

BANKING ON THE CONFUCIAN CLAN: WHY CHINA DEVELOPED FINANCIAL MARKETS SO LATE*

Zhiwu Chen, Chicheng Ma and Andrew J. Sinclair

Over the past millennium, China has relied on the Confucian clan to achieve interpersonal cooperation, focusing on kinship and neglecting the development of impersonal institutions needed for external finance. In this paper, we test the hypothesis that the Confucian clan and financial markets are competing substitutes. Using the large cross-regional variation in the adoption of modern banks, we find that regions with historically stronger Confucian clans established significantly fewer modern banks in the four decades following the founding of China's first modern bank in 1897. Our evidence also shows that the clan continues to limit China's financial development today.

The literature on financial development offers insights into the types of institutions that drive financial progress (La Porta *et al.*, 1997; 1998; Rajan and Zingales, 1998). However, it remains unclear why some countries had the necessary institutions for financial development to take off, whereas others did not.¹ To answer this question, we need to go back in history. Using both theory and anecdotal evidence, Greif and Tabellini (2017) argue that the West has traditionally relied on the 'corporate entity' or corporation to achieve interpersonal cooperation emphasising cooperation beyond bloodlines, whereas China has relied on the Confucian clan. As a result, when the demand for resource pooling and risk sharing among strangers grew exponentially after long-distance ocean trade began to take off in the sixteenth century, the Dutch and British had the institutional capacity to develop large-scale public capital markets and arms-length finance. In contrast, from the Han dynasty (206 BCE–220 CE) onward,² China focused on perfecting lineage institutions and kinship morality to achieve cooperation among relatives. Therefore, the divergent institutional development trajectories in China and the West date back to choices made 1,000 years ago regarding the mode of interpersonal cooperation.

In this paper, we explore the implications for financial development of the divergence in institutional development trajectories between China and the West, using historical and contemporary data. We show that the deeply entrenched Confucian clan has historically stifled and continues to

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This paper was received on 10 August 2020 and accepted on 22 September 2021. The Editor was Hans-Joachim Voth.

The data and codes for this paper are available on the Journal repository. They were checked for their ability to reproduce the results presented in the paper. The replication package for this paper is available at the following address: <https://doi.org/10.5281/zenodo.5525846>.

We are grateful for the helpful comments and suggestions of the editor, Hans-Joachim Voth, three anonymous referees, Sascha Becker, Jin Li, Luigi Pascali, Jared Rubin, Shang-Jin Wei, Wei Xiong, Xiaoming Zhang, and participants at the ASREC24h 2020 Conference, EEA Virtual 2020, the Princeton Finance Webinar, the Hong Kong Baptist University Finance Seminar and the Humboldt University of Berlin Finance Seminar. We thank Xinhao Li and Wanda Wang for their research assistance.

¹ La Porta *et al.* (1997) demonstrate that the historical development of a country's legal institutions affects its financial market development. Haber (1991) shows that political and national institutions play a critical role in financial development. The cause of the financial revolution in England in around 1700 is still widely debated (Temin and Voth, 2008).

² For reviews of the history of Confucianism and its spread in China, see Ebrey (2014) and Lang (1946).

depress both the demand for and the supply of external finance in China. It is helpful to think of the Confucian clan as an internal financial market for its members in which resource pooling and risk sharing are neither based on explicit financial instruments or agreements nor enforced by the rule of law. Rather, they are based on implicit contracts that dictate the rights and obligations of each member with respect to other members and are enforced by Confucian rules. These characteristics have had two important consequences. First, Chinese people had little demand for external finance before the Industrial Revolution, because the Confucian clan and financial markets were functionally substitutable. Second, the focus on the biologically based clan for resource pooling led the Chinese elite to neglect the development of the impersonal institutions needed for formal arms-length finance. Lacking these institutions, China could not supply external finance even when the need arose as a result of the late nineteenth-century industrialisation efforts. This explains the country's sluggish adoption of modern finance in the late nineteenth century (Kirby, 1995; Goetzmann *et al.*, 2007). China's early adoption of Confucianism as the state orthodoxy to structure society for interpersonal risk sharing and resource pooling made the country both uninterested in and unprepared for later external financial development.

For our empirical tests, we use cross-regional banking data for the 1897–1936 period. Modern banking began in China in 1897 as part of the country's modernisation movement, when the institution of the Confucian clan had reached its zenith.³ During this period, the 283 prefectures in our sample varied both in their adoption of modern banking and in the prominence of the clan, offering an ideal context in which to test our hypothesis about the clan and financial markets being substitutes. We measure each prefecture's clan strength using genealogy density, defined as the number of genealogy books per 10,000 population that had been compiled as of 1897. Genealogy books were written records of the lineage's male members since its inception. Importantly, they also contained clan rules transmitting Confucian teachings and prescribing a code of conduct for members, usually detailing rewards for conformity and punishment for violation. The ultimate purpose of these books was to promote clan solidarity and secure intra-clan intertemporal exchange. Our analysis finds that in regions with more dense genealogical records (genealogy), i.e., stronger Confucian clans, significantly fewer modern banks were established during the 1897–1936 period. For 1936, we find that doubling genealogy density reduces bank density by 5.6%. This suggests that strong clans impeded financial development.

Our key explanatory variable, clan strength, may proxy for omitted variables correlated with the development of modern banks. For example, historically impoverished regions may have developed greater reliance on the Confucian clan, and it might not have been profitable for modern banks to expand into poor regions. To address this concern, we measure clan strength using a prefecture's shortest great-circle distance to the nearest academy at which the Confucian master Zhu Xi (1130–1200 CE) taught. Zhu Xi played a crucial role in spreading the Confucian way of life at the grassroots level by encouraging every clan to build an ancestral hall. This was the centre of clan life, where all male members gathered at least once every three months to conduct ancestor-worship rituals. Between 1167 and 1194 CE, Zhu Xi frequently lectured on his operationalised version of Confucianism at three academies. Most of his 448 disciples were from prefectures that were close to these academies (Chan, 1982). Accordingly, his influence on nearby regions is expected to have been high. Furthermore, as these academies were located in neither economic centres nor remote towns, a region's distance from the nearest academy had nothing to do with regional economic conditions or accessibility. Consequently, the academies'

³ The first modern Chinese bank, the Imperial Bank of China (renamed the Commercial Bank of China in 1912), was founded in 1897. The second, now known as the Bank of China, was founded in 1904 (Wu, 1935).

impact on banking development 600 years later should only be through Zhu Xi's indoctrination and its continuing effect on local clan efforts. This exclusion restriction is confirmed by our randomisation inference tests in which we construct counterfactual spatial configurations of the academies at which Zhu Xi taught and find that the distance to the counterfactual academies has little effect on the distributions of clans and modern banks. Our instrumental variable (IV) results reinforce our baseline conclusion; the negative effect of clan strength on bank development becomes approximately 1.25 times stronger.

To examine whether the clan effect is driven by local factors that are not controlled for in our covariates or IV analyses, we conduct a placebo test that shuts down the clan competition channel. We repeat our main analysis by studying the spread of foreign and official banks from 1903 to 1936. The expansion of foreign banks in China in this period was primarily driven by the need to serve foreign-owned businesses and official banks were established to facilitate government activities. As the services provided by these banks did not compete with clan-based informal finance, they probably had little to do with local clans. Indeed we do not find a relationship between clan strength and the presence of foreign or official banks.

As the Confucian clan provided resource pooling services for its members, it is expected to have reduced their demand for and, hence, depress the price of external capital. Clan strength may also have reduced the cost of capital by strengthening local social order and trust, making intertemporal contracts more secure. We thus expect interest rates in regions with stronger clans to have been lower during the sample period. Indeed, based on private-loan data from the China Historical Interest Rate dataset in Chen *et al.* (2016), we find that interest rates during 1912–1936 were significantly lower in prefectures where clan structures were stronger, supporting our claim.

As Confucianism was at the heart of Chinese society for more than 2,000 years, it is appropriate to ask whether its teachings and value system continue to impact China's financial development today. Our final empirical analysis addresses this question of long-term persistence. Using data from the 2010 China General Social Survey (CGSS), we find that in prefectures with strong Confucian clans, people (1) tend to trust relatives more and outsiders less, (2) prefer not to use formal contracts in business with relatives, and (3) are relatively unlikely to borrow money from banks. Further, these prefectures have less per capita banking and a smaller banking sector relative to GDP. Taken together, these results suggest that Confucianism casts a long shadow on financial market development in China, with competition between the clan and modern banking ongoing today.

Consistent with Alesina and Giuliano's (2015) findings regarding how cultural institutions compete with and substitute for formal finance, we show that when clan solidarity is high, the influence of the clan-based order may dominate that of external financial markets. Our findings in China may also help to explain why formal financial development in Italy, Spain and Portugal has lagged behind that in the United Kingdom and the United States. We suggest that after the Counter-Reformation in southern Europe (Becker *et al.*, 2016), Italy and Spain retreated from financial development and sought to rebuild and strengthen their kinship clans for resource pooling and risk sharing, leading to the rise of the extended family and the stagnation or decline of formal finance.⁴ However, the cases of Italy and China have an important difference: the retreat

⁴ This should be especially true for Italy, as it was the most financially developed of all European countries before the late sixteenth century (Peyrefitte, 1995). Bentolila and Ichino (2008) document that Italy and Spain deal with unemployment shocks more effectively than the United Kingdom and United States do, not because of better financial markets or more unemployment welfare (as southern Europe scores lower in both dimensions) but because of tighter extended families (stronger clans).

from finance starting in the sixteenth century led Italy to reconstruct its clan institutions, whereas the excessive Confucian focus on the clan prevented the Chinese from developing an appetite for external finance. The advantages and disadvantages of intra-family risk sharing are studied in other contexts by Kotlikoff and Spivak (1981), Townsend (1994) and Alesina and Giuliano (2010), among many others. Formal financial institutions must contend with informal insurance and financing networks supported by local cultures.

Broadly, our study also contributes to the body of work on the effects of cultural and religious institutions on economic growth (e.g., Knack and Keefer, 1997; Guiso *et al.*, 2003; 2016; Becker and Woessmann, 2009; Grosjean, 2011; Voigtländer and Voth, 2012; Pascali, 2016; Giuliano and Nunn, 2017).⁵ In a related study, De la Croix *et al.* (2018) show that the guild-based apprenticeship institution in pre-industrial Europe promoted knowledge diffusion beyond bloodlines and led to development. Following this line of reasoning, we can infer from our findings that China's closed Confucian clan has constrained knowledge transmission beyond the kinship network and thereby hampered economic growth in historical China.

As mentioned earlier, existing studies usually assume that societies had different institutions or cultures at the beginning of the modern era, with distinct development outcomes. Following Greif and Tabellini (2017), however, our study takes us back to when China and the West diverged in their institutional development trajectories. That is, the divergence dates back at least to the Axial Age. At the dawn of the Industrial Revolution, China and the West had very different sets of institutions. Our empirical tests substantiate the claim that China's Confucian clan-centred institutions are not conducive to external finance.

Our work also relates to studies of the role of Confucian culture in China's economic development (Kung and Ma, 2014; Chen *et al.*, 2019). By documenting the negative effect of Confucianism on modern banking, our analysis contributes to the literature on the determinants of China's modernisation process in the late Qing dynasty (e.g., Goetzmann *et al.*, 2007; Yuchtman, 2017).

This paper has six parts. Section 1 discusses the economics of the Confucian clan. Section 2 presents the data used in our empirical tests. Section 3 studies the impact of the clan on the spread of modern banking in the early twentieth century. Section 4 investigates whether Confucianism reduces demand for external finance. Section 5 discusses the long-term impact of Confucianism on China's financial development, and Section 6 concludes the paper.

1. Economics of the Confucian Clan

Like other traditional societies, China has relied on the extended family for risk sharing and resource pooling for many millennia. However, what makes the Confucian clan unique is not its functional structuring of intra-clan intertemporal exchange but its diverse institutional elements, which have evolved since the time of Confucius (551–479 BCE). These innovations include the codification of rules and norms in genealogy books; the embodiment of the clan through physical facilities (e.g., ancestral halls and ancestor tablets for worship); the introduction of regularised ancestor-worship rituals; the development of a lineage estate trust holding land and other property; the provision of relief for impoverished and otherwise less fortunate members;

⁵ Moreover, Guiso *et al.* (2004; 2008) demonstrate that social capital (especially trust) plays a crucial role in shaping people's financial behaviour and development. D'Acunto *et al.* (2018) document a negative (long-term) effect of historical anti-Semitism on contemporary financial development.

and the structuring of the clan as a business.⁶ Combined with the original prescriptions formed by Confucius and his followers, these innovations transformed Confucianism from a loose collection of norms into an institution that organised daily life, similar to monotheistic religions. As a result, everyone's position in the stratified social hierarchy and his obligations to others were all as dictated by Confucian rules and remained unchanged for life. This constancy is what made such morality-based interpersonal resource pooling and sharing more secure than free will-based market exchange.⁷

Before the Song dynasty, the social engineering efforts by Confucian followers were focused more on tightening the nuclear and extended family, and less on perfecting the wider kinship clan. By the beginning of the period under examination (1897–1936), the Confucian clan had reached its zenith. It was a clearly regulated property ownership system in which the husband owned property rights in and of his wife and, likewise, the father owned property rights in and of his children; furthermore,

The head of the family was its eldest male member. . . . He held the title to all family property and he alone could dispose of it, as well as of the earnings and savings of all the family members. He settled the marriages of his children and signed the marriage contracts. . . . Furthermore, the law exonerated the father or grandfather who killed his son or grandson unintentionally when chastising him 'in a lawful and customary manner'. Nobody disputed the right of the head of the family to sell its members into slavery. (Lang, 1946, pp. 26–7)

This system of property rights was supported by filial piety, the highest moral principle in Confucianism. This ensures that children, in the eyes of parents, are secure and personalised instruments of investment and insurance for old age and sickness. To place our empirical work in context, we first highlight four aspects that made the Confucian clan a robust internal financial market for resource pooling and sharing. This internal financial market was resilient enough to fend off initial competition posed by formal finance during China's modernisation.

First, the rules guiding the bilateral rights and responsibilities of any two members of a Confucian clan were determined by their biological distance, generational gap, relative age and gender. In general, a smaller biological distance between members translated into a greater obligation to share property and income. A kinsman belonging to an older generation or who was older had more claim on the junior's property and income, whereas the latter bore more responsibility to care for the former. Likewise, a man had more seniority than a woman in entitlement claims (Lang, 1946; Ebrey, 2014).

Second, from the Song dynasty onward, clans became prominent owners of land and other property, the income from which was mostly used to pay for lineage festivals, weddings and funerals, children's education, rewards for success, disaster relief and assistance for poor clansmen, and to provide loans for business and emergency needs of clan members. A prominent Confucian scholar-official, Fan Chung-yen (989–1052 AD), created the Fan Clan Charitable Clan Estate in 1050, donating 1,000 acres of his own land as a permanent reserve. He also wrote a charter detailing the estate's operational rules and emphasised the need to help the poor and unfortunate among the Fan clan members (Twitchett, 1959). This model of the charitable estate was widely replicated across the country until the twentieth century (Feng and Yan, 2012).⁸ The resulting

⁶ See Baker (1979, chs 3 and 4) on the organisation of the Chinese Confucian clan and its lineage. Ebrey (2014) gives a detailed account of how Confucian clan structuring was conceptualised and implemented by Zhu Xi and other scholars during the Song and Ming dynasties.

⁷ For more on this, see the references cited in Note 6.

⁸ For example, during the Qing dynasty, a Confucian scholar-official named Zhang Zhao established a 'coffin home' fund (*zhangshi yizhuang*) for his clan in Songjiang prefecture (where Shanghai is located today). He donated 1,000 mu

charitable estates not only gave the Confucian clan a tangible presence and elevated its risk sharing function, but also boosted its appeal to members and increased clan solidarity.

Third, under Confucianism, the formal code recognised property rights as held at the level of either the nuclear family or the *tang* (Zelin, 2005), rather than at the individual level. A *tang* (literally the short version of the Chinese term for ‘ancestral hall’) was a fictional corporate entity. For business purposes, the clan was treated as the equivalent of a Western corporation, owning land and other assets and conducting business on behalf of clan members.⁹ For example, a group of clan members could pool assets and set up a *tang* in the name of a deceased common ancestor. A clan could have just one *tang* with all clan members as its shareholders, or it could have multiple *tangs* located at different nodes along the clan tree. Clan members were expected to support other members in starting businesses or during times of need. Secured by Confucian norms and clan rules, these *tangs* were instrumental for intra-clan fund raising for business ventures, providing a trusted form of internal financial intermediation for economic growth in pre-modern China (Faure, 1989; Shiroyama, 2004; Zelin, 2005).¹⁰ However, as unlimited liability organisations, *tangs* were largely unable to pool resources and spread risk beyond the clan’s own membership, limiting their ability to scale up and compete with modern corporations in the industrial age (Kirby, 1995).

Finally, prior to the Song dynasty, genealogy and ancestral halls were the exclusive privilege of the aristocratic class. However, starting in the late Song dynasty, both practices were popularised to the grassroots level, with the genealogy expanded to include clan rules operationalising Confucian principles, prescribing a code of conduct and stipulating corresponding rewards and punishments (Liu, 1959). With every clan permitted to construct its own ancestral hall, clan members had a physical place to gather and worship ancestors together at least once each quarter and during festivals. The ancestral hall was also where banquets for births, weddings and funerals took place. One key function of such regular gatherings was to allow members to gather information about each other and monitor kinsmen’s behaviour. If they discovered free-riding, the clan’s elders would issue early warnings, addressing the moral hazard that might arise from informal clan-based resource sharing. Thus, the genealogy and ancestral hall became two key devices for strengthening solidarity and building cohesion among clan members. Yet while some regions were quick to adopt both devices, others were less responsive. In this study, we rely on genealogy book data to measure the intensity of Confucian clans’ influence in each region, given the lack of usable ancestral hall data across regions.

After more than two millennia of collective effort and development, the Confucian system centred around the clan worked reasonably well in pre-industrial China. It provided adequate resource pooling for business and risk sharing for everyday life and supported the largest economy in the world for hundreds of years (Faure, 1989; 2006; Zelin, 2005; Pomeranz, 2009). It was largely the only effective interpersonal cooperation medium on which people could securely depend. However, this success came at a high price: the Chinese intellectual elites had no

(approximately 164.8 acres) of land to the coffin home fund. The land was put to productive use and the revenue was used to support clan members in need.

⁹ After the British came to Malaysia and Hong Kong in the nineteenth century, a number of lawsuits occurred concerning whether a Chinese *tang* should have the same standing as a ‘legal person’ in a British court as a corporate entity. The British court ruled that it did not, forcing most Hong Kong *tangs* to re-incorporate in the 1920s and 1930s. See Chung (2010).

¹⁰ Billy So (2001) notes that Chinese merchants engaged in ocean trade during the Song dynasty often relied on their own capital, including capital raised from kinsmen, which limited their scale of trade when compared to Arab Muslim traders who could more easily scale up by using financing structures such as *commenda* to obtain trade capital beyond bloodlines. See So (2001, pp. 213–6).

incentive to develop the impersonal institutions needed for formal financial development (Kirby, 1995). For example, the Qing Dynasty Code had only 31 sections (out of a total of 2,354) devoted to commercial matters, treating them almost as a footnote (K. Peng and Lin, 2020). The Qing state largely left commercial and financial matters to the clans and grassroots associations (Cohen *et al.*, 1981), which made the clan effectively the *de facto* enforcer of property rights and civil rules (unless a dispute led to someone being killed).¹¹ Furthermore, the success of the Confucian clan in meeting members' multiple needs also served to entrench it as an institution and made Confucian scholar-officials more interested in defending it against potential competitors, such as external financial markets. In sum, the long-term success of the Confucian clan as an internal financial market worked against the development of formal finance in two ways: it depressed the demand for and limited the supply of external finance.

After the Opium War of 1839–1841, which revealed the power of Western technology and large-scale capital mobilisation, Chinese elites were forced to adopt Western financial institutions, such as modern banking, joint-stock limited-liability corporations and formal securities markets (Kirby, 1995; Goetzmann *et al.*, 2007). This pitted the clan, as the incumbent facilitator of resource pooling, against formal arm's-length finance as the newcomer. The sections to follow use both the cross-regional results from that competition and recent survey data to test this claim.

2. Data Description

From the late nineteenth century to the early twentieth century, while Confucian influence was still in its heyday, China saw the creation of modern financial markets. Modern banks were introduced by the British and other Europeans after the country was forced to open in 1842. In 1897, Chinese elites began to set up their own modern banks. This provides us with a unique historical context to examine the effect of Confucian culture on financial development. Another unique advantage of the 1897–1936 period is that financial development was primarily manifested through the rise of modern banking, rendering the measurement of financial development cleaner and more uniform than that of other markets at the time.

2.1. Banks

To measure financial development, we use the number of modern Chinese banks (and branches) operating in each prefecture in 1936 as our primary metric. After the first modern Chinese bank, the Imperial Bank of China (*Zhongguo tongshang yinhang*), was established in 1897, the banking industry followed a sustained growth trajectory and reached nearly 2,000 banks (including branches) by 1936, covering 73% of the prefectures across China proper (Figure 1).¹² We use 1936 as the end year because the Sino-Japanese war broke out in 1937, complicating the socioeconomic environment. The bank data are obtained from Lin *et al.* (2021), who count the banks in each prefecture using historical archives and gazetteers (*xianzhi*) compiled between 1933 and 2018.

¹¹ Rowe (1998), for example, notes that during the eighteenth century, lineage headmen had considerable judicial and disciplinary powers over their kinsmen, effectively playing a large role in maintaining local rule and order. In historical China, the state apparatus stopped at the county level, leaving all 'smaller' matters to the clans and grassroots organisations to handle.

¹² 'China proper' refers to territory included under the regular province-county administration, excluding some frontier areas that had alternative forms of administration.

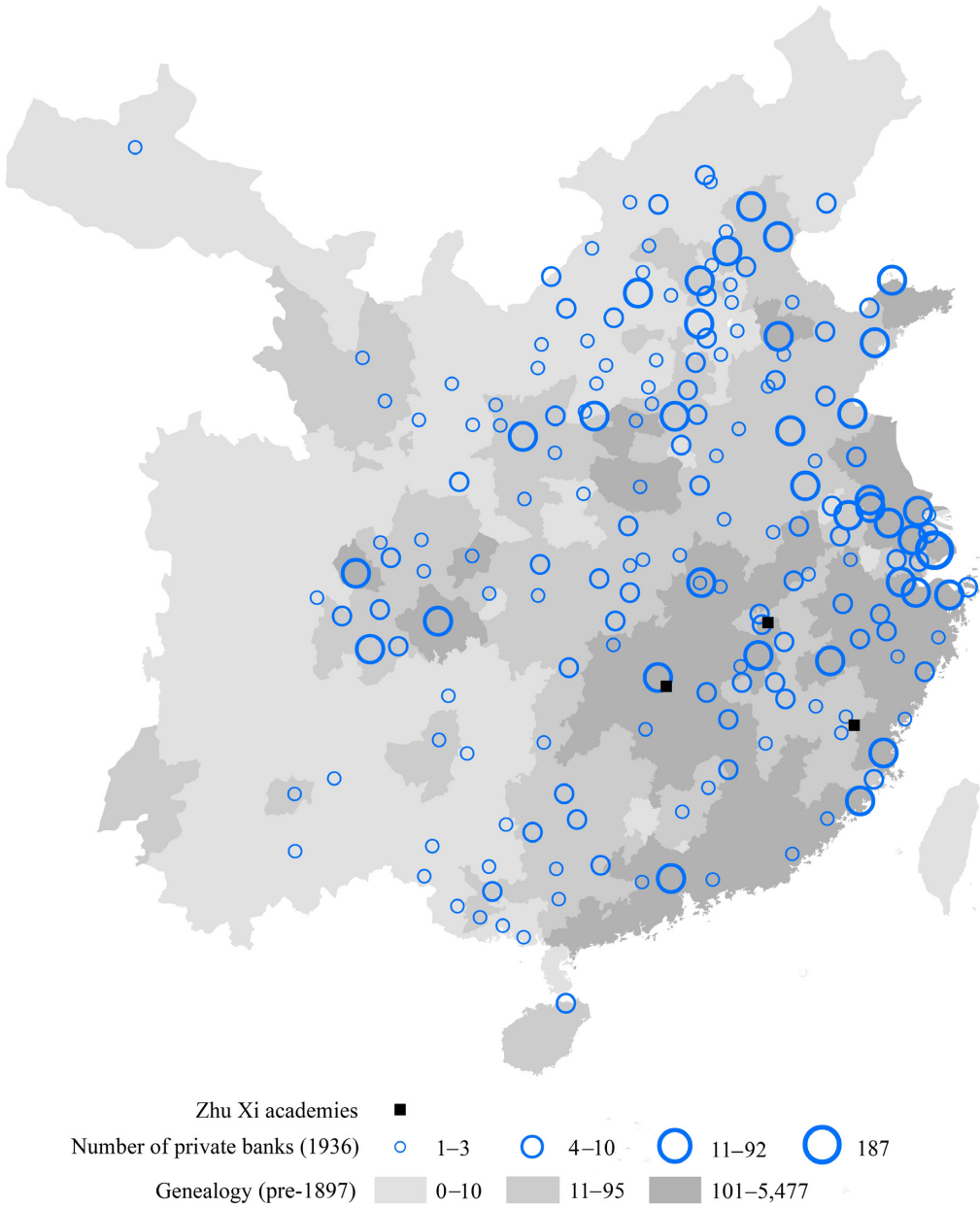


Fig. 1. Prefectural Distribution of Chinese Modern Banks and Genealogy Books.

Notes: This figure depicts the prefectural distribution of the number of Chinese private modern banks in 1936 and that of the genealogy books compiled before 1897 (when the first Chinese modern bank was established). The data on banks are obtained from county gazetteers (*xianzhi*) and banking yearbooks (*yinhang nianjian*) compiled in 1912–1937. The data on genealogy books are obtained from Shanghai Library’s (2009) *zhongguo jiapu zongmu* [Comprehensive catalogue on the Chinese genealogy]. The three black points are the locations of the main academies where the neo-Confucian master Zhu Xi spread his philosophy in the twelfth century.

Specifically, following Stauffer (1922), we define bank density, *banks*, for each prefecture as the number of banks per 10,000 members of the prefectural population in 1920, the last year prior to 1936 for which prefectural population data are available. To attenuate the effect of outliers, our main measure is the natural logarithm of bank density (plus 1), i.e., $\ln(\text{banks} + 1)$. To gauge the growth of banks between 1897 and 1936, we use the annual average number of modern Chinese banks operating in each prefecture between 1897 and 1936 as an alternative outcome variable. We normalise it by the average prefectural population between 1910 and 1920 and take the natural logarithm (plus 1).¹³

2.2. *The Confucian Clan*

As stated by Greif and Tabellini (2010; 2017), the Confucian clan was the predominant medium of cooperation from the Song dynasty onward. To measure the strength of the clan in a prefecture, we use the number of genealogy books compiled in the prefecture before our period of analysis. Genealogy books not only recorded lineage members and relationships to solidify a sense of belonging and promote lineage cohesion (Bol, 2008), but also specified clan rules for members to follow, with ‘carrots’ detailed for conformity and ‘sticks’ for deviation (Liu, 1959). We can thus infer that regions that cared more about clan solidarity, and hence devoted more effort to organising clans, kept more genealogy books.

The genealogy data are obtained from Shanghai Library’s (2009) comprehensive catalogue on Chinese genealogy (*Zhongguo jiapu zongmu*). The catalogue contains the genealogies of up to 52,306 clans, including more than 700 surnames across 283 prefectures, in China. After excluding incomplete records (missing location and/or compilation year) and records outside China proper, there are 41,370 clan records for use in our study. The majority of these genealogy books were compiled during the Ming and Qing dynasties (1368–1911). We use books compiled before 1897, the year of establishment of the first modern bank, as our primary measure of clan strength (*clans*). By doing so, we avoid any reverse causality from financial development on Confucian clans’ strength. Similar to our construction of bank density, we calculate genealogy density as the number of genealogy books¹⁴ per 10,000 members of the population in the prefecture (based on the population averaged over the 1393–1851 period).¹⁵ The distribution of genealogy density is highly skewed, as a few prefectures have considerably more genealogical records than the others (Online Appendix A, Figure A1). To mitigate bias from extreme values, we remove the top 5% tail (13 prefectures) of genealogy density and take the natural logarithm of (1 plus) this variable.¹⁶

The genealogy sample in the Shanghai Library’s catalogue may exhibit survivorship bias, as some genealogy books may have disappeared or been destroyed before 2009, and the survivorship patterns may differ from one prefecture to another. However, this survivorship bias should strengthen our proxy for Confucian influence because genealogical records were more likely

¹³ Population data in 1910 are obtained from Cao (2001).

¹⁴ We also use the total number of unique volumes of genealogy books (normalised by population size) in each prefecture as an alternative measure of clan strength. The reasoning is that stronger clans would compile their genealogy in more detail and thus produce more volumes. The results obtained using the volume measure (not reported) are similar to those reported in this paper.

¹⁵ Cao (2001; 2017) provides estimates of prefectural population for the years of 1393, 1580, 1630, 1680, 1776, 1851, 1880 and 1910. We drop 1880 because the unprecedented population losses during the Taiping rebellion (1850–1864) had not been recovered by then. We also drop 1910 to avoid the feedback effect from bank development.

¹⁶ The results remain consistent when we use the full sample (284 prefectures) and hence are not reported separately.

to survive in prefectures that historically had strong Confucian adherence and powerful clans. Moreover, the geographic distribution of genealogy books (Figure 1) is consistent with historical narratives of the distribution of clans: southern and south-eastern China (especially Zhejiang, Fujian, Anhui and Guangdong provinces) cared more about clans than northern and western China did (Zheng, 2001; Szonyi, 2002). This suggests that our genealogy records at least do not suffer obvious systematic survivorship bias in terms of geographic distribution. We return to this issue when discussing the IV approach in Section 3.

2.3. *Geographic Controls*

We control for the following geographic factors that may be correlated with both clan strength and financial development.

China's modernisation began with the treaty ports—the territorial concessions given to Western powers, beginning with the Treaty of Nanjing in 1842. Under Western influence, modern banks were established in the treaty ports before expanding to inland areas. Meanwhile, the Confucian ethos was gradually undermined by Western culture in or near the treaty ports. We control for the spillover effect of the treaty ports using the shortest distance from a prefecture to its nearest treaty port established before 1897. Furthermore, given the institutional differences between the treaty port prefectures and the traditional inland prefectures, we remove from our analysis the 26 prefectures where treaty ports were established before 1897. Doing so also helps attenuate the outlier concern in bank data. For example, Shanghai, as a treaty port, had 187 banks by 1936, twice as many as the second highest prefecture and 33 times the sample mean (Figure 1).¹⁷

Historically, China had a considerable east–west divergence, with eastern China being more developed and prosperous. Accordingly, clans and banks were more concentrated and more developed in eastern China (Figure 1). Thus, the effect of the Confucian clan on banking is subject to this inherent east–west difference. To address this concern, we include a control dummy for eastern China that takes a value of 0 for prefectures in the five western provinces (Gansu, Guangxi, Sichuan, Guizhou and Yunnan) and 1 otherwise.¹⁸

In addition, we control for distance to the coast, distance to the nearest navigable river, and whether a prefecture was a provincial or national capital using data from the China Historical Geographic Information System (2016). Summary statistics for all the variables are reported in Online Appendix A, Table A1.

3. Confucianism and Modern Banking

Our empirical analysis focuses on the hypothesis that the Confucian clan competed with and impeded the development of modern banking in the late nineteenth and early twentieth centuries, and that more modern banks were adopted in regions with a relatively weak clan presence. We first illustrate this pattern in Figure 2 by simply dividing the sample prefectures into two groups—the strong and the weak clan regions—at the sample mean of clan density and comparing their respective numbers of banks on a five-year basis between 1896 and 1936. Clearly, more banks were established in the weak clan regions. This difference becomes even greater when we restrict the sample to the more homogenous eastern China.

¹⁷ The distribution of treaty ports is obtained from Yan (1955).

¹⁸ We also drop the prefectures of western provinces and obtained consistent results with those of the full sample (not reported).

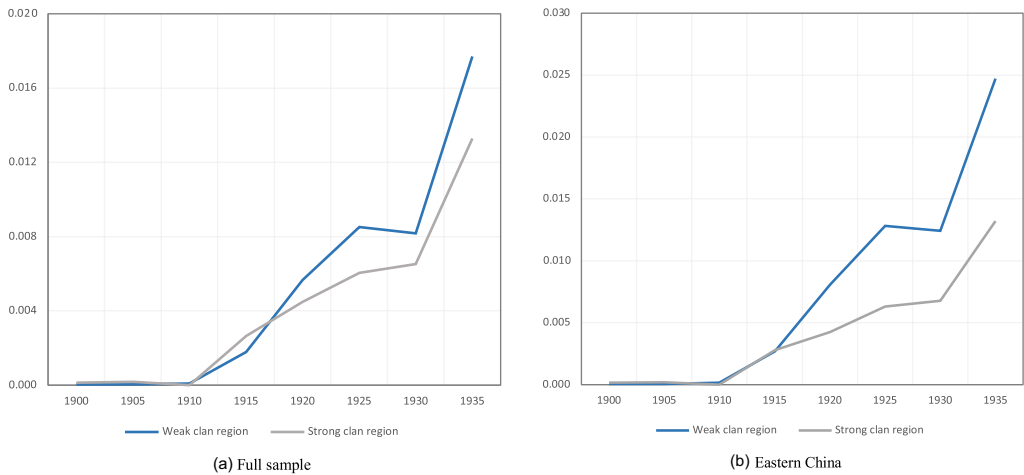


Fig. 2. Banking Development between Strong and Weak Clan Regions.

Notes: Banking development is measured by the average annual number of banks in each five-year interval between 1896 and 1935 (normalised by 10,000 population in 1910). ‘Weak clan region’ refers to the prefectures whose number of genealogy books per 10,000 people in 1896 is below the sample mean (0.36) of all 284 prefectures, whereas prefectures above this mean are defined as strong clan regions. We exclude 36 prefectures that were treaty ports or had an outlier number of clans (top 5% tail) by 1897. To mitigate geographic and economic heterogeneities, as shown in (b), we further exclude the five frontier provinces in western China (Guizhou, Yunnan, Guangxi, Sichuan and Gansu).

To formally test the effect of the Confucian clan on banking, we estimate the following cross-sectional regression:

$$Banks_i = \alpha + \beta Clans_i + \gamma X_i + \varepsilon_i, \quad (1)$$

where $Banks_i$ is the natural logarithm of (1 plus) the modern bank density in prefecture i in 1936, $Clans_i$ is the natural logarithm of (1 plus) the genealogy density compiled in prefecture i before 1897, and X_i is a vector of geographic control variables as described in Subsection 2.3. We use heteroscedasticity-robust standard errors. In addition, to deal with potential spatial correlation among the residuals, we cluster the standard errors within a radius of 136 kilometres based on Colella *et al.* (2019). We choose 136 kilometres because it is the average distance between two adjacent prefectural seats. Clustering by this radius thus approximately covers the banks of adjacent prefectures.¹⁹

The results from estimating equation (1) are reported in Table 1. We first examine the univariate clan effect on banking (column 1), before controlling for other factors. The ordinary least squares (OLS) estimation shows that the Confucian clan has a significantly negative effect on bank density, and this effect becomes greater and more significant after controlling for geographic factors (column 2). The clan coefficient of -0.05 implies that doubling the average clan density for a prefecture decreases bank density by 5%.

¹⁹ We also use greater radii, such as 204 kilometres that approximately cover the next ring of adjacent prefectural seats. This has little influence on the clan effect (not reported).

Table 1. *Clan and Banking Development in 1897–1936.*

	Banks 1936	Banks 1936	Banks 1936	Banks 1936	Banks 1936	Banks 1936	Average banks 1897–1936
	OLS	OLS	OLS	OLS	OLS	Tobit	OLS
	1	2	3	4	5	6	7
Clan	-0.027 (0.014)* [0.016]*	-0.050 (0.018)*** [0.018]***	-0.049 (0.014)*** [0.015]***	-0.051 (0.014)*** [0.016]***	-0.056 (0.015)*** [0.017]***	-0.068 (0.025)***	-0.009 (0.002)*** [0.002]***
Geographic controls		X	X	X	X	X	X
Industrial firms			X	X	X	X	X
Commercialisation			X	X	X	X	X
Urbanisation rate			X	X	X	X	X
Telegraph				X	X	X	X
Post offices				X	X	X	X
Protestantism					X	X	X
<i>Jinshi</i> degree holders					X	X	X
Civil conflicts					X	X	X
Observations	236	236	236	236	236	236	236
R ²	0.007	0.090	0.093	0.104	0.141		0.422

Notes: The dependent variable is the log number of Chinese modern banks in each prefecture in 1936 in columns 1–6, and the log annual average of the number of Chinese modern banks in each prefecture between 1897 and 1936 in column 7. We normalise the number of banks by population in 1920 in columns 1–6 and by the average population of 1910 and 1920 in column 7 (in units of 10,000). Clan is measured by the number of genealogy books that had been compiled by the year 1896 in each prefecture. We normalise the number of genealogy books by the average population between 1393 and 1851 (in units of 10,000) and take the logarithm. Geographic controls include distance to treaty ports in 1896, distance to river, distance to coast, distance to province capital and an eastern China dummy. Robust standard errors are given in parentheses. Standard errors in brackets are clustered within a radius of 136 kilometres to account for possible spatial correlation based on Colella *et al.* (2019). ***, ** and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

3.1. *Additional Controls*

The distribution of clans and modern banks may be related to a gamut of other factors. An obvious one is the need for finance arising from economic development. To the extent that clan formation was an endogenous response to needs, people in a region could respond to increasing demands for financial intermediation by either forming more clans and making them stronger or by developing more financial markets if this was feasible and the appropriate institutional infrastructure existed. For regions lacking economic growth opportunities, the need for more clans or more external finance would not arise.²⁰ This may partly explain why prefectures in the historically prosperous southern and south-eastern China exhibit higher clan density than northern and western China (see Figure 1). We control for the impact of regional variation when assessing the need for resource pooling.

During our sample period, financial needs were mainly driven by rising industrialisation and growing trade and commerce after China began to open up in 1842 (Rawski, 1989). We proxy for industrial development using each prefecture's number of modern industrial firms per 10,000 people in 1896. We also proxy for commercialisation using the total number of members in each

²⁰ Greif and Tabellini (2017) point out that time variation in the national aggregate of genealogy books reflects political changes. The decision to form a new clan in a village was clearly endogenous and a function of need, feasibility and manageability (there was a limit to how large a clan could be before it became unmanageable). Therefore, the time-series variation for the national number of genealogy books should at least partly reflect the country's time variation in economic activity and risk event frequency (i.e., needs). An in-depth investigation of the exact functional relation between needs and clan formation is beyond the scope of the present paper, but we control for this effect through the inclusion of needs-related proxies.

prefecture's local chambers of commerce (per 10,000 people) in 1913. In addition, we control for each prefecture's urbanisation rate in 1910 to capture overall economic prosperity as financing needs are higher in more prosperous areas.²¹

It is also possible that the inaccessibility of remote regions caused both a decrease in banking, due to high costs, and an increase in clan activity, because residents were more likely to be bound together and forced to form strong clans. However, historical evidence suggests that regions dominated by clans (especially southern and south-eastern China) were usually not closed or inaccessible but rather prosperous due to trade and market integration built on their comprehensive river and courier networks. Beginning in the late nineteenth century, many regions were also connected by the telegraph, a communication medium that was instrumental in expanding banking at the time (Lin *et al.*, 2021). To rule out this channel, in which clan strength simply proxies for inaccessibility, we not only include the geographic controls described earlier but also adjust for both the number of telegraph stations and the number of postal offices in each prefecture in 1896.²²

Protestant Christianity, which was arguably instrumental to capitalist growth (Weber, 1930), competed with Confucianism during our period of analysis. Protestant missionaries brought to China not only a new religion but also Western institutions and 'useful knowledge' for economic development (Chen *et al.*, 2014; Bai and Kung, 2015). Thus, Protestant activities may have undermined the strength of Confucian influence. For example, if clan strength and Protestant influence were simply alternatives, the negative clan effect on banking might be confused with the positive impact of Protestantism rather than reflecting competition between the clan and banks. To account for this possible channel, we control for the number of Protestant missionaries per 10,000 people in each prefecture in 1920.²³

Regional clan strength is known to be associated with human capital achievements. To help sons compete in the imperial civil examination,²⁴ a resourceful clan would typically provide support by hiring tutors, acquiring books and paying for schools. Thus, regions with a strong clan culture enjoyed more *jinshi* (the highest imperial civil exam grade) degree winners (Twitchett, 1959; Elman, 2013). Such regions were more likely to prioritise academic achievement (human capital) over business and banking ventures in the early twentieth century, and thus local elites were more interested in academic work rather than establishing new banks. In this case, the negative relationship we document between clan strength and bank development might be driven by the correlation of clan strength with a culture of academic achievement. To rule this out, we control for the number of *jinshi* holders in a given prefecture during the entire Ming–Qing period (1368–1905), capturing its human capital culture and normalised by the average population between 1393 and 1851.²⁵

Last but not least, we control for the number of civil conflicts between 1918 and 1928, a period popularly known as the Warlords Era, when China was divided and controlled by various military

²¹ Data on firms, commercialisation and urbanisation rate are obtained from Du (1991), Cao (2001) and Lin *et al.* (2021), respectively.

²² Data on the telegraph and post offices are obtained from Lin *et al.* (2021).

²³ The data are obtained from Stauffer (1922) who surveys the distribution of Protestants across Chinese counties in 1920. The results are similar when using the density of Protestant communicants or churches as measures of Protestant influence.

²⁴ Since the seventh century, the imperial civil examination was offered once every three years and used to select about 250 candidates per cohort from the entire nation for appointment to senior government positions. This practice was abolished in 1905.

²⁵ The *jinshi* data are obtained from Zhu and Xie (1980).

cliques. It is possible that regions with strong clans experienced greater conflicts,²⁶ causing more interruption to financial development. If so, the occurrence of conflict rather than clan strength may have overwhelmed and hampered bank development. Thus, we adjust for this possibility.²⁷

As shown in Table 1, we gradually include the above-mentioned controls into our regressions in order to correct for other effects and rule out other channels. Specifically, column 3 controls for financial needs: density of industrial firms, commercialisation and urbanisation. Column 4 further controls for accessibility: the number of telegraph stations and post offices. Column 5 considers Protestantism, *jinshi* holders and warlord conflicts. The results confirm the baseline claim that the clan still had a significantly negative impact on bank density. Moreover, conditional on the full set of controls, the clan effect (-0.056 in column 5) is now slightly greater than that with only the geographic controls (column 2), suggesting that the clan effect may be underestimated if we do not adjust for the many correlates and possible channels.

Given that 36% of the prefectures in our sample had no banks in 1936, we also run a tobit estimation, with the results remaining robust (Table 1, column 6). Finally, we find a similar negative effect of the Confucian clan on banking when using the average number of modern banks each year between 1897 and 1936 (column 7).

3.2. Instrumented Results

After controlling for various effects and ruling out several channels, as shown in Table 1, our estimated clan impact on banking may still be biased due to unobserved prefectural factors. For example, given that Confucianism was the state orthodoxy, prefectures with stronger Confucian clans may also have had more powerful local governments, inhibiting bank development. In addition, clan strength may be associated with strong general social capital, which is conducive to economic development (Guiso *et al.*, 2004; 2008). Another factor to consider is measurement errors in the number of genealogy books due to survivorship bias, as discussed in Section 3 (i.e., the bias could underestimate the real effect of the clan on financial development). To address these possible concerns and further establish the Confucian clan as the main channel stifling banking, we additionally use each prefecture's shortest distance to the nearest Zhu Xi academy in the twelfth century as an IV. It is plausible that this instrument only affected modern banking growth 600 years later through its effect on regional clan strength, as explained below.

As mentioned in the introduction, Zhu Xi was the most important figure responsible for popularising Confucianism, especially the Confucian clan, in grassroot communities from the twelfth century onward. His philosophy developed and spread during his teaching at Yuelu Academy in Changsha (in Hunan province), Hanquan Academy in Jianyang (Fujian) and Bailudong Academy in Jiujiang (Jiangxi), as displayed in Figure 1. We refer to these as 'Zhu Xi academies'.²⁸ At these academies, he completed several classical texts, such as *Rituals of the Family*. These classics provided operational details on how the Confucian clan should be organised and this

²⁶ As noted by Rowe (1998), during Chen Hongmou's tenure as the governor of Jiangxi province in the mid-eighteenth century, he greatly expanded the rule-making and enforcement power of the head of each clan, which helped to strengthen the clan's cohesion and solidarity. But, to the emperor's dismay, the strong clans also led to increased frequency of inter-clan conflicts, including the establishment of clan militias. There appeared to be a link between clan strength and inter-clan violence.

²⁷ Data on civil conflicts are obtained from Shizhengchu (1967).

²⁸ Zhu Xi spent about 10 years at Hanquan Academy and four years at Bailudong Academy. Although he spent only a year at Yuelu Academy, he formed and spread his main ideas about the Confucian clan while there, leaving a significant intellectual legacy (Shu, 2003).

organisational structure was widely adopted from the thirteenth century to the nineteenth century (Ebrey, 2014).

Meanwhile, Zhu Xi recruited students and invited renowned Confucian scholars to lecture at his academies (Shu, 2003). Between 1150 and 1200, 448 disciples studied under Zhu Xi. These disciples came from 58 nearby prefectures (Chan, 1982) (Online Appendix A, Figure A2), and they not only spread Zhu Xi's teachings across several regions but also reprinted his books and wrote commentaries from various perspectives (Chan, 1987). The curricula and learning methods of the Zhu Xi academies became the standard for both official and private schools in the succeeding dynasties. More importantly, Zhu Xi's books were required reading materials for the imperial civil examinations from the fourteenth century to 1905. These various channels helped to diffuse his version of Confucianism and thus the Confucian clan (Shu, 2003).

Given the high costs of transport and communication at the time, regions close to the Zhu Xi academies were probably influenced sooner by Zhu Xi's teachings. Over time, these regions would have developed a stronger clan culture compared with more distant regions, especially after the founding emperor of the Ming dynasty adopted Zhu Xi's design for the Confucian clan as a model to be followed throughout the empire. Indeed, Figure 1 shows that genealogy books were concentrated in regions close to the Zhu Xi academies with far fewer genealogy books in remote prefectures (in the north and the west). To formally test the impact of proximity to the Zhu Xi academies on the diffusion of clan culture, we regress each prefecture's clan density on its shortest distance to any Zhu Xi academy, in which the distance is divided into 15 bins (dummies) of 100 kilometres. The results in Figure 3(a) show that clan density in the post-Zhu Xi era (1200–1896 CE) significantly declines with distance to the Zhu Xi academies. As a placebo, Figure 3(b) presents no such relation in the pre-Zhu Xi era (282–1130 CE). By proxying for the increasing difficulty in diffusing clan culture, distance to the Zhu Xi academies predicts modern banking development after 1897. Figure 3(c) and (d) show that both bank density in 1936 and the average bank density between 1897 and 1936 increase significantly with the distance bins.²⁹

Distance to the Zhu Xi academies should arguably be orthogonal to economic and financial development in the early twentieth century. Our two main justifications are as follows. First, Zhu Xi did not choose to teach in the three academies but was there by coincidence. Specifically, Zhu Xi built Hanquan Academy in Jianning, Fujian province, because his mother was buried there. Under Confucian mourning rituals, a son must stay near his mother's tomb for at least one year. During this period, Zhu Xi established Hanquan Academy and resided there for 10 years before he was appointed by the Prime Minister as the Prefect of Nankang (in Jiujiang, Jiangxi) in 1178. One year later, Zhu Xi rebuilt the prestigious Bailudong Academy there, developing new curricula based on his neo-Confucian principles. In 1193, Zhu Xi was appointed a governor of relief in Changsha, Hunan province, where he seized the opportunity to introduce his philosophy and curricula to Yuelu Academy in Changsha (Shu, 2003). Given that his official appointments and mourning rituals were not chosen by Zhu Xi, the three academies were arguably 'selected' by exogenous forces.

Second, the Zhu Xi academies were located in neither economic centres nor backward regions. Accordingly, a prefecture's shortest distance to these academies does not explain its economic

²⁹ In other words, using this distance metric as the IV for genealogy density, we estimate the supply effect of Zhu Xi's philosophy on the formation and strengthening of clans, rather than the demand effect. The supply effect is based on geographical proximity to Zhu Xi's academies and hence is more exogenous, whereas the demand for clan solidarity might be endogenously determined by local factors that might also bear on the demand for finance.

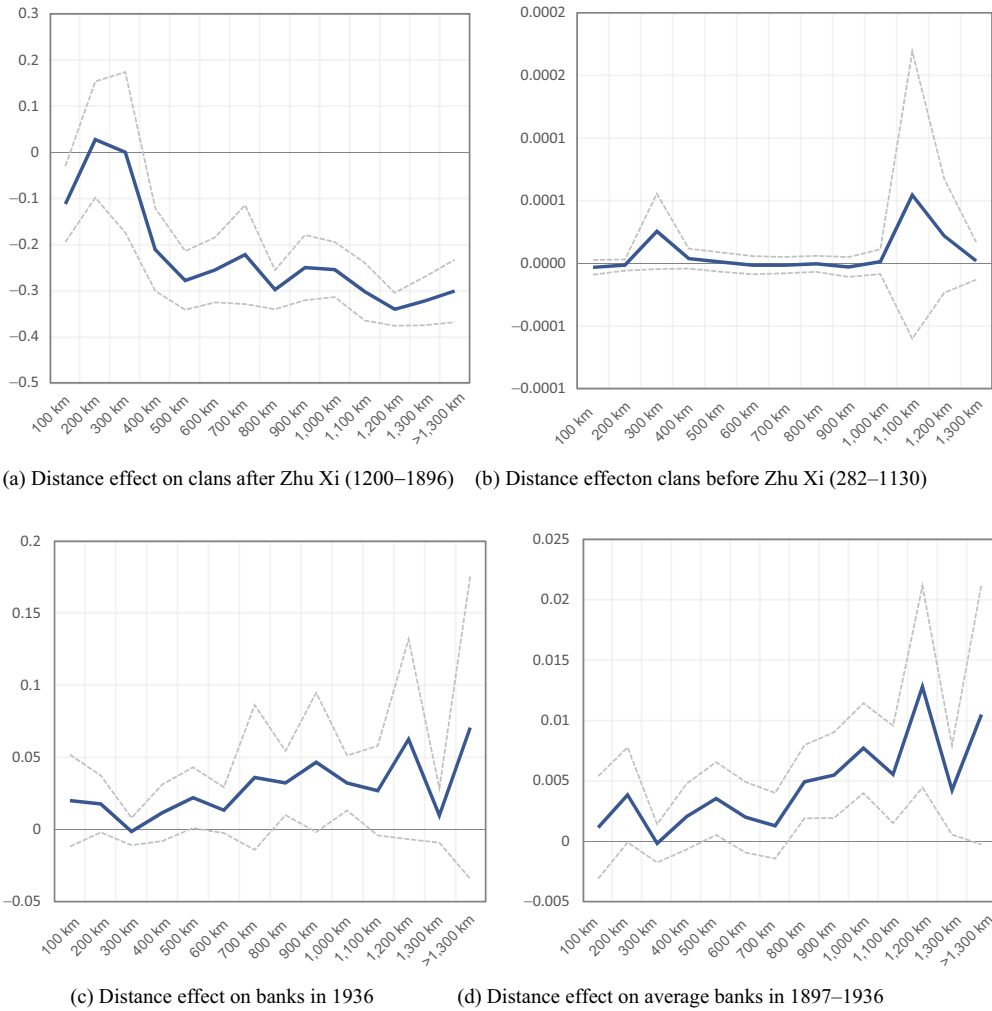


Fig. 3. *Effect of Distance to Zhu Xi Academies on Clans and Banks.*

Notes: Point plot coefficients (and 95% confidence intervals) are estimated by regressing the outcome variable on 100-km bins of distance to the Zhu Xi academies in the twelfth century. Panels (a) and (b) compare the relative importance of distance to the Zhu Xi academies in shaping the distribution of clan genealogy density before and after Zhu Xi’s time. Panels (c) and (d) report the reduced-form effect of distance to the Zhu Xi academies on banking development as respectively measured by the log number of modern banks per 10,000 people in each prefecture in 1936 and the log average number for each year between 1897 and 1936. All regressions control for distance to river, distance to coast, distance to provincial capital and an eastern China dummy.

prosperity as measured by commercial tax and population density between 976 and 1102 (Table 2, columns 1–3). Neither does distance predict long-term development as measured by each region’s urbanisation, commercialisation and industrialisation in the early twentieth century (columns 6–8). In addition, the prefectures close to the Zhu Xi academies were neither remote nor less accessible, as evidenced by the low correlation between their distance to the academies and

Table 2. Balance Check of the Instrumental Variable.

	Commercial tax in 1077	Population density in 976	Population density in 1102	Jinshi degree holders in 960–1279	Jinshi degree holders in 1368–1905
	1	2	3	4	5
Distance to Zhu Xi academy	0.113 (0.163) [0.198]	0.018 (0.149) [0.237]	-0.172 (0.129) [0.180]	-0.524 (0.146)*** [0.132]***	0.004 (0.066) [0.089]
Observations	212	212	212	208	247
R ²	0.118	0.118	0.221	0.151	0.163
	Urbanisation rate in 1910	Industrial firms in 1927	Commercialisation in 1913	Telegraph in 1881–1936	Post offices in 1881–1936
	6	7	8	9	10
Distance to Zhu Xi academy	-0.068 (0.102) [0.139]	0.008 (0.005) [0.005]	-0.169 (0.125) [0.181]	0.140 (0.142) [0.146]	0.153 (0.168) [0.206]
Observations	247	236	247	247	247
R ²	0.165	0.326	0.254	0.292	0.263

Notes: The instrumental variable, distance to a Zhu Xi academy, is measured by a prefecture's shortest great-circle distance (in 100 km) to the nearest Zhu Xi academy in twelfth-century China (in logarithm). All dependent variables are in logarithm form except for those in columns 7 and 8. All results are from OLS estimates conditional on the same full set of geographic controls as in Table 1 (except for the distance to treaty ports). Robust standard errors are given in parentheses. Standard errors in brackets are clustered within a radius of 136 kilometres to account for possible spatial correlation based on Colella *et al.* (2019). ***, ** and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

development of communication in the nineteenth century (telegraph and post offices) (columns 9 and 10). However, distance to the academies has a significantly negative correlation with the density of *jinshi* degree holders during the Song dynasty (column 4).³⁰ This suggests that the Zhu Xi academies might have had a spillover effect on human capital in nearby regions at the time. However, this is not a serious concern, as this spillover effect disappeared in the subsequent Ming–Qing period (1368–1905) (column 5), and we control for each prefecture’s *jinshi* density in the estimations.

To further confirm the exclusion restriction of this IV, we follow the randomisation inference approach to construct counterfactual spatial configurations of Zhu Xi academies. We compare the distance to the counterfactual academies with the distance to the actual ones in terms of its effect on clan strength and bank development. Specifically, if Zhu Xi had chosen his teaching places at will, as a scholar he would have most likely selected academically vigorous areas. We thus obtain counterfactual Zhu Xi academies from prefectures that had academies during Zhu Xi’s lifetime or where the density of *jinshi* degree holders was above the national median during the Song dynasty.³¹ In total, there are 54 prefectures with academies and 90 with above median numbers of *jinshi* degree holders, after excluding the prefectures with actual Zhu Xi academies and their adjacent prefectures.³²

From this remaining subset, we randomly draw three counterfactual Zhu Xi academies and repeat this process 2,000 times, resulting in 2,000 sets of counterfactual academies.³³ Then, for each set, we use a prefecture’s distance to the nearest counterfactual Zhu Xi academy to predict its clan density and bank density, respectively. This process creates 2,000 regression coefficients for each of the two outcome variables. Figure 4 plots the histogram for the absolute values of the distance coefficient for the respective clan and bank density regressions. For comparison, we mark using the red vertical line for the coefficient values based on the actual Zhu Xi academies.

The results show that distance to the counterfactual Zhu Xi academies has much less power to predict the spatial distribution of clans than distance to the actual academies. Evaluated by the *p*-value, the share of counterfactual coefficients that are greater than the coefficient based on the three true Zhu Xi academies is only 5.4% (from the sample of prefectures with an academy) or 3.6% (from the above-median *jinshi* sample). Instead, the majority of the counterfactual coefficients are close to 0 (Figure 4(a) and (b)), indicating that the geography of clans after the Song dynasty was indeed shaped by the cultural spillover of the Zhu Xi academies. Likewise, we find that the counterfactual distance has weak power in predicting cross-regional banking development in the early twentieth century, with only 4.5% to 6.7% of counterfactual coefficients greater than the coefficient based on the actual Zhu Xi academies (Figure 4(c)–(f)). Therefore, our IV is unlikely to affect financial development through channels other than the Confucian clans.

For the above randomisation tests, the counterfactual Zhu Xi academies were drawn from the whole of China proper. Nevertheless, the three actual Zhu Xi academies and more clans were concentrated in the south-eastern corner of China (Figure 1). This raises the concern that our IV

³⁰ Data on commercial tax and population in this period are obtained respectively from Le (1936) and Xu and Liu (2014). Data on *jinshi* in the Song dynasty are obtained from Gong and Zu (2014).

³¹ We obtain data on Song dynasty academies from Ji’s (1996) ‘A dictionary of academies in China’ and data on Song *jinshi* from Gong and Zu’s (2014) ‘Official directory of imperial exam graduates in the Song dynasty’.

³² We also exclude the adjacent prefectures because they are too close to the actual Zhu Xi prefectures to distinguish the counterfactual effect from the real effect of the Zhu Xi academies.

³³ We choose 2,000 times based on the suggestion of Young (2019). The results are robust to alternative numbers of draws.

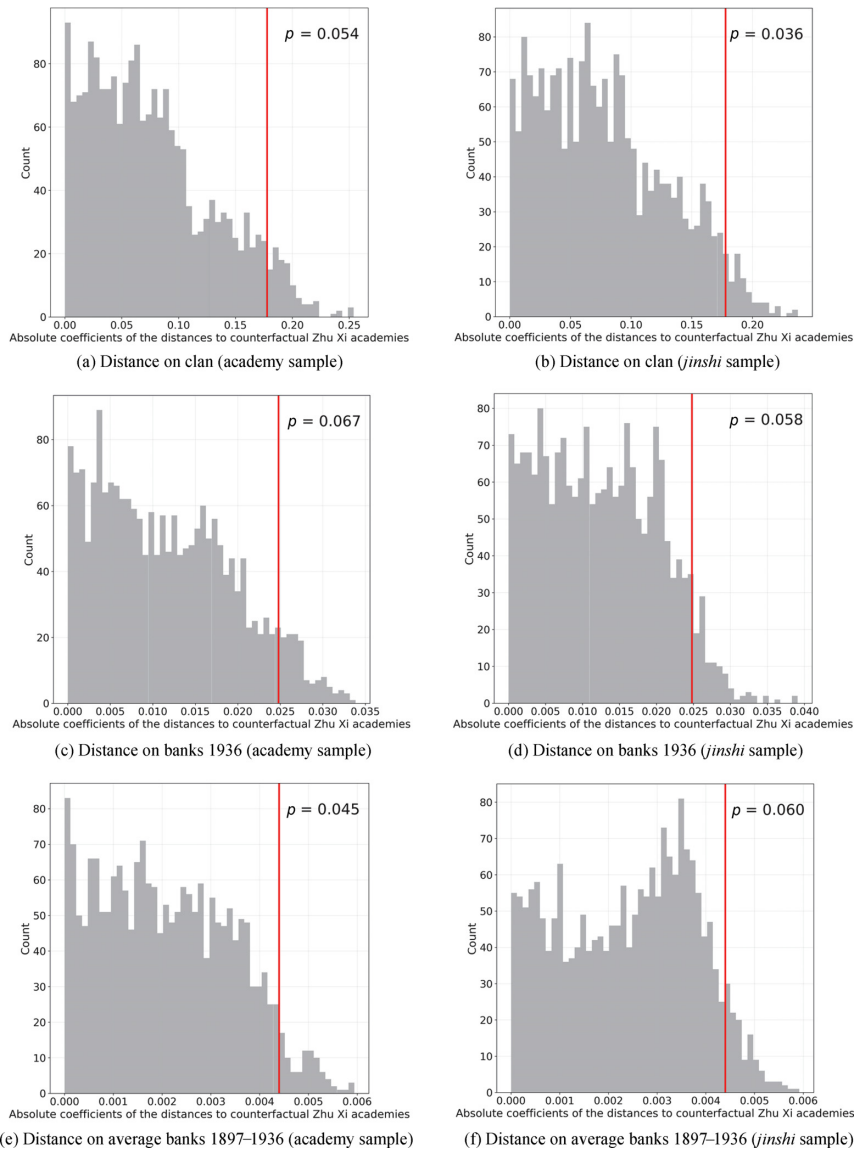


Fig. 4. Randomisation Tests for Zhu Xi Academy's Distance Effects.

Notes: The panels plot histograms of the absolute coefficients of distance to counterfactual Zhu Xi academies. Panels (a) and (b) examine the (first-stage) counterfactual effect on the clans. Panels (c) to (f) examine the (reduced-form) counterfactual effect on banks. All results are OLS estimates with the same set of geographic controls as in Table 1. We randomly select three counterfactual Zhu Xi academies from two different samples: one sample consists of the 54 prefectures with academies during the Zhu Xi era (1130 to 1200) in (a), (c) and (e), whereas the other sample consists of the 90 prefectures whose density of *jinshi* degree holders was above the national median in the Song dynasty in (b), (d) and (f). Both samples exclude the three prefectures with actual Zhu Xi academies and their adjacent prefectures. In each sample, we repeat the drawing 2,000 times and thus construct 2,000 sets of counterfactual academies. The p -value refers to the share of the number of counterfactual coefficients that are greater than the coefficient of distance to the actual Zhu Xi academies (red vertical line). For each figure, the vertical axis stands for the number of occurrences for the regression coefficient lying in a given range on the horizontal axis.

Table 3. *Confucianism and Modern Banks in 1897–1936: Instrumented Results.*

	Banks 1936	Banks 1936	Banks 1936	Average banks 1897–1936
	2SLS	2SLS	IV-Tobit	2SLS
	1	2	3	4
Clan	−0.139 (0.054)*** [0.063]**	−0.126 (0.054)** [0.065]*	−0.152 (0.077)**	−0.026 (0.008)*** [0.008]***
Geographic controls	X	X	X	X
Additional controls		X	X	X
Observations	236	236	236	236
R^2	0.023	0.105		0.324
Kleibergen-Paap F -statistic	28.01	20.11		20.11

Notes: The dependent variable is the log number of Chinese modern banks in each prefecture in 1936 in columns 1–3, and the log annual average of the number of Chinese modern banks in each prefecture between 1897 and 1936 in column 4. We normalise the number of banks by population in 1920 in columns 1–3 and by the average population of 1910 and 1920 in column 4 (in units of 10,000). Clan is instrumented by the log distance to the Zhu Xi academies. Geographic controls include distance to treaty ports in 1896, distance to river, distance to coast, province capital and an eastern China dummy. Additional controls include industrial firms, commercialisation, urbanisation rate, telegraph, post offices, Protestantism, *jinshi* degree holders, and civil conflicts. Robust standard errors are given in parentheses. Standard errors in brackets are clustered within a radius of 136 kilometres to account for possible spatial correlation based on Colella *et al.* (2019). ***, ** and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

might capture a south-eastern China effect rather than the spillover of clan culture from the Zhu Xi academies. For instance, some unobserved natural or cultural endowments in the south-east may have fostered the formation of clans while hindering the development of modern finance. To address this concern, we replicate the randomisation tests in Figure 4 but draw the counterfactual Zhu Xi academies only from south-eastern China. We first define ‘south-eastern China’ as the south-eastern quadrant in Online Appendix A, Figure A3(a) (i.e., from dividing China proper into four quadrants with the axes crossing the centroid), which covers the three prefectures of the Zhu Xi academies and their surrounding areas of relatively high clan density. Doing so ensures that the counterfactual and actual Zhu Xi academies are compared within an otherwise more homogenous region. For robustness, we also define an alternative ‘south-eastern China’ based on William Skinner’s (1977) physiographic macro-regions of China in the nineteenth century. The macro-region in the south-east includes the Middle and Lower Yangtze River delta, south-eastern coastal areas, and Lingnan region (Online Appendix A, Figure A3(b)). This macro-region had similar physiographic and socioeconomic characteristics (relative to the regions in northern and western China). The results from the south-eastern randomisation exercise are reported in Online Appendix A, Figure A4, which shows that distance to the counterfactual Zhu Xi academies in south-eastern China still has much less power to predict the spatial distribution of clans and banks than the distance to the actual Zhu Xi academies.³⁴ This suggests that it is unlikely that our IV is picking up an unobserved south-eastern China effect.

In Table 3, after instrumenting by distance to the Zhu Xi academies, we still find that clan strength has a significant negative effect on bank development (column 1). The result remains

³⁴ To ensure a sufficient number of prefectures for random drawing in this small south-eastern sample, we do not distinguish prefectures with academies from prefectures with an above median number of *jinshi*, but draw the counterfactual Zhu Xi academies from prefectures with either academies or *jinshi* degree holders (or both) in south-eastern China during the Song dynasty. After excluding the prefectures with actual Zhu Xi academies and their adjacent prefectures, there are 72 prefectures in the quadrant sample and 81 in the Skinner sample for this purpose.

robust when we additionally control for financial need, communication infrastructure, human capital, Protestantism and conflicts (column 2); use the tobit model (column 3); use an alternative measure of bank development (column 4); and take into account the spatial correlation of standard errors. The instrumented effect of clan strength on bank density is greater than that of the OLS regression: the magnitude of the effect increases by about 125% and doubling the clan density reduces the bank density in 1936 by 12.6%. This implies that the OLS regressions may underestimate the effect of clans on banks, possibly due to the measurement error (survivorship bias) in the number of genealogy books and omitted prefectural factors or to the endogenous nature of clan formation, as discussed earlier. The *F*-statistics suggest that distance to the academies is far from a weak instrument.

3.3. Persistence of the Clan Effect

We show that Confucian clans inhibited the development of modern banks from 1897 to 1936. However, during this period, China underwent sustained institutional changes, and it is unclear whether the clan way of life remained relevant throughout this period. Following the New Policies reform (1901–1911), the Qing court established the first central bank (the Great Qing Bank), enacted bank laws and unified the national currency. The institutional and market environments were further improved after the collapse of dynastic rule and the establishment of the Republic of China in 1911. The sustained modernisation process may have undermined the dominance of the traditional Confucian system. If so, the hampering effect of the Confucian clan on modern banking should have diminished over time.

To test this, we use a panel regression framework to study the time variation in the effect of clan strength on bank development, with the following specification:

$$Banks_{it} = \alpha + \beta Clans_i \times Period_t + \gamma X_i \times Period_t + Pref_i + Period_t + \varepsilon_{it}. \quad (2)$$

We estimate this regression using five-year windows between 1891 and 1935. We interact *Clans_i* with a full set of five-year-window dummies between 1896 and 1935 to examine whether the negative effect of clans was mitigated by the modernisation progress. We omit the 1891–1895 period. Thus, all estimated coefficients are calculated relative to this baseline period, which is before the emergence of modern banks. To account for the changing effects of prefectural geographic correlates on banks over time, we also interact our set of geographic controls from Table 1 with the five-year-window dummies. *Pref_i* and *Period_t* capture prefectural and five-year fixed effects, respectively.

Figure 5 demonstrates that the negative effect of clan density on banking does not diminish but rather increases over time. The effect remains robust when we instrument the distribution of clans using distance to the Zhu Xi academies. There was almost no clan effect before 1915, because modern banks only covered a small subset of prefectures in the early years and hence show little statistical correlation with the distribution of clans. As modern banks expanded to more territories, the hampering effect of clans gradually gained strength and could not be mitigated by modernisation efforts at least until 1936. Instead, China's modern banks only achieved sustained growth in regions with a relatively weak clan infrastructure.

3.4. Foreign and Official Banks as a Placebo

To provide further support for the claim that the effect of clans on banking does not reflect unobserved local factors (e.g., business tradition or strength of other social organisations), we

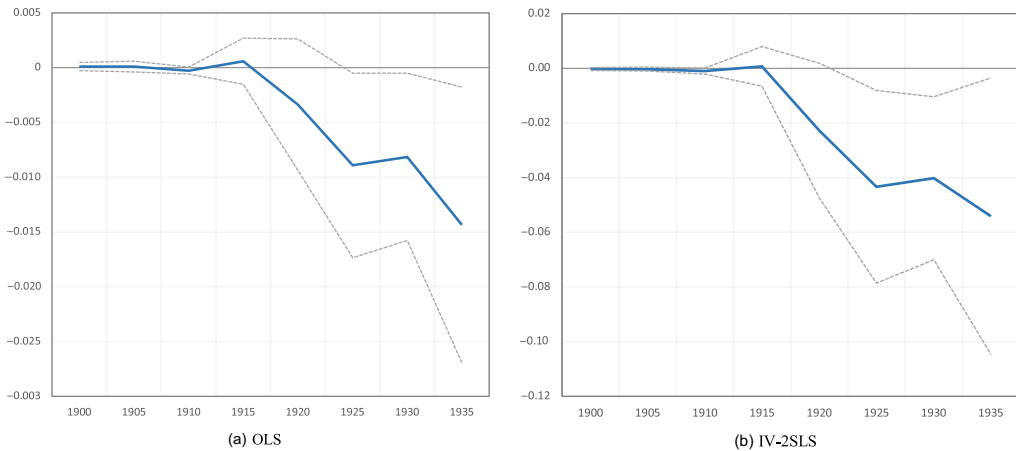


Fig. 5. *The Changing Effects of the Clans on Modern Banks, 1896–1935.*

Notes: These figures show the effect of the clan on the log number of Chinese modern banks per 10,000 people in each 5-year interval between 1896 and 1935. The solid lines are the coefficients of the clans based on the flexible difference-in-differences estimation of equation (2). They indicate the difference in the effect of the clans between each 5-year period and the reference period (1891–1895). The dash lines denote the 95% confidence intervals. All estimations control for the prefectural- and 5-year fixed effects and the interaction terms between geographic factors and a full set of 5-year dummies. Panel (b) uses distance to the Zhu Xi academies to instrument the distribution of the clans.

conduct a placebo test by regressing a prefecture's density of foreign and official banks on its genealogy density. In the early years of the expansion of foreign banks in China, the process was primarily driven by Western powers to support their foreign businesses rather than to serve the local population (and thus these banks did not compete with the local clans). The distribution of foreign banks should therefore have had little to do with Confucian clan culture. Likewise, the official (government) banks mainly served the government's remittance and administrative needs and hence were not in competition with the Confucian clans over the same clientele. However, if our genealogy measure only captures unobserved local determinants of financial development, then it should also have an effect on the distribution of foreign and official banks.

We obtain information on foreign and official banks from Lin *et al.* (2021) to calculate the average annual number of banks in each prefecture between 1903 (when the first official bank was established) and 1936. We construct a measure of bank density at the prefectural level by dividing the total number of foreign and official banks by prefectural population (in units of 10,000 persons), adding 1 to this number and taking the natural logarithm. The instrumented regression results show that clan density has no effect on foreign and official bank density (Table 4, columns 1–3). A remaining concern is that the spatial distribution of foreign and official banks is quite minimal when compared with that of private modern banks, with the former located mainly in the big cities. To rule out the possibility that the insignificant clan effect on foreign and official banks is driven by their small regional variation, we restrict the analysis to big cities, i.e., the 75 prefectures with an urbanisation rate in 1910 above the sample mean of 6.76% (columns 4 and 5). This does not change the result based on the whole sample; the clan still has no effect on foreign and official banks.

Table 4. *Other Banks as Placebo.*

	Foreign and official banks 1903–1936		Foreign and official banks in big cities 1903–1936		Foreign and official banks in big cities 1903–1936		Traditional Chinese banks 1820–1913		Traditional Chinese banks 1820–1913	
	2SLS	IV-Tobit	2SLS	IV-Tobit	2SLS	IV-Tobit	2SLS	IV-Tobit	2SLS	IV-Tobit
	1	2	3	4	5	6	7	8		
Clan	0.001 (0.005) [0.005]	-0.003 (0.005) [0.005] X	0.002 (0.007) X	-0.006 (0.008) [0.008] X	-0.002 (0.009) X	-0.189 (0.092)** [0.110]*	-0.304 (0.103)*** [0.104]*** X	-0.590 (0.217)*** X		
Controls			X	X	X		X	X		
Observations	236	236	236	75	75	243	243	243		
R ²	0.009	0.338		0.597		-0.041	0.083			
K-P F-statistic	48.57	20.11		10.35		55.82	31.73			

Notes: The dependent variable is the log annual average of the number of foreign and official banks (per 10,000 population) in each prefecture between 1903 and 1936 in columns 1–5. Columns 4 and 5 restricts the sample to the prefectures with urbanisation rates in 1910 above the sample mean of 6.76%. Dependent variable in columns 6–8 is the log number of traditional Chinese banks, *qianzhuang* (money houses) and *iaohao* (Shanxi banks), which were established in each prefecture in 1820 to 1912. We normalise it by population (per 10,000 people) of 1910. Clan is instrumented by the log distance to the Zhu Xi academies. Controls in columns 1–5 are the same as those in Table 3, column 2. Controls in columns 6–8 are the same as those in Table 3, column 1. Robust standard errors are in parentheses. Standard errors in brackets are clustered within a radius of 136 kilometres to account for possible spatial correlation based on Colella *et al.* (2019). ***, **, * and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

3.5. *Confucian Clans or Conservatism?*

Given the extreme emphasis of Confucianism on the status quo and stability—as it is conservative, averse to change and learning from outsiders, and hostile to commerce (Weber, 1930; Landes, 2006)—we expect that in prefectures with strong clans, people had little incentive or desire to start modern banks or any new ventures. For this reason, the negative clan effect that we demonstrate might be driven by Confucian conservatism towards new financial institutions (in which case Confucianism is still not a friend of modern finance), rather than by substitutive competition between formal finance and the Confucian clan.

To rule out this channel, we conduct two separate exercises. First, we examine the effect of clans on each prefecture's number of traditional Chinese banks. There were two main types of traditional banks in historical China. The first were money houses (*qian zhuang*) or native banks that arose from convenience shops, providing currency exchange and small loan services to petty merchants and households. The second were Shanxi banks (*piao hao*), which operated inter-regional remittance and loan transactions and were run by merchants from Shanxi province. Many traditional banks had been around for centuries and faced competition from the Confucian clans as informal internal financial markets. For this reason, if the clans also had a negative impact on the number of traditional banks, the clans' internal resource pooling and sharing function, not Confucian conservatism, may have decreased the demand for and suppressed external financial development.

The data on money houses are obtained from Nongshangbu's (1914) *Zhonghua minguo yuan-nian diyici nongshang tongji biao* [First statistics on agriculture and commerce]. Huang (2002) provides systematic records of the prefectural distribution of Shanxi banks and their branches spanning from the early nineteenth century to the early twentieth century. We use the annual average number of traditional banks in each prefecture between circa 1820 and 1912 and construct a measure of traditional bank density in the same way as for the other bank density measures. Again, clan strength has a significant negative impact on a prefecture's traditional bank density (columns 6–8, Table 4). The instrumented results indicate that doubling the clan density reduces the number of money houses by approximately 30%.³⁵

To further ensure that our result is mainly driven by the Confucian clan rather than conservatism, we use the number of Confucian temples to proxy for overall Confucian cultural influence in each prefecture and contrast it with the clan measure in terms of impact on modern bank density. Confucian temples were built to worship Confucian sages and local eminent Confucian exemplars, and hence their number serves to gauge the comprehensive influence of Confucian culture (not just the clan as an economic institution) in a region (Kung and Ma, 2014). Confucian temples were mainly the product of government initiatives to strengthen the ruling culture, whereas clan formation and organising were private initiatives. Specifically, we use the log number of Confucian temples per 10,000 members of the population in the nineteenth century, with temple data obtained from the provincial gazetteers compiled at various time points throughout that century (see Online Appendix B for the list of gazetteers and Online Appendix A, Figure A5, for the prefectural distribution of the number of Confucian temples). The results in Table 5 show that the negative clan effect on banking remains robust after controlling for the density of

³⁵ A related concern is whether the negative effect of clans on modern banks derives from the weak presence of traditional banks. To test this possibility, in a separate exercise, we control for the traditional bank density in the same set of regressions as in Tables 1 and 2. In addition, given the possible effect of foreign and official banks on the development of private modern banks, we also control for the density of foreign and official banks. The results show that the clan effect on modern banks remains robust (see Online Appendix A, Table A2).

Table 5. *Confucian Temples and Modern Banks.*

	Banks 1936				
	OLS	OLS	2SLS	2SLS	IV-Tobit
	1	2	3	4	5
Confucian temples	-0.044 (0.033) [0.031]	-0.041 (0.033) [0.031]	-0.034 (0.030) [0.031]	-0.059 (0.032)* [0.031]*	-0.107 (0.048)**
Clan		-0.044 (0.017)*** [0.018]**	-0.162 (0.074)** [0.085]*	-0.144 (0.062)** [0.069]**	-0.198 (0.093)**
Geographic controls	X	X	X	X	X
Additional controls				X	X
Observations	225	225	225	225	225
R ²	0.089	0.103	-0.002	0.113	
K-P F-statistic			15.48	16.92	

Notes: This table assesses the relative importance between the overall Confucian culture and the Confucian clan in affecting modern banking. The overall Confucian culture is measured by the number of Confucian temples that existed in the nineteenth century. It is normalised by the average population (in units of 10,000) in 1393 to 1851 and takes the logarithm. Measures of clan, banks and controls are the same as that of Table 3. In columns 3–5, clan is instrumented by the distance to the Zhu Xi academies. Robust standard errors are in parentheses. Standard errors in brackets are clustered within a radius of 136 kilometres to account for possible spatial correlation based on Colella *et al.* (2019). ***, ** and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Confucian temples. Confucian temples have a negative effect on modern bank density, but with only a marginally statistically significant coefficient, which is much smaller than that of the clans. Therefore, Confucian conservatism did dampen incentives to create banks, but the Confucian clans as an internal financial market played a much more important role in inhibiting modern finance.

4. Clans and Weak Demand for External Finance

We argue that the negative impact of the clan on financial development is primarily due to the suppressed demand for external finance. Ideally, we would analyse data on each prefecture's aggregate financial demand, total intra-clan financial transaction volume and total external finance volume. However, such detailed data are not readily available even today, let alone for the early twentieth century. It is thus difficult to conduct a direct breakdown analysis of intra-clan finance and external finance. Nonetheless, we can use a prefecture's average interest rate for private lending as a proxy. Holding total demand constant, if the clans provided enough internal financial solutions, then the demand and resulting interest rate for external finance should both be lower.

To test this, we use the China Historical Interest Rate database constructed by Chen *et al.* (2016), which includes 23,489 private lending/borrowing records from 1563 to 1950. The records are mainly collected from surviving private documents (e.g., contracts, business correspondences, bank archives, homicide case archives, diaries and notes); newspapers and periodicals (e.g., *Bank Weekly*, *Central Bank Monthly Reports* and *Economic Statistics* published during the Republican period); economic surveys conducted by the Republican government; and, finally, academic publications on finance. Each record has detailed information on interest rates, credit clauses and lender/borrower identity. To the best of our knowledge, this constitutes the most complete collection of China's historical interest rates.

We focus on the regional interest rates during 1912–1936 because the records during this period are most complete and suitable for inter-regional comparison. Another reason is that this period saw the genesis of China's modern financial markets. Figure 6(a) depicts the prefectural variation of the average interest rate between 1912 and 1936, ranging from 0 to nearly 100% (the mean is 32%). Note that the interest rates in prefectures with more clans were significantly lower than in other areas.

We formally examine the effect of the Confucian clan on interest rates in Table 6, where observations with interest rates above 100% are removed and clan density is based on the number of genealogy books compiled as of 1911 and the prefectural population in 1910. We cluster the standard errors at the prefectural level to mitigate within-prefecture autocorrelation and address the spatial correlation of standard errors as in the bank development regressions. Among the controls in the regressions are indicator variables for the five types of lender: (1) individual (the reference group); (2) social organisation; (3) merchant; (4) traditional financial institution (money houses); and (5) bank (private, official and foreign banks). In addition to the controls used in the earlier tables to capture prefectural characteristics, we control for the term to maturity (one month to over three years) of each loan, and whether the loan occurred in a rural area. We control for provincial fixed effects because interest rates were affected by local currency and inflation factors, which mainly varied due to provincial level factors in early twentieth-century China (Dai, 1993). To adjust for the temporal change in inflation, we also include the year–province fixed effects.

Our log-on-log regression results show that interest rates were significantly lower in prefectures with higher clan density, supporting our main hypothesis. These results are robust across specifications with different controls and when using distance from the Zhu Xi academies as the instrument for clan strength. The instrumented estimates with the full set of controls indicate that doubling the density of clans reduces the interest rate by 54.3% (column 7).³⁶

Thus, intra-clan financing and resource pooling must have been more prevalent in regions with strong clans. Although there are no systematic statistics on intra-clan pooling and sharing services, case studies of powerful clans document practices such as land trusts and alms relief (Section 1), in which the clans usually provided low- or zero-interest loans to members (as our private lending-borrowing dataset also demonstrates). In the dataset used here, the average interest rate for intra-clan loans (23%) was also much lower than that for the other loans (32%). It is possible that the average risk level of loans in prefectures with strong clans was lower than in other prefectures, making the equilibrium interest rates in the former prefectures lower. Unfortunately, we do not have loan- or region-specific risk data for each historical time period; however, in addition to the loan-specific controls described above, we control for each prefecture's geographic and economic prosperity indicators in Table 6. This should correct for each prefecture's socioeconomic characteristics, such as business risk and general economic risk. Furthermore, it is possible that regions with strong clans were also better financially integrated with other regions, in which case their financial supply was higher and the average interest rate lower, and not due to the clans' resource pooling services. This channel is ruled out by the inclusion

³⁶ A remaining concern is that the lower interest rates in the strong clan regions may be due to the high ratio of productive to emergency consumption loans. A possible explanation is that prefectures dominated by clans may have had less demand for emergency loans, which usually have high interest rates. We use the share of loans borrowed by commoners (out of those borrowed by merchants, banks and other business organisations) as a proxy for the share of emergency loans and regress it on clan density, with the same set of controls as reported in Table 1. Clans do not significantly reduce the number of local emergency loans (Online Appendix A, Table A3). This result may be due to the lack of information on the specific use/situation of each loan.

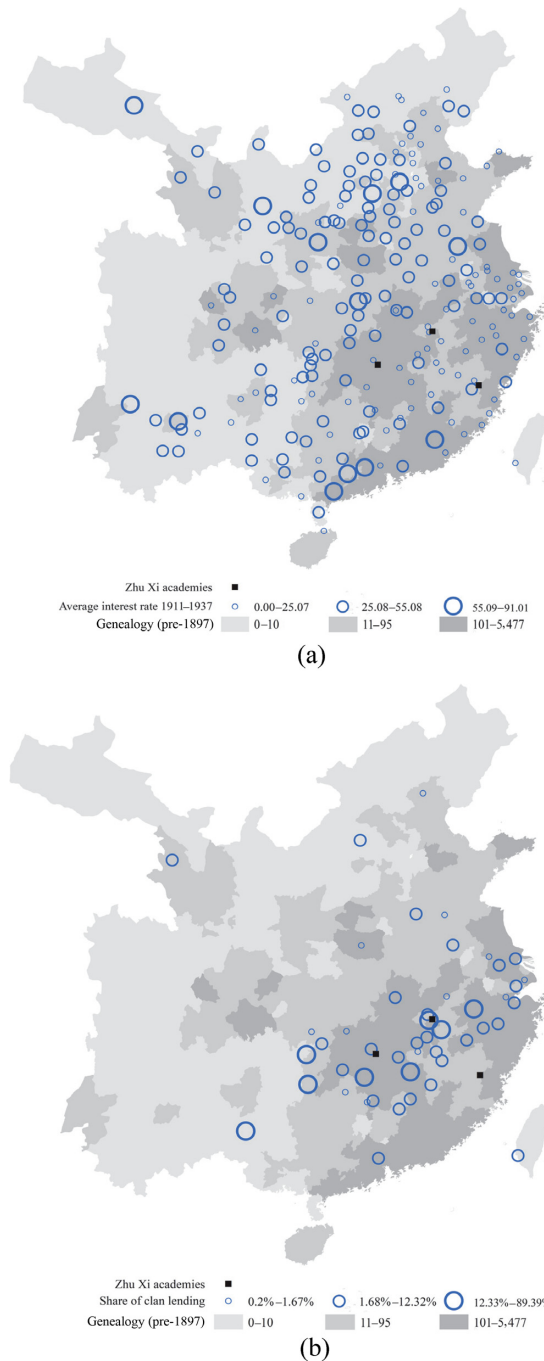


Fig. 6. *Distribution of Interest Rates and Intra-Clan Lending, 1912–1936.*

Notes: The data of interest rates and clan lending are obtained from the China Historical Interest Rate database constructed by Chen *et al.* (2016). The three dark points refer to the locations of the Zhu Xi academies in the twelfth century. In (b), clan lending refers to percentage of credit provided by clan organisations.

Table 6. *Confucianism and Interest Rate, 1912–1936.*

	Interest rate of each lending						
	OLS	OLS	OLS	OLS	2SLS	2SLS	2SLS
	1	2	3	4	5	6	7
Clan	−0.251 (0.117)** [0.116]**	−0.193 (0.076)** [0.079]**	−0.190 (0.062)*** [0.058]***	−0.209 (0.059)*** [0.057]***	−0.376 (0.151)** [0.141]***	−0.529 (0.223)** [0.209]**	−0.543 (0.253)** [0.240]**
Lending controls		X	X	X	X	X	X
Geographic controls		X	X	X	X	X	X
Year FE		X	X	X	X	X	X
Province–year FE			X	X		X	X
Additional controls				X			X
Observations	6,790	5,278	5,278	5,278	5,278	5,278	5,278
R ²	0.022	0.574	0.699	0.716	0.565	0.684	0.703
K-P F-statistic					17.92	22.79	14.48

Notes: The dependent variable is the logarithm of the interest rate of each lending record between 1912 and 1936. Clan is measured by the log number of genealogy books per 10,000 people in 1910. In columns 5–7, clan is instrumented by the distance to the Zhu Xi academies. Lending controls include maturity, rural area dummy, and lender category dummies (individual, community, merchants, traditional banks and modern banks). Geographic controls and additional controls are the same as those in Table 3. Robust standard errors adjusted for clustering at the prefectural level are given in parentheses. Standard errors in brackets are clustered within a radius of 136 kilometres to account for possible spatial correlation based on Colella *et al.* (2019). ***, ** and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

of prefecture-specific controls such as distance to treaty ports, rivers, the coast, the provincial capital, telegraph stations and postal offices.

We informally assess the extent of intra-clan finance by checking the number of clan-based lending records in the China Historical Interest Rate database. As illustrated by the 2010 survey data (discussed below), intra-clan borrowing rarely took the form of a written contract. Rather, it was performed orally, leaving no written record. However, borrowing between non-relatives (especially borrowing from financial institutions) was more likely to be recorded. Thus, there may be a strong bias against intra-clan financial transactions in the surviving records on private finance. Of the 14,309 loan transactions in the database between 1912 and 1936, 483 (3.4%) were provided by clan organisations. We call these ‘clan loans’. To account for possible recording biases, we calculate the ratio of the number of clan loans to the total number of loans in each prefecture. To mitigate the effect of outliers, we take the natural logarithm of 1 plus this value in percentage points. Figure 6(b) shows that most clan loans in the database were concentrated in regions with high clan density, suggesting a positive correlation between clan strength and intra-clan lending. The regression results in Table 7 confirm that the share of clan loans was significantly higher in prefectures with strong clans, implying that the clans indeed played an important role in providing informal financial services for members. This result remains robust to the inclusion of prefectural characteristics and other specifications.

5. Long-Term Effects of Confucianism on Finance

Despite China’s modernisation effort during the early twentieth century, Confucianism continued to stifle financial development by reducing the demand for external finance. Does China’s prefectural clan culture still shape demand for and attitudes towards external financial markets? As Confucianism developed over more than two millennia, its effect on Chinese people’s way

Table 7. *Confucianism and Intra-Clan Lending, 1912–1936.*

	Share of intra-clan lending						
	OLS	OLS	OLS	Tobit	2SLS	2SLS	IV-Tobit
	1	2	3	4	5	6	7
Clan	0.437 (0.153)*** [0.178]**	0.370 (0.161)** [0.193]*	0.580 (0.170)*** [0.186]***	2.464 (0.528)***	1.678 (0.487)*** [0.618]***	2.004 (0.532)*** [0.555]***	8.633 (2.046)***
Geographic controls		X	X	X	X	X	X
Additional controls			X	X		X	X
Observations	184	184	184	184	184	184	184
K-P <i>F</i> -statistic					27.35	23.49	

Notes: The dependent variable is the logarithm of the share (percentage points) of intra-clan lending in all lending records at the prefectural level between 1912 and 1936. Clan lending refers to lending transactions by clan organisations to members. Clan and controls are the same as those of Table 3. In columns 5–7, clan is instrumented by the distance to the Zhu Xi academies. Robust standard errors are given in parentheses. Standard errors in brackets are clustered within a radius of 136 kilometres to account for possible spatial correlation based on Colella *et al.* (2019). ***, ** and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

of life is likely to have persisted. As Greif and Tabellini (2017) point out using contemporary survey data, clan culture and clan-based cooperation quickly revived after the market reforms that started in 1978, although Confucianism was denounced and clan structures were destroyed before and during the Cultural Revolution (1966–1976) (see also Y. Peng, 2004; Hu and Tian, 2018; and our Online Appendix A, Figure A6). However, we seek to determine whether the negative effect of the clan on financial development has survived to the present day. As seen in the next section, the Confucian clan continues to hamper external finance in modern China.

For this exercise, we measure each prefecture's clan strength by including all genealogy books compiled prior to 2009 that are kept in the Shanghai Library's (2009) comprehensive catalogue on the Chinese genealogy. As many genealogy books were written long ago and are unlikely to reflect the robustness of clans in China today, we also use the number of genealogy books compiled during the recent reform period (1980–2009) as an alternative measure of clan strength. We normalise the number of genealogy books by population size in 2009.

To test whether past clan strength predicts today's clan culture, we rely on two trust variables based on data from the CGSS (China General Social Survey, 2010).³⁷ We first collect the answers to the following questions: (1) 'To what extent do you trust your family members and relatives?' and (2) 'To what extent do you trust other people (outside the family)?' Answers to both are graded on a scale of 1–5, where 5 denotes complete trust and 1 denotes complete distrust. For each of the two questions, we convert the graded values to a dummy variable: 1–3 are coded as 0 (less trust) and 4–5 as 1 (more trust).

Next, we regress the two dummy variables of trust on clan density at the prefectural level by controlling for individual characteristics that may affect trust, such as education, age, gender, rural household dummy, ethnic minority dummy and number of kin; for prefectural factors such as GDP per capita in 2010, *jinshi* degree holders (1368–1905), dummy for Protestantism in 1920; and for the set of geographic factors reported in Table 1. We report the probit estimates in Table 8, where we instrument clan density by using distance to the Zhu Xi academies. The results show that in prefectures with historically stronger clans, people report greater trust in relatives

³⁷ The CGSS, conducted by Renmin University of China, is the most representative social survey in China. In 2010, 11,783 people were interviewed across all provinces. See Chinese General Social Survey (2010).

Table 8. *Persistence of Clan Values (China General Social Survey, 2010).*

	Trust relatives	Trust relatives	Trust relatives	Trust others	Trust others	Trust others	Trust others	Business contract with relatives	Business contract with relatives	Business contract with relatives
	1	2	3	4	5	6	7	8	9	
Clan	0.037 (0.035)	0.116 (0.051)**		-0.093 (0.035)***	-0.127 (0.036)***	-0.381 (0.138)***	-0.153 (0.046)***	-0.195 (0.063)***		
Clan 1980–2009			0.411 (0.186)**						-0.625 (0.211)***	
Individual controls		X	X	X	X	X		X	X	
Prefectural controls		X	X	X	X	X		X	X	
Observations	9,481	9,063	9,165	9,484	9,062	9,165	9,433	9,017	9,119	

Notes: All dependent variables are dummies based on the respondents' answers in China General Social Survey (2010) and are estimated using the probit model. Clan is measured by the log number of existing genealogy books per 10,000 people in 2009. Clan 1980–2009 is measured by the log number of genealogy books compiled between 1980 and 2009 (per 10,000 people). Both are instrumented by the distance to the Zhu Xi academies. Individual controls include education, age, gender, rural household, minority, and kin size. Prefectural controls include distance to treaty ports, distance to river, distance to coast, province capital, *jinshi* degree holders (1368–1905), Protestantism in 1920, and GDP per capita in 2010. Robust standard errors adjusted for clustering at the prefectural level are given in parentheses. ***, **, * and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

(columns 1 and 2) and distrust outsiders more (columns 4 and 5). Note that when historical clan density is replaced by modern clan density (1980–2009), the negative clan effect is even stronger. This is true for the other specifications in Tables 8 and 9. Thus, a region's clan culture from the past continues to determine clan ties today.

To gauge the influence of past Confucian clan culture on members' business conduct in the present, we use the answers to another CGSS question: 'To what extent do you prefer to use formal contracts when doing business with relatives?' (1–5 scale). Likewise, we convert each answer into a dummy variable: 1–3 are coded as 0 (less likely to use formal contracts) and 4–5 as 1 (more likely). The instrumented results illustrate that people in prefectures with historically stronger clans do not prefer to use formal contracts in business dealings with relatives (columns 7–9). In such an environment, the demand for, and hence the supply of, formal impersonal institutions, legal and otherwise, cannot be high.

A probable direct consequence of the persistence of clan culture is that people from stronger clans are less likely to use formal external finance. To test this, we proxy for individual participation in formal finance based on the answers to the following CGSS question: 'Do you borrow money from banks (including mortgage loans)?' The results are as expected: people in prefectures with historically stronger Confucian clans are less likely to take out bank loans (Table 9, columns 1–3). Moreover, we find that even when people do borrow from a bank, the typical loan size is significantly smaller in prefectures with higher clan density in the past (columns 4–6). These results are robust to the other specifications used in earlier exercises.

Last, we find that in prefectures with a stronger clan culture, the level of financial development is also lower today. To proxy for financial development, we use both (1) the logarithm of total bank loans and deposits per 10,000 members of the population, and (2) the logarithm of bank loans and deposits to GDP, based on data obtained from the National Bureau of Statistics' (2011) *City Statistical Yearbook of China*. In addition to the controls used in Table 1, we control for the density of banks in 1936, *jinshi* degree holders (1368–1905) and Protestantism in 1920 to capture their long-term effects, along with contemporary economic prosperity, measured by GDP per capita in 2010.³⁸ Columns 7–12 of Table 9 show that there is less banking per capita and that banking is a smaller part of the local economy in prefectures that had stronger clans in the past or have higher genealogy density today.

6. Conclusion

Based on data from 1897 to 1936 as well as from recent decades, our empirical work shows that since modern finance was introduced to China in the late nineteenth century, it has faced subtle but significant competition from the traditional resource pooling and risk-sharing services provided by the Confucian clan. After more than two millennia of efforts to perfect the clan by Confucian scholars and imperial courts, the clans served sufficiently well as internal financial markets and business corporations. It is then no surprise that many aspects of modern finance were, and may still be, redundant for many ordinary people and businesses. Therefore, when formal finance was first introduced, few individuals had an incentive to switch to it, limiting the demand for financial development. In addition, it was not easy to stimulate the supply side of arms-length finance. Since the Han dynasty, and especially since the Song dynasty, the Confucian

³⁸ GDP per capita is not included in examining the clan effect on bank loans and deposits to GDP. Data on banks in 1936, *jinshi*, and Protestant missionaries are the same as those mentioned above.

Table 9. *Clan and Financial Development in 2010.*

	Bank loan dummy		Bank loan dummy		Bank loan dummy		Bank loan amount		Bank loan amount		Bank loan amount	
	IV-Probit	2SLS	IV-Probit	2SLS	IV-Probit	2SLS	IV-Tobit	2SLS	IV-Tobit	2SLS	IV-Tobit	2SLS
	1	2	3	4	5	6						
Clan	-0.135 (0.068)**	-0.186 (0.078)**		-2.306 (1.128)**								
Clan 1980–2009			-0.576 (0.283)**									-9.077 (4.608)**
Individual controls		X	X		X				X			X
Prefectural controls		X	X		X				X			X
Observations	9,499	9,074	9,176	9,499	9,074	9,176			9,074			9,176
	Bank loans and deposits to population											
	2SLS		2SLS		2SLS		2SLS		2SLS		2SLS	
	7	8	9	10	11	12						
Clan	-0.291 (0.399)	-1.006 (0.435)**		-0.686 (0.210)**					-0.872 (0.398)**			
Clan 1980–2009												
Prefectural controls		X								X		
Observations	252	249	250	252	249	250			249			250
K-P <i>F</i> -statistic	42.21	12.57	12.15	42.21	10.45	12.14			10.45			12.14

Notes: Columns 1–6 examine the clan effect on individual participation in external finance in 2010. The dependent variables are based on the respondents' answers in the China General Social Survey (2010). Bank loan amount is in log form. Columns 7–12 examine the clan effect on prefectural financial development in 2010. Bank loans and deposits are measured in CNY100 million based on the *City Statistical Yearbook of China*. Clan and Clan 1980–2009 are the same as those of Table 8, and both are instrumented by the distance to the Zhu Xi academies. Controls are the same as Table 8, except that the log number of banks in 1936 (per 10,000 people) is also included. Robust standard errors adjusted for clustering at the prefectural level are given in parentheses. Standard errors in brackets are clustered within a radius of 136 kilometres to account for possible spatial correlation based on Colella *et al.* (2019). ***, **, * and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

clan has provided much of the solution and hence hampered the development of impersonal market institutions. Although China had introduced money (Goetzmann and Koll, 2005) and simple lending–borrowing practices prior to Confucius’ time,³⁹ not only did external finance fail to develop endogenously, but when it was eventually transplanted, society also remained comparatively uninterested. Even in today’s China, regions that have traditionally had strong clans still maintain a relatively low demand for modern finance, relying instead on intra-clan services.

A key insight from our analysis is that financial development is path dependent. This contrasts with the focus of financial development studies on the institutions that are common in well-developed financial markets. Our study shows that to understand why some societies have developed the necessary institutions for finance whereas others have not, we need to go back in history. Some societies may have developed alternative systems with the same resource pooling and risk sharing roles as formal finance; therefore, these societies have not perceived the need to introduce or entrench the kinds of impersonal institutions needed for financial development. As discussed in Greif and Tabellini (2017), China and the West have found different ways to achieve interpersonal cooperation, leading to distinct institutional and cultural development paths. In this paper, we take a step further to explore the financial development implications of the divergence in the trajectories of institutional development between China and the West. In particular, we conduct formal tests of the implications of our framework using historical data. Our results shed new light on the causes of the divergence in financial development between China and the West. This finding implies that it will probably take a while longer for China and other traditional societies to catch up.

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³⁹ Intertemporal lending is reflected in one of the first three Confucian classics, *The Rites of Zhou*, which was written during the second century BCE and about the practice back in the earlier Zhou dynasty (1046–256 BC). Furthermore, *The Nine Chapters on Mathematical Art (Jiuzhang suanshu)*, written by scholars from the tenth to the second centuries BCE, contains examples of classical asset pricing and discounted cash-flow problems, including the time value of money (Goetzmann, 2005).

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