

The Effect of Elites and Colonization on Literacy*

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Abstract

In this paper we look at the impact of elite class and Japanese colonization on modernizing Korea. Our case study focuses on the historical Korean kingdom known as Joseon, the first monarchical state to be colonized by Japan in 1910. In particular we investigate how pre-existing scholarly traditions and colonial public school provision influenced the overall literacy level in Korea. We introduce novel data from Joseon's historical court exam archives, colonial education data, and census data going back to 1930. Our main findings suggest that the spread of literacy is mainly explained by the historical presence of educated upper class from the Joseon dynasty, rather than the school system established under the colonial rule. We also find that areas with elite presence had more teachers as well as other types of educational institutions including private and traditional schools.

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1 Introduction

There is a growing literature tracing the root of institutions and modernization to colonization.¹ While these studies show that colonization sometimes led to both good institutions and economic development for colonies, the findings appear heavily dependent on both geographic and historical contexts. The results also depend on the type and level of endowments that the colonies had; in addition to geography, climate, natural resources and other physical capital, these endowments include human capital and institutions that determined the level of pre-colonial development.

Since the recent revival of debate on modernizing effects of colonization, scholars have generally focused on European states and their colonies in the New World and Africa. The reasons for this are several. First, the intense scholarly interest on the rise of the West and the advent of the Industrial Revolution have led to a large body of works explaining, among many things, the role of institutions in economic development of the West, and why the Revolution happened in Western Europe but not other parts of the world. Building on this literature, scholars have then moved on to consider institutional and modernization outcomes in European colonies as legacies of colonization and settlement. Second, the relative scarcity of data from colonies ruled by non-European states has hindered more numerous studies of these regions. Third, most colonies were in fact ruled by the European empires, making it easier for scholars to test generalizable claims only within the European framework.

Although numerous works argue the importance of pre-colonial development (Englebert 2000; Gennaioli and Rainer 2007; Van de Walle 2009; Huillery 2010; Juif and Baten 2013; Michalopoulos and Papaioannou 2013), they often provide contrasting findings when it comes to the lasting impact of pre-colonial development interacting with colonization process. For example Huillery (2010) argues that most prosperous pre-colonial areas in West Africa lost their advantage because of they were hostile to the colonizers. The author claims this causes the ‘reversal of fortune’. On the other hand, Gennaioli and Rainer (2007) find that pre-colonial centralization in African countries improved current public goods provision in rural areas. A direct test between colonization and transfusion of subsequent institutions is also often made difficult by lack of data.²

In light of these issues, we present in the following paper a study of pre-colonial human capital accumulation, colonization and literacy rate in Korea. Economists have often presented theories and

¹See for example Acemoglu et al. (2001), Albouy (2012) and Fails and Krieckhaus (2010), Banerjee and Iyer (2005), Iversen et al. (2013) and Porta et al. (2008)

²One reason Acemoglu et al. (2001) use settler’s mortality as an instrumental variable for good colonial institutions for example is due to the absence of comparable measure for colonial institutions.

evidence supporting a positive linkage between human capital accumulation and modern economic growth (Nelson and Phelps 1966; Schultz 1967; Romer 1990; N. Gregory Mankiw and Weil 1992; Foster and Rosenzweig 1996; Galor and Moav 2004). Much of the literature uses literacy and primary education as an indicator of human capital accumulation, arguing that literacy is one of the key skills necessary for economic production (Romer 1990; Azariadis and Drazen 1990; Psacharopoulos 1994; Galor and Moav 2004; Hanushek and Woessmann 2008). Different works specifically related to the Korean context have also used literacy improvement during the colonial period to support the modernization theory (Kimura 1993; Kohli 1994). Kohli (1994, pp.1276-1277) for example claims that the Japanese colonial rule contributed to subsequent economic development of South Korea by “inheriting a relatively literate labor force.” Haggard et al. (1997, p.877) on the other hand rebuts this claim, instead arguing that the main driver behind the economic growth was not the Japanese but the Joseon dynasty which made educational attainment the “chief means to political and economic success”.

Joseon, as Korea was known before the colonization, was the first monarchical state in Asia to be invaded and colonized by Japan in 1910. We introduce novel data from Joseon’s historical court exam archives, colonial education data and census data going back to 1930. Our main findings suggest that the variation in literacy rate across different provinces is mainly explained by the historical presence of the educated upper class from the Joseon dynasty, rather than the school system established under the colonial rule. We argue that that only with the pre-colonial human capital accumulation was the established colonial public schooling system effective in improving the literacy rate. Furthermore the findings suggest that regions with higher concentration of pre-colonial educated class also had more traditional and private schools, as well as Korean teachers in public schools (also called *hundo*). We interpret this result as confirming evidence that pre-colonial development was paramount to the effectiveness of new institutional provisions, such as public schooling, and that independent of the pre-existing educated elite class, the impact of the public good on literacy improvement would have been marginal.

In this paper we attempt to shed light on the Asian countries on which Japanese colonization had significant influence on their social and economic outcomes. In comparison with the existing studies focusing on Europe, the study of Japanese colonization and its impact on the colonies warrant a new investigation into how colonial institutions were influenced by pre-colonial development, and why these institutions varied in terms of their performances. There continues to be much debate among historians and economists on how the Japanese colonization at the brink of the 20th century

modernized the state (Eckert 1991; Kimura 1993; Kohli 1994; Haggard et al. 1997; Kohli 1997). On the one hand, this act of aggression may have acted as a catalyst for modernization by exposing the subjugated states to the frontiers of new technology and capital. On the other hand, the imperialists used extractive means to hinder the natural trajectories of these states towards development, which likely would have taken place by themselves even without the intervention of the external force. The following study is, to our knowledge, the first systematic analysis of how the pre-colonial elite class in Korea interacted with the colonial public school system to influence the literacy outcome.

The remainder of the article is structured as follows. The next section presents a brief background of the class system in Joseon and a time-line of the country’s transition from the Joseon dynasty to Japan’s first colony. Section three describes the historical exam data construction and 1930 census data. Section four discusses various empirical strategies and the main findings. Finally, section five concludes with an extended discussion on the Japanese colonial legacies in Korea and their impact on the country.

2 Background

Classical economic growth models emphasize the importance of human capital for growth, and educated masses are seen as instrumental for development and increasing the welfare of the state. The status of nobility in Korea during the Joseon Dynasty between the 15th and 19th Century was determined largely by scholarship. That is, the educated upper class historically was primarily based on passing court exams. This class was called *yangban*; *yangban* literally means two groups, consisting of civilian officials (*munban* or *mungan*) and military officials (*muban* or *muguan*)³.

Before the end of the Joseon Dynasty and abolishment of official court examination (*guageo*) system in 1894, those who became civilian or military court officials only did so by first passing these difficult exams. Passing these exams was the first step toward obtaining high social status and exerting significant influence in Joseon’s court politics. There were different types of exams for court official positions. In civil service, there were two preliminary “small” exams (*sogwa*) and one “big” exam (*daegwa*), which combined were called *mungwa*. *Sogwa* consisted of two exams (*saengwon-si* and *jinsa-si*); *Saengwonsi* involved the study of the Confucian classics (*saseo-samkyung*), while *jinsasi* involved essay writing. In order to prepare for *daegwa*, scholars would attend *Sungkyunkwan*, a higher educational institution that prepared students. The very first

³From an early study by Wagner (1974), scholars agree that *yangban* was an aristocratic elite group of Joseon until the early twentieth century.

munghwa exams were held in 1399, and over the course of 500 years during the Joseon dynasty between 1393 and 1894, there were in total 230 *saengwon-si*, 212 *jinsa-si* and 804 *daegwa* exams held. Passing *daegwa* appears to have been extremely difficult; on average the age of successful applicants who completed all three exams was 34.3, and exam preparation time took ten to fifteen years. Given that kings during Joseon Dynasty lived for 46.3 years on average and the average life expectancy was estimated around forty, studying for these exams would likely have been an option available only for the elite families (Lee 1980).

The military exam, or *mugwa* involved both military training (*muye*), as well as Confucian classics also known as Four Books and Three Classics (of ancient China), or the Seven Chinese Classics, and theory of legislation (*Gyeongguk Daejeon*). 801 *mugwa*, or military exam, were held from 1402 to 1894. In addition to military and civilian exams, there were other exams reserved for the middle class (*jungin*) in lower ranking official positions, in the fields of medicine, law, astrology and physics, and translation and foreign diplomacy. There were also a subset of official positions that were either bought off or reserved for the merit subjects avoiding the exam requirement (*eumguan*).⁴

While the elite class was formally inclusive of both families of military and civil officials, the status of those with only military lineage was often undermined. In general scholars agree that there was much discrimination against military officials by civilian officials, especially during the late Joseon period. A number of factors appear to have contributed to this outcome; typically there were more applicants from lower social class for military exams, which would have further contributed to the class division within the *yangban* class.⁵ During war times (the Japanese Invasion of Korea (*Imjinwaeran*) from 1592-1598 and the Manchu invasion of Korea (*Byeongjajhoran*) from 1636 to 1637), more commoners were recruited and promoted to military ranks. Furthermore, studying for military exams would have entailed a set of physical skills not required of in civil exams but have placed less emphasis on literary knowledge. Given *munghwa*'s social status during the Joseon period as well as the nature of its scholarly pursuit and exclusivity, this paper uses the number of *daegwa* passers in history in each region as a proxy for the presence of educated upper elite class.

After violent confrontations at Ganghwa Island in 1875-76, Japan was the first country which successfully enforced the Joseon Dynasty to open modern diplomatic relationships and to allow foreign businesses to trade with Joseon. Since then, the Joseon government struggled between tra-

⁴Paik (2014) provides a detailed summary on different types of exams and qualifications involved in taking the exams.

⁵See Eugene Park's work on military exams (Park 2000, 2001) and Kyungmoon Hwang's work (Hwang 2004) on the middle class.

ditional governance and modern reform, with frequent political interventions from foreign countries including China, Japan, and Russia. After defeating competitors by winning two consecutive wars (the First Sino-Japan War in 1894-95 and the Russo-Japanese War from 1904 to 1905), Japan made Korea a protectorate state in 1905 and finally colonized Korea under the Japan-Korea Annexation Treaty of 1910.

It is worth noting that Joseon's tributary relationship with China was fundamentally different from its colonial status under Japan. For a long period,⁶ kingdoms founded in the Korean peninsula maintained a hierarchical relationship with Chinese dynasties. Although this tributary system was based on the idea of strict superiority of the Chinese empire, it was clearly distinct from the modern colonial system (Fairbank 1968). The main purpose of the tributary system was to set up an orderly foreign relationship confirming the hierarchy, not to conquer the tributary states. Regular exchanges of envoys and tributes represented such nature of the system, and the internal politics of Joseon stayed largely independent.

Over the course of colonization, the Japanese government set out to dramatically change the underpinnings of Joseon's pre-existing institutions. In education and literacy, the government quickly noticed that the education system in Joseon had to differ from that of other colonies because of relatively advanced culture and education within Joseon (Kang 2007, p.19). Therefore, in 1911 the Japanese government adopted a schooling system that Joseon already had established before the colonial occupation in 1910.⁷ The Japanese government however pursued the expanded use of Japanese language through schooling since the beginning of colonization. The Education Decree in Joseon issued in 1911 states that the main purpose of elementary education is the propagation of the Japanese language. Whether to teach Korean in primary education or not was debated within the Japanese government and the Japanese Government General of Korea (Kang 2007, pp.41-42). In the end, Korean language classes and the use of Chinese characters became part of the regular teaching curriculum. The Japanese government needed to include the Korean language in the curriculum not only as means to teach Japanese but also to attract Korean students to public schools in competition with private schools and traditional schools called *seodang* (Kang 2007, p.43). As colonial institutions settled, however, hours of Korean language classes decreased over time. Records indicate that the Korean language was taught in public primary schools for five to

⁶Although the length of the tributary relationship varies among scholars, most agree that the incipient tributary relationship between the kingdoms in the Korean peninsula and Chinese dynasties began around the 4th century.

⁷After 1894 certain members of the Joseon court attempted various reforms in governance and policies. One of these initiatives included establishing public schools in Seoul (or *Hanyang*, as the capital was called during this period) and numerous private schools by both the reformists and missionaries.

six hours per week from 1911 to 1921, which later reduced to three to four hours in 1922. These classes became optional in 1938 and were finally abolished by 1943 (Kim 2005).

3 Data

In order to examine the variation in literacy rates during the colonization period, we present the colonial census data from 1930 and education records both at the district and provincial level. Data on district-level literacy during the colonial period is collected from the 1930 census taken by the Japanese Government General of Korea. It reports literacy in 4 groups - residents who are literate in Japanese and Korean, literate in Korean, literate in Japanese, and illiterate residents. Literate population (either in Korean or Japanese) in 1930, after twenty years of colonial occupation, was 23 percent of total population. There exists a clear gap in literacy between the Japanese population in Korea and Koreans. The literacy rate among Japanese was 80 percent while for Koreans it was 22 percent. For analysis the population is classified into two groups, one literate in Korean and another literate in Japanese. We calculate the literacy rate in Japanese by combining the number of people who are literate in Japanese and both languages. Likewise, Korean literacy rate is calculated by combining the number of residents literate either in Korean or both languages.

For the number of public schools and teachers in each district in 1929, we gather the data from *Japan's Colonial Education Policy Document Collection: Joseon* (Watanabe and Abe 1987). Given that district-level literacy data are available only for the 1930 census, the paper also uses provincial-level data on annual population, schools of different kinds (traditional and private schools, as well as public schools) from 1911-1930. These colonial records are available from Statistics Korea. From the same source we also use the area, population and share of agricultural area as a set of control variables.

As described above, the most stringent classification of elite class is used for our study. Based on the scholarly effort families would have needed to put in for studying the civil court exams and the status that *munguan* enjoyed, this paper looks at how many people passed the big civil exam (*daegwa*) as an indicator for the level of pre-colonial education, especially with respect to literacy. The examination records during the Joseon Dynasty are obtained from the Academy of Korean Studies' Historical Figures Comprehensive Information System (<http://people.aks.ac.kr>). According to the database there were 15,150 people who passed *mungwa* in total. In order to create a proxy for pre-colonial elite presence in each region, we first identified the district from

which each *daegua* passer came from: Out of 15,150 passers, 6,193 have information on residence. Then we matched the location to the 1930 census administrative units, for which we successfully matched 6,178 out of 6,193 passers. We then added the number of all the *daegua* passers located in each district.⁸

4 Empirical Strategy

In order to assess the impact of pre-colonial elite class and public schools on literacy rate, we first present a reduced-form equation of the following form at the district level:

$$LitRate_i = \alpha + \sum I_i^{prov} + \sum I_i^{city} + \beta_1 Mungua_i + \varepsilon_i \quad (1)$$

which estimates the average effect of the elite class on literacy rate. In the equation i indexes districts in Joseon. $LitRate_i$ is the literacy rate in 1930 (literacy rates in Korean and in Japanese are considered separately), $Mungua_i$ is the number of *mungua* passers in each district, and $\sum I_i^{prov}$ and $\sum I_i^{city}$ are provincial and city fixed effects, respectively.

Next we are interested in looking at the average effect of public schools on literacy:

$$LitRate_i = \alpha + \sum I_i^{prov} + \sum I_i^{city} + \beta_1 PublicSchool_i + \varepsilon_i \quad (2)$$

In the equation $PublicSchool_i$ is the number of public schools in 1929 in district i , and $\sum I_i^{prov}$ and $\sum I_i^{city}$ are provincial and city fixed effects, respectively.

The main district-level variable of interest here is $PublicSchool_i$. Coefficient β_1 captures the estimated impact of colonial education system on the district level of literacy by 1930, twenty years since colonization. A positive β_1 would indicate evidence of higher literacy through provision of public school. Next, in order to assess the direct effect of pre-colonial elite class presence independent of public schools, we present the following equation:

$$LitRate_i = \alpha + \sum I_i^{prov} + \sum I_i^{city} + \beta_1 PublicSchool_i + \beta_2 Mungua_i + \varepsilon_i \quad (3)$$

where $Mungua_i$ is the number of *mungua* passers in district i , a proxy for pre-colonial elite class

⁸It is worth noting that missing residence data do not bias our results. Residence information was rarely recorded in the early Joseon period, and only from the 18th century and on was residential information systemically recorded for all *daegua* passers.

presence. A positive β_2 would indicate evidence of long term elite class effect in general, since the impact of *mungua* passers is independent of the district's number of public schools by 1929. In this setup, provincial fixed effects control for all time invariant factors across provinces, and city fixed effects control for any urbanization may confound our findings. If the coefficient β_1 is positive but insignificant after controlling for the number of *mungua* passers, we argue that the provision of public schooling had the expected positive impact on improving literacy, but only through the presence of existing elite class.

Since we do not have the literacy rate information before colonization, the above equations do not estimate improvement in literacy before and after colonization. Instead they estimate which factors were important in explaining the literacy level variation across regions by 1930. One possible interpretation is that a region with many *mungua* passers prior to colonization simply continued to have many highly educated descendants and led to a higher overall literacy rate in the region.⁹ A more likely scenario however would be where there was a more active role played by the elite class to influence both the public school system as well as the overall literacy rate. Given the number of public schools and the number of Korean teachers hired, we explore two likely channels through which the elite class influenced the literacy rate in the following equations; first we look at whether elites influenced the number of public schools, and also whether more elite-concentrated regions had more Korean teachers:

$$PublicSchool_i = \alpha + \sum I_i^{prov} + \sum I_i^{city} + \beta_1 Mungua_i + \varepsilon_i \quad (4)$$

and

$$KoreanTeachers_i = \alpha + \sum I_i^{prov} + \sum I_i^{city} + \beta_1 Mungua_i + \varepsilon_i \quad (5)$$

At the provincial level, there are also records available on other types of schools that existed from 1911 and 1930. These include the traditional schools (*seodang*) which taught Chinese classics and Confucian studies, and private schools set up by missionaries and Korean donors. These schools are other channels through which the elite class likely contributed to improvement in literacy. We can infer the importance of pre-colonial elite class on these institutions by again looking at their

⁹Such claim itself will not hold if there was systematic migration of elites over the colonization period, which would weaken the link between exam records and concentration of elites in the region. However we find no evidence of such migration except perhaps for urbanization trend, in which both non-elites and elites alike moved to cities and controlled by city fixed effect in the regressions.

influence on the number of schools and teachers hired at each institution type. We present the following equations for comparison:

$$School_{p,t}^z = \alpha + \sum I_p^t + X_{p,t}\gamma + \beta_1 Mungua_p + \varepsilon_{p,t} \quad (6)$$

where $School_{p,t}^z$ is the number of school type z (*seodang*, private school, or private school) in year t . $X_{p,t}$ is a vector of province characteristics in year t . These province-specific variables include geographic variations (area and share of agricultural area), as well as the population.

Similarly, we present a set of equations that look at the impact of pre-colonial elite class on the number of Korean teachers hired in each of the school types:

$$Teacher_{p,t}^z = \alpha + \sum I_p^t + X_{p,t}\gamma + \beta_1 Mungua_p + \varepsilon_{p,t} \quad (7)$$

where $Teacher_{p,t}^z$ is the number of Korean teachers in school type z in year t . Positive β_1 's in the above equations will indicate that pre-colonial elite class has a positive impact on the number of schools and the number of teachers supplied. We can also look at the differential effects that the elite class had schools depending on the type of school.

5 Results

5.1 Descriptive Statistics

In 1930, the Japanese colonial census recorded detailed information on the literacy rate in Joseon at the district (*bu* and *gun*) level. For all 234 districts, we matched the number of schools and teachers from another source (*Japan's Colonial Education Policy Document Collection: Joseon*) to each district, as well as the number of *mungua* passers from the Academy of Korean Studies. Table 1 presents detailed statistics on the number of *mungua* passers at the province and city level. There are 14 districts coded as cities; these include Seoul (Gyeongseong), Incheon, Gaesung, Gunsan, Mokpo, Daegu, Busan, Masan, Pyongyang, Jinnampo, Shineuiju, Wonsan, Chongjin, Hamheung. In each of the cities we do in fact see more *mungua* passers (the mean number of passers in cities is 193 including Seoul, and 16 excluding Seoul), suggesting urbanization effect over this period mainly driven by the capital city. In comparison the mean number of *mungua* passers in rural districts is 16. There were 15,150 people in total who passed *mungua*, and 6178 of them had residence information; the district with the highest number of passers, 2,498, is Seoul (Gyeongseong-bu)

located in Gyeonggi province. The standard variation in the number of *mungwa* passers is 164 while the mean is 26.4, and the number of districts with zero *mungwa* passers was 36, suggesting a highly skewed distribution. About 85 percent of districts witnessed at least one or more *mungwa* passers in its area.

Table 2 presents statistics on the number of schools and literacy rate by province. Overall we see a strongly positive correlation between *seodang* schools and the Korean literacy rate. We also see that the provinces in the north (Huanghae, Pyeongbuk, Pyeongnam, Hambuk and Hamnam) dominate over the southern provinces in terms of both Korean and Japanese literacy rates despite having a smaller number of public schools. The Korean literacy rate in Pyeongnam province, for example, is 30 percent, compared to 17 percent in Geyogbuk or Gyeongnam province. Both Pyeongnam and Pyeongbuk provinces have exceptionally high literacy rates in Japanese as well (9.3 and 9.8 percent, respectively), suggesting that province-specific mechanisms are at hand. The high literacy rates in these provinces, as well as Gyeonggi, Huanghae, Hambuk and Hamnam relative to the rest, can be attributed to the movement aimed at “educating and saving the country” (*Gyoyuk Guguk Undong*). This movement between 1905 and 1910 was particularly active in the northern regions (Jeong 2009) and arguably remained influential for consequent decades. Among a number of organizations involved in the patriotic enlightenment movement, the New Citizens society (*Sinminhoe*), was the most active in the northern provinces. The society was founded in 1907 by intellectuals from the northern provinces (Pyeongang, Huanghae, and Hamgyeong provinces) and prospered under political activists including An Changho, Yang Gitak and Shin Chaeho, establishing branches in six provinces - Gyeonggi, Huanghae, Pyeongbuk, Pyeongnam, Hambuk and Hamnam. It was especially involved in the establishment of private schools in Pyeongan area.

Table 3 presents district-level summary statistics. In 1930 the mean Japanese literacy rate in Korea was only 8.5 percent, while the mean Korean literacy rate was 22 percent. Records show that 80 percent of Japanese living in Korea were literate in Japanese, and 6.2 percent of them were literate in Korean as well. By comparison only 7 percent of Koreans were literate in Japanese, and 22 percent were literate in Korean. The mean number of public schools per district by 1929 was 6.4, while the number of teachers per district was 26.6. Finally the district mean population in 1930 was 89,993. Among the total population, 4,304,235 were within the primary education age group, between 6 to 14 in 1930, whereas the number of public schools was 1,620 (8,259 classes) which educated only 422,820, less than 10% of the given age group, in 1929. In Seoul, there were only 18 primary public schools, and 14,758 students out of 49,768 6-to-14-year-old population were

enrolled in them.

At the provincial level, the data are available for 20 years (1911 to 1930) for the 13 provinces (5 in North Korea, 8 in South Korea). Table 4 presents the number of *munqua* passers, different types of schools and teachers, as well as provincial-level controls including population, land area and agricultural data. The mean number of *munqua* passers increases to 47; Gyeonggi province has the highest number of *munqua* passers with 3066 records in total, while Hamgyeong-buk province has the lowest number of records (59). There also appears to be a time trend; in the 1920s we see dramatic changes in the number of *seodang*, which increase over the years 1911 and 1921 from 16,540 to 25,482 but decreases afterwards to 10,036 in 1930. One can attribute this result to the colonial policy on *Seodang* enacted in 1918, which mandated the Japanese Government General’s permission for establishment of any *seodang* and qualification of teachers. Meanwhile, the number of public schools gradually expanded from 382 (1,330 classes) in 1914 to 1,750 (8,511 classes) by 1930. There were yearly increase in the number of schools presented in Table 4 across all provinces.

5.2 Main Results

In the first two columns of Table 5, we first estimate the average effect of pre-colonial elite class on literacy in 1930, as described in Equation (1). The results demonstrate that pre-colonial elite group accumulation measured by the number of successful candidates in *munqua* examination has positive and statistically significant explanatory power on the overall literacy rate at the district level. When province fixed effects and city controls are included, having 10 more *munqua* passers increases the literacy rate in 1930 approximately by 1.7 percent point in Korean language (Columns (2)). We also find that *munqua* passers remain positively correlated with Japanese literacy, although the standard error fails to meet the traditional confidence intervals with a small margin (p -value of *munqua* is 1.6 in column (1)). An average district witnessed 26 *munqua* passers, but the standard deviation of the elite class proxy is 164. The effect of one standard deviation of *munqua* passers is estimated 2.8 (Korean) unit change in literacy (Column (2)). This translates 55 percent of the standard deviation in Korean literacy.

The rest columns in Table 5 present the empirical findings from Equation (2) and (3). We first investigate whether colonial public schools have effects on Japanese or Korean literacy rate. The Column (3) and (4) in Table 5 present the average effect of colonial public schools built since Japanese colonial occupation in 1910 to 1929, a year before the 1930 census, on literacy rate at the district level. Both regressions in Column (3) and Column (4) include provincial fixed effects

and city dummies. The results show that the presence of public schools *per se* does not affect the literacy rate at the district level, except for the Japanese literacy (in Column (3)).

When considered with the historical presence of pre-colonial elite class, the impact of school becomes even smaller, as seen in Columns (5) to (6). That is, controlling for the effects of pre-colonial human capital accumulation explained by the number of *mungwa* passers, public schools appear to have negligible. By contrast, the pre-colonial elite effect on Korean literacy are positive and significant, and is robust with province fixed effects and city controls. Controlling for the number of schools where all regular courses were taught in Japanese, the elite presence has a significantly positive and direct impact on Korean literacy; according to Column (6), one standard deviation change in *mungwa*-passers predicts a 2.8 unit change in Korean literacy rate, about 55 percent of the standard deviation in Korean literacy rate.

The empirical results above suggest two findings. First, the main predictor of Korean literacy level in a representative district is the presence of pre-colonial elite class. Second, the implementation of colonial public school system appears to have played a negligible role in explaining the overall literacy rate. The first finding is perhaps not surprising, especially if one considers the persistent, inter-generational effect of lineage system, and the scholarly nature of *mungwan* families.¹⁰ If there are simply more elite families in districts with higher number of *mungwan* passers, then the finding is evident of continuing social division. Given that the public school system did not help much with literacy improvement, one may simply conclude that descendants of elite families continue to be literate while others do not.

There are several issues with this interpretation. First, we do not have population data on elite vs. non-elites in 1930. There is a possibility that the proportion of elite members out of total population corresponds to the number of *mungwa* passers, but one also cannot ignore the possibility that in certain districts most *mungwa* passers came from a small number of exclusive elite families, and their relative share of total population was also very small. Furthermore during the 18th century, the period of the largest number of *mungwa* passers, only 3,493 candidates passed the exam, while the average population of Joseon was approximately 7.3 million (Oh 2010). Even when the number of passers was the largest, it did not exceed 0.05 percent of total population. Therefore it is unlikely that the direct descendant effect of *mungwan* families alone can explain why there is a strong correlation between our proxy for elite class presence and literacy rate in 1930.

¹⁰For long-lasting effects of lineage system and social mobility, see Clark (2013); Clark and Cummins (2013) and Paik (2014). For the direct descendant effect on education see Banerjee et al. (2007).

More importantly, however, there are historical records describing concerted effort by the elites to enlighten the illiterate class by establishing *seodang* as well as private schools. In the aftermath of failed independence movement (the March 1st Movement or *Sam-Il Undong*), the patriotic enlightenment movement (*Aeguk Gyemong Undong*) also involved active participation from some elite members to educate the public mass through the colonial public school system. The elite class also likely provided the necessary human capital needed to run these public schools, as each public school was headed by Japanese principals but staffed otherwise by local teachers. In fact, the literature suggests that local elites affected education during colonial period in three ways. First, the elite class taught classes to local children through various channels. In many cases, they established *seodang* in their communities and recruited students, while some set up smaller gatherings called *sasuk* or worked as independent teachers. The number of (*seodang*) had increased since the occupation and peaked in 1920. Although the number has decreased through 1920s and 30s, the size of traditional education in Korea stayed relatively larger in Korea than in Taiwan (Oh 2007).

Scholars also find that local elites were actively involved in the establishment of public schools (Ryuta 2007; Oh 2000). In this regard one can interpret the empirical results as evidence of the colonial government selecting to establish schools where there were more elites, and the effect of schools is subsumed by the elite presence proxy. Construction of new schools was mostly initiated by local leaders (*yuji*), who were often of pre-colonial elite lineage, financed by local tax collection and contribution from wealthy families in the locality (Ryuta 2007, p.204). The Japanese government's role in regard to the establishment of individual schools was to issue a permission and provide limited subsidy (Oh 2000, p.69). In all public schools, the majority of teachers were Koreans; this was especially the case for most schools in rural areas.¹¹ Large shares of Korean teachers also likely affected the level of literacy positively. Andrabi et al. (2008) suggests, for example, that teachers from the same group are likely to induce better educational attainment through teachers' efforts and parents' demands. It further provide evidence that new educational institutions could successfully settle down because there was prior educational investment.¹² Finally, some elites provided private education to local students who had limited access to public schools.¹³

How and why did the local elites play a crucial role in education during this period? We do not

¹¹ At the beginning of the colonial period, a central training institution trained all public school teachers. By the early 1920s, provincial-level training institutions were built in all provinces to train local elites into teachers. (Lee 2007)

¹² Andrabi et al. (2008) finds that private schooling proliferated in Pakistan only in places where female teachers were available as they were cheaper than the male counterparts. Furthermore, they show that only in areas where there was prior education making female students literate did one find female teacher candidates.

¹³ Private institutions expanded in the 1920s. Many of them were later substituted by public schools as the number of public schools increased (Ryuta 2007).

intend to argue that their active engagement in primary education was driven solely by patriotic or altruistic motivation. Given that the major skills of *yangban* came from studying Confucian classics and writing essays, their comparative advantage certainly would have been in the areas of teaching classical literature. Many of the elites lost their status and place in the court after the Japanese colonization, which in turn led to loss of income source. For those who had never worked in agriculture or commerce, education would have been the most suitable sector to be employed in. The Confucian culture, which considers scholars (and teachers) to be superior to other professions, must have played some role as well. The Japanese government did not ban the elites' involvement in education and low-level administration, especially in the early period of occupation. According to Park (1995, 1999), 68 percent of the Korean bureaucrats who served in 1909, a year prior to the annexation, kept working in the government under the Japanese rule. Our data also show large-scale employment of Korean elites as teachers in primary schools. In 1914, out of 1,716 total teachers in primary schools, 1,207 (70.3 percent) were Korean teachers.

In light of the evidence suggesting the various roles that the elite class played in improving literacy, the subsequent analyses investigate the effects of pre-colonial elite presence on different types of schools during the colonial era. First, Table 6 presents the effects of elite class on the number of public schools and the number of Korean teachers in public primary schools at the district level. We find that the presence of elite class increases the number of schools and teachers, with or without provincial and city fixed effects. The size of effect is also significant; the coefficient values for *munghwa* passers in Columns (2) and (4) for example suggests that one standard deviation change in *munghwa* passers leads to 5.58 more schools and 31.67 more teachers.

Since our data from the colonial period provide detailed information on public schooling but not other types of education at the district level, Table 6 presents empirical results on public schools and public school teachers. In Table 7, we analyze the impact of elites on various types of primary education. The analysis is at the provincial level employing the numbers of schools and teachers from 1911 to 1930. As discussed earlier, there are three distinctive types of primary education in the colonial period: *seodang*, public schools, and private schools. We find that the elite class had positive influence on all types of primary education institutions.¹⁴ Columns (1) to (3) present the effects of elites on the number of schools by province. From column (4) to (6), we test the

¹⁴The impact of different types of primary schools on literacy improvement in colonial era are hard to separate from one another. Throughout the colonial period, especially until 1930s when the Japanese government's assimilation policy was less intensive, many students attended more than one type of school. Based on school registers, ? shows that many of incoming students had experience of traditional or private education before entering public primary school (p. 221).

impact of *munqua* on the number of teachers by province. The results show that the elite presence has a positive impact on the number of public schools, but it has a more significant impact on *seodang* and private schools. We also find positive correlations between *munqua* passers and the number of teachers in all types of education. These results are also consistent with the district level analysis presented in Table 5. They suggest that perhaps in addition to having more educated descendants in the region, the channels through which the elite class influenced the literacy rate ranged from establishing *seodang* and private schools, to supplying Korean teachers to the colonial public schools.

5.3 Robustness Check

So far we measured human capital accumulation of the elite class during the Joseon dynasty using all the *munqua* examination passers whose residential information is available on the historical record. While it is only from 1700 and on that most of the residential information is available, some records are from an earlier period. For instance, the earliest residence record is from 1414. As we claim that the legacy of former elites lasts for a long time in local communities, we need to check whether recent *munqua* passers had more direct and larger impact on education during the colonial period. In addition, we are interested in whether the type of reign over which the exams took place matters. That is, we need to check whether the quality of the regime determined the legacy of elites. One may argue for a strong correlation between the quality of regime and that of human resources selected under the regime, while others may believe that the quality of an elite group depends solely on the selection mechanism.

To address these issues, we restrict our measure of elite accumulation to *munqua* passers after 1800. 1800 is the year when King Jeongjo suddenly died under mysterious circumstances. The era governed by King Yeongjo and Jeongjo (1724-1800) is largely considered as the renaissance period of the Joseon dynasty. Amid intense court politics and polarized officials, Yeongjo and Jeongjo pursued pragmatic policies that facilitated economic development and cultural prosperity in the 18th century. A general consensus among Korean historians is the decline of the Joseon dynasty since King Jeongjo, which eventually led to political turmoils in the 19th century and the colonial invasion of Japan.

The results in Tables 9-11 give support to our story. Using the restricted sample (*munqua* passers since 1800), we find that the pre-colonial elite presence has a statistically significant effect on various measures of education during the colonial period. The results are consistent with our

main results. Moreover, the coefficient values are larger in magnitude than the previous findings, indicating that more recent *yangban* and their direct descendants have stronger and positive impact on education under the colonial ruling. As the results show, we also find little evidence that the quality of regime affected the legacy of the elite group in influencing the literacy rate.

6 Conclusion

In this paper we present evidence that the pre-colonial elite class in Korea had significant influence on the literacy rate during the Japanese colonization period. By 1930, twenty years after the Annexation Treaty, Japanese public schools became prevalent in the peninsula, set up to teach both Korean and Japanese languages to students. Given the importance of literacy on income levels and human capital development, public schooling was undoubtedly one of the most important public goods benefitting the colonial subjects. We find however that its impact on the literacy rate, independent of the pre-existing elite class, was small. The pre-colonial elite class not only built traditional and private schools but also provided the necessary human capital to run the public schools, and in some cases pushed for public schools to be built in their districts. While we cannot exclude the possibility that the literacy rate in 1930 was simply a reflection of the concentration of elite descendants in certain areas, we present several empirical results backed by the existing literature to suggest that the elites intended and indeed succeeded in enlightening the public.

From these findings we do not claim that there was no positive outcome in public schooling provision during this period. Once set in place, the colonial system continued on to provide the necessary education for the public after Korea's liberalization from Japan in 1945, while the traditional form of schooling (*seodang*) has declined in popularity and are now rarely found. In many aspects the current Korean school system continues to closely follow the institutional structure (in curriculum, class times and teacher-student relations, etc.) introduced during the colonial period. We do however find that without the presence of the elite class, the institution would have not been established as pervasively as it was and would instead have had little impact on raising the literacy rate.

Finally, since other Asian colonies had established political dynasties before colonization, our research inquiry can be extended to those with similar historical paths such as India, Vietnam, Indonesia and Taiwan. The colonial period can be considered as an enforced rupture in history, but as this paper suggests the long-term legacy of pre-colonial socioeconomic structures appear to

remain influential. In the case of obtaining comparable data, we believe that more in-depth studies of other former Japanese colonies are warranted.

7 Tables and figures

Table 1: *Mungua* passers by province and city

Province City	<i>Mungua</i>	Population (1930)	Province City	<i>Mungua</i>	Population (1930)
Gyeonggi	3,065	215,7413	Gyeongnam	179	2,135,716
Gyeong	2,498	394,240	Busan	0	146,098
Incheon	9	68,137	Masan	0	27,885
Gaeseong	32	49,520	Huanghae	110	1,523,523
Gangwon	141	1,487,715	Pyeongbuk	446	1,562,791
Chungbuk	297	900,226	Sineuiju	0	48,047
Chungnam	342	1,382,888	Pyeongnam	305	1,331,705
Jeonbuk	173	1,503,695	Pyongyang	76	140,703
Gunsan	2	26,321	Jinnampo	0	38,296
Jeonnam	312	2,332,256	Hambuk	59	140,703
Mokpo	0	34,689	Cheongjin	0	35,925
Gyeongbuk	630	2,416,762	Hamnam	119	1,578,491
Daegu	27	93,319	Wonsan	0	42,760
			Hamheung	60	43,851

Table 2: Schools and Literacy Rate by Province

Province	Seodang		Public		Private		Korean Literacy rate	
	schools	teachers	schools	teachers	schools	teachers	Korean	Japanese
	(1929)		(1929)		(1929)		(1930)	
Gyeonggi	1,113	1,139	169	789	21	169	29.29	10.65
Gangwon	1,341	1,397	94	297	1	5	19.97	5.05
Chungbuk	564	573	72	236	1	3	19.07	5.04
Chungnam	673	682	122	475	1	6	21.68	5.90
Jeonbuk	868	880	135	425	0	0	21.07	5.59
Jeonnam	869	928	205	659	8	24	19.88	5.78
Gyeongbuk	547	568	161	611	5	32	16.76	4.99
Gyeongnam	386	386	203	710	2	6	16.94	6.30
Huanghae	1,589	1,605	122	396	10	43	24.84	6.16
Pyeongbuk	1,413	1,554	103	490	1	6	26.80	7.21
Pyeongnam	1,297	1,316	101	391	3	29	30.04	9.29
Hambuk	220	255	54	259	7	22	24.86	9.84
Hamnam	589	625	79	369	18	72	22.80	8.42
Total	11,469	11,908	1,620	6,107	78	417	22.23	6.79

Table 3: Summary statistics (district level)

Category	Variable	Obs	Mean	Std. Dev.	Min	Max
Literacy rate	Japanese literacy (%)	234	8.461142	7.025455	2.829925	43.75482
	Korean literacy (%)	234	21.92127	5.184458	11.61769	43.74394
<i>yangban</i>	<i>mungua</i> passers	234	26.40598	164.0963	0	2498
Public schools	# of schools (1929)	233	6.437768	3.130321	0	18
	# of teachers (1929)	233	26.59657	16.15871	0	182
Controls	population	234	89992.76	42878.1	11231	394240

Table 4: Summary statistics (province level, 1911-1930)

Category	Variable	Obs	Mean	Std. Dev.	Min	Max
<i>yangban</i>	<i>mungua</i> passers	260	475.3077	764.3798	59	3066
	<i>seodang</i>	260	1502.2	667.9083	220	3274
Schools	public schools	221	351.8552	256.2337	52	1017
	private schools	221	17.93665	31.26682	0	195
	<i>seodang</i>	260	1529.769	672.3665	255	3292
Teachers	public schools	221	269.4932	183.3629	46	801
	private schools	221	10.92308	29.85508	0	186
	population	260	1310771	435587.5	435995	2267620
Controls	land area	260	1100.923	494.139	481	2073
	agricultural area (%)	260	7.066924	4.219247	2.315485	29.11111

Table 5: *Yangban*, schools and literacy rate (district level)

	(1)	(2)	(3)	(4)	(5)	(6)
	Japanese	Korean	Japanese	Korean	Japanese	Korean
<i>mungua</i>	0.006 (0.005)	0.016** (0.007)			0.001 (0.005)	0.016** (0.007)
public schools			0.130* (0.072)	0.097 (0.097)	0.125 (0.078)	0.041 (0.101)
province fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
city controls	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	234	234	233	233	233	233

Robust standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table 6: *Yangban* and Korean teachers in public primary schools for Korean (district level)

	(1)	(2)	(3)	(4)
	public schools	public schools	Korean teachers	Korean teachers
<i>munghwa</i>	0.005*** (0.001)	0.034*** (0.008)	0.067*** (0.004)	0.190*** (0.039)
province fixed effects	No	Yes	No	Yes
city controls	No	Yes	No	Yes
<i>N</i>	233	233	233	233

Robust standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table 7: The effects of *yangban* on schools and teachers (province level)

	(1)	(2)	(3)	(4)	(5)	(6)
		schools			Korean teachers	
	<i>seodang</i>	public schools	private schools	<i>seodang</i>	public schools	private schools
<i>munghwa</i>	0.163* (0.096)	0.002 (0.002)	0.004*** (0.001)	0.172* (0.098)	0.040*** (0.014)	0.018*** (0.002)
population (thousand)	-0.015 (0.361)	0.050*** (0.008)	-0.000 (0.003)	-0.011 (0.362)	0.146*** (0.040)	0.000 (0.003)
share of agricultural area	13.498** (5.407)	0.680 (0.984)	-0.141 (0.410)	12.668** (5.462)	3.967 (5.176)	0.110 (0.764)
area	0.395** (0.175)	-0.015*** (0.004)	0.002 (0.003)	0.413** (0.182)	-0.016 (0.021)	0.008 (0.007)
year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	260	221	221	260	221	221

Robust standard errors clustered at the provincial level are shown in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table 8: Summary statistics across *mungua* passer groups (district level)

Variable	Obs (total)	Mean	Std. Dev. (district-level)	Min	Max
Total <i>mungua</i> passers*	6178	26.40171	164.1006	0	2498
<i>Mungua</i> passers since 1800	3673	15.69658	89.26816	0	1352

* include all *mungua* examination passers with residence information

Table 9: *Mungua* passers since 1800, schools and literacy rate (district level)

	(1)	(2)	(3)	(4)	(5)	(6)
	Japanese	Korean	Japanese	Korean	Japanese	Korean
<i>mungua</i> (since 1800)	0.007 (0.007)	0.023** (0.010)			0.001 (0.008)	0.022** (0.011)
public schools			0.130* (0.072)	0.097 (0.097)	0.127 (0.077)	0.049 (0.099)
province fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
city controls	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	234	234	233	233	233	233

Robust standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table 10: *Mungua* passers since 1800 and Korean teachers in public primary schools for Korean (district level)

	(1)	(2)	(3)	(4)
	public schools	public schools	Korean teachers	Korean teachers
<i>mungua</i> (since 1800)	0.010*** (0.001)	0.045*** (0.011)	0.123*** (0.007)	0.257*** (0.055)
province fixed effects	No	Yes	No	Yes
city controls	No	Yes	No	Yes
<i>N</i>	233	233	233	233

Robust standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table 11: The effects of *mungwa* passers since 1800 on schools and teachers (province level)

	(1)	(2)	(3)	(4)	(5)	(6)
		schools			Korean teachers	
	<i>seodang</i>	public schools	private schools	<i>seodang</i>	public schools	private schools
<i>mungwa</i> (since 1800)	0.289 (0.177)	0.003 (0.005)	0.006** (0.003)	0.306* (0.181)	0.074*** (0.025)	0.032*** (0.005)
population (thousand)	-0.010 (0.358)	0.050*** (0.008)	-0.000 (0.003)	-0.006 (0.359)	0.145*** (0.040)	0.001 (0.003)
share of agricultural area	13.577** (5.410)	0.672 (1.002)	-0.133 (0.414)	12.739** (5.464)	3.735 (5.167)	0.089 (0.797)
area	0.390** (0.172)	-0.015*** (0.004)	0.002 (0.003)	0.408** (0.179)	-0.018 (0.021)	0.007 (0.007)
year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	260	221	221	260	221	221

Robust standard errors clustered at the provincial level are shown in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

References

- Acemoglu, D., Johnson, S. and Robinson, J. A. (2001). The colonial origins of comparative development: An empirical investigation, *American Economic Review* **91**(5): 1369–1401.
- Albouy, D. Y. (2012). The colonial origins of comparative development: An empirical investigation: Comment, *American Economic Review* **102**(6): 3059–3076.
- Andrabi, T., Das, J. and Khwaja, A. I. (2008). A dime a day: The possibilities and limits of private schooling in Pakistan, *Comparative Education Review* **52**(3): 329–355.
- Azariadis, C. and Drazen, A. (1990). The role of cognitive skills in economic development, *Quarterly Journal of Economics* **105**(2): 501–526.
- Banerjee, A. and Iyer, L. (2005). History, institutions, and economic performance: The legacy of colonial land tenure systems in india, *American Economic Review* **95**(4): 1190–1213.
- Banerjee, A. V., Cole, S., Duflo, E. and Linden, L. (2007). Remedying education: Evidence from two randomized experiments in india, *Quarterly Journal of Economics* **August**: 1235–64.
- Clark, G. (2013). What is the true rate of social mobility in Sweden? a surname analysis, 1700-2012. Working Paper.
- Clark, G. and Cummins, N. (2013). What is the true rate of social mobility? surnames and social mobility, England 1800-2012. Working Paper.
- Eckert, C. J. (1991). *Offspring of Empire: The Koch'ang Kim and the Colonial Origins of Korean Capitalism, 1876-1945*, Seattle: University of Washington Press.
- Englebert, P. (2000). Pre-colonial insitutions, post-colonial states, and economic development in tropical africa, *Political Research Quarterly* **53**(1): 7–36.
- Fails, M. D. and Kriekhaus, J. (2010). Colonialism, property rights and the modern world income distribution, *British Journal of Political Science* **40**(3): 487–508.
- Fairbank, J. K. (1968). *The Chinese World Order: Traditional China's Foreign Relations*, Cambridge, MA: Harvard University Press.
- Foster, A. D. and Rosenzweig, M. R. (1996). Technical change and human-capital returns and investments: Evidence from the green revolution, *American Economic Review* **86**(4): 931–953.

- Galor, O. and Moav, O. (2004). From physical to human capital accumulation: Inequality and the process of development, *Review of Economic Studies* **71**: 1001–1026.
- Gennaioli, N. and Rainer, I. (2007). The modern impact of precolonial centralization in africa, *Journal of Economic Growth* **12**: 185–234.
- Haggard, S., Kang, D. and in Moon, C. (1997). Japanese colonialism and korean development: A critique, *World Development* **25**(6): 867–881.
- Hanushek, E. A. and Woessmann, L. (2008). The role of cognitive skills in economic development, *Journal of Economic Literature* **46**(3): 607–668.
- Huillery, E. (2010). The impact of european settlement within french west africa: Did precolonial prosperous areas fall behind?, *Journal of African Economies* **20**(2): 263–311.
- Hwang, K. (2004). *Beyond Birth: Social Status in the Emergence of Modern Korea*, Cambridge, MA: Harvard University Press.
- Iversen, V., Palmer-Jones, R. and Sen, K. (2013). On the colonial origins of agricultural development in india: A re-examination of banerjee and ivyer, 'history, institutions and economic performance', *Journal of Development Studies* **49**(12): 1631–1646.
- Jeong, G. (2009). Patriotic enlightenment movement and the formation of modern educational fervor, *The 2009 Korean Sociology Conference* pp. 1187–1200.
- Juif, D.-T. and Baten, J. (2013). On the human capital of inca indios before and after the spanish conquest: Was there a “pre-colonial legacy”?, *Explorations in Economic History* **50**: 227–241.
- Kang, M. (2007). Analysis of enactment process of the first joseon education decree in japanese colonial period (Iljesidae je-1-cha joseon gyoyukryeong jejeong guaajeong yeongu), in M. Kang, K. Takeshi, S. Nam, C. Park and S. Oh (eds), *Diversification of Colonial Education Research*, Seoul, Korea: Kyoyookbook, chapter 1.
- Kim, G. (2005). *Frustration of Korean Modern Primary Education (Hanguk geundae chodeung gyoyukeui joajeol)*, Seoul, Korea: Kyoyookbook.
- Kimura, M. (1993). Standards of living in colonial korea: did the masses become worse off or better off under japanese rule?, *Journal of Economic History* **53**(3): 629–652.

- Kohli, A. (1994). Where do high growth political economies come from? the japanese lineage of korea's "developmental state", *World Development* **22**(9): 1269–1293.
- Kohli, A. (1997). Japanese colonialism and korean development: A reply, *World Development* **25**(6): 883–888.
- Lee, G. (2007). The social status of the teachers assigned at common schools and their perception of themselves, *History and Reality (Yeoksawa Hyeonsil)* **63**: 99–135.
- Lee, S. (1980). *Study on Yangban in Early Joseon (Joseon Chogi Yangban Yeongu*, Iljogak.
- Michalopoulos, S. and Papaioannou, E. (2013). Pre-colonial ethnic institutions and contemporary african development, *Econometrica* **81**(1): 113–152.
- N. Gregory Mankiw, D. R. and Weil, D. N. (1992). A contribution to the empirics of economic growth, *Quarterly Journal of Economics* **107**(2): 407–437.
- Nelson, R. R. and Phelps, E. S. (1966). Investment in humans, technological diffusion, and economic growth, *American Economic Review* **56**(1/2): 69–75.
- Oh, G. (2010). Provincial population and farmland in the joseon dynasty and analysis of tax burden, *Korean Journal of Taxation Research* **27**(3): 241–277.
- Oh, S. (2000). *Formation of Colonial Primary Education (Sikminji Chodeung Gyoyukeui Hyeongseong)*, Seoul, Korea: Kyoyookbook.
- Oh, S. (2007). Education expansion in colonial korea and taiwan: Basic research for a comparative study (sikminji joseongua daemaneui gyoyuk huakdae: Bigyo yeongureul wihan gicho josa), in M. Kang, K. Takeshi, S. Nam, C. Park and S. Oh (eds), *Diversification of Colonial Education Research*, Seoul, Korea: Kyoyookbook, chapter 8.
- Paik, C. (2014). Does lineage matter? a study of ancestral influence on educational attainment in Korea. Working Paper.
- Park, E. (1995). A study on korean bureaucrats under the japanese colonial rule, *Korean Political Science Review* **28**(2): 133–163.
- Park, E. (1999). *A Study on Korean Bureaucrats under the Japanese Colonial Rule*, Seoul: Hak-minsa.

- Park, E. Y. (2000). Military Examination Graduates in Early Chosun: Their Social Status in the Fifteenth Century, *The Review of Korean Studies* **3**(1): 126–53.
- Park, E. Y. (2001). Military Examinations in Late Chosun: Elite Substratification and Non Elite Accommodation, *Korean Studies* **25**(1): 1–50.
- Porta, R. L., de Silanes, F. L. and Shleifer, A. (2008). The economic consequences of legal origins, *Journal of Economic Literature* **46**(2): 285–332.
- Psacharopoulos, G. (1994). Returns to investment in education: A global update, *World Development* **22**(9): 1325–1343.
- Romer, P. M. (1990). Human capital and growth: Theory and evidence, *Carnegie-Rochester Conference Series on Public Policy* **32**(1): 251–286.
- Ryuta, I. (2007). Public primary schools and local community in colonial period: A case from sangju, gyeongsangbukdo (sikminjigi botong hakgyowa jiyeok sahoi: Gyeongsangbukdo sangjueui han hakgyoreul jungsimeuro), in M. Kang, K. Takeshi, S. Nam, C. Park and S. Oh (eds), *Diversification of Colonial Education Research*, Seoul, Korea: Kyoyookbook, chapter 6.
- Schultz, T. W. (1967). *The Economic Value Education*, New York: Columbia University Press.
- Van de Walle, N. (2009). The institutional origins of inequality in sub saharan africa, *Annual Review of Political Science* **12**: 307–27.
- Wagner, E. (1974). *The Literati Purges: Political Conflict in Early Yi Korea*, Cambridge, MA: Harvard University Press.
- Watanabe, M. and Abe, H. (1987). *Japan's Colonial Education Policy Document Collection: Joseon (Nihon shokuminchi kyoyiku seisaku shiryō shusei: Chosen hen)*, Tokyo, Japan: Ryokei Shosha.