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**The Allocation of Talent and Financial
Development, 1897 to 1936**

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Abstract

We examine how the supply of talent affected financial development, based on a historical experiment that abruptly changed the allocation of talent in early 20th - century China. A millennium-long meritocratic institution, the imperial civil examination system had firmly linked Chinese intellectual and educational ambitions to government service. The abolition of this system in 1905, however, released the learned elites from the scholar-official system and they looked to modern industries for new opportunities of wealth and status. By analyzing the data of 281 prefectures between 1897 and 1936, we find that regions where there were more candidates for the civil examination produced more bankers and students of finance after 1905; this translated to a greater development of modern banks. From the aspect of the early development of modern finance, our findings coincide with Murphy, Shleifer and Vishny's (1991) view on the growth implications of the allocation of talent to innovative industries.

Keywords: Allocation of talent, human capital, modern banks, financial development, China, civil examination

JEL Classification: G21, N25, O43

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1. Introduction

The relationship between finance and growth has been well recognized in the literature of financial development (Levine 1997). However, the fundamental roots of financial development remain a paradox; why did some countries and regions develop sophisticated financial systems as early as the late 19th century, while others have not? This question has been the subject of wide discussion from the perspectives of institutional environment (La Porta et al., 1997, 1998; Acemoglu et al. 2001; Levine, 2005), technological advances (Lin et al., 2020); culture and religion (Stulz and Williamson, 2003) and other historical endowments (Pascali, 2016; D’Acunto, 2017; D’Acunto et al., 2018), among others. In this paper, we attempt to examine the role of human capital, in particular the supply of its ‘upper tail’, in affecting financial development.

By providing distinct pecuniary rewards, the financial sector has attracted an increasing number of talents (e.g., Philippon and Reshef, 2012; D’Acunto and Fresard, 2018). In both developed and developing economies, quite a few of the best students aim to major in business and finance and compete to enter banks or other financial institutions. Just as Murphy, Shleifer and Vishny (1991, 1993) suggest, the occupational choice of such talent is primarily shaped by the rewards.¹ Meanwhile, they also propose an important reversal causation: the allocation of talent plays a pivotal role in affecting economic growth; growth would be inhibited if talents were absorbed from the productive or innovative sectors into the rent-seeking ones. To what extent the influx of talent into the finance industry contributes to financial development, however, remains an empirical question. The main challenge in examining the effect of talent allocation on financial development lies in the obviously reciprocal relation between the supply of talent and the demand (reward) for it from the financial sector.

We examine the effect of talent on financial development by making use of a historical experiment that abruptly changed the allocation of talent in late Qing China. From about the 7th century onwards, China developed an imperial civil examination system (*keju*)—the earliest meritocratic institution in the world—to select officials. The examination was opened to all family background, and thus provided commoners the only institutionalized ‘ladder of success’ in traditional China. Millions of gifted candidates sat in the triennially-held examinations, competing for academic qualifications in order to enter officialdom or, at least,

¹ See also Baumol (1990) and Acemoglu (1995).

attain ‘gentry’ status. By passing the examinations, they became scholar-officials (*shi*), the elite who sat at the top of traditional Chinese society; they were entitled to the highest political, legal and cultural privileges and likely to be wealthy (Elman, 2000). By providing an established channel of upward mobility, the civil examination effectively absorbed most if not all Chinese talent into the preparation for the exams, or, to borrow Murphy, Shleifer and Vishny’s (1991) term, the ‘rent-seeking sector’, at the expense of shrinking the human capital pool of the productive sectors. After all, in the social hierarchy of traditional China, merchants and craftsmen had long been treated as the bottom class. Therefore, the ‘misallocation’ of talent under the civil examination system has been viewed as a reason behind China’s stagnation in modern science and industrialization after the 14th century, a time when the civil examination became fully institutionalized (e.g., Needham, 1969; Baumol, 1990; Lin, 1995; Mokyr, 2017).

In 1905, the Qing dynasty abolished the civil examination system, as the system was denounced to be responsible for China’s military defeats by Western powers and Japan since the 1840s. The abolition exerted a shock on the Chinese learned class, frustrating their plans for career mobility along the scholar-to-official track. Although the learned elites’ civil service ideal might have been undermined by the emergence of modern forces after China’s opening up to the West in 1842, the abolition of the civil examination system finally disillusioned them, forcing them to seek alternative outlets for wealth and fame. Indeed, many students deliberately learned and adopted modern technologies from the West and Japan (Bai, 2019), whereas others started a more radical venture by organizing political parties and revolutions (Bai and Jia, 2016); and the remaining others may have used their privileges as literati to become teachers, writers and other knowledge-intensive professionals (Elman, 2000).

Modern banking was transplanted by Western powers to China in the 1840s. Unlike the traditional Chinese banks (money houses), which had an unlimited liability and mainly provided small-scale loan services to local petty merchants and households, modern banks operated upon a substantially greater economic and geographic scale; they enjoyed limited liability and a highly institutionalized administrative system. Modern banking undoubtedly provided a new path to success to the Chinese literati. Backed by their recognized intellectual ability, sophisticated liberal-arts training and social capital, the educated men trained for the civil examination system were competent candidates for the modern financial elite of China. Indeed, many of them were employed by foreign banks as ‘compradors’, a unique group of managers-cum-middlemen who helped connect foreign businesses to the Chinese market

(Hao, 1988). These learned elites quickly mastered the rules and knowledge of modern finance, establishing Chinese modern banking from 1897 (the foundation of the first Chinese modern bank, the Imperial Bank of China). Moreover, the growth of Chinese modern banking did not gain momentum until the first decade of the 20th century, a time coinciding with the abolition of the civil examination (Figure 1).

To assess the extent to which modern banking was promoted by the supply shock of talent after the abolition of the civil examination, we employ a difference-in-differences strategy. The first difference captures the increased number of modern banks after the abolition of civil examination in 1905. The second difference captures the spatial variation in the increased number of banks across prefectures that previously varied by civil examination quota. To ensure more chance of social mobility across regions, the Qing dynasty had assigned exam quotas to each prefecture.² The number granted to each prefecture was roughly based on prefectural size and historical performance in the examinations. Consequently, across the 281 prefectures in our sample, there are striking regional variations in the quota, from a minimum of 2 to 422 at the most. By the 1720s, the quotas had become fixed and changed little. Since the quotas capped the number of candidates who could eventually be conferred gentry status and the qualification for entering officialdom, such regional variation in the quotas directly shaped the odds of exam success. In regions with a greater number of quotas, a larger share of talent would be more likely to be drawn to the civil examinations and, accordingly, to be released to the modern financial sector after the examination system was abolished.

Based on the records in historical gazetteers and government yearbooks, we collected information about 821 modern banks (and their 3,412 branches) between 1897 and 1936. We enumerate the banks across the 281 prefectures on an annual basis. The regression results show that the increase in modern banks after the abolition of the civil examination was significantly greater in prefectures with more civil examination quotas. On average, doubling the number of exam quotas was associated with an increase of two banks per prefecture per year, or a nearly 20 percent increase in annual growth of the number of banks, after 1905. The quota has no effect on the number (and growth trend) of modern banks before the abolition of the civil examination, which provides a placebo to demonstrate that the quota effect on banking after 1905 is unlikely to have been driven by unobserved correlates of the

² A prefecture was an administrative unit under the province and above the county. The Qing dynasty assigned exam quotas to each county, and meanwhile assigned to each prefecture some common quotas that were shared (and thus competed for) by the counties within the prefecture.

civil examination.

To further confirm the effect of civil examination abolition on banking development, we conduct the following robustness checks. First, we control for possible factors that correlate with both the distribution of exam quotas and of banks. These include a prefecture's population (the main yardstick in quota allocation in the Qing dynasty), the distance to the coast, and prefectural land area. We interact each of them with the post-1905 time dummy, assuming that their effect on banking development might change upon the abolition of the civil examination. Second, we replicate the difference-in-difference estimations at the county level (1,425 counties) in order to control for the prefecture-specific year fixed-effects. Doing so can largely mitigate any confounding effects from unobserved correlates of exam quotas at the prefectural level. Finally, to account for any remaining omitted variable bias, we instrument the distribution of exam quotas using the number of small rivers in each prefecture based on Bai and Jia (2016). The rationale behind the instrument is that the division (and thus the number) of counties in a prefecture was in part shaped by the number of small rivers. A prefecture endowed with a denser river network would be more likely to be segmented into more counties and hence receive more exam quotas from the imperial court. However, the small river density has little to do with the expansion of modern banks. We find that the effect of the civil examination quota on modern banks remains robust across the above checks.

A related concern is that the observed effect of civil examination abolition on banking might be driven by modern economic growth, rather than the direct contribution of the talent released by the civil examination system. For instance, the abolition of the civil examination also inspired educated people to learn and adopt new technologies from the West; and this fostered the growth of industrial firms. Given that a majority of financial demand came from industrialization in early 20th-century China, we control for the number of industrial firms established in each prefecture in each year to rule out its effect on banking development. Likewise, we also control for the number of telegraph stations, reasoning that the telegraph as a major modern communications tool had facilitated banking expansion (Lin et al., 2021). Last but not the least is the role of treaty ports. As the bridgeheads of modern economic (and financial) transition in China, treaty ports had also agglomerated elites for new business opportunities. For this reason we control for the number of treaty ports in each prefecture in each year. After the inclusion of these variables of economic development, the coefficient of the exam quota on banks shrank by about 36 percent, whilst the direct effect of the talent from the past civil examinations remains significant and substantial.

We also provide evidence on the human capital transition to modern finance upon the abolition of the civil examination. Drawing upon the records in the 1936 *Banking Yearbook*, we count the bankers (bank board members and managers) based on their home prefectures, and link the number of bankers to their home prefecture's civil examination quotas. The cross-sectional estimations reveal that prefectures with more civil examination quotas produced significantly more bankers by 1936, suggesting a reallocation of talent from civil service to finance. The reallocation effect is further reinforced by the students' choice of major. Based on the *Statistics of Education* in 1914, we count the number of students who majored in business (and finance), and find that the number is significantly greater in prefectures where there had been more civil examination quotas.

The remaining question is how the educated elites were channeled to modern banking amongst a variety of modern occupational choices. In addition to the high compensation rate in modern banking, the proximity to foreign banks also played. This is especially true in that modern Chinese banks were developed according to Western models, and the proximity to foreign banks determined the chance and cost for learning modern finance from the West (Cheng, 2003). Using the distance to the nearest foreign bank headquarters as a proxy for the geographic spillover of modern finance, we find that the effect of civil examination abolition on the number of modern Chinese banks after 1905 is significantly greater in or near the prefectures in which a foreign bank was headquartered. As a placebo, the effect of civil examination abolition on the number of modern Chinese banks depended much less on the distance to a traditional Chinese bank (money house), suggesting the importance of the access to Western finance in allocating talent to modern banking.

The rest of the paper is organized as follows. Section 2 offers a brief overview of the historical background of the civil examination and modern financial development in late 19th- to early 20th-century China. Section 3 introduces the empirical strategy and data. Our main results on the effect of civil examination abolition on banking development are presented and discussed in Section 4. To understand the channels of human capital reallocation further, Section 5 conducts further tests on the relation between civil examination quota and the distributions of bankers and business-major students, and on the role of the geography of foreign banks in channeling educated elites to modern banking. Concluding remarks are offered in Section 6.

2. Historical Background

2.1. The Intellectual Foundation of Modern Finance in Qing China

Upon opening up in 1842, China was introduced to modern finance. After the British opened a branch of the Oriental Bank in Hong Kong in 1845, modern foreign banks gradually expanded their business in China and served a growing international trade and commerce (Cheng, 2003). The year 1897 witnessed the birth of the first Chinese modern bank, the Imperial Bank of China (IBC). Approximately a decade later, Chinese modern banking began to grow remarkably; by 1936, the number of Chinese banks had reached 259, with 1,296 branches in 207 (72%) Chinese cities. Different from the traditional Chinese money houses that provided small loans and other informal financial services locally, modern banks were much more professional and institutionalized in management, assembled more shareholders and capital, and operated on a greater geographic and economic scale (Sheehan, 2003).

Accordingly, modern banking had distinct requirements for human resources. For example, unlike the apprenticeship in money houses, modern banks relied on the market of professionals and had a formal human resource management system. They recruited managers and staff through examinations, and required the candidates to have a broad intellectual horizon (Ji, 2016). In the context of the late 19th to early 20th century China, a qualified candidate had to not only master the necessary skills of modern finance and business, but also have a profound knowledge of foreign languages, laws, mathematics and geography, among others. Equally important was a grounding in Chinese culture whilst having an international outlook. For example, in the recruitment examination for the Bank of Communications in 1936, the exam questions included Chinese, English, bookkeeping, and algebra, and required candidates to write an essay on current important economic issues (Liu, 2016)

China had in fact prepared a sophisticated human capital pool for modern economic transition. Thanks to the millennium-long civil examination system, China had developed a nation-wide school system. The schools were mostly run by the county and prefectural governments and were connected to the civil examination. Designated to select qualified officials for the empire, the examination was open to almost all social strata and thus provided commoners a primary way for upward mobility. In traditional China, becoming a scholar-official was the common dream of students. Therefore, the civil examination had firmly fostered a literati with a respect for learning (Chen et al., 2020). It was not uncommon

in late imperial China that students attended schools from very young ages (usually about six), painstakingly prepared for the examinations, and took them multiple times in event of failure.³

In order to pass the highly competitive examinations, candidates had to master a wide range of knowledge pertaining to statecraft. First and foremost was the Confucian classics, which collected moral, philosophical and other humanistic works of great Confucian scholars from ancient times. To consolidate the orthodoxy of Confucianism, the imperial authorities had continuously promoted Confucian classics as examination curricula from the 10th century onward. In addition, to meet the various administrative needs of government, the examination also tested students on considerable concrete knowledge; these included mathematics, geography, agriculture, medicine, and also economy and public finance (Elman, 2000).

This large group of literati provided a remarkable human resource pool for China's modern transition in the late 19th century. However, the highly institutionalized civil examination system plus the overwhelming rewards of becoming a scholar-official absorbed most if not all the available talent. The belief that 'officialdom is the natural outlet for good scholars' (*xue er you ze shi*) was widespread. Certainly, given the limited number of government posts amidst a growing population, only a small portion of candidates could eventually become an official. Nevertheless, provided one passed the entry-level examination, one could obtain gentry status. As an esteemed local elite, the gentry class was exempt from tax demands, corvee labor and corporal punishment; maintained close connections with the magistrates and prefects who led the local governments; and acted as informal administrators in many local affairs. With their academic qualifications and political capital, they never needed to worry about earning a livelihood, but were usually employed as tutors, writers, consultants and other sorts of professionals. On average, the income of gentry was up to 16 times higher than that of commoners in the Qing dynasty (Chang, 1955, 1962). For these reasons, Chinese talent before the 20th century had been effectively allocated to the realm of civil service.⁴ This allocation pattern remained in place until 1905.

³ There were three levels of examinations that corresponded to three academic degrees. The lowest (entry) level was the prefectural examination, in which the successful candidates would be conferred the title of *shengyuan*. This was the passport to enter the gentry or *shi* class. Only *shengyuan* were eligible to compete for the next level, the provincial exam; success in the provincial examination led to conferral of the title of *juren* (recommended men). A *juren* was qualified to serve in the government but was not guaranteed an official post, unless they finally obtained the highest *jinshi* degree at the national or palace exam (Elman 2000).

⁴ For example, even though modern schools that adopted a Western-style curriculum in science and engineering had been set up in some Chinese cities during the late 19th century, their students still aimed to

2.2. The Reallocation of Talent to Modern Finance

The Confucian regime faced unprecedented challenges after China was defeated by Britain in the First Opium War (1839-1842). After the War, China was forced to open up to Western powers. Both shocked and enlightened by the military and industrial superiority of the West, Chinese elites sought ways of modernization to solve the dynastic crisis. Some elites, known as the ‘Westernization school’, embraced Western learning and appealed to the emperor to modernize China’s education system. They attributed China’s military failure to the fossilized civil examination. For example in his essay *Bian keju yi* (On the reformation of the civil examination), the eminent Qing official Feng Guifen (1809-1874) argued that the ‘stereotyped writing’ expected for the examination format made intelligent people put huge efforts into useless issues (Feng [1861] 2002). Later, China’s defeat in the First Sino-Japanese War (1895) and the invasion of the Eight-Nation Alliance (1900) further solidified the Qing elite’s determination to reform. Finally, in September of 1905, the Qing authority abolished the civil examination and began to modernize the traditional education system following the Western model. Meanwhile, the Qing government did not provide an alternative system of civil servant recruitment, but expected the students to study in the modern educational system and to pursue multiple, modern professions (Elman, 2000, Bai and Jia, 2016).

Given that the abolition of the civil examination had ‘pushed’ the learned class to the market, what possible factors ‘pulled’ them to modern banking in particular? First, modern banking was undoubtedly a leading sector with high income and esteem in late 19th- to early 20th-century China. Even a simple employee of a Chinese commercial bank could receive a salary (50 yuan) that was more than double that of a teacher in a modern school. Needless to say, a bank manager received far better remuneration: a monthly salary up to 200 yuan, along with a year-end bonus and a decent office. More importantly, modern finance in China had gained momentum, thanks to the sustained commercialization and industrialization since the late 19th century. For example, by the time of the abolition of the civil examination, 141 modern industrial firms had been established in 28 prefectures; from 1905 to 1927, 2,606 new firms were established, covering half of the prefectures. There was an unprecedented demand for external finance. Meanwhile, modern technology and communication infrastructure (e.g.,

participate in the civil examination, because it was still the most widely accepted and reliable channel of success. These students usually skipped classes so as to prepare for the civil examination (Franke, 1960).

telegraph and railway) had also been constructed, which greatly facilitated the expansion of banking networks (Lin et al., 2021). These modern forces and opportunities incentivized the learned elite, whose members were frustrated (but liberated) by the abolition of the civil examination, to pursue a new ‘ladder of success’ into the financial elite. Indeed, many well-known Chinese bankers in the early 20th century had a traditional education. For example, Chang Kia-Ingau (1889-1979), a prominent manager of the Bank of China in the 1910s, received his early education in a traditional Chinese school and obtained the *shengyuan* degree in 1904 (Peng, 2007).

Second, the supply of talent for modern banking was also shaped by such learning opportunities. This is especially true for the early development of Chinese modern banks that basically followed the model of their Western counterparts. Foreign banks provided interested Chinese the best places to learn and practice the new financial knowledge. Taking advantage of their rich experience in foreign banks and their networks, these bankers went on to start their own ventures. Consequently, the genesis of Chinese modern banks emerged in or near the cities in which foreign banks were headquartered, such as Shanghai and Tianjin. In contrast, in many inland regions where local elites had little chance to access foreign banking, Chinese modern finance developed much later and more slowly.

3. Empirical Setup

Our sample covers 281 prefectures in China proper.⁵ The sample period begins from 1897 when the first Chinese modern bank was established, and ends in 1936, on the eve of the Japanese invasion that effectively interrupted financial development of China. This time span covers the abolition of the civil examination in 1905; the eight years before the abolition will be referenced in the following difference-in-differences analyses.

Our dependent variable, financial development, is measured by the number of modern banks (and branches) in each prefecture on an annual basis. Given the predominance of banking in the financial industry during the late 19th and early 20th centuries, the number of banks could largely reflect the level of financial development at the time. We manually collected the data on modern banks from gazetteers (*fangzhi*), a kind of encyclopedic book focused on an administrative unit (e.g., county, prefecture, province) and compiled by the

⁵ China proper refers to the territory under the regular county-province administration; it included 18 provinces in the Qing dynasty, excluding the frontier regions that were dominated by non-Han Chinese and under alternate forms of administration (Figure 2).

relevant government; we use gazetteers published between 1933 and 2018, some of which are reprints of earlier works. We supplemented the data by identifying banks that were missing in the gazetteers from the *Banking Yearbooks* (1934–1937) and historical archives, which are specified in the Supplementary Materials of Lin et al. (2021).

To identify the effect of the reallocation of talent on banking development, we employ a difference-in-differences approach. The first difference compares the civil examination period (1897–1904) to the post-examination period (1905–1936), and captures the extent to which the number of banks increased after the abolition of the civil examination. The second difference compares prefectures that varied in the extent of the allocation of talent to the civil examination before 1905. If banking development really benefited from the release of talent from the civil examination after 1905, we should expect that in prefectures where more talent was attached to the civil examination, there would be more banks established after 1905. The question, then, is what determined the cross-prefectural variation in the extent of talent allocation to the civil examination. To a large extent, as we will argue below, the allocation was shaped by the civil examination quotas that were directly assigned by the imperial court to each prefecture.

3.1. The Allocation of Civil Examination Quotas in the Qing Dynasty

To balance the chance of exam success (and thus social mobility) across regions, the imperial authorities assigned an admission quota to each county.⁶ By doing so, the emperors effectively agglomerated (and controlled) the elites from all sides of the empire. Of course, the imperial authorities also took into account the regional variations in human capital endowments, and differentiated the amount of the quotas across counties. The quota assigned to a county was by and large based on this county's population size and examination performance in the past, among other factors (Chang, 1955; Elman, 2000). As a result, the quotas varied drastically across counties (and prefectures accordingly), as shown in Figure 2 and Table 1.

The quota capped the number of candidates who could eventually enter the gentry or officialdom in each prefecture. Therefore, in prefectures with higher quotas, more educated people would be attracted to compete for the examinations relative to other prefectures with

⁶ The central government assigned a fixed quota to each county, and meanwhile assigned each prefecture a fixed quota that was shared among the counties within this prefecture. Therefore, the quota was bounded at the prefecture level.

lower quotas. Therefore, we expect that after the abolition of the civil examination, prefectures with higher quotas would release more members of the educated elites to the modern sectors, including banking. The distribution of quotas had become fixed in the early Qing period (circa the 1720s) and remained stable until the abolition of the system in 1905.⁷ The figures for the quotas are obtained from the *Qing Hui Dian* (Imperially Established Institutes and Laws of the Great Qing Dynasty) (Kun, 1862).

Figure 2 shows the positive relationship between the civil examination quota and banking development after 1905. Before the abolition of the civil examination (1904), only a few big cities had modern Chinese banks. After the abolition of the civil examination (1936), modern Chinese banks had expanded to a majority of prefectures; more importantly, prefectures that previously had high examination quotas had obviously more banks.

3.2 Measuring the Modern Transition of Human Capital

To document the ‘reallocation’ of talent from the civil service to the modern banking sector after 1905, we employ two variables pertaining to modern financial human capital at the prefecture level. One is the number of Chinese bankers, a figure based on the name list in the *Banking Yearbook* of 1936. The bankers included the members of bank boards or councils, supervisors, executives and managers. We hand-collected each banker’s biography and identified their home prefectures. There were 874 bankers who came from 129 prefectures in 1936. If the abolition of the civil examination indeed promoted the learned class to seek new opportunities in modern banking, we should expect that prefectures with higher quotas would produce more bankers after 1905.

The other variable is the number of students who chose to study in a business school. If there was a human capital transition (from traditional civil examination candidates to modern finance), we should expect that prefectures with higher examination quotas would have more candidates in the discipline of banking and finance after 1905. We obtain this data from the *Jiaoyu Tongji Tubiao* (Statistics on Education) of 1914. The *Statistics* lists all the schools (by types and disciplines) and their enrolments. We count the vocational schools and colleges that specialized in business studies (including banking and finance) and the number of students in these schools at the prefecture level.

⁷ The only exception is that the emperor rewarded some additional quotas to the prefectures that contributed to the suppression of the Taiping rebellion (1850-1864). We use the quotas before the Taiping rebellion to avoid the possible endogenous increase in quotas among these rewarded prefectures, albeit the results remain consistent if taking into account the additional quotas after the rebellion.

4. The Effect of the Abolition of the Civil Examination on Banking Development

4.1 Baseline Results

According to the empirical strategy outlined in Section 3, we examine the extent to which the abolition of the civil examination affected modern banking development in Equation (1):

$$Banks_{it} = \alpha + \beta \times Post_t \times CivilExamQuota_i + \gamma_1 \times Post_t \times \mathbf{X}_i + prefecture_i + year_t + \varepsilon_{it} \quad (1)$$

where $Banks_{it}$ denotes the number of modern banks (and branches) in prefecture i in the year t between 1897 and 1936. $CivilExamQuota_i$ denotes the figure for the civil examination quota that the Qing emperors assigned to each prefecture before 1905. To attenuate extreme values in the quota, we take the natural logarithm of each quota figure. $Post_t$ is a time dummy that equals one for years after the abolition of the civil examination (1905–1936) and zero for years before then (1897–1904). The coefficient β of the $Post_t \times CivilExamQuota_i$ captures the difference-in-differences in the number of banks arising from the abolition shock and the quota distribution. If talent was ‘reallocated’ into modern banking from civil service after the abolition of the civil examinations, we should expect β to be significantly positive.

The prefectural fixed effects ($prefecture_i$) absorb all the time-invariant prefectural effects on banks, whereas the year fixed effects ($year_t$) control for all the annual shocks common to all prefectures. In addition, we control for the interaction terms between $Post_t$ and a set of baseline correlates of both quotas and banks, denoted by the vector \mathbf{X}_i , reasoning that the impact of these correlates of the quota on banks might also change after the abolition of civil examination. They are introduced below.

First, given that the quota allocation was primarily based on population size, and population size may affect market or economic scale in ways that are important for financial development, we control for prefectural population in 1880. We choose the year 1880 in order to avoid the feedback effect from civil examination abolition or banking development while considering data availability. The population data are obtained from Cao (2000). Second, and in the same vein, we control for a prefecture’s shortest distance to the coast, reasoning that both the civil examination quota and the level of banking development were

distinctly higher in coastal areas. Third, we also control for the prefectural land area because Chinese prefectures varied drastically in land size; land size may be associated with the size of the quotas (for example, by hosting more counties) and also the landscape for bank branch expansion. Distance to coast and land area are calculated on the basis of the data and maps in CHGIS (2016). More (time-varying) covariates will be introduced where appropriate for specific purposes of robustness in the following regression analyses.

The baseline results are reported in Table 2. To provide a benchmark, we begin by regressing all modern banks (including foreign banks and Chinese banks) on the interaction term between the civil examination quota and the post-1905 time dummy (column 1). The interaction term has a significant and positive coefficient (2.355). Its marginal effect is substantial: doubling the size of the quotas before 1905 would increase the number of banks by 2.355 after 1905; this implies that the number of banks per prefecture per year would double when evaluated by the sample mean (2.32 banks). The effect of the abolition of the civil examination on banks changes little when we control for the interaction terms between the post-1905 time dummy and population size, distance to coast, and land size (column 2).

We next examine whether the abolition of the civil examination mainly promoted the development of modern Chinese banks (columns 3 and 4 of Table 2). This approach is based on the following assumption that, 1) from 1897, the newly emerged modern banks were dominated by Chinese banks rather than foreign banks (Figure 1), and 2) people drawn from the Chinese learned elite might dedicate more time and effort to opening new Chinese banks since foreign banks were established and controlled by foreigners. We find that the effect of the civil examination abolition on banking development is mainly driven by the increase in Chinese banks. Not only does the coefficient of the examination quota remain significantly positive, but the magnitude of the coefficient is very close to that of all (Chinese and foreign) banks. For this reason, we will focus on the development of modern Chinese banks in the remaining analyses.

Under our difference-in-differences setting, the effect of the civil examination abolition on banks is premised on the assumption that the examination quotas had no effect on banks until 1905. If it was unobserved correlates of the quotas that caused banking development, we should expect that banks would have experienced greater growth before 1905 in prefectures with higher quotas. To test this possibility, we regress the number of banks on the interaction terms between the civil examination quotas and a full set of year dummies between 1900 and 1910, i.e., a balanced and homogenous short period around the abolition of the civil examination. The number of banks in 1905 is omitted as the reference point. We

also control for population in 1880, distance to coast, and land area (all interacted with year dummies) and the prefectural and year fixed-effects. As shown in Figure 3, the civil examination quota had no effect on the number of banks before the abolition of the civil examination. The coefficients of the quota are all close to zero and do not exhibit any increasing trend. This suggests that when the civil examination was still at play, the Chinese learned class was still in thrall to the exam-to-status ideal and hesitated to venture into the new banking businesses. After the civil examination was finally dismantled, the disillusioned elites gradually turned to modern banking, among other sectors, for alternative outlets. Figure 3 shows that the coefficients of examination quotas turn to be significantly positive after 1905, and this effect becomes greater over time.

The positive effect of the abolition of the civil examination remains robust when we use alternative measures of banking development. We present these results in Table 3. First, the civil examination quota has a significantly positive effect on the growth of modern Chinese banks (column 1). We define the growth as the annual difference in the number of banks (and their branches) in each prefecture.⁸ Given that the size of civil examination quotas are measured in natural logarithm, the coefficient (0.18) of this factor indicates that doubling the quotas would increase the average annual growth of banks by nearly 20 percent. Second, we only count the presence of banks regardless of the number of branches in a prefecture. That is, whenever a bank, either a headquarters, a branch or more than one branch of that bank, opened in a prefecture, we count this as one bank. We find that the effect of the civil examination quota on bank presence remains significant and positive (column 2). Third, we separate the number of bank headquarters and the number of bank branches in each prefecture (columns 3 and 4), and find that the civil examination quota has a significantly positive impact on both measures after 1905. The results in columns 2 to 4 suggest that the release of talent from the civil examination promoted both the foundation of new banks and expanded their branching networks.

As both the number of banks and the civil examination quotas varied within a prefecture, i.e., across the counties, we also perform the county-level regressions following the same difference-in-differences strategy used in Equation (1). The county-level analysis allows us to control for the prefectural effect over years by fully interacting prefectural dummies and year dummies (prefecture-year fixed effects). This can rule out the effects of

⁸ An alternate is the log growth of banks, i.e., $\log(\text{bank}_t/\text{bank}_{t-1})$. We do not use this measure simply because there is a considerable number of prefectures without any banks ($\text{bank}_{t-1}=0$).

unobserved time-varying prefectural factors on banking development. The results are reported in Table 4. The civil examination quota has a significantly positive impact on the number of modern Chinese banks at the county level. The magnitude of coefficient (2.06 in column 2) is very close to that of the prefecture-level estimate in Table 2. The civil examination quota also has a positive effect on the growth of banks, bank presence, number of bank headquarters and number of bank branches at the county level (columns 3-6). The magnitudes of coefficients of the quota on the alternative measures of banking development are also close to those of the prefecture-level estimates in Table 3.

4.2 The Confounding Modernization Effect and the Instrumented Results

The abolition of the civil examination propelled talent not only into banking but also into other modern sectors. First and foremost were modern industrial firms, which had been the focus of the ‘Westernization movement’ initiated by Qing officials since the 1840s. Industrialization was accelerated by the abolition of the civil examination, as documented in Bai (2019); in regions with higher exam quotas, there were also more industrial firms (defined by the adoption of steam or electronic power) established after 1905. Meanwhile, industrial firms also generated a high demand for external finance (Rawski, 1989). This raises the concern as to whether, and if so, to what extent, the effect of civil examination abolition on banking development was driven by industrialization. To test this, we further control for the number of industrial firms established in each prefecture in the previous year. The number of industrial firms is obtained from Du (2014); data are available for the years between 1897 and 1927, so we end the sample period by 1928.

The results are reported in Table 5. To provide a benchmark for the 1897 to 1928 sample, we first report the effect of the civil examination quota on the number of modern Chinese banks without controlling for industrial firms (column 1). The coefficient of the civil examination quota is 1.16 and significant at the 1 percent level.⁹ Then, in column 2, we control for the number of industrial firms. As expected, the number of industrial firms has a close (positive) relation with the number of banks, and the firms absorb 38 percent of the effect of the civil examination abolition on banks. However, the direct effect of the civil examination abolition on banks, which is now net of the effect of industrial firms, remains

⁹ Please note that we are now using a shorter period of 1897 to 1928 because of the missing firm data after 1927. This coefficient of the exam quota, 1.16, is smaller than the corresponding coefficient of 1.84 under the full sample period (1897 to 1936). This is because there was a sustained growth in the number of banks after 1928.

highly significant and substantial in magnitude. Of course, these estimates should be viewed as suggestive rather than conclusive, because they might be biased by the endogenous relation between industrial firms and banks.¹⁰

Besides industrial firms, Chinese elites also endeavored to develop other modern technologies in China. For modern banking development, fast communications is a necessary condition. The introduction of the telegraph to China from the late 19th century is found to have greatly facilitated the expansion of modern banking (Lin et al., 2021). To examine the extent to which the effect of the civil examination abolition on banks was driven by the growth of the telegraph system (which might be correlated with the distribution of the civil examination quotas), we control for the number of telegraph stations in each prefecture in the previous year (column 3 of Table 5). This mitigates only a small portion of the civil examination effect on banking, as the coefficient of the examination quotas slightly decreases (from 1.162 to 1.096).

Chinese modern banks originated from (and continued to be concentrated in) the treaty ports. Following upon a series of treaties between China and Western powers since 1842, a total of 54 treaty ports had been opened along the coast and the Yangtze River by the 1930s. By connecting China to foreign trade, technology and culture, treaty ports functioned as the bridgeheads of China's modernization. As a result, treaty ports assembled a large group of Chinese elites who embraced Western learning and new business ventures, especially after the abolition of the civil examination. To rule out the possibility that the effect of the civil examination abolition on banking development was also driven by the treaty ports, we control for the number of treaty ports opened in each prefecture in each previous year (column 4 of Table 5). There is no doubt that treaty ports have a strong correlation with the distribution of modern banks, but they do not mitigate to a large degree the effect of the civil examination abolition on banking development.

Given that the above three variables respectively capture different dimensions of China's modernization, we control for them simultaneously to examine the extent to which the effect of the civil examination abolition on banks was mitigated (column 5, Table 5). Doing so reduces the effect of civil examination quota from 1.16 to 0.59, a 50 percent decrease. However, the effect of the civil examination quota still remains highly significant and positive. These findings suggest that the abolition of the civil examination had a direct

¹⁰ However, given the positive correlation between industrial firms and banks, the coefficient of industrial firms is most likely to be overestimated; so the 38 percent reduction in the effect of the civil examination abolition on banks might be the upper bound; the actual degree of reduction might be smaller.

human capital effect on banking development.

We might not, of course, have ruled out all the unobserved factors that are correlated to both the civil examination quota and banks. To add more confidence to the effect of civil examination abolition on banking development, we borrow the instrumental variable approach from Bai and Jia (2016). We use the number of small rivers in each prefecture to instrument the size of civil examination quotas, and use these instrumented examination quotas to predict the number of banks after 1905. We briefly introduce the rationale behind this instrumental variable below.

First, given that the Qing dynasty assigned quotas at the county level, the number of counties in a prefecture affected the total quotas this prefecture eventually had. The number of counties varied drastically across prefectures, ranging from only one to a maximum of 27. The division of counties in a prefecture was not only determined by prefectural size, but also shaped by natural barriers, in particular, the rivers. Based on the historical geography of China, the county-level administrative divisions were usually set up along (and thus bordered by) rivers, because rivers provided natural and economical boundaries for county administration. Therefore, a prefecture endowed with a denser river network would be more likely to be divided into more counties. To the extent that river density may facilitate trade and economic prosperity, we need to rule out the economic effect of the rivers. To this end, we exclude the major rivers (i.e., length over 70 km), and scale the number of the remaining ‘small’ rivers by the total river length in a prefecture according to Bai and Jia (2016).

Second, the number of small rivers is unlikely to affect modern banking development in the early 20th century (other than through the distribution of the civil examination quota), because the expansion of modern banks was mainly shaped by modern communications and transportation rather than by rivers. This can be gleaned from Lin et al. (2021)’s finding that modern banks in early 20th century China expanded largely along the telegraph and railways rather than the traditional postal routes.

Using the number of small rivers as the instrument of the number of civil examination quotas, we find that the latter’s positive effect on banks remains robust, even after the inclusion of the additional controls of modernization (columns 6 and 7 of Table 5). Comparing the instrumented coefficient (2.104) in column 7 to the OLS estimate (0.591) in column 5, the effect of the civil examination quota under the IV estimation becomes 3.56 times greater than that of the OLS estimation.

5. Evidence on the Allocation of Talent to Modern Finance

This section examines whether the positive effect of the civil examination abolition on banking development works through the ‘reallocation’ of talent from the civil service to modern banking. To test this, we collect data on the distribution of Chinese bankers and the students who majored in business and finance, and provide cross-sectional evidence on the impact of the distribution of the civil examination quota before 1905 on the distribution of modern financial elites thereafter.

5.1. Bankers

If the abolition of the civil examination pushed the learned class to seek a new profession in banking, we should expect that more bankers originated from prefectures where there were higher civil examination quotas. We test this using the number of bankers as described in sub-section 3.2. As the information on bankers are available only for 1936, we examine the effect of the civil examination quota on the number of bankers at the cross-sectional level (the 281 prefectures). The results are presented in Table 6. After controlling for population size, distance to coast, and land area, the correlation between the civil examination quota before 1905 and the number of bankers 30 years later remains highly positive and statistically significant. Doubling the size of the quotas is associated with a 34 percent increase in the number of bankers (column 1). This positive relation becomes nearly three times greater when we instrument the civil examination quota using the number of small rivers in a prefecture (column 2).

The effect of the civil examination quota on the number of bankers may be confounded by the presence of modern banks before the abolition of the civil examination. Specifically, if some high-quota prefectures had had modern banks before 1905, talented men in these prefectures might have learned about modern finance and hence been more likely to become bankers after 1905. To rule out this possibility, we dropped the 15 prefectures where there were already modern banks before 1905, and still found the quota effect on bankers to be robust and close to that of the full sample in magnitude (columns 3 and 4, Table 6). We also obtain consistent results at the county level, conditional on the prefecture-year fixed effects, as reported in the Appendix Table A1.

5.2. Students Majoring in Business and Finance

As a highly selective elite group, bankers may not fully reflect a prefecture's human capital transition toward modern finance. An alternative (and more comprehensive) measure for the degree of transition is the number of students who chose finance-related majors. As a new and innovative modern sector in the early 20th century, banking recruited talented men who were equipped with a knowledge of modern business and finance (as we discussed in Section 2). If the abolition of the civil examination spurred a human capital transition to modern finance, we should expect more students to study business and finance in regions with more exam quotas.

Using the data on school enrolment in subsection 3.2, we regress the number of students in the business schools in 1914 on the civil examination quota before 1905, at the prefectural level. The results in Table 7 show that a higher exam quota before 1905 is associated with a greater number of students who majored in business and finance. The marginal effect of the civil examination quota is substantial; doubling the quota would increase the number of business students by 43 percent (column 1), and this effect becomes 4.5 times greater under the IV estimation (column 2). In addition, prefectures with higher examination quotas before 1905 also see more business schools established by 1914 (columns 3 and 4 of Table 7), suggesting a high demand for finance curricula after the civil examination system had gone. All of these results are robust when we use the county-level estimations (Appendix Table A2).

5.3. Learning from Foreign Banks As a Condition of Talent Transition

Given that they had a variety of choices of modern professions, why and how were these talented men channeled into the modern finance sector after the abolition of the civil examination? The high rewards from modern finance, as shown in Section 2, is a necessary 'pull' force. On this basis, we argue that the distribution of foreign banks in China played a significant role in leading Chinese talent to develop an indigenous modern finance. To some extent, Chinese elites were nurtured by foreign banks before they adopted the Western financial model and associated knowledge to China's financial market. And indeed, the early Chinese modern banks completely mimicked foreign banks in their management and operation. We thus hypothesize that talented men in prefectures with, or near to, foreign banks would have had more resources and chances to learn modern finance, and thus be more likely to develop Chinese modern banks. As a result, the effect of the civil examination abolition on modern Chinese banking might be conditional on the proximity to foreign

banks.

To test this, we measure the accessibility to modern finance using a prefecture's shortest distance from the prefectural capital to the nearest foreign bank headquarters, and examine its interactive effect with the civil examination quota on the number of modern Chinese banks after 1905. There were 16 foreign banks headquartered in five cities (Shanghai, Tianjin, Qingdao, Wuhan, and Ji'nan) between 1897 and 1936. This generated strikingly regional and temporal variations in the degree of accessibility to Western finance. The results are reported in Table 8. In prefectures headquartered by a foreign bank, the effect of the civil examination abolition on the number of Chinese modern banks is the most pronounced, in that doubling the quota would increase the number of Chinese modern banks by a factor of nearly 20 (column 1). This effect decreases in prefectures that were farther from foreign bank headquarters, as evidenced by the significantly negative coefficient (-2.882) of the triple interaction term between the civil examination quota, post-1905 time dummy, and the distance to foreign bank. In terms of the magnitude, a 100 percent (879 km) increase in the distance from a foreign bank would reduce the number of Chinese banks by nearly three, depending on the size of civil examination quotas.

The effect of the proximity to foreign banks may capture the effect of economic prosperity, big cities, or other unobserved correlates of financial need. To confirm the spillover of modern finance from foreign banks to Chinese elites, we use the distance to traditional Chinese banks, that is, to money houses (*qianzhuang*), as a placebo. The distribution of money houses was correlated with economic prosperity or financial need but had little to do with the diffusion of modern finance. Based on *Nongshang Tongji Biao* (Statistics on Agriculture and Commerce), published in 1912, there were 4,714 money houses in 177 prefectures. We interact a prefecture's shortest distance to its nearest money house with the civil examination quota and post-1905 time dummy, and compare their effect with that of the distance to foreign bank headquarters (column 2 of Table 8). The distance to the nearest money house does not affect the degree of the contribution of civil examination elites to modern banking after 1905. The effect of the distance to a foreign bank headquarters remains significantly positive, with little change in the magnitude of coefficient.

We also document the importance of foreign banks in nurturing financial elites that were drawn from the pool of talent historically oriented towards the civil service. In column 3 of Table 8, we regress the number of Chinese bankers in 1936 on the interaction term between the civil examination quota and the distance to a foreign bank headquarters in 1904 at the prefectural level. The coefficient of the civil examination quota (1.393) is highly

significant and three times greater than the average quota effect on bankers (0.341 in column 1 of Table 6). This implies that in prefectures with foreign bank headquarters, there were distinctly more educated people engaging in the banking business after the abolition of the civil examination. However, this number significantly decreases where the elites live farther from the headquarters of foreign banks. Likewise, the effect of foreign banks is not confounded by the distribution of Chinese money houses (column 4).¹¹

6. Conclusion

The above empirical findings indicate the importance of the supply of talent in modern financial development. This importance was manifested in the early development of the financial market in the late 19th and early 20th centuries. This illuminates the close relationship between the supply of talent and the financial industry, and the distinctly high compensation rate in this sector until the present. We disentangle the reverse causality between the supply of talent and financial development by exploring a unique historical experiment in early 20th-century China, where the millennium-long civil examination system was suddenly abolished in 1905. This abruptly changed the allocation of talent; men who had been firmly linked to the study of Confucian classics and the competition to succeed in the civil examinations had to seek alternative chances for wealth and social status. This increased the momentum of the transfer of talent from exam preparation and the civil service to the world of finance.

By analyzing a panel data of 281 prefectures over 40 years (1897–1936), we find that the increase in number of modern banks after the abolition of the civil examination was significantly greater in prefectures where there had been higher civil examination quotas than in other regions. This is in part due to the effects of the modernization of human capital, in that there were more students who chose to study in a business school and finally became a member of the financial elite (banker) in prefectures that previously had high examination quotas. Not all such talent was channeled to modern finance after the abolition of the civil

¹¹ The interaction term between civil examination quota and the distance to money house is also negative and statistically significant. This is straightforward, in that the presence of money houses may also cultivate a preference for a career in finance among the local people, but this does not necessarily benefit the development of modern banks. Nevertheless, comparing the coefficient (0.057) of the money houses to that of foreign banks (0.141) in their interactions with the civil examination quota, we find that the effect of money houses in directing Chinese talent into modern finance is much smaller than that of foreign banks.

examination; only those who could access foreign banks, especially those who had significant contact with Western finance, could eventually succeed in this new sector and thus contribute to the rise of modern finance in China.

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Figures and Tables

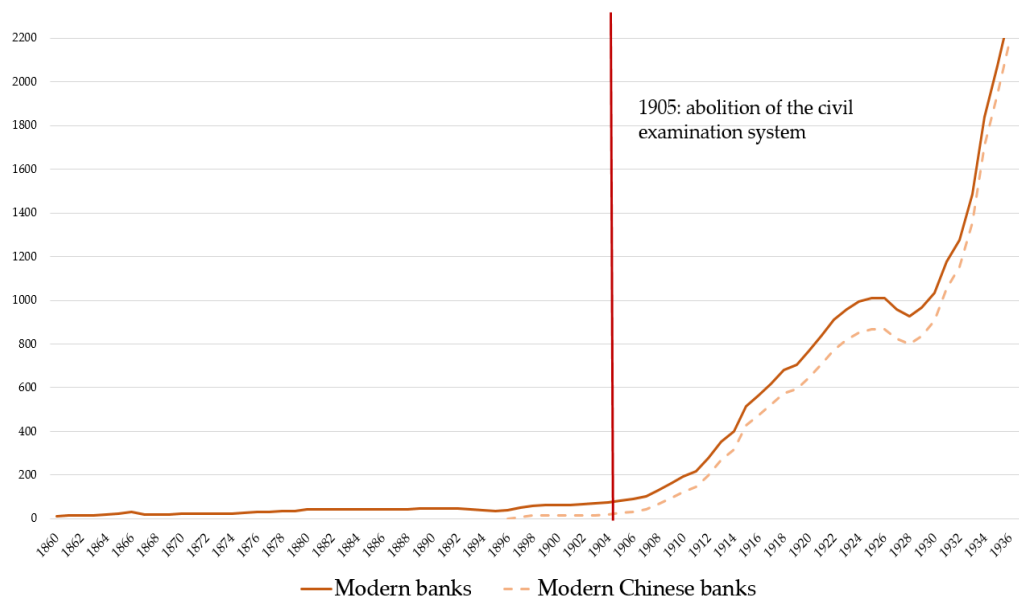


Figure 1. Number of modern banks in China

Notes: Modern banks include both foreign banks (founded and run by foreigners) and Chinese banks (founded and run by Chinese). The numbers include also bank branches.

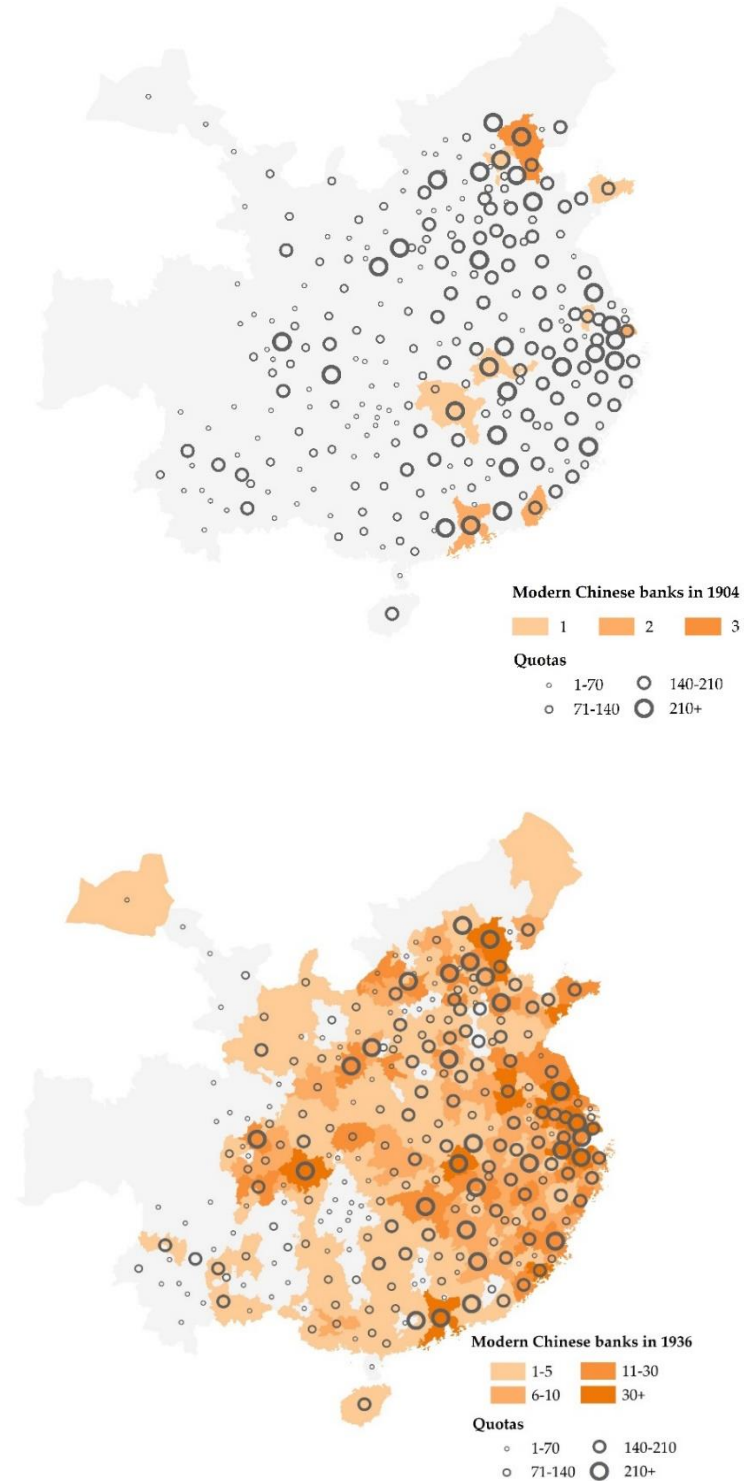


Figure 2. Distributions of civil examination quotas and modern Chinese banks

Notes: The two figures show the change in the number and geographical distribution of modern banks before and after the civil examination abolition in 1905. While the total number of banks increased remarkably after 1905, prefectures with higher civil examination quotas saw more banks established. The data are at the prefectural level. There are 281 prefectures in the maps; these basically cover ‘China proper’ and exclude frontier regions of the Qing dynasty.

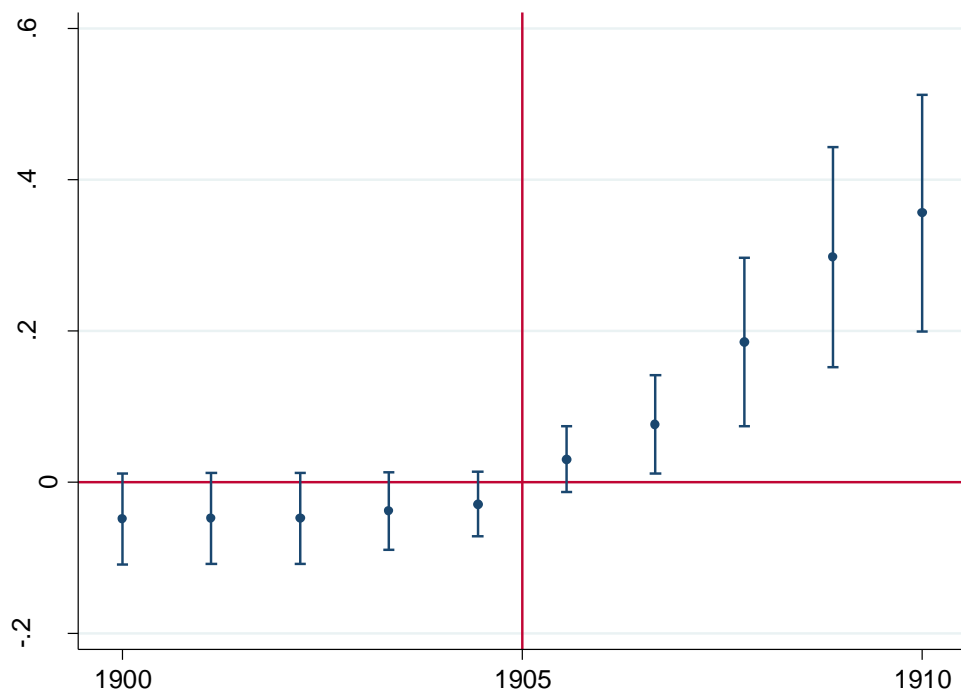


Figure 3. The effect of the civil examination quota on modern Chinese banks by year

Notes: This figure shows the pre- and post-abolition trend in the effect of the civil examination quota on banking. The coefficients (with confidence intervals) are obtained from regressing the number of banks on the interaction terms between the log number of civil examination quotas and the ten-year dummies between 1900 and 1910, conditional on the prefectural and year fixed effects and the interactive effects between the year dummies and the baseline prefectural factors (log population in 1880, log distance to coast, and log prefectural land area).

Table 1. Summary statistics

Variable	Obs.	Mean	S.D.	Min	Max
Civil examination quota	281	90.01	64.19	2	422
Number of banks	11,240	2.32	9.43	0	258
Number of Chinese banks	11,240	1.98	7.88	0	229
Number of Chinese banks (presence)	11,240	1.71	6.49	0	132
Growth of Chinese banks	11,240	0.19	1.19	-13	40
Number of Chinese bank headquarters	11,240	0.46	2.67	0	64
Number of Chinese bank branches	11,240	2.32	9.43	0	258
Population in 1880 (in 1,000 people)	281	155.48	370.31	0.73	4625.71
Land area (in 1,000 km ²)	281	13.91	12.58	0.26	131.19
Distance to coast (in km)	281	488.20	374.86	0.38	2181.95
Industrial firms	8,992	0.29	1.85	0	60
Treaty ports	8,992	0.15	0.48	0	6
Telegraph	8,992	1.55	1.65	0	11
Number of small rivers (normalized by total river length in a prefecture)	281	0.59	0.63	0	3.23
Distance to foreign bank (km)	11,240	878.92	530.41	0	2515.52
Distance to money house (km)	281	49.56	87.02	0	679.52
Number of business schools	281	0.25	0.72	0	5
Number of Chinese students majoring business	281	14.92	45.97	0	421
Number of Chinese bankers	281	3.11	10.24	0	111

Table 2. The abolition of the civil examination and modern banking development

The dependent variable in columns 1 and 2 is the number of foreign banks and modern Chinese banks (including branches) in each prefecture in each year. The dependent variable in columns 3 and 4 is the number of modern Chinese banks (and branches) in each prefecture in each year. The main explanatory variable is the interaction term between the log number of civil examination quotas before 1905 and the post-1905 time dummy that equals to one for years after 1905 and zero for years before 1905. The sample period is from 1897 to 1936. Standard errors are clustered at the prefecture level and are reported in parentheses. *, **, and *** indicate significance at 10%, 5% and 1%, respectively.

	Number of banks		Number of Chinese banks	
	1	2	3	4
Civil examination quota \times Post	2.355*** (0.600)	2.058*** (0.689)	2.112*** (0.518)	1.839*** (0.595)
Population in 1880 \times Post		0.722** (0.312)		0.695** (0.270)
Distance to coast \times Post		-0.667** (0.269)		-0.534** (0.220)
Land area \times Post		-0.930 (0.780)		-0.893 (0.670)
Year FE	Yes	Yes	Yes	Yes
Prefecture FE	Yes	Yes	Yes	Yes
R-squared	0.579	0.583	0.507	0.511
Observations	11,240	11,240	11,240	11,240

Table 3. Alternative measures of banking development

Growth of modern Chinese banks (column 1) is the annual increase in the number of modern Chinese banks in each prefecture. Number of Chinese banks (presence) in column 2 is the number of banks regardless of the number of each bank's branches. Other variables are the same as those of Table 2. Controls include log population in 1880, log distance to coast, and prefectural land area (all interacted with the post-1905 time dummy). The sample covers from 1897 to 1936. Standard errors are clustered at the prefecture level and are reported in parentheses. *, **, and *** indicate significance at 10%, 5% and 1%, respectively.

	Growth of Chinese banks	Number of Chinese banks (presence)	Number of Chinese bank headquarters	Number of Chinese bank branches
	1	2	3	4
Civil examination quota × Post	0.180*** (0.051)	1.465*** (0.478)	0.538** (0.214)	1.301*** (0.395)
Controls × Post	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Prefecture FE	Yes	Yes	Yes	Yes
R-squared	0.186	0.667	0.520	0.479
Observations	11,240	11,240	11,240	11,240

Table 4. The abolition of the civil examination and modern banking development: County-level evidence

We replicate Table 2 (columns 3 and 4) and Table 3 using the county-level civil examination quota and variables on banks. Controls include log population in 1880 (still at the prefecture level), log distance to coast, and log county land area. Columns 2 to 6 additionally control for prefecture-specific year fixed-effects in order to rule out the prefectural effect on banking development over time. Standard errors are clustered at the county level and are reported in parentheses. *, **, and *** indicate significance at 10%, 5% and 1%, respectively.

	Number of Chinese banks	Number of Chinese banks	Growth of Chinese banks	Number of Chinese banks (presence)	Number of Chinese bank headquarters	Number of Chinese bank branches
	1	2	3	4	5	6
Civil examination quota × Post	1.278*** (0.484)	2.060** (0.836)	0.167** (0.066)	1.739** (0.700)	0.632** (0.307)	1.427*** (0.538)
Controls × Post	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes					
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Prefecture × Year FE		Yes	Yes	Yes	Yes	Yes
R-Squared	0.490	0.484	0.153	0.641	0.488	0.456
Observations	57,000	55,720	55,720	55,720	55,720	55,720

Table 5. The abolition of the civil examination and modern banking development: Additional controls and the instrumented evidence

We examine whether the positive effect of the civil examination quota on banking is driven by the development of other modern sectors (industrial firms, trade and communications (telegraph)). The dependent variable is the number of modern Chinese banks (and branches) at each prefecture in each year. The sample period is from 1897 to 1928 (there is no data on industrial firms after 1927). Industrial firms are measured by the number of newly established industrial firms in the previous year. Treaty ports refer to the number of treaty ports in the prefecture in the previous year. Telegraph is measured by the number of telegraph stations in each prefecture in the previous year. In columns 6 and 7 we instrument the civil examination quota using the number of small rivers in a prefecture (normalized by the total river length of this prefecture) based on Bai and Jia (2016). The small rivers are defined as rivers the length of which is shorter than 70 km. Controls are the same as those of Table 2. Standard errors are clustered at the prefecture level and are reported in parentheses. *, **, and *** indicate significance at 10%, 5% and 1%, respectively.

	Number of Chinese banks						
	OLS	OLS	OLS	OLS	OLS	IV	IV
	1	2	3	4	5	6	7
Civil examination quota × Post	1.162*** (0.377)	0.715*** (0.192)	1.096*** (0.375)	1.086*** (0.378)	0.591*** (0.189)	4.225*** (1.319)	2.104** (0.890)
Industrial firms		1.639*** (0.253)			1.629*** (0.255)		1.600*** (0.256)
Telegraph			0.464*** (0.141)		0.438*** (0.124)		0.397*** (0.125)
Treaty ports				3.021*** (0.782)	2.567*** (0.596)		2.405*** (0.601)
Controls × Post	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Prefecture FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.509	0.657	0.513	0.517	0.667		
F-statistics						13.633	13.086
Observations	8,992	8,992	8,992	8,992	8,992	8,992	8,992

Table 6. Evidence on talent reallocation: Civil examination and number of bankers

The dependent variable is the log number of bankers in each prefecture (based on the place of origin) in 1936. Bankers include the board members, top executives and managers in all modern Chinese banks that existed in 1936. In columns 2 and 4, we instrument the civil examination quota using the number of small rivers. Controls are the same as those of Table 2. Standard errors (in parentheses) are clustered at the prefecture level. *, **, and *** indicate significance at 10%, 5% and 1%, respectively.

	Number of bankers in 1936		Number of bankers in 1936, excluding those whose home prefectures had no banks before 1905	
	1	2	3	4
	OLS	IV	OLS	IV
Civil examination quota	0.341*** (0.061)	1.339*** (0.417)	0.308*** (0.060)	1.122*** (0.399)
Controls	Yes	Yes	Yes	Yes
R-squared	0.310		0.265	
F-statistics		13.489		13.356
Observations	281	281	266	266

Table 7. Evidence on talent reallocation: Civil examination and business education

Business schools refers to the log number of business schools in each prefecture in 1914. Business students refers to the log number of students majoring in business (including banking and finance) in each prefecture in 1914. Business schools include the vocational schools and colleges specialized in business studies. In columns 2 and 4 we instrument civil examination quota using the number of small river length. Controls are the same as those of Table 2. Robust standard errors are reported in parentheses. *, **, and *** indicate significance at 10%, 5% and 1%, respectively.

	Number of students majoring in business		Number of business schools	
	1	2	3	4
	OLS	IV	OLS	IV
Civil examination quota	0.432*** (0.112)	2.392*** (0.830)	0.095*** (0.023)	0.633*** (0.215)
Controls	Yes	Yes	Yes	Yes
R-squared	0.157		0.155	
F-statistics	13.489		13.489	
Observations	281		281	

Table 8. Learning from foreign banks

We examine whether the proximity to foreign banks increased access to modern finance knowledge (and reduced the learning cost to acquire such knowledge), and thus directed more men of talent to develop modern Chinese banks after the abolition of the civil examination. Access to modern finance is measured by a prefecture's shortest (great circle) distance to the nearest foreign bank headquarters (in log). We use a prefecture's distance to the nearest traditional Chinese bank (money house) in 1912 as a placebo; it measures the accessibility (and learning cost) of traditional Chinese banking skills. Controls are the same as those of Table 2. Standard errors are clustered at the prefecture level and are reported in parentheses. *, **, and *** indicate significance at 10%, 5% and 1%, respectively.

	Number of modern Chinese banks, 1897–1936	
	1	2
Civil examination quota × Post	19.636** (8.522)	19.568** (8.639)
Civil examination quota × Post × Distance to foreign bank	-2.882** (1.230)	-2.842** (1.277)
Civil examination quota × Post × Distance to money house 1912		-0.110 (0.155)
Distance to foreign bank	Yes	Yes
Distance to foreign bank × Civil examination quota	Yes	Yes
Distance to foreign bank × Post	Yes	Yes
Distance to money house 1912 × Post		Yes
Controls × Post	Yes	Yes
Year and Prefecture FE	Yes	Yes
R-squared	0.575	0.575
Observations	11,240	11,240
	Number of Chinese bankers in 1936, cross-sectional estimation	
	3	4
Civil examination quota	1.393*** (0.532)	1.316*** (0.492)
Civil examination quota × Distance to foreign bank 1905	-0.171** (0.076)	-0.141** (0.071)
Civil examination quota × Distance to money house 1912		-0.057** (0.023)
Distance to foreign bank 1905	Yes	Yes
Distance to money house 1912	Yes	Yes
Controls	Yes	Yes
R-squared	0.422	0.433
Observations	281	281

Appendix

Table A1. Evidence on talent reallocation: Impact of the civil examination quota on number of bankers

The dependent variable is the log number of bankers in each county (based on the place of origin) in 1936. Bankers include the board members, top executives and managers in all modern Chinese banks that existed in 1936. Controls are the same as those of Table 2 except that the distance to coast and land area are measured at the county level. Standard errors (in parentheses) are clustered at the prefecture level. *, **, and *** indicate significance at 10%, 5% and 1%, respectively.

	Number of bankers in 1936		Number of bankers in 1936, excluding those whose home counties had no banks before 1905	
	1	2	3	4
Civil examination quota	0.233*** (0.037)	0.262*** (0.041)	0.200*** (0.034)	0.212*** (0.034)
Controls	Yes	Yes	Yes	Yes
Prefecture FE		Yes		Yes
R-squared	0.146	0.388	0.135	0.402
Observations	1,425	1,425	1,425	1,425

Table A2. Evidence on talent reallocation: Impact of the civil examination quota on business education at the county level

Business schools refer to the log number of business schools in each prefecture in 1914. Business students refer to the log number of students majoring in business (including banking and finance) in each prefecture in 1914. Controls are the same as those of Table 2 except that the distance to coast and land area are measured at the county level. Standard errors (in parentheses) are clustered at the prefecture level. *, **, and *** indicate significance at 10%, 5% and 1%, respectively.

	Number of students majoring in business		Number of business schools	
	1	2	3	4
Civil examination quota	0.225*** (0.060)	0.338*** (0.095)	0.044*** (0.013)	0.064*** (0.022)
Controls	Yes	Yes	Yes	Yes
Prefecture FE		Yes		Yes
R-squared	0.040	0.108	0.043	0.115
Observations	1,425	1,425	1,425	1,425