A Rise of New Elites:

The Role of Secondary Schools in Early Development

Hidehiko Ichimura Yasuyuki Sawada Yutaro Takayasu Mari Tanaka*

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Abstract

Do educational institutions change the selection of people who reach top positions in private and public sectors? We examine the role of secondary education in elite formation in the context of Japan in late 19th century when only a small fraction of the population proceeded to post-elementary education. Even after the country transitioned from a hereditary society to meritocracy, a small group of nobles (i.e., former samurai families) over-represented the share of elites in both private and public sectors as well as the share of secondary school graduates. We examine how the rapid construction of secondary schools happened during this period altered the probability of commoners and nobles becoming occupational elites. To identify the causal impact, we use cohort-specific discontinuities in access to the neighborhood school. Our empirical results show that constructing a secondary school led to a significant increase in high-income business managers and professional elites from commoner families but only an insignificant effect on elites from noble families, suggesting a critical role of secondary schools in forming new elites.

Keywords: elite, secondary education, intergenerational mobility, human capital, history

*Hidehiko Ichimura: The University of Arizona, Department of Economics, McClelland Hall 401, P.O. Box 210108, Tucson, AZ 85721-0108 and University of Tokyo, Faculty of Economics. 7-3-1 Hongo, Bunkyo-ku, Tokyo, Japan, email: ichimura@arizona.edu, ichimura@e.u-tokyo.ac.jp. Yasuyuki Sawada: University of Tokyo, Faculy of Economics. 7-3-1 Hongo, Bunkyo-ku, Tokyo, Japan, email: sawada@e.u-tokyo.ac.jp. Yutaro Takayasu: Hitotsubuashi University, Graduate School of Economics. 2-1 Naka, Kunitachi, Tokyo, Japan, email: ed205003@g.hit-u.ac.jp. Mari Tanaka: Hitotsubashi University, Institute of Economic Research. 2-1 Naka, Kunitachi, Tokyo, Japan, email: mari.tanaka@r.hit-u.ac.jp.

1 Introduction

A small number of individuals holding top positions in private and public sectors greatly influence the economy and society. When a small group of population over-represent these top positions and organize society for their own interests, it can create persistent inequality and discontents (Acemoglu and Robinson, 2012). Hence, how policies and institutions affect the formation of these elites has been a central question in economics and sociology research (Chetty et al., 2014; Bai and Jia, 2016). While researchers have considered the role of education policies as one of the most critical elements in forming elites, the existing evidence on whether higher education institutions lead to diversification of elites is mixed (Zimmerman, 2019; Michelman et al., 2022). Furthermore, evidence is still scarce in the context of developing economies, where only a tiny fraction of the population proceeds to secondary and higher education.

This paper aims to bridge these research gaps by examining the role of secondary education in elite formation from the historical angle of a country's early development stage. To be concrete, we study the effects of a rapid expansion of secondary schools in Japan in the 1890s-1900s. We believe our historical research provides critical insights for the current developing countries because, around that time in Japan, only about 2% of the population enrolled in secondary schools, which is comparable to some of the low-income countries today such as South Sudan, Niger, and Burkina Faso with the secondary school enrollment rates of 1.5%, 2.1%, and 4.4%, respectively. In these economies, secondary education is likely to play an important role in producing the upper-tail human capital.

Our study period is a few decades after the country transitioned from a hereditary society of the former Tokugawa period (1603–1868) to a more meritocratic society in the Meiji period (since 1868). In the Tokugawa period, individuals were strictly divided by social classes: commoners (families of merchants, artisans, and farmers) and samurai (families of public servants and warriors). The social classes were hereditary and determined their occupations and educational opportunities: only samurai received education above the elementary level. At the beginning of the Meiji period, the Meiji government abolished samurai's privileges and renamed them nobles. However, nobles kept over-representing the share of occupational

elites relative to their small share in the population, possibly because they also significantly over-represented the share of secondary school graduates.

While the Meiji government also conducted educational reforms, it lacked resources, and investments in post-elementary schools were delayed. To concentrate limited resources, the government first restricted the number of secondary schools to at most one per prefecture. In 1891, this restriction was removed, causing rapid construction of the 2nd secondary schools in many prefectures within a decade.

We investigate the long-run impacts of improved access to secondary schools on students' lifetime trajectories by nobility, particularly, whether they reach top positions in private and public sectors. For this purpose, we newly digitized the Personnel Inquiry Records (PIR) published in 1928, 1934, and 1939, which provide a list of around 68,664 distinguished individuals (e.g. high-income top managers in companies, high-ranking government officials, distinguished scholars) together with their biographical information (including year, prefecture of birth, and nobility).[1] To identify arguably causal impacts of school construction on making new elites, we exploit discontinuity at the cohort who became schooling age for the 2nd school established in the birth prefecture.

To preview our empirical findings, first, we confirm that nobles over-represented the share of elites listed in PIRs for baseline cohorts (who turned schooling age just before the school expansion period). Noble, consisting of only 5% of the population, represented 16% of elite business managers, 29% of professional elites (such as scholars, lawyers, and doctors), and 27% of elite public officers.

Second, we find that the construction of the 2nd secondary school almost doubled the existing school capacity in the prefecture, raising the secondary school enrollment rate by around 0.5 percentage points on average. In the long run, our results show that the construction of a secondary school led to a significant increase in occupational elites from commoner families: in particular, high-income business managers increased by 27% and professional elites increased by 25%. The rise of commoner elites is driven by an increase in commoner

[1]Tanaka et al. (2019) use the same data in 1939 and show that the data covers a large fraction of the national population of elites (e.g., 53% of the top 0.01% income earners) by comparing our data with national administrative statistics. They also show that there is no systematic variation in the sampling rates across prefectures, consistent with our assumption that sample selection bias is uncorrelated with the prefecture-cohort variation we use.

elites whose fathers were not elites, measured by whether the father was listed in earlier publications of PIRs. The number of commoner elites whose fathers were elites rather declined by the school expansion. These results suggest that the schools improved upward intergenerational mobility.

For noble families, however, the expansion of secondary schools had only an insignificant effect on production of elites. Our additional evidence suggests that this is possibly because an increase in commoners who graduated secondary schools crowded out nobles by intensifying competition to enter national higher schools (leading to Imperial Universities).

The occupational paths of commoners after graduating the secondary school differed substantially by the access to national higher schools and the school's local neighborhood characteristics. In areas where a national higher school was established, the new secondary school led more commoners to become elite public officers instead of high-income business managers. In addition, new secondary schools built on the legacy of former fief schools and castles increased commoner professional elites, while new secondary schools built in merchant towns with more commercial activities increased commoner business manager elites. We also explore the role of classmate networks for producing business elites working in same companies.

Overall, secondary schools expanded new types of occupational paths for commoners, who used to be underrepresented in elites. We find that having one additional secondary school in all prefectures reduces noble share by 1.7 percentage points for elite business managers and 0.4 percentage points for professional elites. One possible reason why the secondary schools expansion was more effective for commoners than nobles is that these new schools accommodated a higher fraction of commoner students than the existing schools. We also document evidence that these new schools were more likely to be located in merchant towns rather than in former fief schools or samurai residents (where most of the existing schools were located), implying that the new schools were more accessible for commoners.

This study is related to four strands of literature. The first is the empirical literature on the effects of educational institutions on elite formation. Zimmerman (2019) and Michelman et al. (2022) examine the role of selective higher education institutions on the production of top executives and find that these institutions do not benefit students from

low-status families. On the other hand, Barrios Fernández et al. (2021) provides evidence that such institutions improve the upward mobility of the children of those who were admitted through enhanced social capital. Our contribution to this literature is to provide evidence on the effects of secondary education on elite formation.

Second, this study builds on the recent empirical literature that explores the relationship between inter-generational mobility and education. Notable correlational evidence has been presented by Chetty et al. (2014), Acciari et al. (2019), and Fairbrother and Mahadevan (2016). We seek to extend this by providing causal evidence on the impact of secondary education on inter-generational mobility.

Third, this study is connected to the literature on the effects of secondary education on labor market outcomes. While Angrist et al. (2006), Blimpo et al. (2019), and Brandt and Mkenda (2020) examined short- to mid-run effects on academic outcomes, Spohr (2003), Ozier (2015), Duflo (2022), and Sakai and Masuda (2020) study the long-run effects of labor markets outcomes. Our study differs from these works in three aspects: (1) providing evidence on further long-run impacts of secondary education covering individuals' lifetime trajectories, (2) focusing on outcomes of whether individuals obtained top positions in the economy, and (3) providing insights on inter-generational mobility.

Finally, this study contributes to the historical sociology and the formation of elites in Japan. Sonoda et al. (1995), Asô (n.d.), Takane (1976), and Takeuchi (1981) have made significant contributions to the study of samurai families' (nobles) transitions into Meiji period and elite formation. Our study bridges the gap between historical narratives and empirical analysis and analyzes educational institutions' causal impact on elite formation in this context.

This paper proceeds as follows. Section 2 describes the background of the study context and secondary school expansion. In section 3 explains our data. We present and discuss our empirical specification and findings in section 4 and explore the mechanisms by heterogeneity analysis in section 5. We provide concluding remarks in section 6.

2 Background

We focus on the construction of secondary schools in the 1890s-1900s. This period is a few decades after the Meiji Restoration (1869), which marked a major transition from the hereditary society of the Tokugawa period (1600–1868) to the meritocratic society of the Meiji period (1869–1912). The Meiji Restoration was accompanied first by the abolition of various vested rights belonging to the nobles, followed by decades of educational reforms. These institutional changes are summarized below.

2.1 Transition from Tokugawa period to Meiji Period

For around 250 years of the Tokugawa period, Japan was governed by the Tokugawa family. The Tokugawa family adopted a decentralized political system by delegating control to the local lords. Local lords governed a clan (a group of vassals) and the local community according to the guidelines set by the Tokugawa family.

Tokugawa family ruled the country under a hereditary status system that strictly separated samurai (the families of Tokugawa, local lords, and vassals) and commoners (including farmers, artisans, and merchants) in terms of occupation, residence, and marriage. Samurai families dominated most public sector jobs including roles in the government, military, and police. Samurai were forbidden to work in the private sector and commoners were forbidden to work in the public sector. Housing was also divided by class, and marriages across class lines were rare.

Educational opportunities varied considerably according to social class. At the elementary level, temple schools (Terakoya) were widespread across the country at the end of the Tokugawa period and accessible for commoners. These schools aimed to provide the minimum knowledge to engage in business activities such as reading, writing, and arithmetic.

Above the elementary level, however, there were only fief schools mainly targeted at the children of samurai families. Children of upper-class samurai were required to attend fief schools in order to take over the family occupations. The fief schools provided Confucianism and neo-Confucianism education that were considered essential to becoming public servants. While there were a few fief schools and specialized private schools that accommo-

dated commoners, the number of such schools was limited (Dore, 2010). Among commoners, practical knowledge and skills were individually imparted within families and through the apprenticeship system (Kudo and Siba, 2022).

The Tokugawa period ended in 1868 with the Meiji Restoration. Faced with foreign threats, the Meiji government conducted various reforms to rebuild the country. The abolition of the status system (samurai, farmers, artisans, and merchants) and education reforms were the central pillars of the reforms.

The abolition of the status system was materialized by three major reforms that deprived the privileges of nobles. First, the Meiji government required local lords to return the control of their land and people to the Emperor in 1869. Samurai were given an alternative status called nobles,[2] and all others were called commoners.[3] Second, the Conscription Law (1873) stipulated the obligation of citizens to serve in the military regardless of nobility. Third, the Abolition Measure of Hereditary Stipend (1875) abolished the privilege of nobles to receive the public stipend.

2.2 Over-representation of nobles in elites

Even after a few decades since nobles were deprived of their privileges, nobles over-represented shares in elites. Figure 1 shows the fraction of nobles among occupational elites listed in the Personnel Inquiry Records (PIRs) published in 1903, 1915, 1928, 1934, and 1939. PIRs are similar to Who's Who and provide a long list of socially distinguished individuals, such as top executives, distinguished scholars, and top-ranking bureaucrats, with detailed biographical information (we provide more detailed descriptions in a later section). We call them "elites". We classify the elites by three occupation categories: business managers, professionals, and high-ranking central government officers.[4]

In 1903, nobles represented 50.2% of occupational elites, while the share of nobles in

[2]The term "nobles" here includes both peerages ("*Kazoku*", or former local lords) and former lower class samurai (former vassals). But in terms of numbers, former lower-class samurai consisted of a much larger share.

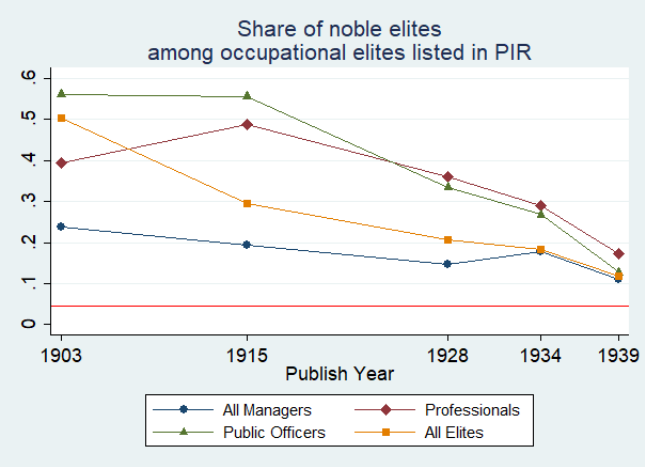
[3]However, there was an outflow from the samurai to the commoners. The percentage of former samurai in the early Meiji period was about 10% (Azuma, 1940).

[4]High-ranking central government officers are defined as officers above "Han-nin-kan" or "Jun-nin-kan".

the population was only about 4.6% (Statistical Yearbook of Imperial Japan). This over-representation was ubiquitous across occupational categories, but began to decline, especially around 1928–1939.

This evidence is consistent with other studies in the literature using alternative data. Using a random sample for 200–300 individuals from each PIR (1903, 1915, and 1928), Asô (n.d.) similarly shows a high share of nobles among business elites and professional elites as well as its declining trend. Aonuma (1965) uses data on top managers in corporations and finds that the proportion of nobles among them was 25% in 1900 and continued to be above 20% in the 1930s.

Figure 1: Share of Noble Elites



Notes: This figure shows the fraction of nobles among all individuals listed in the PIRs by year of PIR publication and occupational categories. We focus on the individuals in three occupational categories: "All Managers" (individuals who are employed in private sector), "Professionals" (individuals whose occupation is either lawyer, doctor, or scholar), and "Public Officers" (individuals who work at central government either as an officer or politician). "All Elites" are individuals in any of these three categories. For more details about the PIR and description of these occupational elites, see Section 3.1. The bottom parallel line shows the proportion of nobles in the population.

Why could nobles dominate a large share of elite positions in the 1890s-1910s, and what were the sources of advantages for nobles to advance to elites? Most of the nobles did not inherit job positions from their parents. Back in the Tokugawa period, top government positions were dominated by local lords (*Daimyo*) and court nobles (*Kuge*), who later became peerages (*Kazoku*). Peerages were allowed to inherit some elite government positions even

after Meiji Restoration. However, they constitute only a tiny fraction of nobles.

Aside from peerages, a much larger population of nobles were previous lower-class samurai who worked for local lords, and they did not inherit any public sector position from their parents after Meiji Restoration. Indeed, there is evidence of substantial upward mobility among these former lower-class samurai in the sense that their parents did not have a chance to become top government officers in the Tokugawa period but did have such a chance in the Meiji period (Takane, 1976). Income level was not likely to be the major advantage of nobles. Since a large share of nobles lost their jobs after Meiji Restoration, many of them had difficulty making ends meet and were poorer than wealthy merchant families (Sonoda et al., 1995).

An outstanding factor that possibly explains why nobles continued to over-represent the elite share is the levels of education, especially at secondary and tertiary levels. Figure 2 shows the number of secondary school students by nobility. Until around the 1880s, almost a half of secondary school students were nobles. This share is very high given that the noble's share in population was only about 5%. For instance, in 1886, nobles were about ten times more likely to be enrolled in secondary schools than those of commoners.

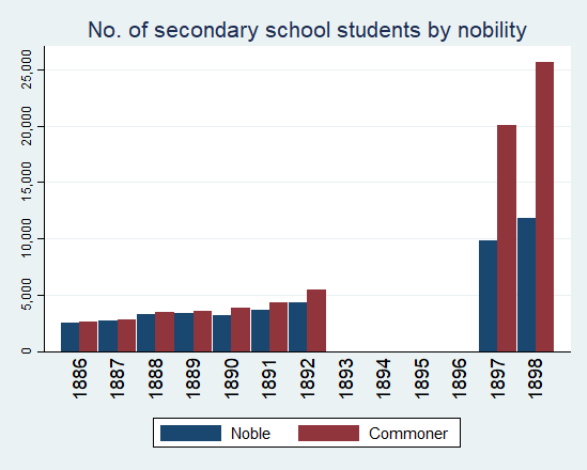
Historians have discussed several possible reasons for the over-representation of nobles in secondary and tertiary education. First, these noble students largely consisted of those originally from samurai families of high status (Sonoda et al., 1995). These samurai families could have kept financial and physical assets since Tokugawa period, which might have helped them afford expensive secondary school fees. Second, Takeuchi (1981) points out that, after the abolition of samurai class, nobles had strong aspirations to secure upper-level positions in the society which are similar to their original occupations. Third, given that formal education institutions were new to commoners at that time, only nobles might have known the value of educational human capital as an asset to earn income (Amano, 2006). Fourth, in contrast to the children of merchants, farmers, and manufacturers, nobles' children did not have family businesses to engage in, which might have allowed them to engage in upper-level education (Sonoda et al., 1995). Lastly, some secondary schools in the early period were funded by nobles and explicitly targeted for noble students (see next subsection).

Another important question is why the initially large differences in education and elite

production rates between nobles versus commoners gradually declined from the 1900s to 1930s. As noted by historians, this period coincides with rapid expansions of secondary schools since the 1890s (Takeuchi, 1981; Sonoda et al., 1995). Figure 2 shows the number of secondary school students by nobility from 1886 to 1898 (data is missing in 1893–1896). Overall, the number of secondary school students increased from 5,271 in 1886 to 38,509 in 1898. In particular, the number of commoner students increased dramatically sometime between 1892 to 1897.

The main goal of this study is to investigate the causal link between secondary school expansion and the increase in the share of commoner elites. To this end, we describe the background of secondary school expansions.

Figure 2: No. of Secondary School Students by Nobility



Notes: This figure presents the number of secondary school students by nobility from 1886 to 1898. The data is missing in 1893–1896. We use two data sources: *Goinbunko Bunsho* for 1886–1892 and Mitsuihara (1898) for 1897–1898.

2.3 Education reforms in Meiji Period

The Meiji government initiated the education reform by the promulgation of the Education System Order (1872). The law defined the main concepts of the new education system, emphasizing that education would now be the critical determinant of occupations and future earnings, rather than family background, as in the past. The law laid out a plan to construct

elementary schools, secondary schools, and imperial universities based on a zoning system adopted from France. Although the plan was somewhat idealistic and not strictly enforced for budgetary and other reasons, the law is considered to have marked a significant milestone in establishing the modern education system in Japan.

The government prioritized the spread of elementary schools. Since the promulgation of the Elementary School Order (1886), the eight years of elementary school education starting from the age of six were divided into ordinary and higher courses, each consisting of four years of schooling. The ordinary course was compulsory education, and students who finished the ordinary course with adequate grades could proceed to the higher class.

Secondary school was one of the subsequent educational institutions to which students who have completed four years of ordinary courses in an elementary school could apply.[5] Since the government devoted most resources to establishing elementary schools, the development of standards for secondary schools had to wait until the 1880s. Until 1879, there were about 800 public and private secondary schools, a mix of different types of schools, including former fief schools and new European-style schools. However, most of these schools did not meet the standard required by the government mainly due to a shortage of public funds and qualified teachers: 70% of the schools had only one teacher. There were also significant differences in education levels across schools. In addition, some schools prioritized admission to children of parents who invested in the school, often upper-class nobles (Yasumitsu, 1990).

To cope with these issues, the government first enforced standardization of secondary schools based on the Education Order (1879), some 630 private schools lost their former secondary school status, and only 188 secondary schools (including public and private) remained in 1880. The government further enforced standardization by publishing General Rules for Middle School (1884). This law defined secondary schools as educational institutions that offered five years of practical and general higher education. The new standards were required to employ qualified teachers, teaching materials, subject standardization, and number of class hours. Admission policies were also standardized. As a result, the number of secondary schools decreased to 108 in 1885. The standardization led to the loss of control

[5]This standard was maintained until 1898. In 1899, the central government enforced a revision, then completing two years of higher course of an elementary school became the standard for admission. We will explain more details in Section 2.4.

by nobles and wealthy business families (Ministry of Education, 1972).

Next, in order to concentrate resources, the government issued the Secondary School Order (1886), limiting the number of publicly funded secondary schools to, at most, one per prefecture. For more than one public secondary school to be continued, private individuals had to invest in the schools. At the same time, the administration was entrusted to the Minister of Education or the prefectural governor's decree. Due to the poor financial condition of the prefectures, and the reluctance to be placed under the central government's control, most prefectures chose to hold one or none of the public secondary schools. Since this regulation was strictly enforced, the law limited the number of public secondary schools to remain constant for several years (see Figure 3a for the total number of schools). However, the number of public secondary school graduates did not decline over this period, implying that this law only affected the concentration of the resources but not the overall capacity of the schools within prefectures (see Figure 3b for the total number of graduates).

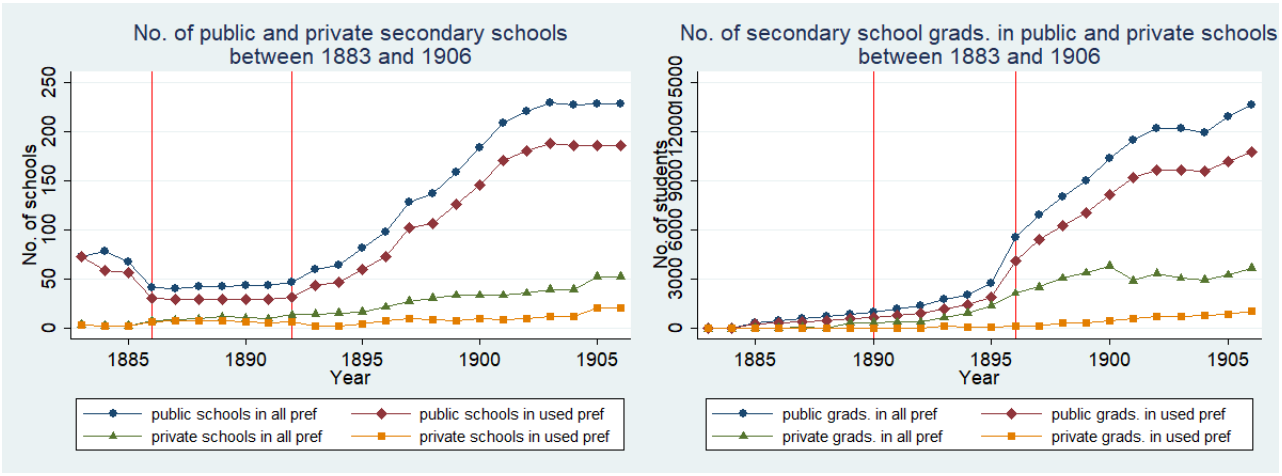
The restriction on the number of schools was removed by the Revision of Secondary School Order in December 1891. The revision allowed more than one publicly funded secondary schools to operate in a prefecture. Soon after the enforcement of the revision, the number of public secondary schools increased rapidly from around 50 to nearly 250 within a decade (Figure 3a). The increase in the number of schools accompanied an increase in the number of graduates, suggesting that the total capacity of the schools per prefecture also increased.

Figure 4 shows the number of prefectures that had more than one secondary school by year. Within a decade, most prefectures established the 2nd school. In our analysis, we focus on 37 prefectures where the 2nd school was established within 10 years of the revision (1892–1901). This excludes 10 prefectures, including Tokyo that had a national public secondary school in addition to a local public school. The timing of the 2nd school establishments slightly differed across prefectures within 10 years. This is possibly due to the differences in the length of time it takes for decision-making and enforcement, the degree of resource constraints, and local demand for the schools. We assume that such unobserved conditions affecting school establishment timing move smoothly around the year of establishment, and use regression discontinuity at cohorts.

While we focus on public secondary schools in our analysis, private secondary schools

were always allowed by the government and existed. Figures 3a and 3b show that the numbers of private schools and their graduates were much less than that of public schools. In addition, most of these private schools are concentrated in Tokyo, which is not in our sample for analysis. Therefore, the number of private schools in the prefectures we use for analysis is small, less than 10 in total in most years.

Figure 3: No. of Secondary Schools and Secondary School Grads.



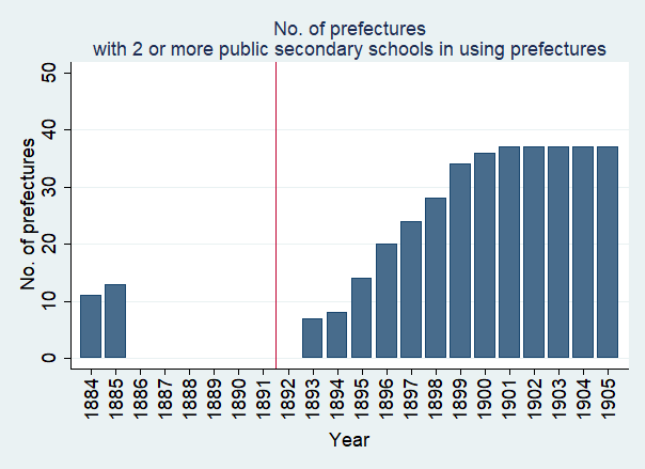
(a) No. of Secondary Schools **(b)** No. of Grads. in Secondary Schools

Notes: Panel (a) shows the number of public/private schools by year. "Public schools in all pref" (or "private schools in all pref") represents the number of public (or private) secondary schools among all 47 prefectures. "Public schools in used pref" (or "private schools in used pref") shows the number of public (or private) secondary schools in the subset of prefectures we use in our analysis (these are 37 prefectures that established 2nd schools in 1893–1901). Vertical lines mark the year of the Secondary School Order (1886) and the year of the Revision of the Secondary School Order (1892). Panel (b) shows the number of public/private school graduates by year. As in panel (a), we show the statistics for all 47 prefectures and the subset of prefectures used in our analysis. Vertical lines mark the year of Secondary School Order + 4 (1890) and the year of Revision of Secondary School Order + 4 (1896) since it took five years to graduate from a secondary school.

2.4 Institutional details of secondary schools

It is worthy to describe some key additional features of secondary schools during the period of our study (around 1889–1905). A series of educational reforms enacted in the 1880s unified the content and quality of secondary school education among the schools across the country. Students had 28 periods of classes per week, including 5 hours of Japanese and 6 hours of foreign language and 4 hours of mathematics, which did not differ significantly from today's secondary education in Japan. Furthermore, the recruitment criteria for secondary school

Figure 4: No. of Prefectures with Two or More Secondary Schools



Notes: This figure shows the number of prefectures with two or more secondary schools by year. We focus on the subset of prefectures that we use in our analysis (37 prefectures that established 2nd schools in 1893–1901).

teachers were specified as graduation from either imperial universities or teacher's schools, or passing the national standard teacher recruitment examination.

We should note that the school fees were not cheap. They varied across schools, but the annual fees were around 20% of GDP per capita during this period, implying that most students might have come from relatively wealthy families.[6]

In 1886-1898, eligibility for secondary schools was restricted to male students above 12 years old who had completed an ordinary course of four years of elementary school. In 1886, the attendance rate of secondary schools was roughly 4 out of every 1,000 male births. By 1898, when most prefectures had constructed 2nd schools, the rate increased to about 20 per 1,000 male births.

Demand for secondary schools also increased over this period. As the number of applicants exceeded capacity, individual schools either conducted entrance exams or adjusted their admission requirements to complete the additional two years in higher courses of an elementary school.[7] Mitsuihara (1898) indicate that the fraction of applicants to capacity was, on average, 0.5 for schools established before 1891 and 0.75 for those established after

[6]Formal fellowship schemes were likely to be absent.

[7]If a student does not repeat a grade, the student is 12 years old when he finishes two years of higher course of an elementary school.

1892. To make admission requirements uniform for all schools across the country, the government implemented the 2nd Revision of the Secondary School Order in 1899, requiring completion of an additional two years in higher courses of an elementary school.

According to the Mitsuihara (1898), the average age of the first-year students of secondary schools was 14.3. However, this is likely to be higher than the entrance age because statistics are typically measured several months after entrance. Therefore, we assume the average entry age to be 13. One year of delay relative to the minimum entry age of 12 is plausible given that students were likely to have taken one year for preparation for the entrance exam or for repeating grades in elementary schools. We use this age 13 as the baseline threshold for empirical RDD specification.

3 Data

3.1 PIR

We mainly use Personnel Inquiry Records (PIRs) published in 1928, 1934, and 1939 to measure the outcomes of elites. PIRs are a version of Who's Who and used as a source of information about potential business and marriage partners. The number of unique individuals listed in at least one of three years of PIRs is 68,664. When a person is listed in multiple PIRs, we use information on the latest record to identify the occupation category.[8] These records are a selective list of socially distinguished individuals, such as top business managers, high-ranking public servants, professional elites, high-income earners, medal recipients, and high-ranking military servants. For each listed individual, the records provide biographical details such as birth year, birthplace, final education institution, and career history. We utilized the information regarding birth year and birth prefectures to make aggregate counts of elites by cohorts (birth year) and birth prefectures.

For identifying socially distinguished individuals, the PIR sourced information from multiple directories, which include the government's official personnel list (Shokuin-roku in

[8]1939 PIR lists 55,781 individuals, representing about 0.15% of the total population. 1934 PIR lists 26,185 individuals, representing about 0.038% of the total population. 1928 PIR lists 25221 individuals, representing about 0.04% of the total population.

Japanese), bank and corporate directories (Teikoku Ginkou Kaisha Youroku and Zenkoku Ginkou Kaisha Youroku in Japanese), the member list of the national commerce and industry chamber (Zenkoku Shoukou Kaigisho Giin Meibo in Japanese), and the directory of Japanese notables (Nihon Shinshi-roku in Japanese) (see PIR 1934). The government directory include details of all public servants in national and local governments. Similarly, the bank and corporate directories include a complete list of banks and companies whose capital exceeds a certain threshold (Teikoku Ginkou Kaisha Youroku 1938, p.2). Another notable source, the Japanese notables' directory, identified affluent residents of 24 urban prefectures based on their tax contributions (Nihon Shinshi-roku, 1938, p.i).

Using the same data for 1939 PIR, Tanaka et al. (2019) provide detailed comparison between PIR sample and the population for top-income earners. Sampling rate is decent compared to complete count from tax statistics: 53% and 39% for the top 0.01% and 0.05% income earners. The number of top income earners listed in PIR and the complete count from tax statistics are highly correlated at the prefecture level, with similar sampling rates across prefectures.

Still, given that we mainly use broader categories of career elites, we need to care about possible sampling biases. Sampling may be biased toward prefectures with a larger population (possibly for higher demand in such areas). Then, we control for prefecture fixed effects. We also have age effects that people are more likely to reach top positions around their late 50s. We assume that the age effect is not discontinuous at the cutoff in each prefecture (note that cutoff cohort differs across prefectures).

For each occupation category, we count the number of persons who appear in at least one of three years of PIRs as a person satisfying the following criteria.

1. High-income managers who are either (modern) business managers, holding formal titles as top business managers, or (pre-modern type) family business managers, identified by family-business type firm names. They are limited to ones who pay tax, implying that their incomes were high enough to be above the threshold to start paying the tax (1,000 yen/year). Below this income level, individuals did not need to pay income tax. Since the average GDP per capita between 1928 and 1939 was 297 yen/year, 1,000 yen/year was three to four times of the average GDP per capita.

2. Professional elites who are either lawyers and judges, doctors, and scholars.

3. High-ranking public officers who are either central government officers, politicians, or prefectural governors.

We start from describing the fraction of commoners among elites listed in the PIRs. Using the occupational categories described above, Table 1 displays the number of elites among commoners and the number of elites among nobles. In this table, we focus on cohorts born between 1876 and 1878, which represent the cohort who turned to 13 years old just before the expansion of secondary schools. The first three rows present the average number of occupational elites per cohort. While the number of commoner elites is larger than that of noble elites, note that nobles constituted only 5% of the population. Even so, nobles represented 16% of elite business managers, 29% of professional elites, and 27% of elite public officers. In the subsequent three rows, we divide the numbers by 1,000 male births. The results indicate that nobles were much more likely to become an elite across all occupational categories. The likelihood to become an elite for nobles is approximately 4 times larger than that of commoners for high-income managers, and about 8 times larger for professional elites.

Table 1: Baseline Cohorts

	Commoners Born in 1876-1878	Nobles Born in 1876-1878
Total(average no. of elites per cohort		
High Income All Managers	294.7	57.3
Professionals	121	49
Public Servants	23.3	8.33
Total(average no. of elites per cohort in 1000 birth population		
High Income All Managers	0.86	3.38
Professionals	0.35	2.89
Public Servants	0.068	0.49

Notes: This table shows the average number of individuals listed in the PIRs for the cohorts born between 1876 and 1878 by major occupational categories and nobility. We focus on individuals who were born in the subset of prefectures that we use in our analysis (we use 37 prefectures that established 2nd schools in 1893–1901). First three rows show the average number of individuals listed in the PIRs per cohort, and last three rows show the average number of individuals listed in the PIRs per 1,000 male births. "High Income Managers" are individuals who are employed in a private sector and pays any positive amount of income or corporate tax. "Professionals" are individuals whose occupation is either lawyer, doctor, or scholar. "Public Servants" are individuals who work at the central government either as an officer and a politician. See Section 3.1 for more detailed descriptions.

3.2 Data on secondary schools

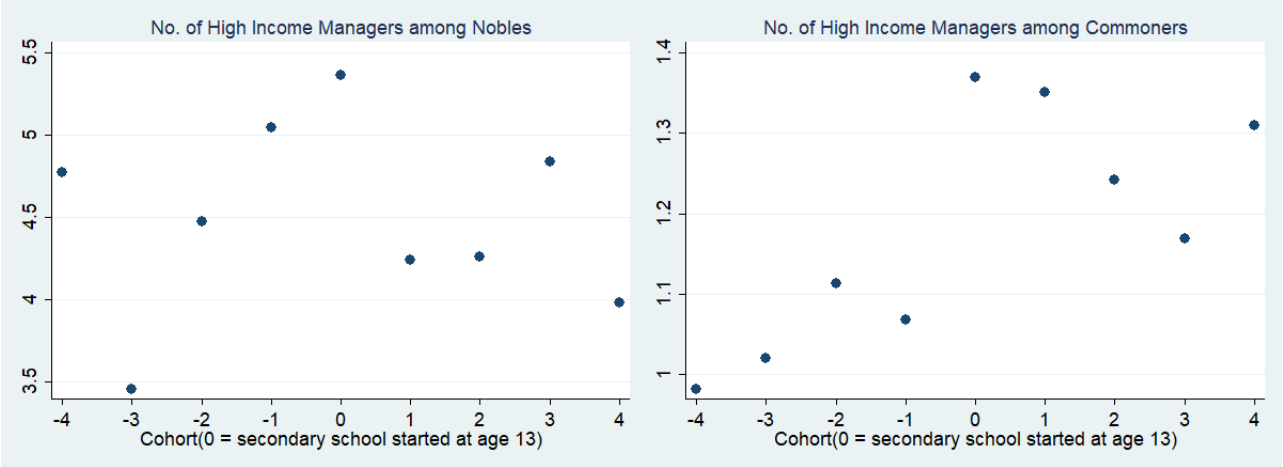
Another data source is the Ministry of Education Yearbook in 1892–1901. The data are aggregated at the prefectural level and include the number of secondary schools, the number of students enrolled (for students in grades 1–5), and the number of graduates.

4 Empirical specification and results

Throughout our analysis, we focus on 37 prefectures where the 2nd secondary schools were established between 1892 and 1901. See Appendix Figure D1 for the map of these prefectures.

4.1 Graphical results

Figure 5: High-income managers



(a) Nobles **(b)** Commoners

Notes: These figures show the average number of high-income business managers (per 1,000 male births) across prefectures for each cohort. We define cohort by "the year when a birth cohort turned age 13" subtracted by "the year when the 2nd secondary school was established in the prefecture". That is, cohort 0 is the cohort who turned age 13 when the the 2nd secondary school was established in the prefecture. Cohort -4 to cohort -1 are pre-treatment cohorts, while cohorts 0–4 are treatment cohorts. "High Income Managers" are defined as individuals listed in the PIRs who are employed in a private sector and pays any positive amount of income or corporate tax. For a detailed description of the outcome, see Section 3.1. We focus on individuals who were born in the subset of prefectures we use in our analysis (we use 37 prefectures that established 2nd schools in 1893–1901).

Figure 6: Professional elites



(a) Nobles **(b)** Commoners

Notes: These figures show the average number of professional elites (per 1,000 male births) across prefectures for each cohort. The definition of cohort is the same as Figure 5. "Professionals" are defined as individuals in the PIRs whose occupation is either lawyer, doctor, or scholar. For a detailed description of the outcome, see Section 3.1. We focus on individuals who were born in the subset of prefectures we use in our analysis (we use 37 prefectures that established 2nd schools in 1893–1901).

Before starting regression analysis, we graphically examine the relationship between one's exposure to 2nd secondary school and the probability of becoming an elite.

To capture the variation in exposure to 2nd secondary school, we define *cohort* by "the year when a birth cohort turned age 13" subtracted by "the year when the 2nd secondary school was established in the prefecture". That is, cohort 0 is the cohort who turned age 13 when the the 2nd secondary school was established in the prefecture. Cohort k is the cohort who turned age 13 after k years since the 2nd secondary school was established in the prefecture. For negative k, cohort k turned age 13 $-k$ years prior to the establishment of 2nd school. In each prefecture and cohort, the probability of becoming an elite by nobility is measured by the number of individuals listed in PIR per 1,000 male birth population of the nobility. We create this measure for each occupational category: high-income managers, professionals, and public servants.

Figures 5 and 6 depicts the average probability of becoming a high-income manager and a professional elite over nine cohorts (from cohort -4 to cohort 4) across 37 prefectures. Figure 6 shows the same figure for the probability of becoming a professional elite. In both figures,

the probabilities jump up at cohorts 0–1 only for commoners. We also examine the same figure for public servants (see Appendix Table D2) but do not find the jumps for commoners.

4.2 Empirical strategy

4.2.1 Staggered DiD

Since the establishment of the 2nd schools varied across years and prefectures, one natural empirical specification is Staggered DiD. Figure 7 shows the results of staggered DiD based on Callaway and Sant'Anna (2021) method.[9]. We use the cohorts who became age 13 between 1888 and 1905 in 37 prefectures. We use only not-yet-treated units as comparison. Aggregating the estimates by cohorts, we find positive and statistically significant effects for around cohorts 0–2. However, we find that Staggered DiD specification suffers from the existence of pre-trend. We test the null hypothesis that pretrend in pre-treatment cohorts within window from -4 to -1 is equal to 0. Then, for all elite occupational categories and nobilities, the test is rejected at a 1% level (see Appendix Table A1 for χ^2(df)).

4.2.2 RDD approach

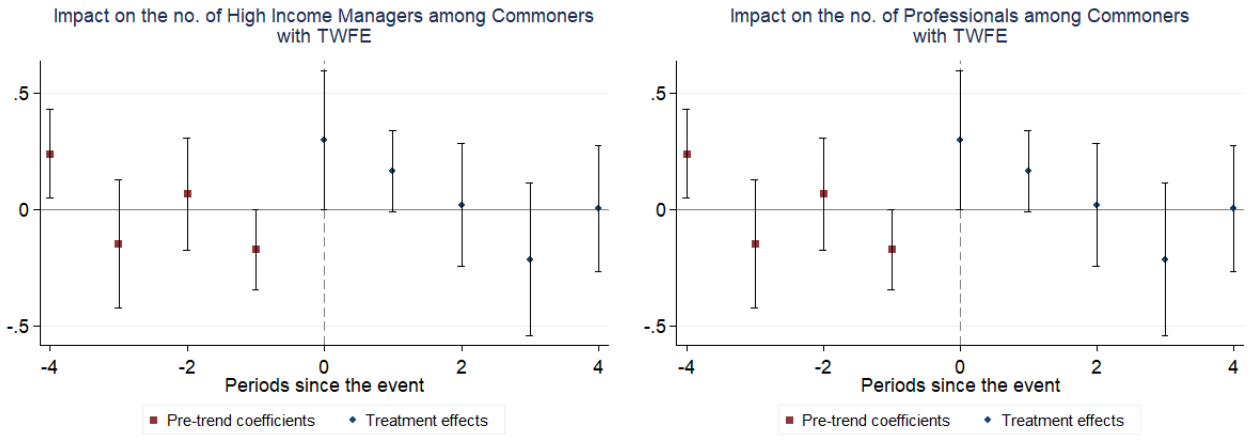
As our main empirical specification, we use regression discontinuity at the cohort who became secondary school entrance age when the prefecture's 2nd secondary school was established.

$$\frac{N^k_{j,c}}{pop_j} \times 1000 = \beta^k After_{j,c} + Trend^k_c + \delta^k_j + u^k_{j,c} \tag{1}$$

where, j is the prefecture, c is a cohort, and k is an occupation category (either high-income managers, professionals, and public servants). In our main analysis for long-run effects, the dependent variable indicates the probability of becoming an elite for each occupational category k. The definition is the same as in section 4.1. For each occupation k, prefecture j, and cohort c, the variable is defined by the number of individuals listed in PIRs per 1,000 male birth population of the nobility. As a measure of birth population, we take an average male birth population in prefecture j across the cohorts born between 1871

[9]We use csdid command in Stata.

Figure 7: Staggered DiD



(a) High-income managers among commoners **(b)** Professional elites among commoners

Notes: This figure presents the results of staggered DiD estimation of the long-run effects of the 2nd secondary schools on the number of commoner occupational elites. We use the method proposed by Callaway and Sant'Anna (2021) and implemented by csdid package in Stata. We focus on the individuals who turned age 13 in 1888–1905 and were born in 37 prefectures that established 2nd secondary school in 1893–1901. We use only not-yet-treated units as comparison. The estimates are based on the prefecture-cohort level data, counting the number of individuals listed in the PIRs (per 1,000 male births) by birth prefecture and birth cohort. We aggregate the estimates by cohort. Panel (a) shows the estimates for "High Income Managers" defined as individuals in the PIRs who are employed in a private sector and pays any positive amount of income or corporate tax. Panel (b) shows the estimates for "Professionals" defined as individuals in the PIRs whose occupation is either lawyer, doctor, or scholar. For a detailed description of the outcome, see Section 3.1. The bars represent 95% confidence intervals.

and 1896 of our sample. We use the average instead of the raw population data in order to mitigate the influence of measurement and estimation errors in the original population data.

The indicator variable $After_{j,c}$ takes 1 for cohorts who were 13 years old or younger when the 2nd secondary school was established in prefecture j, and is set to 0 for those in cohorts who were 14 years or older at the establishment. Some prefectures established 3rd or 4th secondary schools at the same time of the 2nd school establishment. This problem will lead to an overestimation of the impact of expansion of the 2nd secondary schools within those prefectures. To cope with this problem, we use a dummy variable that takes 1 if the 3rd school was established at the same time, and interact it with $School_{j,c}$ in Section 4.6.

In our baseline specification, we focus on the nine cohorts who turned age 13 years old between four years before and four years after the establishment of the second secondary school in the prefecture. We include a linear cohort trend, denoted $Trend_c^k$. This term

controls for any smoothly varying cohort trends, such as local demand for secondary schools gradually changing over cohorts. This term also controls for the effects of ages to become an elite. An individual becomes more likely to reach a top position and listed in PIR in late 50s. The cohorts in our analysis (born in 1876-1892) were aged around between 40 and 60 during the year of the survey. Therefore, the probability of being listed in PIR has a negative linear trend from older cohorts to younger cohorts. We test robustness of this specification in Section 4.6, where we alternatively include squared trend term or birth-year fixed effect. We also include prefecture fixed effects, denoted by δ_j^k, to control for the sampling bias toward prefectures with a larger population. We cluster the standard errors at a prefecture level.

4.3 Secondary schools & secondary school grads.

Table 2: Secondary schools & secondary school grads.

	No. of Middle Schools		No. of Middle School Grads	
	(1) Public	(2) Private	(3) Public	(4) Private
After	1.635***	-0.157*	5.285***	0.087
	(0.220)	(0.089)	(1.434)	(0.177)
No. of prefecture-cohort	333	333	333	333
Mean Dep Before	0.96	0.20	5.39	0.14
Percent Effect(%)	170	-77	98	63

Note: This table shows regression discontinuity design estimates of the short-run effects of the 2nd secondary schools on the number of public/private secondary schools and graduates. The estimates are based on the prefecture-year level data from the Ministry of Education Yearbook in 1892–1901, counting the number of public/private secondary schools and graduates from public/private secondary schools in the prefecture (per 1,000 male births). For the number of graduates, we take a lag of four years to adjust for the time gap between school entrance and graduation. We use 37 prefectures that established the 2nd schools in 1893-1901. "After" is an indicator variable that takes 1 in the years after 2nd school was established in the prefecture, and takes 0 otherwise. We include a cohort linear trend term and prefecture fixed effects. "Mean Dep. Before" shows the mean of the dependent variable for the 4 years before the 2nd school establishment. "Percent Effect" indicates the percentage increase in dependent variables compared to the "Mean Dep. Before". Standard errors reported in parentheses are clustered at the prefecture level. ***, **, and * mean significance at the 1%, 5%, and 10% levels, respectively.

Using the specification in equation (1), we first check how much the number of secondary schools and their graduates increased after the establishment of the 2nd school. Since the 2nd school constructions were rapidly conducted, it is possible that the additional schools

only divided the original school resources (such as teachers) without expanding the total school capacity in the prefecture.

Table 2 shows the results. As shown in columns 1-2, the number of public schools increased by 1.6 after establishing the 2nd school. The coefficient is above one because some prefectures established a 3rd school just after the establishment of 2nd school. In contrast, the number of private schools declined by -0.157. This is possibly because some private schools were converted to public schools due to the reform that allowed more than one public school in a prefecture.

Columns 3 and 4 indicate the results for the number of graduates (per 1,000 male births) from public and private schools in the prefecture. Since the school year for secondary schools was five years, we take a lag of four years to adjust for the time gap between school entrance and graduation. The coefficient for public school graduates is positive with a magnitude of 5.3, corresponding to an improvement of the secondary school enrollment rate by 0.53 percentage points. Given that the number of graduates was 5.4 on average prior to the establishment of 2nd school, this result implies that the number of graduates doubled. Note that the number of public schools more than doubled. This implies that second and third schools typically had a smaller capacity than the prefecture's first schools. The coefficient for private school graduates is small and insignificant, suggesting that the changes in the number of private schools have only negligible effect on overall capacity. In summary, we find that the establishment of 2nd school significantly increased the overall capacity of secondary schools in the prefecture. Since it almost doubled the existing school capacity, it is likely to have improved access to secondary education for potential candidates.

The introduction of the 2nd school improved commoners' access to secondary education more than nobles. As shown earlier in Figure 2, after additional school establishment started in 1892, there was a large increase in the number of commoner students relative to noble students.[10] In addition, there is evidence that the 2nd schools accommodated a higher fraction of commoner students than the 1st schools. In 1898, the fraction of commoners was around 70–80% in 2nd schools, which was 10-15% higher than 1st schools (Mitsuihara, 1898).

[10]We do not run regression because we do not have information on the number of secondary school students by nobility for each prefecture between 1889 and 1905.

One reason for this feature could be the location of the schools: these 2nd schools were more likely to be located in merchant towns rather than inside of the castles, inside of samurai residences, or former fief schools. The difference in school neighborhoods implies that these new schools were targeted and more accessible for commoners than the ones before. We will explore this feature more in section 5.3.

4.4 Long-run effects on production of elites

We explore the effects of secondary school expansion on production of elites by nobility. We estimate equation (1) for probability of becoming an elite for each occupational category.

Table 3 panel A shows the results for all elites combining both nobles and commoners. Column 1 shows the effect for the number of all categories of occupational elites who were either high-income business managers, professional elites, or public servants. Columns 2-4 report the result for each category of elites. The coefficients are positive and significant for the number of all occupational elites and the numbers of high-income managers and professional elites. Creation of an additional school in a prefecture corresponds to increases of 0.25 high-income managers and 0.15 professional elites per 1,000 male birth population on average. These are large effects compared to the mean of the variables in baseline cohorts, amounting to 22-25% increases in such elites. Although the coefficient for public servants is not statistically significant, it implies a 36% increase relative to the mean of the baseline cohorts. This lack of statistical power is possibly due to a small number of observations for public servant elites. These results indicate that the establishment of 2nd schools increased the number of elites in both private and public sectors to a similar degree.

Next, we explore the results by nobles (in panel B) and commoners (in panel C). In panel B, we do not find statistically significant effects of an additional school on the production of noble elites. It should be noted that the magnitude of the coefficient for public servants is large (50% compared to the baseline mean). As shown in panel C, the coefficients for commoner high-income managers and professional elites are positive and significant. These coefficients are large: about 25-27% increase compared to the mean of baseline cohorts. The coefficient for public servants is not statistically significant, although the magnitude is similar to other categories of elites (25% increase compared to the mean of the baseline cohort).

Table 3: Long-run impacts of additional secondary schools: baseline specification

	All Occupational Elites (1)	High Income Managers (2)	Professionals (3)	Public Servants (4)
Panel A: All				
After	0.432***	0.248***	0.153**	0.057
	(0.096)	(0.076)	(0.066)	(0.041)
No. of prefecture-cohort	333	333	333	333
Mean Dep Before	1.77	1.13	0.62	0.16
Percent Effect(%)	24	22	25	36
Panel B: Nobles				
After	2.074	0.474	1.078	0.457
	(1.436)	(0.777)	(1.115)	(0.416)
No. of prefecture-cohort	333	333	333	333
Mean Dep Before	7.65	4.44	3.12	0.91
Percent Effect(%)	27	11	35	50
Panel C: Commoners				
After	0.408***	0.280***	0.136**	0.032
	(0.094)	(0.093)	(0.060)	(0.052)
No. of prefecture-cohort	333	333	333	333
Mean Dep Before	1.61	1.05	0.55	0.13
Percent Effect(%)	25	27	25	25

Notes: This table shows regression discontinuity design estimates of the long-run effects of the 2nd secondary schools on the number of occupational elites. The estimates are based on the prefecture-cohort level data, counting the number of individuals listed in the PIRs (per 1,000 male births) by birth prefecture and birth cohort. We focus on the individuals who turned 13 years old in 1888–1905 and were born in 37 prefectures that established 2nd secondary school in 1893–1901. "Occupational Elites" are defined as individuals in the PIRs who are either "High Income Managers", "Professionals", or "Public Servants" as detailed in following. "High Income Managers" are defined as individuals in the PIRs who are employed in the private sector and pay any positive amount of income or corporate tax. "Professionals" are defined as individuals in the PIRs whose occupation is either lawyer, doctor, or scholar. "Public Servants" are defined as individuals in the PIRs who work at the central government either as an officer or a politician. For a detailed description of these outcome variables, see Section 3.1. "After" is an indicator variable that takes one if the cohort was 13 years old or younger when 2nd school was established in the prefecture, and takes 0 otherwise. We control for a cohort linear trend term and prefecture fixed effects. "Mean Dep. Before" shows the mean of the dependent variable for the four years before the 2nd school establishment. "Percent Effect" indicates the percentage increase in dependent variables compared to the "Mean Dep. Before". In panel A, we use the total number of elites in noble and commoner families. In panels B and C, we examine nobles and commoner elites separately. Standard errors reported in parentheses are clustered at the prefecture level. ***, **, and * mean significance at the 1%, 5%, and 10% levels, respectively.

Why did the introduction of additional schools mainly benefit commoner elites rather than noble elites? As we pointed out in section 4.3, the new schools attracted more commoner students than the older ones. This is possibly because these new schools were more accessible and targeted for commoners. In our analysis in section 5.3, we use the location of the 2nd

school as a proxy for whether the school targeted commoners to examine the heterogeneous effects.

So far the results suggest that the construction of additional schools expanded new types of occupational paths for commoners, who used to be significantly underrepresented in elites. In the baseline cohort, Table 1 shows that nobles represented 16.3% of elite business managers, 28.8% of professional elites, and 26.3% of elite public servants, even though they represented only 4.6% of the population. To understand the shift of commoners' share in elites induced by the new secondary schools, we calculated the percentage increase in the occupational elites from the baseline cohorts for both nobles and commoners. We find that the impact of having one additional secondary school in all prefectures in this analysis reduces the noble share of elites by 1.7 percentage points for high-income business managers and 0.4 percentage points for professional elites.

4.5 Long-run effects on intergenerational mobility

We now explore an intergenerational aspect of the impacts of secondary school expansion. Since secondary school fee was moderately expensive (as described in section 2.4), these schools might have been more accessible for students from relatively wealthy families even among commoners. Did the secondary schools merely help children of wealthy merchant family to become wealthy merchants?

To explore this question, we compiled earlier editions of PIRs published in 1903, 1915, 1928[11]. If the father of an elite in our sample is also an elite, the father is likely to be listed in one of these editions. These earlier editions of PIRs contain information on family registry information of the listed individuals such as their children's names and birth years. Using name and birth year, we successfully identified whether the father of the elite was listed in PIRs (i.e. whether having an elite father). About 5.3% (6.5%) of all occupational elites (high-income business manager) in our sample had an elite father listed in these earlier editions. While these numbers may be considered small, they are substantially higher than

[11]Digitized data from PIRs in 1903, 1915, and 1928 are publicly available to be searched for each listed individual at `https://jahis.law.nagoya-u.ac.jp/who/search`. We compiled these data by a web scraping method.

unconditional probability of having an elite father: note that PIRs select and list socially distinguished individuals representing about 0.1% of the total population.

In Table 4, the dependent variables are the probability of becoming an elite, conditional on having an elite father (panel A) or conditional on having non-elite father (panel B), both in the unit of per 1,000 male births. To calculate these variables, the denominator is the number of male children of individuals listed in the earlier editions of PIRs in panel A, or the number of male children of non-elite fathers approximated by total male birth population in panel B, calculated for each birth cohort, prefecture, and nobility. Note that the small number of observations for elites with elite fathers in some occupational groups (especially professional elites and public servants) requires a caution in interpretation as it possibly leads to erroneous estimates.

For noble elites (column 1-4), we do not find any statistically significant effect of secondary school expansion on the production of elites in either panel A (those with elite fathers) or panel B (those with non-elite fathers). It is notable, however, that panel A column 2 shows a large positive increase in high-income managers (a 142% increase compared to the baseline cohorts), while the coefficient for this column is close to zero in panel B. These results tell that there is no evidence suggesting improved upward mobility for nobles.

For commoner elites (column 5-9), the coefficients for business managers and professional elites are statistically insignificant but mostly negative and sizable in panel A, suggesting that secondary schools reduced the probability of becoming elites for commoner children with elite fathers. In panel B, the coefficients are the positive and statistically significant for high-income managers and professional elites, showing a similar pattern as Table 3. These results suggest that the secondary school expansion promoted commoners in non-elite families to climb up the social ladders and join the top elites, rather than it only helped the children of successful merchant-family to become successful merchants.

Table 4: Long-run impacts of additional secondary schools: intergenerational mobility

	Nobles				Commoners			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	All Occupational Elites	High Income Managers	Professional Elites	Public Officers	All Occupational Elites	High Income Managers	Professional Elites	Public Officers
Panel A: Fathers are Elites								
After	99.693	97.576	0.856	9.099	-49.033	-45.081	-15.272	34.624
	(73.447)	(67.999)	(31.962)	(20.436)	(57.236)	(43.197)	(29.196)	(29.962)
No. of prefecture-cohort	333	333	333	333	333	333	333	333
No. of Elites	74	52	15	13	277	232	44	17
Mean Dep Before	87.95	68.81	13.18	17.45	151.93	117.84	30.49	12.75
Percent Effect(%)	113	142	6	52	-32	-38	-50	272
Panel B: Fathers are Non Elites								
After	1.553	-0.013	1.029	0.484	0.396***	0.278***	0.126*	0.022
	(1.377)	(0.782)	(1.059)	(0.406)	(0.091)	(0.082)	(0.063)	(0.053)
No. of prefecture-cohort	333	333	333	333	333	333	333	333
No. of Elites	980	532	389	151	5303	3551	1646	452
Mean Dep Before	7.23	4.16	2.99	0.83	1.53	0.99	0.53	0.12
Percent Effect(%)	21	-0	34	58	26	28	24	18

Notes: This table shows regression discontinuity design estimates of the long-run effects of the 2nd secondary schools on the number of occupational elites. We use the same data and specification as in Table 3 except that we divide the sample by the fathers' listing status in the PIRs from 1903, 1915, and 1928. These results are presented separately for two categories: elites whose fathers are listed in PIRs (panel A), and elites whose fathers are not listed in PIRs (panel B). For a detailed description about this table, see Section 4.5. Standard errors reported in parentheses are clustered at the prefecture level. ***, **, and * mean significance at the 1%, 5%, and 10% levels, respectively.

4.6 Robustness checks

Alternative specifications

We present several robustness tests using alternative specifications to our main equation (1) presented in Section 4.2. To account for cohort trends and age effects, we use a linear trend term in the main specification. Appendix Table B1 shows that the results are qualitatively unchanged even when we control for a quadratic trend term. As an alternative approach, we include birth year fixed effects and confirm that the results are largely consistent with our main results (see Appendix Table B2 for the result). In addition, the results are similar when we restrict the sample cohorts to two years before and after the establishment (instead of four years before and after), as shown in Appendix Table B3.

Influence of military careers

Since the period of our study for long-run effects corresponds to the First World War, we check whether transitioning from/to military positions has any influence on our results. We first examine whether the secondary school expansion is related to an alternative educational track to become an elite military officer. In this period, preparatory military schools (Rikugun Yonen Gakko in Japanese) were open for students aged 13-15 years old, attracting those aspiring to become military servants.[12] After graduating these schools, these students entered regular military schools. Using the information on the final education in PIRs (which also list elite military officers), we count the number of individuals in PIRs who graduated from any kind of military schools. We also count the number of military servants listed in PIRs. As shown in Appendix Table B4, the establishment of additional secondary schools did not have any statistically significant impact on the number of military school graduates or the number of elite military servants.

Furthermore, to exclude the influence of retired military officers transitioning to high-income managers, we decomposed the sample of high-income managers based on military experience in their career history (Appendix Table B5). Elites with military experience does

[12]Preparatory military school was not for free. To enroll the preparatory military school, the applicants had to take physical examination, followed by academic examination (Japanese, Writing, Geography, History, Mathematics, Science).

not influence our results.

Influence of peerages

Next, we exclude the influence of the top elite families among nobles, peerages (*Kazoku*, e.g. children of former local lords) since they could inherit some elite government positions even after Meiji Restoration. We conducted the same analysis as the baseline specification after excluding the peerages, as presented in Appendix Table B6. These results align with our main results. This consistency is attributed to the small sample size of the peerage.

Spillovers across prefectures

Students could apply and enter a secondary school in other prefectures from the original home. If such migration for a secondary school was prevalent, local students in prefectures that built 2nd school in earlier period might have been more likely to be crowded out. To the baseline specification, we add $Post_j$, a time-invariant dummy variable that takes 1 if the 2nd school was established after the median year of establishment among the sample prefectures, and its interaction with $After_{j,c}$. The results in Appendix Table B7 suggest that establishment in early periods and later periods did not differentially affect elite production.

Establishing multiple schools in the same year

Lastly, since some prefectures established 3rd school at the same time as establishing 2nd school, the effect of 2nd school may be confound with the effect of 3rd school. In Appendix Table B8, we include the interaction term with $TwoMoreSchools_j$ which is a time-invariant dummy variable set to 1 if prefectures established two or more secondary schools at the same year of the 2nd school's establishment. The results on the coefficients of 2nd school remain largely consistent with our main results.

5 Possible channels

In this section, we explore several possible channels through which secondary schools expanded new types of occupational paths for commoners. We focus on four channels: (1)

an increase of qualified teachers, (2) progression to higher education institutions, (3) school neighborhood effects (including peer effects), and (4) classmate networks after graduation.

5.1 Increase of qualified teachers

Production of new commoner elites might not have materialized if the increase in number of schools was not accompanied by expansion of educational resources, impost importantly, qualified teachers. While Secondary School Order (1886) required each school to employ only qualified teachers by specifying recruitment criteria, an increase of such teachers might have taken longer than establishing new schools. Therefore, the heterogeneity in the number of teachers across prefectures might have influenced the effectiveness of 2nd schools. In Appendix Table C1, we add to the main specification the ratio of secondary school teachers to graduates (measured for each prefecture and year) and its interaction term with $After_{j,c}$. For commoner high-income managers, the coefficient of $After_{j,c}$ remains large and significant, while the interaction term is negative and insignificant. However, for commoner professional elites, the magnitude of $After_{j,c}$ becomes smaller and insignificant after controlling for the interaction term, possibly suggesting the importance of teacher resources.

5.2 Progression to higher education institutions

Graduating a secondary school possibly opened up the opportunities to enter higher education institutions for commoners, which can an important pathway to become an occupational elite. An increase in commoners applying for higher education institutions, in turn, might have intensified the competition to enter these schools and possibly crowded out nobles, if the school seats in these schools did not increase at the same rate.

In our context, the most prestigious higher education institutions were Imperial Universities and National Higher Schools that served as preparatory schools for Imperial Universities. In 1894, when the earliest cohorts in our sample started to graduate secondary schools, there were one Imperial University along with five National Higher Schools. By 1910, when the latest cohorts in our sample graduated secondary schools, the higher education system was expanded to four Imperial Universities and eight National Higher Schools located across

different areas in Japan. Graduating a five-year secondary school was required for eligibility to apply for the National Higher Schools.

Notably, National Higher Schools were the exclusive entry point to Imperial Universities, and basically all graduates of these schools were admitted to these universities without further examinations. In addition, Imperial University graduates were partially or wholly exempted from the Higher Civil Service Examinations for becoming a public officer at the central government and other selective national qualification exams to become diplomats, judges, and physicians. Therefore, entering National Higher Schools were considered highly important for becoming an elite. Among all occupational elites in our sample of PIRs, 33% of them were indicated to have graduated from an Imperial University, and this fraction goes up to 53% for noble occupational elites and above 70% for noble professional and public servant elites.

We examine how the access to these higher education institutions influenced the students' paths after graduating the secondary schools. To do this, we add to the baseline specification an indicator variable that takes one if a National Higher School existed in the prefecture in the year when the cohort graduated a secondary school, and its interaction with $After_{j,c}$. The results are reported in Table 5.

Interestingly, the coefficients of the interaction term for nobles are negative for all categories of elites. This is possibly because the expansion of secondary schools raised the competition to enter the local National Higher School. Entering these higher education institutions was the primary pathway for noble students to become elite, and competition with commoners might have lowered this chance. Consistently, in areas without a National Higher School, all of the coefficients of $After_{j,c}$ for noble elites are positive, and it is marginally significant for the number of all occupational elites.

For commoners, the existence of a higher education institution increases the chance of becoming professional elites (even before establishment of the new secondary school, as shown in column 3) and public servant elites (together with the new secondary school, as shown in column 4). Consistently, we observe a similar link between post-graduation education and occupational paths when we separately count the elites by their highest level of education and occupations, as presented in Table C2 in the Appendix. Here we classify elites into

three categories based on the information on final education institution in PIRs: graduates from Imperial Universities, graduates from other higher education institutions, and those without any indication of proceeding to higher education. The results shows that overall increases in professional elites and public officers come from those who graduated from Imperial Universities, while increases in high-income managers come from those who did not proceed to higher education.

Table 5: Interaction with Existence of Higher School in the Prefecture

	All Occupational Elites (1)	High Income Managers (2)	Professionals (3)	Public Servants (4)
Panel A: All				
After	0.458***	0.286***	0.155**	0.040
	(0.099)	(0.077)	(0.065)	(0.040)
Higher School × After	-0.197	-0.229**	-0.065	0.100**
	(0.211)	(0.092)	(0.123)	(0.044)
Higher School	0.287	0.168*	0.249	-0.048
	(0.266)	(0.088)	(0.185)	(0.130)
No. of prefecture-cohort	333	333	333	333
Panel B: Nobles				
After	2.724*	0.945	1.264	0.498
	(1.492)	(0.839)	(1.169)	(0.436)
Higher School × After	-3.414	-2.550*	-0.950	-0.260
	(2.673)	(1.441)	(1.205)	(0.444)
Higher School	0.557	0.730	0.040	0.252
	(2.045)	(1.114)	(0.858)	(0.699)
No. of prefecture-cohort	333	333	333	333
Panel C: Commoners				
After	0.406***	0.305***	0.127**	0.010
	(0.101)	(0.096)	(0.061)	(0.050)
Higher School × After	-0.101	-0.171	-0.037	0.117**
	(0.179)	(0.126)	(0.096)	(0.050)
Higher School	0.511**	0.212	0.393**	-0.013
	(0.204)	(0.157)	(0.157)	(0.089)
No. of prefecture-cohort	333	333	333	333

Notes: This table shows regression discontinuity design estimates of the long-run effects of the 2nd secondary schools on the number of occupational elites. We use the same data as in Table 3 except that here we include "Higher School" that takes 1 if a national higher school was located in the prefecture and its interaction term with "After". In panel A, we use the total number of elites in noble and commoner families. In panels B and C, we separately examine noble elites and commoner elites. Standard errors reported in parentheses are clustered at the prefecture level. ***, **, and * mean significance at the 1%, 5%, and 10% levels, respectively.

5.3 School neighborhood effects

How did the heterogeneity in secondary schools' characteristics and peers affect the students' career paths? Motivated by the literature on the long-run effects of childhood neighborhoods (e.g. Chetty et al. 2014), we examine the influence of the new school's location, namely, whether the school that was built on the legacy of former fief schools and castles, or inside a merchant town with more commercial activities. This difference in school location also speaks to historical origins of the schools and characteristics of peers in our context as detailed below.

Town classification

The historical background of the location of secondary schools played significant roles in determining the social background of the students who enrolled the schools. Before the Secondary School Order (1886) was implemented, school facilities, even public schools, relied heavily on private donations and investments. Both peerages and samurais contributed greatly for funding the education of their heirs. These donations were not only financial, but also included bequests of land and residences, and former fief schools in Tokugawa period.

We start from classifying the historical origins of the locations where the 1st schools operated under the Secondary School Order (1886). The first category is schools built on a former fief school ("samurai schools"). The second category is schools established within old castle grounds or samurai residences ("in-castle"). In both "saumurai schools" and "in-castle" schools, schools in such locations were typically supported by peerages and samurais. We categorize them as schools in "samurai towns". The third category is schools located in areas unassociated with peerages or samurais, but typically in towns next to castles or merchant areas, are labelled as "Merchant Towns". Appendix Figure E1a demonstrates classification results across prefectures in a map. Out of the 37 prefectures in this study, 73% established their 1st schools in samurai towns. Half of these were within castles or samurai residences, while the rest had ties with fief schools. Conversely, only 27% of prefectures established their 1st schools in merchant towns.

We similarly classify the historical origins of locations where the 2nd schools were estab-

lished in each prefecture in Appendix Figure E1b. Among the 37 prefectures, 43% set up their 2nd school in samurai towns, while 57% of prefectures established their 2nd school in merchant towns, marking a near 30 percentage point increase compared to the 1st schools. This gaps implies the 2nd schools were more likely to be located in merchant towns compared to the 1st schools.

The subsequent question is whether the location of schools influences the proportion of their students in terms of nobility.[13] Figure 8 illustrates the average share of commoner students from 1886 to 1898 by 1st and 2nd schools and by school location.[14] Due to data limitations, we lack information for the years between 1893 and 1896. Regardless of the school location, the proportion of commoner students in 1st schools were similar and gradually increased from 1886 to 1898. In contrast, for the 2nd schools, there was a large difference in the share of commoner students by location: 69.3% in samurai towns and 78.6% in merchant towns on average in 1897–1898. This evidence provides two important implications. First, 2nd schools encouraged more commoners to enroll than the 1st schools. This is consistent with our earlier main results that the effect of 2nd schools were greater among commoners than among nobles. Second, 2nd schools in merchant towns accommodated more commoner students than the schools in samural towns. This implies that effect of secondary schools was potentially heterogeneous depending on the location of the schools. To explore this conjecture, we use the location of the 2nd schools to explore the mechanisms of the effects on the commoners.

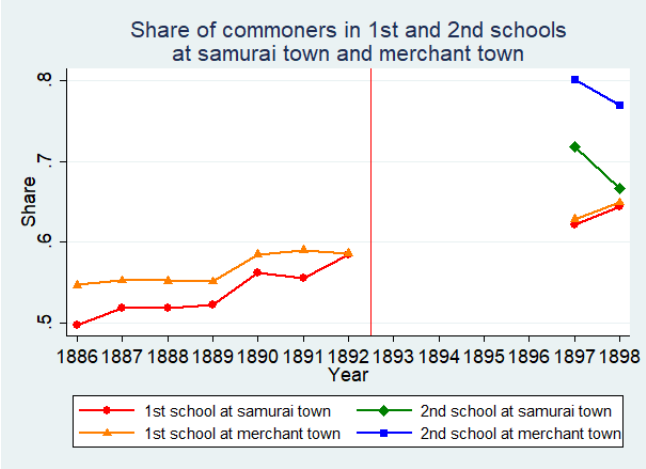
What is the possible mechanisms through which locations of schools affect the outcomes? For one thing, schools in samurai and merchant towns differed by the compositions of peers since schools in samurai towns had high proportion of noble students. This might have resulted in the peer effects for commoners to have strong aspiration to go on to higher education institutions and become professional elites, which is a career path similar to that of the nobles (as we showed in Table 3). For schools in merchant towns, due to higher fraction

[13]Kikuchi (2003) similarly observed the effect of the historical background of the area where the secondary school was established on the fraction of commoners in secondary schools.

[14]The primary sources of this data are derived from *GoinBunko Bunsho*, including the data from 1886 to 1892, and the secondary sources are from Mitsuihara (1898) including the data from 1897 to 1898. For this figure, prefectures lacking data on the number of both noble and commoner students in the 1st and 2nd schools were excluded.That means prefectures without 2nd schools between 1897 and 1898 were removed from the calculation for each data point of this figure.

of commoner peers, commoner students may become more likely to pursuit traditional career paths to be successful in business. Note that the school location might also reflect the level of commercial activities or power of merchants in the areas.

Figure 8: Share of commoners and nobles in the first and second secondary schools



Notes: This figure shows the fraction of students from commoner families among all public secondary school students between 1886 and 1898, separately by 1st and 2nd schools and by school locations. The data is missing in 1893–1896. For a detailed description about this figure, see Section 5.3.

Heterogeneity by school towns

We analyze the heterogeneous effects among commoners depending on the location of the 2nd schools. We divide the sample of prefectures by whether the 2nd school was established in a samurai town or a merchant town, as defined above. Table 6 presents results for samurai town sample and merchant town sample, employing the same econometric model and outcome variables as presented in Section 4.2.

Samurai town sample (column 1 in panel A) shows a positive but not significant effect for high-income managers, while merchant town sample (column 1 in panel B) shows a positive and significant effect on high-income managers. Interestingly, the magnitudes of the coefficients are quite similar, 0.276 in samurai towns, and 0.283 in merchant towns. This suggests that the difference in significance arises not from the coefficient magnitude, but from the size of the standard errors — 0.167 at samurai towns and 0.108 at merchant towns. This discrepancy might be attributed to the small sample size in samurai towns. Furthermore, we

Table 6: Commoners in Samurai Town vs. Merchant Town

	All Occupational Elites (1)	High Income Managers (2)	Professionals (3)	Public Servants (4)
Panel A: Commoners in the Samurai Town				
After	0.478***	0.276	0.259**	0.055
	(0.162)	(0.167)	(0.097)	(0.098)
No. of prefecture-cohort	144	144	144	144
Mean Dep Before	1.49	0.97	0.50	0.12
Percent Effect(%)	32	28	52	45
Panel B: Commoners in the Merchant Town				
After	0.355***	0.283**	0.043	0.016
	(0.114)	(0.108)	(0.071)	(0.055)
No. of prefecture-cohort	189	189	189	189
Mean Dep Before	1.70	1.10	0.58	0.13
Percent Effect(%)	21	26	7	12

Notes: This table shows regression discontinuity design estimates of the long-run effects of the 2nd secondary schools on the number of commoner occupational elites by school location. We use the same data and specification as in Table 3 panel (c) except that we divide the sample by the location of the 2nd school in the prefecture, which is either a samurai town (panel A) or a merchant town (panel B). For a detailed description about this table, see Section 5.3. Standard errors reported in parentheses are clustered at the prefecture level. ***, **, and * mean significance at the 1%, 5%, and 10% levels, respectively.

observe similar impacts: a 28% increase at samurai towns and a 26% increase at merchant towns relative to the mean of the baseline cohorts. These results indicate that there is a homogeneous impact on the increase of high-income managers among commoners in both samurai and merchant towns.

Next, we explore the effects on professional elites (column 2 in panel A and panel B). The coefficient at samurai towns is positive and significant with a magnitude of 0.259, which is 52% increase from the baseline cohorts. However, the effect at merchant towns is approximately 0 and not significant. The averages of baseline cohorts are not so different between samurai towns and merchant towns, suggesting that these impacts were likely to have arisen from the locations where secondary schools were established. While the percentage effects on public servants vary widely between samurai and merchant towns, both show large standard errors, making it difficult to precisely interpret the coefficients.

5.4 Classmate networks after graduation

The above evidence suggests that the factors explaining the impacts on production of business elites are neither qualified teachers nor progression to higher education but rather possibly some kinds of peer effects. One relevant channel could be utilization of classmate networks for business careers after graduation. For instance, classmates might have introduced job opportunities through referrals, or they might have established a company together. We unfortunately do not have information on the secondary school for each business elite listed in PIRs. As a second-best strategy, we use a group of manager elites who were born in the same prefecture in the same year as a likely group of classmates and identify those working in the same companies by matching company names within each group.

To identify whether business elites born in the same prefecture in the same year work in the same companies, we use the sample of either managers (without restricting by high-income criteria) or high-income managers in PIRs and apply Levenshtein distance-based string matching to their company names.[15] With this method, we calculate the total number of unique companies at which elites in each prefecture and cohort worked, as well as the number of companies per managers (measured by the number of unique companies divided by the number of managers or high-income managers). We also calculate the Herfindahl & Hirschman index, indicating the dispersion of employment across companies.

Table 7 panel A shows the result for the impact of additional school on the number of unique companies where the same cohort peers worked. The coefficients are positive but statistically insignificant. Panel B shows the number of unique firms per manager (per high-income manager for Column 2). The coefficients are negative and significant for managers, suggesting an increased likelihood of the peers working in the same companies. Panel C shows the effect for Herfindahl & Hirschman index. The coefficients are positive but statistically insignificant. (Although the results so far are not conclusive, we are currently further exploring this channel.)

[15]This method defines the cost as the minimum number of steps required to transform one string into another through insertion, deletion, or substitution of characters, treating companies as identical if the transformation requires one or zero changes.

Table 7: Long-run impacts of additional secondary schools: classmate networks

	All Managers (1)	High Income Managers (2)
Panel A: No. of Unique Companies		
After	0.803	2.327
	(3.134)	(1.755)
No. of prefecture-cohort	333	333
No. of Elites		
Mean Dep Before	49.26	25.86
Percent Effect(%)	2	9
Panel B: No. of Unique Companies per Managers		
After	-0.176*	-0.242
	(0.096)	(0.146)
No. of prefecture-cohort	333	333
No. of Elites		
Mean Dep Before	1.93	2.18
Percent Effect(%)	-9	-11
Panel C: Herfindahl & Hirschman Index		
After	3.789	42.470
	(49.399)	(281.158)
No. of prefecture-cohort	333	332
No. of Elites		
Mean Dep Before	310.04	1009.38
Percent Effect(%)	1	4

Notes: This table shows regression discontinuity design estimates of the long-run effects of the 2nd secondary schools on the total number of unique companies at which elites born in the same prefecture and cohort worked (panel A), the number of unique companies per managers (panel B), and Herfindahl & Hirschman index (panel C). We use the same specification as in Table 3 except that we limit the sample to managers and high-income managers (see definition at section3.1). Standard errors reported in parentheses are clustered at the prefecture level. ***, **, and * mean significance at the 1%, 5%, and 10% levels, respectively.

6 Concluding Remarks

This study investigates the impact of the expansion of secondary schools on elite formation during Japan's developmental period experiencing a transition from a hereditary society to a more meritocratic society. Prior to this expansion, the number of publicly-funded secondary schools was restricted to one per prefecture to concentrate educational resources. This regulation, however, was subsequently relaxed, allowing prefectures to establish more than one public secondary schools. Following this deregulation, each prefecture individually set up 2nd schools, but the timing of these establishments varied across prefectures. Using this setting for a RDD identification strategy, we explore the causal relationship between the expansion of secondary school and elite formation. Notably, these newly established schools were located to be more accessible to students from commoner families, improving the representation of commoners in these institutions.

Even after the country transitioned from a hereditary society to meritocracy, nobles, who constituted about 5% of the population, over-represented across various occupational categories, such as high-income business managers (16%), professional elites (29%), and high-ranking public servants (26%). Our finding suggest that the expansion of the 2nd secondary schools increased the number of elites from commoner families, especially in high-income business managers and professional elites. The rise of commoner elites is driven by an increase in commoner elites whose fathers were not elites, implying that these schools improved upward intergenerational mobility. In contrast, the number of occupational elites among nobles did not significantly increase. This is possibly because an increase in commoner secondary school graduates crowded out noble students in competition to enter national higher education institutions. Overall, we find that the impact of having one additional secondary schools in all prefectures in this analysis reduces noble share of elites by 1.7 percentage points for high-income business managers and 0.4 percentage points for professional elites.

When a small group of population over-represent top positions of private and public sectors and organize society for their own interests, it can create persistent inequality and discontents (Acemoglu and Robinson, 2012). One solution is to promote education aimed at a meritocracy. However, meritocracy does not always promote the production of elites from

disadvantaged group and sometimes even legitimizes the over-representation of existing elite. Unlike recent studies (Zimmerman, 2019; Michelman et al., 2022), showing that students from low-status families do not benefit when selective institutions of higher education produce top executives, our results indicate that providing access to secondary education to under-represented groups improve their representation in the elite compositions.

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1 Appendix

1.1 Staggered DiD

Table A1: Staggered DID: pretrend test

	χ^2(df)		
	High Income Managers	Professionals	Public Servants
All	1691.66(31)	10165.85(31)	1656.62(31)
Nobles	715.00(31)	2506.19(31)	893.31(31)
Commoners	2450.09(31)	733.54(31)	36718.57(31)

Notes: In this table, we test the null hypothesis that the pretrend in pre-treatment cohorts within window from -4 to -1 is equal to 0. Degree of freedom are in parentheses. The definition of the outcome variables are the same as Table 7.

1.2 Different specification with RD approach

Table B1: Controlling for squared trend term

	All Occupational Elites (1)	High Income Managers (2)	Professionals (3)	Public Servants (4)
Panel A: All				
After	0.364***	0.198**	0.146**	0.032
	(0.100)	(0.076)	(0.067)	(0.041)
No. of prefecture-cohort	333	333	333	333
Mean Dep Before	1.77	1.13	0.62	0.16
Percent Effect(%)	21	18	24	20
Panel B: Nobles				
After	1.544	0.285	0.764	0.369
	(1.483)	(0.825)	(1.152)	(0.352)
No. of prefecture-cohort	333	333	333	333
Mean Dep Before	7.65	4.44	3.12	0.91
Percent Effect(%)	20	6	25	40
Panel C: Commoners				
After	0.369***	0.245**	0.141**	0.009
	(0.096)	(0.090)	(0.059)	(0.054)
No. of prefecture-cohort	333	333	333	333
Mean Dep Before	1.61	1.05	0.55	0.13
Percent Effect(%)	23	23	26	7

Notes: This table shows regression discontinuity design estimates of the long-run effects of the 2nd secondary schools on the number of occupational elites. We use the same data and specification as in Table 3 except that here we include a quadratic trend term. In panel A, we use the total number of elites in noble and commoner families. In panels B and C, we separately examine noble elites and commoner elites. Standard errors reported in parentheses are clustered at the prefecture level. ***, **, and * mean significance at the 1%, 5%, and 10% levels, respectively.

Table B2: Controlling for birth year fixed effect

	All Occupational Elites (1)	High Income Managers (2)	Professionals (3)	Public Servants (4)
Panel A: All				
After	0.309***	0.169**	0.120*	0.042
	(0.097)	(0.079)	(0.067)	(0.044)
No. of prefecture-cohort	333	333	333	333
Mean Dep Before	1.77	1.13	0.62	0.16
Percent Effect(%)	17	15	19	27
Panel B: Nobles				
After	1.714	0.387	0.806	0.429
	(1.408)	(0.853)	(1.158)	(0.434)
No. of prefecture-cohort	333	333	333	333
Mean Dep Before	7.65	4.44	3.12	0.91
Percent Effect(%)	22	9	26	47
Panel C: Commoners				
After	0.295***	0.204**	0.107	0.019
	(0.091)	(0.093)	(0.066)	(0.055)
No. of prefecture-cohort	333	333	333	333
Mean Dep Before	1.61	1.05	0.55	0.13
Percent Effect(%)	18	19	20	15

Notes: This table shows regression discontinuity design estimates of the long-run effects of the 2nd secondary schools on the number of occupational elites. We use the same data and specification as in Table 3 except that here we include a birth year fixed effect instead of using a linear cohort. In panel A, we use the total number of elites in noble and commoner families. In panels B and C, we separately examine noble elites and commoner elites. Standard errors reported in parentheses are clustered at the prefecture level. ***, **, and * mean significance at the 1%, 5%, and 10% levels, respectively.

Table B3: 2 years before and after

	All Occupational Elites (1)	High Income Managers (2)	Professionals (3)	Public Servants (4)
Panel A: All				
After	0.372**	0.311**	0.090	0.020
	(0.149)	(0.121)	(0.109)	(0.065)
No. of prefecture-cohort	185	185	185	185
Mean Dep Before	1.81	1.19	0.60	0.19
Percent Effect(%)	21	26	15	11
Panel B: Nobles				
After	1.733	0.675	1.172	0.314
	(2.131)	(1.195)	(1.580)	(0.710)
No. of prefecture-cohort	185	185	185	185
Mean Dep Before	7.90	4.76	3.21	0.97
Percent Effect(%)	22	14	36	32
Panel C: Commoners				
After	0.424**	0.381**	0.097	0.006
	(0.157)	(0.150)	(0.109)	(0.074)
No. of prefecture-cohort	185	185	185	185
Mean Dep Before	1.65	1.09	0.53	0.16
Percent Effect(%)	26	35	18	4

Notes: This table shows regression discontinuity design estimates of the long-run effects of the 2nd secondary schools on the number of occupational elites. We use the same data and specification as in Table 3 except that here we narrow the cohorts to two years before and after the establishment instead of four years before and after establishment. In panel A, we use the total number of elites in noble and commoner families. In panels B and C, we separately examine noble elites and commoner elites. Standard errors reported in parentheses are clustered at the prefecture level. ***, **, and * mean significance at the 1%, 5%, and 10% levels, respectively.

Table B4: Military related outcomes

	Military School Grads. (1)	Military Servants (2)
Panel A: All		
After	0.008	-0.022
	(0.029)	(0.042)
No. of prefecture-cohort	333	333
Mean Dep Before	0.11	0.24
Percent Effect(%)	7	-9
Panel B: Nobles		
After	0.075	0.034
	(0.327)	(0.404)
No. of prefecture-cohort	333	333
Mean Dep Before	0.72	1.57
Percent Effect(%)	10	2
Panel C: Commoners		
After	0.001	0.003
	(0.028)	(0.042)
No. of prefecture-cohort	333	333
Mean Dep Before	0.08	0.19
Percent Effect(%)	1	2

Notes: This table shows regression discontinuity design estimates of the long-run effects of the 2nd secondary schools on the number of military related elites that here we restrict the sample of elites who graduate from military schools (column (1)), or higher-ranking of military servants (column (2)). We use the same data and specification as in Table 3. In panel A, we use the total number of elites in noble and commoner families. In panels B and C, we separately examine noble elites and commoner elites. Standard errors reported in parentheses are clustered at the prefecture level. ***, **, and * mean significance at the 1%, 5%, and 10% levels, respectively.

Table B5: Military vs. non-military high-income managers

	High Income Managers		
	(1)	(2)	(3)
	All	Military	Non-Military
Panel A: All			
After	0.248***	-0.016	0.265***
	(0.076)	(0.018)	(0.075)
No. of prefecture-cohort	333	333	333
Mean Dep Before	1.13	0.07	1.06
Percent Effect(%)	22	-25	25
Panel B: Nobles			
After	0.474	-0.261	0.734
	(0.777)	(0.199)	(0.770)
No. of prefecture-cohort	333	333	333
Mean Dep Before	4.44	0.47	3.96
Percent Effect(%)	11	-55	19
Panel C: Commoners			
After	0.280***	0.002	0.278***
	(0.093)	(0.020)	(0.089)
No. of prefecture-cohort	333	333	333
Mean Dep Before	1.05	0.05	0.99
Percent Effect(%)	27	4	28

Notes: This table shows regression discontinuity design estimates of the long-run effects of the 2nd secondary schools on the number of high-income managers. We use the same data and specification as in Table 3 except that here we restrict the sample of total high-income business managers (column (1)), high-income managers who have a military experience (column (2)) or high-income managers who do not have a military experience (column (3)). In panel A, we use the total number of high-income managers in noble and commoner families. In panels B and C, we separately examine noble elites and commoner high-income managers. Standard errors reported in parentheses are clustered at the prefecture level. ***, **, and * mean significance at the 1%, 5%, and 10% levels, respectively.

Table B6: Excluding Kazoku

	All Occupational Elites (1)	High Income Managers (2)	Professionals (3)	Public Servants (4)
Panel A: All				
After	0.421***	0.237***	0.152**	0.057
	(0.096)	(0.075)	(0.065)	(0.041)
No. of prefecture-cohort	333	333	333	333
Mean Dep Before	1.76	1.13	0.62	0.16
Percent Effect(%)	24	21	25	37
Panel B: Nobles				
After	1.738	0.148	1.056	0.451
	(1.455)	(0.767)	(1.108)	(0.419)
No. of prefecture-cohort	333	333	333	333
Mean Dep Before	7.60	4.40	3.12	0.88
Percent Effect(%)	23	3	34	51
Panel C: Commoners				
After	0.408***	0.280***	0.136**	0.032
	(0.094)	(0.093)	(0.060)	(0.052)
No. of prefecture-cohort	333	333	333	333
Mean Dep Before	1.61	1.05	0.55	0.13
Percent Effect(%)	25	27	25	25

Notes: This table shows regression discontinuity design estimates of the long-run effects of the 2nd secondary schools on the number of high-income managers. We use the same data and specification as in Table 3 except that here we exclude Kazoku (former local lords, Damimyo and Kuge) from the noble elites. In panel A, we use the total number of elites in noble and commoner families. In panels B and C, we separately examine noble elites and commoner elites. Standard errors reported in parentheses are clustered at the prefecture level. ***, **, and * mean significance at the 1%, 5%, and 10% levels, respectively.

Table B7: Prefectures established secondary schools in early years vs. later years

	All Occupational Elites (1)	High Income Managers (2)	Professionals (3)	Public Servants (4)
Panel A: All				
After	0.540***	0.290***	0.240***	0.077
	(0.110)	(0.090)	(0.069)	(0.050)
Post × After	-0.185*	-0.072	-0.148**	-0.034
	(0.102)	(0.075)	(0.064)	(0.048)
No. of prefecture-cohort	333	333	333	333
Mean Dep Before	1.77	1.13	0.62	0.16
Percent Effect(%)	31	26	39	49
Panel B: Nobles				
After	3.914*	1.287	2.196	0.396
	(1.941)	(1.255)	(1.340)	(0.470)
Post × After	-3.153*	-1.393	-1.915	0.105
	(1.850)	(1.323)	(1.170)	(0.499)
No. of prefecture-cohort	333	333	333	333
Mean Dep Before	7.65	4.44	3.12	0.91
Percent Effect(%)	51	29	70	43
Panel C: Commoners				
After	0.439***	0.285**	0.185***	0.051
	(0.100)	(0.119)	(0.063)	(0.049)
Post × After	-0.053	-0.008	-0.084	-0.032
	(0.090)	(0.098)	(0.057)	(0.038)
No. of prefecture-cohort	333	333	333	333
Mean Dep Before	1.61	1.05	0.55	0.13
Percent Effect(%)	27	27	34	39

Notes: This table shows regression discontinuity design estimates of the long-run effects of the 2nd secondary schools on the number of occupational elites. We use the same data as in Table 3 but here we include "Post" that takes 1 if the 2nd school was established after the median year of establishment among the sample prefectures and its interaction term with "After". In panel A, we use the total number of elites in noble and commoner families. In panels B and C, we separately examine noble elites and commoner elites. Standard errors reported in parentheses are clustered at the prefecture level. ***, **, and * mean significance at the 1%, 5%, and 10% levels, respectively.

Table B8: Prefectures with two or more secondary schools

	All Occupational Elites (1)	High Income Managers (2)	Professionals (3)	Public Servants (4)
Panel A: All				
After	0.444***	0.269***	0.147*	0.045
	(0.128)	(0.093)	(0.074)	(0.052)
1 if No. of 2nd Schools $\geq 2 \times$ After	-0.025	-0.044	0.012	0.025
	(0.147)	(0.086)	(0.096)	(0.038)
No. of prefecture-cohort	333	333	333	333
Mean Dep Before	1.77	1.13	0.62	0.16
Percent Effect(%)	25	24	24	29
Panel B: Nobles				
After	3.554**	1.559	1.448	0.804*
	(1.611)	(0.970)	(1.222)	(0.427)
1 if No. of 2nd Schools $\geq 2 \times$ After	-3.042*	-2.230*	-0.761	-0.714*
	(1.628)	(1.175)	(0.818)	(0.404)
No. of prefecture-cohort	333	333	333	333
Mean Dep Before	7.65	4.44	3.12	0.91
Percent Effect(%)	46	35	46	88
Panel C: Commoners				
After	0.366***	0.270**	0.102	0.009
	(0.126)	(0.105)	(0.073)	(0.059)
1 if No. of 2nd Schools $\geq 2 \times$ After	0.087	0.020	0.071	0.048
	(0.129)	(0.090)	(0.094)	(0.034)
No. of prefecture-cohort	333	333	333	333
Mean Dep Before	1.61	1.05	0.55	0.13
Percent Effect(%)	23	26	19	7

Notes: This table shows regression discontinuity design estimates of the long-run effects of the 2nd secondary schools on the number of high-income managers. We use the same data and specification as in Table 3 except that here we include "Two More Schools" which is a time-invariant dummy variable set to 1 if the prefecture established two or more secondary schools at the same year of the 2nd school's establishment and its interaction term with "After". In panel A, we use the total number of elites in noble and commoner families. In panels B and C, we separately examine noble elites and commoner elites. Standard errors reported in parentheses are clustered at the prefecture level. ***, **, and * mean significance at the 1%, 5%, and 10% levels, respectively.

1.3 Heterogeneity of treatment effect

Table C1: Interaction term with the no. of teachers per graduates

	All Occupational Elites (1)	High Income Managers (2)	Professionals (3)	Public Servants (4)
Panel A: All				
After	0.323*	0.210*	0.022	0.077
	(0.173)	(0.111)	(0.101)	(0.050)
$\frac{No.\ of\ Teachers}{No.\ of\ Grads.}\times$ After	0.288	0.083	0.407	
	(0.461)	(0.293)	(0.282)	
No. of prefecture-cohort	333	333	333	333
Mean Dep Before	1.77	1.13	0.62	0.16
Percent Effect(%)	18	19	4	49
Panel B: Nobles				
After	0.745	-0.458	0.253	0.793
	(1.801)	(1.126)	(1.315)	(0.695)
$\frac{No.\ of\ Teachers}{No.\ of\ Grads.}\times$ After	3.047	2.474	2.036	-1.520
	(4.801)	(3.454)	(2.849)	(1.490)
No. of prefecture-cohort	333	333	333	333
Mean Dep Before	7.65	4.44	3.12	0.91
Percent Effect(%)	10	-10	8	87
Panel C: Commoners				
After	0.378**	0.313**	0.035	0.054
	(0.163)	(0.121)	(0.115)	(0.083)
$\frac{No.\ of\ Teachers}{No.\ of\ Grads.}\times$ After	0.064	-0.134	0.325	-0.076
	(0.401)	(0.265)	(0.294)	(0.152)
No. of prefecture-cohort	333	333	333	333
Mean Dep Before	1.61	1.05	0.55	0.13
Percent Effect(%)	24	30	6	42

Notes: This table shows regression discontinuity design estimates of the long-run effects of the 2nd secondary schools on the number of high-income managers. We use the same data and specification as in Table 3 except that here we include the ratio of secondary school teachers to graduates (measured for each prefecture and year) and its interaction term with "After". In panel A, we use the total number of elites in noble and commoner families. In panels B and C, we separately examine noble elites and commoner elites. Standard errors reported in parentheses are clustered at the prefecture level. ***, **, and * mean significance at the 1%, 5%, and 10% levels, respectively.

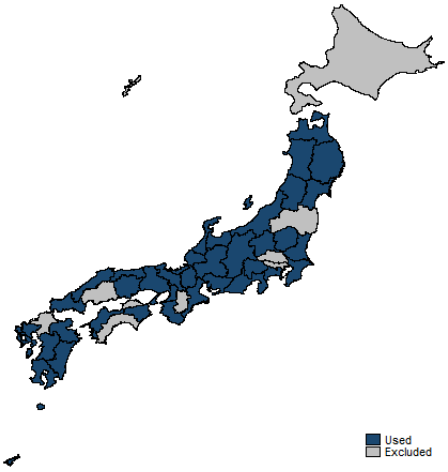
Table C2: Educational path

	Imperial University			Other Higher Education			No Higher Education		
	(1) High Income Managers	(2) Professionals	(3) Public Servants	(4) High Income Managers	(5) Professionals	(6) Public Servants	(7) High Income Managers	(8) Professionals	(9) Public Servants
	Panel A: All								
After	0.028	0.129***	0.048*	0.046	-0.002	0.000	0.174**	0.026	0.009
	(0.045)	(0.043)	(0.026)	(0.059)	(0.032)	(0.018)	(0.069)	(0.022)	(0.014)
No. of prefecture-cohort	333	333	333	333	333	333	333	333	333
Mean Dep Before	0.24	0.35	0.10	0.29	0.18	0.03	0.59	0.08	0.03
Percent Effect(%)	11	37	48	16	-1	1	29	31	28
	Panel B: Nobles								
After	0.903	0.903	0.406	-0.594	0.144	-0.117	0.163	0.034	0.154
	(0.538)	(0.796)	(0.421)	(0.486)	(0.457)	(0.172)	(0.412)	(0.288)	(0.103)
No. of prefecture-cohort	333	333	333	333	333	333	333	333	333
Mean Dep Before	1.60	1.95	0.66	1.47	0.78	0.15	1.36	0.38	0.10
Percent Effect(%)	56	46	62	-40	18	-80	12	9	152
	Panel C: Commoners								
After	0.008	0.098*	0.035	0.066	-0.003	-0.007	0.204***	0.040*	0.005
	(0.044)	(0.049)	(0.032)	(0.066)	(0.033)	(0.020)	(0.075)	(0.023)	(0.015)
No. of prefecture-cohort	333	333	333	333	333	333	333	333	333
Mean Dep Before	0.19	0.30	0.07	0.26	0.17	0.03	0.59	0.08	0.03
Percent Effect(%)	4	33	47	25	-2	-29	35	52	17

Notes: This table shows regression discontinuity design estimates of the long-run effects of the 2nd secondary schools on the number of occupational elites by post-graduation education paths. We use the same data and specification as in Table 3 except that here we count the number of elites by the type of final education institutions. Columns (1)-(3) show the results for the elites who graduated from the Imperial Universities, column (4)-(6) show the results for the elites who graduated from other higher education institutions, and column (7)-(9) show the results for the elites who did not proceed to any higher education. For a detailed description of these variables, see Section 3.1. In panel A, we use the total number of elites in noble and commoner families. In panels B and C, we separately examine noble elites and commoner elites. Standard errors reported in parentheses are clustered at the prefecture level. ***, **, and * mean significance at the 1%, 5%, and 10% levels, respectively.

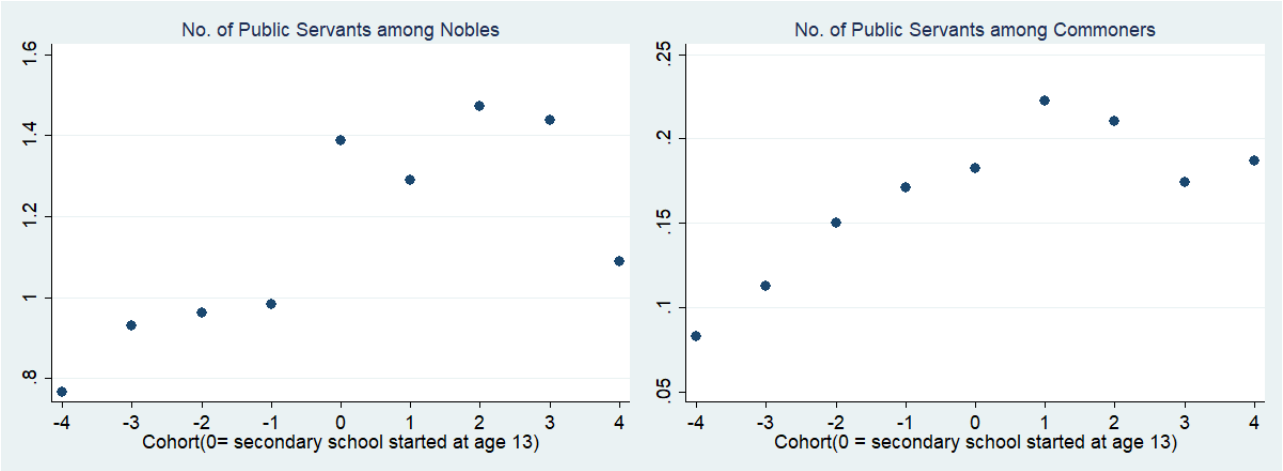
1.4 Figure

Figure D1: Prefectures focused in the main analysis



Notes: This figure displays the map of all 47 prefectures in Japan. For our analysis, we focus on 37 prefectures (blue) that established 2nd secondary schools between 1893 and 1901 and did not simultaneously establish both 1st and 2nd schools.

Figure D2: Public servants

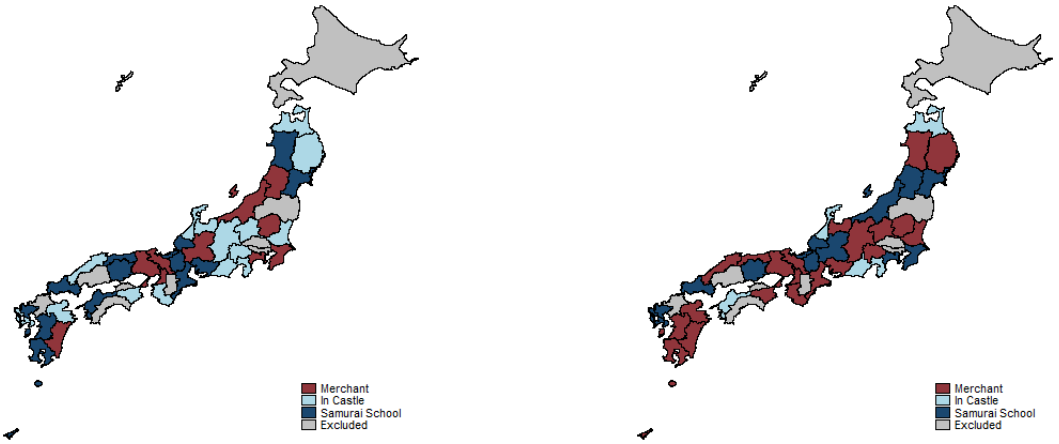


(a) Nobles **(b)** Commoners

Notes: These figures show the average number of public servants (per 1,000 male births) across prefectures for each cohort. The definition of cohort is the same as Figure 5. "Public Servants" are defined as individuals who work at the central government either as an officer and a politician. For a detailed description of the outcome, see Section 3.1. We focus on individuals who were born in the subset of prefectures we use in our analysis (we use 37 prefectures that established 2nd schools in 1893–1901).

1.5 Additional analysis

Figure E1: Town classification in 1st schools and 2nd schools



(a) 1st schools **(b)** 2nd schools

Notes: This figure shows a classification of prefectures depending on the location of 1st/2nd secondary schools. We use three categories: first, schools were built on a former fief school ("samurai schools") second, schools established within old castle grounds or samurai residences ("in castle"), third, schools located in areas unassociated with Kazoku or samurais, but typically in towns next to castles or merchant areas ("merchant towns"). Panel (a) shows the classification of prefectures depending on the location of 1st school. Panel (b) shows the classification of prefectures depending on the location of 2nd school.