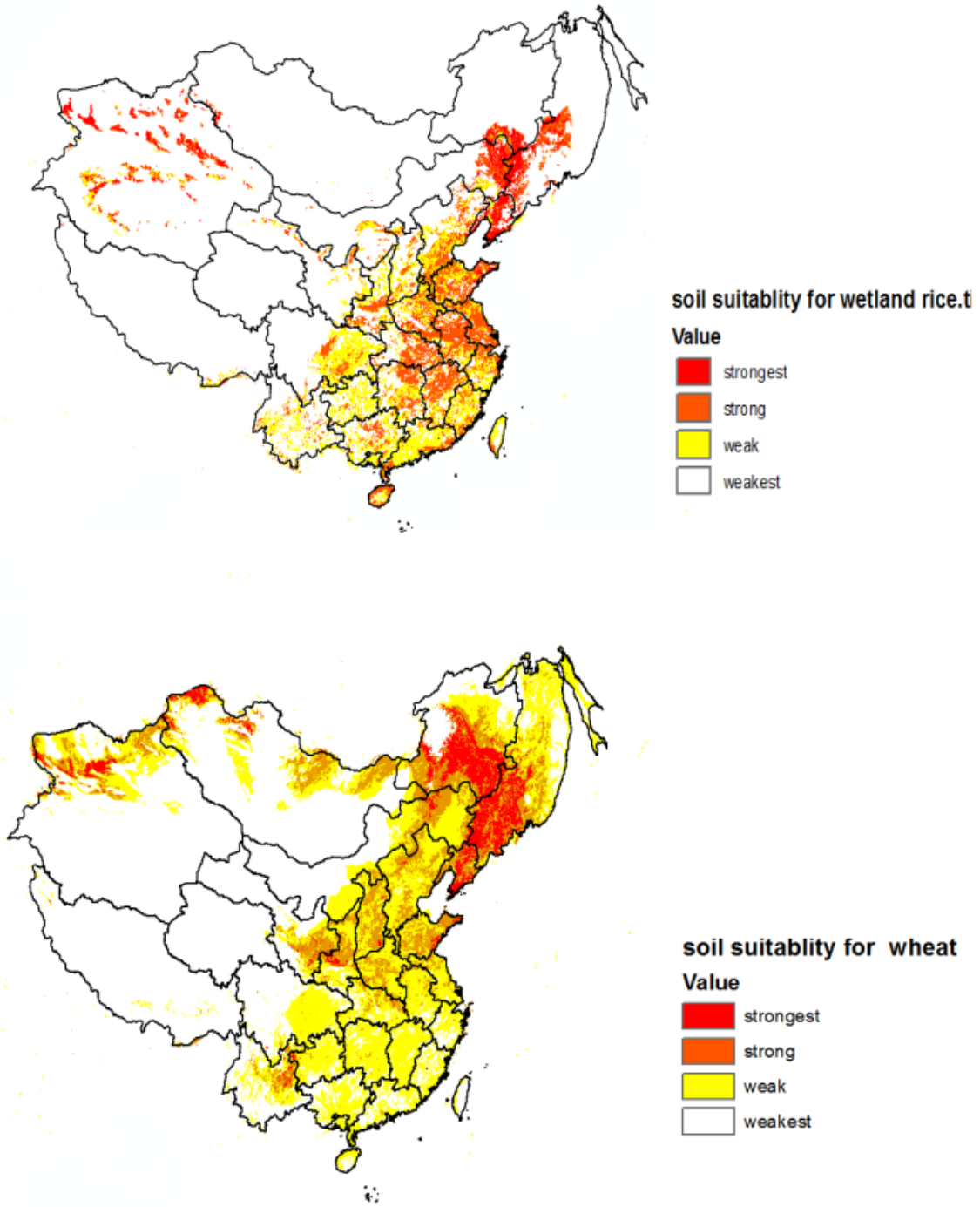
Panel C: Data coverage in 1930



Panel D: Sample counties

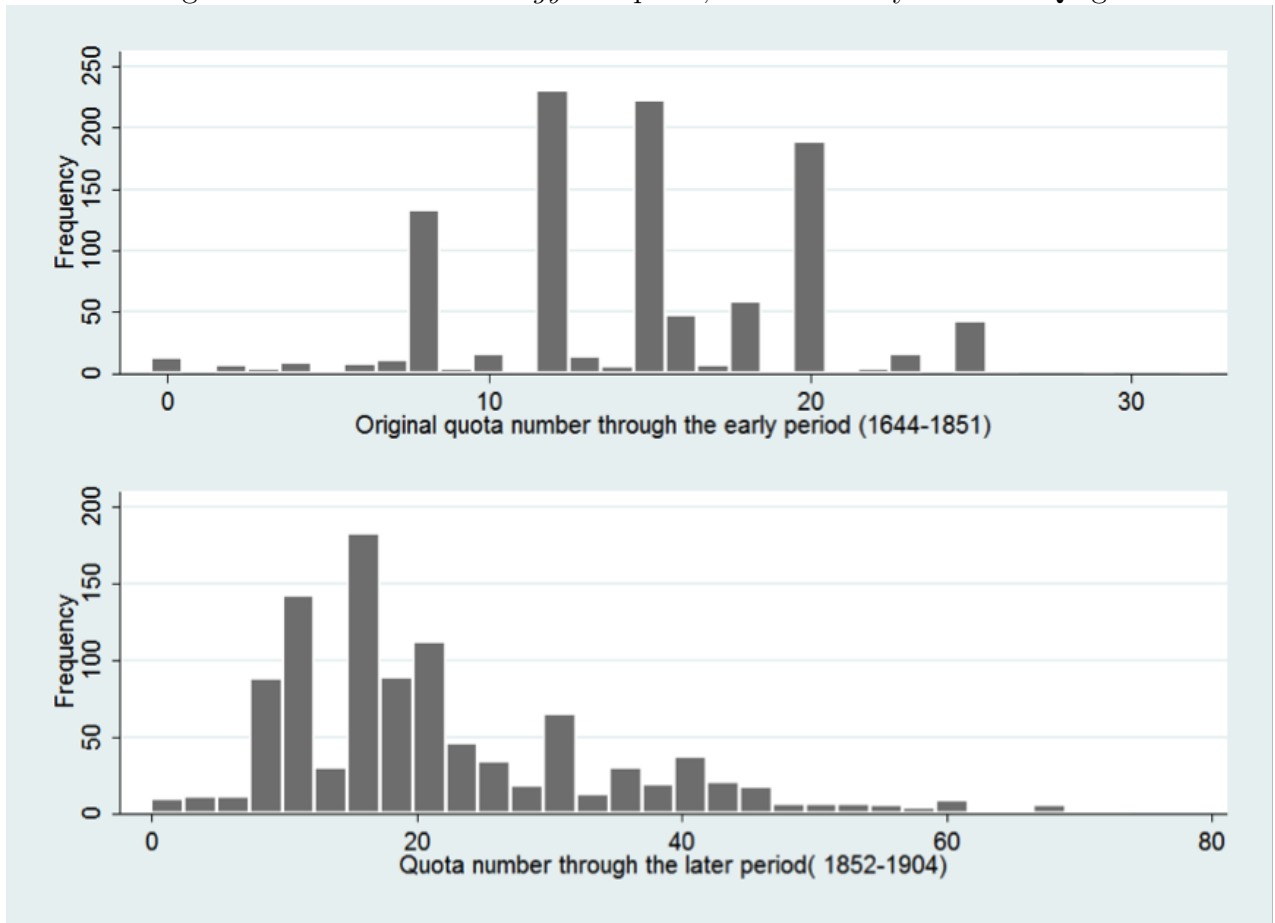


Fig. 4. Soil suitability for major crops



Source: FAO.(2012), Global Agro-ecological Zones (GAEZ v3.0)

Fig. 5. Distribution of *Shengyuan* quota, for both early and late Qing



\*Sources: (i). *Shengyuan* Quota:(Kun, 1899) (ii). *Jinshi*: (Jiang, 2007)

Table 1: Composition of primary schools(national/provincial/county/private)

Year	Private(%)	Public(%)			
		National	Provincial	County	Sub-county
1916	25.9	0.03	74.07		
1930	24.40	0.01	0.61	26.45	48.49
1933	17.99	0.01	0.62	17.26	64.12
1940	6.87	0.01	0.16	47.49	45.47
1946	5.74	0.02	0.14	94.1	

\*Sources:

- (i). Primary: the sources noted under Figure 2.1
- (ii). Secondary: (Zhu, 1948, pp. 1429-1430)
- (iii). Tertiary: (Zhu, 1948, p. 1402)

Table 2: Composition of public primary schools by province in 1933

Province	Public Primary School (%)				
	National & Provincial	County	District	Township	Others
All	0.62	16.98	26.39	34.5	3.97
Zhili	0.11	14.84	5.85	74.01	2.69
Henan	0.14	15.55	28.1	47.7	3.69
Shanxi	0.13	3.29	0.5	93.2	2.31
Shandong	0.17	8.34	26.28	51.27	11.38
Shaanxi	0.18	16.85	16.55	35.33	10.8
Gansu	0.82	34.06	54.16	2.67	1.23
Jiangsu	0.44	88.41	2.32	2.43	0
Anhui	1.11	37.74	38.08	1.57	0.31
Jiangxi	1.15	13.51	16.69	18.28	6.09
Fujian	1.06	22.41	39.22	0	0
Zhejiang	0.21	6.6	44	8.48	0.7
Guangdong	0.06	3.27	13.95	18.61	0.9
Guangxi	0.05	5.52	90.21	0	0
Hubei	4.34	28.78	18.67	4.87	1.08
Hunan	0.04	1.94	48.42	12.32	2.07
Yunnan	0.11	6.59	53.27	33.63	3.45
Guizhou	0	62.36	16.65	5.34	1.63

\*Source:

- (i). Department of Education, Quanguo Jiaoyu Jingfei Tongji 1932–1933(The national educational finance report 1932–1933), 1937
- ii). Department of Education, Quanguo Chudeng Jiaoyu Tongji (The statistical report on primary education), 1934

Table 3: The difference between provincial, local and private

Year	Student per school			Expenditure per school		
	Provincial	Local	Private	Provincial	Local	Private
1916	205.33	33.91	27.46	27.70	6.35	22.22
1933	163.98	44.78	52.81	28.54	7.74	10.01
1940	383.40	112.54	128.68	21.16	6.57	7.33
1946	359.68	57.65	125.14	207371.83	24727.31	20833.45

\*Note:

(i).The 1940 educational yearbook covers only nine provinces.

(ii).The high expenditure per student in 1946 was due to the soaring inflation rate.

\*Sources:

(i).1916: (Zhonghua minguo jiaoyu tongji tubiao (The education statistic report for Republic of China, fifth) 1916)

(ii).1933: (Quanguo Chudeng Jiaoyu Tongji (The statistic report on primary education) 1934)

(iii).1940: (Quanguo Jiaoyu Tongji ( The national education statistic report ), 1940)

(iv). 1946: (Zhu, 1948)

Table 4: The revenue composition for primary education (county)

	All	Hubei	Shandong	Henan	Zhili	Jiangsu
<b>Surcharges</b>	63.7	41.49	70.4	76.7	59.62	70.29
surcharges on land tax	40.61	21.94	62.3	51.8	26.43	
<b>Endowed school land</b>	17.8	43.51	12.9	16.33	8.53	8.19

\*Note:

In the 1930s, a number of provinces published government reports on education enclosing statistics at county level, but the informativeness of these reports differ significantly across provinces. Of the provincial reports that I collected from archive, five carefully document the source and composition of educational income. The above table presents data from Hubei, Zhili, Jiangsu, Shandong and Henan, 423 counties in total.

\*Sources:

(Quanguo Jiaoyu Jingfei Tongji 1932–1933 (The national educational finance 1932–1933) 1937, pp. 105–109)

(Shandongsheng Gexian Difang shibaniandu Jiaoyu Jingfei Suiruiyilanbiao (County balance sheets for education in Shandong Province across counties, 1929) 1930)

(Hunansheng Zuijin Geniandu Shengshixianqu Jiaoyu Jingfei Diaocha Tongji (The county-level reports on education finance of Hunan Province), 1933)

(Hebeisheng Gexian Putong Jiaoyu Gailan (The county-level reports for general education in Hebei province), 1928)

(Henan jiaoyu yanjian (The Education Yearbook of Henan province), 1930; Jiangsu Jiaoyu Gailan (The education reports for Jiangsu province), 1933)

Table 5: Turnover of county magistrates

Local Magistrate	Average length in office (year)					
	<0.3	0.3-0.5	0.5-1	1-1.5	1.5-2	>2
1911-1917	0.59	9.7	64.71	12.94	7.06	4.9
1917-1932	0	3.07	55.36	26.3	3.97	7.33

\*Note:

(i). This table relies on information from a large collection of Chinese gazetteers. I collected information on 592 counties, the gazetteers of which recorded the names and tenure of its magistrates through this period.

(ii). The list of county gazetteers is too long to present here, and can be found in the Appendix B.

Table 6: Summary statistics for dependent variables: schooling variables

Schooling Variables	Obs	Means	S.D	Min	Max
1907					
Primary enrolment ratio	1027	1.90%	0.034	0.01%	45.18%
Primary school density by population(1000)	1027	1.34	2.7	0.0003	3.41
Primary school density by area(1000km <sup>2</sup> )	1027	0.198	0.446	0.0005	9.17
1916					
Primary enrolment ratio	1066	9.42%	0.0881	0.22%	84.24%
Primary school density by population(1000)	1066	4.9	4.7	0.0074	4.875
Primary school density by area(1000km <sup>2</sup> )	1066	0.807	1.159	0.0012	23.99
Primary expenditure per capita	1066	0.086	0.24	0.0012	4.62
Student-teacher ratio	1066	31.58	102.58	1.18	2541
1933					
Primary enrolment ratio	787	22.65%	0.177	0.29%	84.24%
Primary school density by population(1000)	787	8.9	8.1	0.01	5.29
Primary school density by area(1000km <sup>2</sup> )	787	1.32	1.18	0.0001	9.95
Primary expenditure per capita	787	0.38	0.69	0.004	7.6

\*Sources:

i.1907: Ministry of Education(1907), Guangxu Diyici Jiaoyu Tongji Tubiao (The first statistical report on Education)

ii.1916: National Board of Education (1916), Zhonghua Minguo Jiaoyu Tongji Tubiao (The education statistical report for the Republic of China, no. 5); Population: (Stauffer, 1922)

iii.1933:There is no national yearbook on county-level schooling information nor population in 1930s; instead, a number of provinces published government reports on education enclosing detailed statistics respectively. We gather 10 provinces that published similar education reports in 1930s, covering 787 counties.

Education Bureau of Fujian Province(1930), Fujiansheng Jiaoyu Tongji (Education reports of Fujian province) Education Bureau of Guangdong Province(1935), Guangdongsheng ershisan niandu Jiaoyu Gaikuang (The education reports of Guangdong Province in 1933) Education Bureau of Guangxi Province(1932), Guangxisheng Jiaoyu Tongji (The education reports for Guangxi Province) Education Bureau of Guizhou Province(1932), Guizhousheng Jiaoyu Tongji (The education reports on Guizhou province) Education Bureau of Hebei Province, Hebeisheng Gexian Putong Jiaoyu Gailan (The county-level reports for general education in Hebei province), 1928 Education Bureau of Henan Province(1930), Henan jiaoyu yianjian (The education yearbook of Henan province) Education Bureau of Hunan Province(1931), Hunan quansheng Jiaoyu Tongji (The education reports for Hunan province), Education Bureau of Jiangsu Province (1933), Jiangsu Jiaoyu Gailan (The education reports for Jiangsu province) Statistic Department of Shanxi Province(1930), Shanxisheng Dishici Jiaoyu Tongji (The tenth education report on education in Shanxi province) Education Bureau of Hubei Province(1932), Zuijin Hubei Jiaoyu Yilan (The education reports on Hubei province)

Table 7: Summary statistics for the numbers of the gentry

<b>Gentry Variables</b>	<b>Obs</b>	<b>Means</b>	<b>S.D</b>	<b>Min</b>	<b>Max</b>
Original <i>Shengyuan</i> quota	1499	13.24	6.14	0	32
<i>Shengyuan</i> quota in the later period	1499	19.43	13.2	0	74
<i>Shengyuan</i> quota density in late Qing	1499	1.58	1.66	0	20
Accumulated number for <i>Jinshi</i>	1499	14.22	27.4	0	306
<i>Jinshi</i> density in late Qing	1499	0.86	1.3	0	13

\*Source:

(i). *Shengyuan*: (Kun, 1899); (ii). *Jinshi*: (Jiang, 2007).

\*Note: The *Jinshi* density in late Qing is calculated by the accumulated *Jinshi* numbers through the Qing era and then normalised by the population in 1910.

Table 8: Summary statistics for the turnover of county magistrates

<b>County Magistrate Turnover</b>	<b>Obs</b>	<b>Means</b>	<b>S.D</b>	<b>Min</b>	<b>Max</b>
1911-1916: average tenure in office	592	1.22	0.701	0.29	5
1917-1933: average tenure in office	592	1.13	0.806	0.32	8

\*Note:

This table relies on information derived from a large collection of Chinese gazetteers. I collected information on 592 counties, the gazetteers of which recorded the names and reshuffle times of its magistrates through this period. The list of county gazetteers it can be found in a table in the Appendix B.

Table 9: Summary of statistical of control variables

Variable Definition	Source	Obs	Means	S.D
<b>Agricultural productivity</b>				
Soil quality data (rice)	4	1066	1.035	1.22
Soil quality data (wheat)	4	1066	2.788	1.21
Agricultural tax quota in Qing dynasty	3	977	24.37	17.01
<b>Population density</b>				
Population density1907	2,3	1025	1.81	2.19
Population density1916	2,6	1066	1.94	2.29
Population density1933	2	620	2.25	2.73
<b>Urbanization level</b>				
Population in 1880	3	1066	22.57	16.44
Large city (=1, if population>300,000)	5	1066	0.25	0.44
Medium-sized city (=1, if 70,000<population <300,000)	5	1066	0.56	0.49
Small city (=1, if 30000<population<70,000)	5	1066	0.13	0.34
<b>Industrial development</b>				
Modern Industry location	1	1066	0.114	0.318
<b>Westernization</b>				
Treaty port	7	1066	0.22	0.41
Christians per capita(over 10,000)	6	1066	8.78	17.43
Missionary primary school enrolment ratio	6	1066	0.21%	0.0053
Nearest distance to county with telegraph	8	1066	542.9	467.2
<b>Political geography</b>				
Distance to provincial capital	2	1066	46.51	25.57
Distance to prefecture seat	2	1066	170.26	101.24
<b>Geographical controls</b>				
Coastal line	2	1066	0.096	0.29
Yangtze River	2	1066	0.043	0.21

\*sources:

1. Chang, Y.(1989).“Private Industries in the Late Ch’ing and the Early Republic of China, 1860–1916”:Bulletin of the Institute of Modern History, Academia Sinica, 18, 315–561.
- 2.CHGIS.(2007) Version 4, Harvard Yenching Institute
- 3.Zhong, Liangfang.(1981).Zhongguo Lidai Hukou Tiandi Tianfu Tongji(Statistics on China’s Historical Population, Land and Land tax).Shanghai: Shanghai Renmin Press.
- 4.FAO.(2012),Global Agro–ecological Zones (GAEZ v3.0)
- 5.Rozman, G.(1973). Urban Networks in Ch’ing China and Tokugawa Japan. Princeton University Press.
- 6.Stauffer.(1922),The Christian occupation of China:A General Survey of the Numerical Strength and Geographical Distribution of the Christian Forces in China.China Continuation Committee. Shanghai
- 7.Yan, Zhongping.(1955). Zhongguo Jindai Jingjishi Tongji Ziliao Xuanji (Selected Statistical Materials of Modern China Economic History). Beijing: KeXue Press
- 8.Statistical department of the Inspectorate general of Customs. (1907). Da Qing youzheng beiyong yutu (China postal working map)
- 9.Zhenhe Zhang and Yuanying Ding.(1982). Qingmo Minbian Nianbiao(The History of Civil Conflict in the Late Qing)



Table 10: Correlation between primary schooling provision and local gentry

Variables	Primary School Density over 10,000 People					
	1907		1916		1933	
	(1)	(2)	(3)	(4)	(5)	(6)
Local gentry	0.72*** (0.14)	0.58*** (0.001)	1.02*** (0.2)	0.73*** (0.17)	0.75** (0.31)	0.62* (0.39)
Pop density	0.028 (0.019)	0.014 (0.035)	-0.063* (0.036)*	-0.036 (0.05)	-0.57** (0.14)**	-0.57** (0.16)**
Other Controls	NO	YES	NO	YES	NO	YES
Province FE	YES	YES	YES	YES	YES	YES
Observations	904	904	1066	1066	599	599
R-squared	0.38	0.43	0.39	0.43	0.58	0.61

	Primary Schooling Expenditure per capita			
	1916		1933	
	(7)	(8)	(9)	(10)
Local gentry	0.007*** (0.0018)	0.0052** (0.0025)	0.021*** (0.0076)	0.039*** (0.009)
Pop density	0.0014 (0.0013)	-0.0019 (0.0034)	-0.0053*** (0.0019)	-0.011*** (0.0024)
Province FE	YES	YES	YES	YES
Other Controls	NO	YES	NO	YES
Observations	1066	1066	386	386
R-squared	0.07	0.11	0.7	0.77

\*Note:

(i). In this table, the numbers of local gentry are based on the shenyuan quota density (normalised by 1907 population)

(ii). Control variables include: potential soil quality for rice, late Qing land tax quota, modern industry location dummy, treaty port dummy, density of Christians over 10,000 people, distance to nearest telegraph station, distance to prefectural seat, distance to provincial capital, dummy for Yangtze river, dummy for coastal area.

(iii). All the standard errors are clustered at county level in parentheses.

(iv). \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

Table 11: Correlation between primary enrollment ratio and local gentry

Variables	Primary Enrollment Ratio					
	1907		1916		1933	
	(1)	(2)	(3)	(4)	(5)	(6)
Local gentry	0.0075*** (0.0015)	0.0056*** (0.001)	0.006*** (0.0018)	0.0046* (0.002)	0.004 (0.005)	0.0043 (0.007)
Pop density	0.00028 (0.00029)	0.00002 (0.0004)	0.0012 (0.0008)*	-0.0006 (0.0012)	-0.008 (0.002)**	-0.009 (0.003)**
Other Controls	NO	YES	NO	YES	NO	YES
Province FE	YES	YES	YES	YES	YES	YES
Observations	904	904	1066	1066	599	599
R-squared	0.3	0.39	0.34	0.37	0.52	0.57

\*Note:

(i). In this table, the numbers of local gentry are based on the shenyuan quota density (normalised by 1907 population)

(ii). Control variables include: potential soil quality for rice, late Qing land tax quota, modern industry location dummy, treaty port dummy, density of Christians over 10,000 people, distance to nearest telegraph station, distance to prefectural seat, distance to provincial capital, dummy for Yangtze river, dummy for coastal area.

(iii). All the standard errors are clustered at county level in parentheses.

(iv). \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

Table 12: Dynamic effects of local gentry on primary education

Variables	Primary School Density		Primary Enrollment Ratio	
	(1)	(2)	(3)	(4)
Local gentry	0.062*** (0.007)	0.058*** (0.008)	0.0011*** (0.0001)	0.000089*** (0.0002)
Year 1916	4.9*** (0.43)	4.9*** (0.39)	0.095*** (0.004)	0.094*** (0.005)
Year 1933	10.2*** (0.86)	10.5*** (0.8)	0.22*** (0.013)	0.22*** (0.015)
Gentry * Year1916	-0.059*** (0.009)	-0.059*** (0.0092)	-0.0008*** (0.0001)	-0.00078*** (0.0001)
Gentry * Year1933	-0.13*** (0.018)	-0.16*** (0.022)	-0.0014*** (0.0004)	-0.0017*** (0.0005)
Pop density	-0.28*** (0.044)	-0.38*** (0.063)	-0.0041*** (0.0009)	-0.0067*** (0.0009)
Potential agriculture yield		-0.06 (0.087)		0.0011 (0.0043)
Land tax quota (Qing)		0.035*** (0.005)		-0.00067*** (0.00012)
Modern industry		0.17 (0.25)		0.016** (0.006)
Treaty port		0.64** (0.38)		0.015*** (0.0053)
Christianity density		152.9** (61.2)		2.55 (-1.6)
Distance to telegraph		-0.75* (0.23)		-0.007** (0.0039)
Distance to prefecture-seat		-0.014** (0.005)		-0.00025*** (0.0001)
Distance to provincial capital		0.003** (0.001)		0.00005** (0.00002)
Local protests		0.091 -0.1		-0.0027 -0.0024
Geo Control	NO	YES	NO	YES
Province FE	YES	YES	YES	YES
Observations	2701	2701	2701	2701
R-squared	0.5	0.54	0.54	0.57

\*Notes:

(i). In this table, the numbers of local gentry were based on the shenyuan quota

(ii). All the standard errors clustered at county level in parentheses

(iii). \* significant at 10 %; \*\* significant at 5%; \*\*\* significant at 1%.

Table 13: Falsification tests: the effect of instrument on other variables

	Quota number (late Qing)	Quota density (late Qing)	Potential agriculture yield	Land tax quota	Treaty Port	Modern Industry	Telegraph Station
1907							
Change in quota	10.4*** (0.82)	0.78*** (0.08)	0.042 (0.065)	0.01 (0.32)	0.76 (0.14)	0.212 (0.33)	0.009 (0.026)
Controls	YES	YES	YES	YES	YES	YES	YES
Observations	904	904	904	904	904	904	904
R-squared	0.66	0.61	0.67	0.52	0.35	0.37	0.32
1916							
Change in quota	10.5*** (1.02)	1.32*** (0.06)	0.037 (0.076)	-0.0026 (0.003)	-0.21 (0.23)	0.108 (0.35)	0.032 (0.028)
Controls	YES	YES	YES	YES	YES	YES	YES
Observations	1140	1140	1140	1140	1140	1140	1140
R-squared	0.66	0.49	0.67	0.45	0.35	0.37	0.32
1933							
Change in quota	13.27*** (2.1)	0.63*** (0.13)	0.041 (0.032)	0.0012 (0.002)	0.01 (0.33)	-0.033 (0.027)	0.002 (0.003)
Other Controls	YES	YES	YES	YES	YES	YES	YES
Observations	599	599	599	599	599	599	599
R-squared	0.7	0.67	0.69	0.52	0.3	0.36	0.17

\*Note:

- (i). All the standard errors clustered at county level are shown in parentheses.
- (ii). \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

Table 14: Estimation results from IV strategy

	<b>First Stage</b>					
	1907		1916		1933	
	(1)	(2)	(3)	(4)	(5)	(6)
Change in quota	1.46*** (0.042)	1.49*** (0.036)	0.48*** (0.22)	0.39** (0.18)	0.023*** (0.008)	0.043** (0.009)
Province FE	No	Yes	No	Yes	No	Yes
Other Control	Yes	Yes	Yes	Yes	Yes	Yes
Observations	876	876	909	909	532	532
R-squared	0.58	0.71	0.56	0.62	0.58	0.64
<b>Second Stage: the dependent variable is enrolment ratio</b>						
	1907		1916		1933	
	(7)	(8)	(9)	(10)	(11)	(12)
	Local Gentry	0.0053** (0.002)	0.0061** (0.0034)	0.016*** (0.006)	0.014*** (0.006)	0.098* (0.06)
Province FE	Yes	Yes	Yes	Yes	Yes	Yes
Other Control	No	Yes	No	Yes	No	Yes
Observations	876	876	909	909	532	532
R-squared	0.29	0.36	0.29	0.35	0.07	0.54
<b>Second Stage: the dependent variable is school density</b>						
	1907		1916		1933	
	(13)	(14)	(15)	(16)	(17)	(18)
	Local Gentry	0.22* (0.12)	0.24* (0.13)	0.48** (0.22)	0.47** (0.023)	0.34 (1.06)
Province FE	Yes	Yes	Yes	Yes	Yes	Yes
Other Control	No	Yes	No	Yes	No	Yes
Observations	876	876	909	909	532	532
R-squared	0.37	0.41	0.38	0.36	0.58	0.61

\*Note:

(i). The numbers of local gentry are based on the shenyuan quota, normalised by 1907 population

(ii). Control variables include: potential soil quality for rice, late Qing land tax quota, modern industry location dummy, treaty port dummy, density of Christians over 10000 people, distance to nearest telegraph station, distance to prefectural seat, distance to provincial capital, dummy for Yangtze river, dummy for coastal area.

(iii). All the standard errors clustered at county level in parentheses.

(iv). \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

Table 15: Dynamic effect of the local gentry on primary education from IV strategy

variables	Primary School Density		Primary Enrolment Ratio	
	OLS	IV	OLS	IV
Local gentry	0.062*** (0.007)	0.076*** (0.022)	0.0011*** (0.0001)	0.0018*** (0.0007)
Year 1916	4.9*** (0.43)	4.8*** (0.39)	0.095*** (0.004)	0.089*** (0.007)
Year 1933	10.2*** (0.86)	10.5*** (0.8)	0.22*** (0.013)	0.17*** (0.021)
Gentry*Year1916	-0.059*** (0.009)	-0.047*** (0.017)	-0.0008*** (0.0001)	-0.0006 (0.0004)
Gentry*Year1933	-0.13*** (0.018)	-0.078*** (0.034)	-0.0014*** (0.0004)	-0.0026*** (0.0009)
Province FE	YES	YES	YES	YES
Other Controls	NO	YES	NO	YES
observations	2701	2701	2701	2701
R-squared	0.5	0.47	0.54	0.5

\*Notes:

(i). In this table, the numbers of local gentry are based on the shenyuan quota.

(ii). Control variables include: potential soil quality for rice cultivation, late Qing land tax quota, modern industry location dummy, treaty port dummy, density of Christian over 10000 people, distance to nearest telegraph station, distance to prefectural seat, distance to provincial capital, dummy for Yangtze river, dummy for coastal area.

(iii). All the standard errors clustered at county level are shown in in parentheses.

(iv). \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

Table 16: Political turnover and schooling development

	Primary Enrolment Ratio			
	1916		1933	
	OLS	IV	OLS	IV
Local gentry	0.016*** (0.006)	0.058*** (0.008)	0.105*** (0.032)	0.069* (3.4)
Tenure of magistrate	0.11* (0.006)	0.075*** (0.029)	0.12*** (0.03)	0.058*** (0.012)
Gentry * magistrates	-0.031** (0.0013)	-0.029* (0.01)	-0.041 (0.032)	-0.023*** (0.0046)
FE province	Yes	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes	Yes
Observations	581	581	462	462
R-squared	0.45	0.41	0.32	0.34
	Primary School Density			
	1916		1933	
	OLS	IV	OLS	IV
Local gentry	0.162*** (0.05)	0.149*** (0.05)	2.14** (0.93)	1.59** (0.067)
Tenure of magistrate	0.042** (0.026)	0.103* (0.059)	0.37* (0.153)	0.41*** (0.192)
Gentry * magistrate	-0.017* (0.009)	-0.035* (0.002)	-0.129* (0.077)	-0.146* (0.084)
FE province	Yes	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes	Yes
Observations	581	581	462	462
R-squared	0.45	0.41	0.67	0.67

\*Notes:

(i). Control variables include: potential soil quality for rice cultivation, late Qing land tax quota, modern industry location dummy, treaty port dummy, density of Christians over 10000 people, distance to nearest telegraph station, distance to prefectural seat, distance to provincial capital, dummy for Yangtze river, dummy for coastal area.

(ii). All the standard errors clustered at county level are shown in parentheses.

(iii). \* significant at 10 %; \*\* significant at 5 %; \*\*\* significant at 1%.

Table 17: Robustness check using Shanxi Province

	School density	expenditure per capita	Enrolment ratio
Lower gentry	0.19** (0.78)	0.16* (0.094)	0.48** (0.25)
Control	YES	YES	YES
observations	94	94	94
R-squared	0.44	0.28	0.27

\*Notes:

- (i). In this table, the numbers of local gentry are based on the shenyuan quota density  
(ii). Control variables include: average productivity per mu, average cost of living, late Qing land tax quota, modern industry location dummy, treaty port dummy, density of Christian over 10000 people, distance to nearest telegraph station, distance to prefectural seat, distance to provincial capital, dummy for Yangtze river, dummy for coastal area.  
(iii). All the standard errors clustered at prefecture level are shown in in parentheses.  
(iv). \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

Table 18: Alternative influencing mechanism

	Logit (Secondary)				Primary Enrolment Ratio		
	1907	1916	1933		1907	1916	1933
Local gentry	0.42 (0.32)	-0.25 (0.19)	-0.18 (0.21)	Scholar Culture	0.00029 (0.0003)	-0.00089 (0.003)	-0.00053 (0.0008)
FE province	Yes	Yes	Yes	FE province	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes	Other Controls	Yes	Yes	Yes
Observations	904	1066	599	Observations	904	1066	599

\*Notes:

- (i). In this table, the numbers of local gentry are based on the shenyuan quota density (normalised by 1907 county population). Scholar culture is measured by *Jinshi/Shengyuan* quota  
(ii). Control variables include: potential soil quality for rice cultivation, late Qing land tax quota, modern industry location dummy, treaty port dummy, density of Christians over 10000 people, distance to nearest telegraph station, distance to prefectural seat, distance to provincial capital, dummy for Yangtze river, dummy for coastal area.  
(iii). All the standard errors clustered at county level are shown in in parentheses.  
(iv). \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.



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