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Unlocking China's Banking Competition: The Role of Clan Culture*

By **Qing He, Haitian Lu, Chang Xue, Chi Zhang** *

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Abstract

Banking competition matters, for its importance in the efficiency of capital allocation and innovation. This study examines the role of clan culture in China, as a traditional form of informal institution and social capital, in banking competition across regions, and finds that prefectures with strong clan culture are more likely to have intensive banking competition, especially the competition among non-state-owned banks. Such encouraging effects of clan culture are stronger in prefectures with less government intervention, freer financial markets, and better rule of law. Our findings demonstrate robustness across multiple sensitivity checks, including instrumental variable estimation, alternative model specifications, and the inclusion of additional controls for regional economic and cultural factors.

JEL Classification: A14,G21, R12, Z12
Keywords: Clan culture, banking competition, China

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1. Introduction

Bank competition plays a fundamentally important role in the capital allocation process, banking system performance and stability.[1] A number of studies have shown, theoretically or empirically, that bank competition influences household and firms' access to external finance, in turn affecting the development of the financial market and economic growth.[2] While prior literature identifies several factors influencing banking system competitiveness, such as institutional frameworks and technological innovation,[3] the influence of cultural factors has been largely overlooked. This paper fills this void and investigates the impacts of China's clan culture on shaping the patterns of regional banking competition.

Clan culture in China—a deeply entrenched social organization based on groups sharing common ancestry,[4] fostering unity in interpersonal relationships and collective decision-making—is likely to influence banking competition in two ways. First, the local organizations embedded in clan culture serve as a set of informal rules and norms that govern the behavior of its members, thereby complementing formal institutions to enhance property protection and law enforcement.[5] Banks are more inclined to enter markets where property rights are robustly protected, which reduces the costs of financial services. Second, the clan enforces codes and norms among clan members, and facilitates shared beliefs and collective actions,[6] which are two integral components of social capital. Banking systems tend to exhibit greater competitiveness in environments with lower information gathering costs, a scenario more prevalent in regions characterized by high social capital.[7]

To examine our hypothesis, we collect information from two main databases. First, we extract the genealogy records from *Catalog of Chinese Genealogy* (*Zhongguo Jiapu*

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[1] S. Claessens, and L. Laeven, 'What Drives Banking competition? Some International Evidence' (2004), 36(3) Journal of Money, Credit, and Banking 563–583; and M. R. Goetz, 'Competition and bank stability' (2018) Journal of Financial Intermediation 35 57–69.

[2] M. J. Garmaise, 'Production in Entrepreneurial Firms: The Effects of Financial Constraints on Labor and Capital' (2008) 21(2) The Review of Financial Studies 543–77.

[3] For instance, the greater foreign bank entry and fewer entry restrictions are associated with more competitive banking market (B. N. Jeon, M. P. Olivero, J. Wu, 'Do Foreign Banks Increase Competition? Evidence from Emerging Asian and Latin American Banking Markets' (2011) Journal of Banking and Finance 35 856–75). Financial deregulation also stimulates intense competition among banks through more branches (J. Cornaggia, and others, 'Does Banking Competition Affect Innovation?' (2015) Journal of Financial Economics 115 189–209).

[4] J. Fei, and T. Liu, 'The Growth and Decline of Chinese Family Clans' (1982) Journal of Interdisciplinary History 12(3) 375–408; and Z. Chen, C. Ma, and A. J. Sinclair, 'Banking on the Confucian Clan: Why China Developed Financial Markets So Late' (2022) The Economic Journal 132 1378–413.

[5] A. Greif, and G. Tabellini, 'The Clan and the Corporation: Sustaining Cooperation in China and Europe' (2017) Journal of Comparative Economics 45 1–35.

[6] Opportunistic behaviors, i.e. the pursuit of personal benefits at the expense of others, is not morally acceptable in clan culture. 'Cooperation within the clan is sustained mainly by moral obligations and reputational incentives that discourage cheating and free riding'. (A. Greif, and G. Tabellini, 'Cultural and Institutional Bifurcation: China and Europe compared', (2010) American Economic Review 100(2) 135–40).

[7] L. Guiso, S. Paola and Z. Luigi, 'The Role of Social Capital in Financial Development' (2004) American Economic Review 94(3) 526–56; I. Hasan, and others 'Social Capital and Debt Contracting: Evidence from Bank Loans and Public Bonds' (2017) Journal of Financial and Quantitative Analysis 52 1017–47; and I. Hasan, Q. He, H. Lu, 'Social Capital, Trusting, and Trustworthiness: Evidence from Peer-to-Peer Lending' (2022) Journal of Financial and Quantitative Analysis 57(4) 1409–53.

Zongmu, 2009) published by the Shanghai Library. The *Catalog* includes the genealogy books dated back to Tang dynasty, and consists of 52,603 clans and covers 608 surnames across 301 prefectures. Each genealogy book of a clan records relationships of the clan members from its ancestor, the clan's origin and development and its moral restrictions. Genealogy books reflect important events that the clan and its members experienced. The degree of genealogy book's completion and detailedness shows the influence and attention to family inheritance of the clan. To quantify clan strength within a prefecture, we employ the number of genealogies, normalized by per 10,000 individuals.[8] Second, we collect bank branch-level information from China Industrial Enterprise Registration Database (CIER). CIER collects detailed information, i.e. address, opening and ending times, on bank branch registration in 288 prefectures during the 2001–2020 period. We then calculate the sum of the squares of the branch shares of each individual bank in each prefecture (Herfindahl-Hirschman index, HHI), as our main measure of prefecture-level banking competition.

We find that the level of banking competition varies substantially across Chinese prefectures. Banking competition is disproportionately more intensified in regions with strong clan culture. A robust negative correlation exists between clan strength and the Herfindahl-Hirschman Index, even when controlling for temporal effects and various prefecture- and province-level attributes, including local economic conditions and the presence of formal institutions. When categorizing banks into large state-owned banks (SOBs), non-state-owned banks (NSOBs)[9] and foreign banks, we find that clan strength is associated with lower SOB concentration. And, clan culture appears to significantly improve the competition among NSOBs but does not similarly affect that among SOBs. The findings also highlight a complementary relationship between clan culture and formal institutions, wherein the latter reinforce the positive impact of clan culture on banking competition. Notably, clan strength demonstrates a more pronounced association with the HHI in regions marked by lower government intervention, greater financial marketization, and improved legal environments.

We conduct a variety of tests to ensure our results are robust. First, we use an alternative measure of bank concentration, concentration ratio (CR3), defined as the ratio of the sum of the branch numbers of the three largest banks to the total number of branches within a prefecture. We also exclude municipality cities (cities directly administrated by the central government) to ensure all prefectures are at the same administrative level. To alleviate the disturbance of population mobility, genealogy density calculated by the fixed population in 1992 is used. The results remain robust using these alternative measures and specifications. Someone may concern that market structure indicators, such as HHI and other concentration indices, do not necessarily reflect the competitiveness of banking systems. We thus use alternative measure of

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[8] J. Cheng, and others 'Clan Culture and Family Ownership Concentration: Evidence from China' (2021) China Economic Review 70 101,692.

[9] State-owned banks include the Agricultural Bank of China, Industrial and Commercial Bank of China, Bank of China, China Construction Bank and Bank of Communications in the earlier time. Postal Savings Bank of China also turned to state-owned in the 2007 reform. Other bank types contain 12 joint-equity banks, urban commercial banks and rural commercial banks which established with different operating ranges. Foreign banks are those headquartered outside China in sole proprietorship and set subsidiaries in China. Our sample excludes policy banks, village banks, rural credit communities and internet banks.

banking competition by focusing on performance[10] of local banks, i.e. city or rural commercial banks, small institutions similar to U.S. credit union, serving for local market. The majority of their deposits were collected in the local area. Following Claessens and Laeven,[11] we use the Panzar and Rosse methodology[12] to estimate the degree of competition in the Chinese prefecture's banking system. Finally, we employ three additional measures of clan culture and construct a composite index to comprehensively capture clan strength. We still find that the clan strength is positively associated with banking competition.

Secondly, clan strength may reflect the influence of unobservable institutional confounding factors. To address potential endogeneity concerns stemming from omitted variable bias, we utilize three instrumental variables: the minimum distance to Zhu Xi Academies, the number of southward migrants following the *Jingkang Incident*, and the number of traditional villages. The first instrument seeks to capture the impact of these academies on clan cultures in surrounding regions. *Zhu Xi*, a prominent 12th-century Chinese philosopher, played a pivotal role in promoting clan life at the grassroots level by advocating for the establishment of ancestral halls and genealogy records. His frequent lectures at three academies significantly influenced nearby areas. Following the methodology outlined by Chen et al.,[13] we obtain the latitude and longitude of these academies and the sample prefectures using the Baidu Map API, allowing us to construct a variable, *mindist*, to measure the geographic distance from each prefecture to its nearest academy. The second instrument leverages data on the number of migrants who settled in Chinese prefectures during the *Jingkang Incident* (1126–1127), a period marked by the Jurchen invasion and the collapse of the Northern Song dynasty. This event prompted significant migration between 1127 and 1130, subsequently intensifying clan activities in the regions that received these migrants.[14] We further source migrant data from the *History of Migration in China*[15] and construct a variable, *migration*, defined as the logarithm of the number of migrations in each prefecture during 1127–1130. The third instrumental variable is constructed from the official registry of traditional villages certified by China's Protection and Development Committee for Ancient Villages. This variable reflects the preservation of cultural heritage within traditional clan structures, providing exogenous variation for identifying historical settlement patterns. The results

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[10] S. N. Brissimis, M. Delis, and M. Iosifidi, 'Bank Market Power and Monetary Policy Transmission' (2014) International Journal of Central Banking 10(4) 173–214; and S. Clerides, M. D. Delis, and S. Kokas, 'A New Data Set on Competition in National Banking Markets' (2015) Financial Markets, Institutions and Instruments 24 267–311.

[11] S. Claessens, and L. Laeven, 'What Drives Banking competition? Some International Evidence' (2004) Journal of Money, Credit, and Banking 36(3) 563–83.

[12] J. C. Panzar, and J. N. Rosse, 'Testing for "Monopoly" Equilibrium' (1987) Journal of Industrial Economics 35 443–56.

[13] Z. Chen, C. Ma, and A. J. Sinclair, 'Banking on the Confucian Clan: Why China Developed Financial Markets So Late', (2022), The Economic Journal 132 1378–1413.

[14] Y. Bai, 'The Struggle for Existence: Migration, Competition and Human Capital Accumulation in Historic China' (2022) International Economic Review 63 1239–69; and H. Fan, and others 'Clan Culture and Patterns of Industrial Specialization in China' (2023) Journal of Economic Behavior and Organization 207 457–78.

[15] S. Wu, History of Migration in China (Zhongguo Yimin Shi) Vol. 4 (Fuzhou, Fujian People's Publishing House, 1997).

of instrumental variables regressions show that the findings regarding the positive association between clan strength and banking competition remain largely unchanged.

We examine possible channels through which clan culture can influence banking competition. First, if clan culture fosters informal institutional environments, clan strength should be beneficial for performance in financial activities,[16] which alleviates potential conflicts during financial service provision and reduces costs for banks. As a result, bank credits should increase in places where informal institutions are relatively well developed.[17] We analyze the number of mediation institutions in each prefecture over our sample period and correlate this with clan strength. Mediation institutions, as emergent civil organizations dedicated to conflict resolution, significantly enhance civil management. The analysis reveals a significantly positive correlation between clan strength and the number of mediation institutions, thereby supporting our expectation that clan culture offers an alternative institutional framework for addressing civil disputes.

Second, if clan culture can be conceptualized as a form of social capital shaping generalized trust among individuals, clan strength should be associated with increased financial transactions as lower information asymmetry emerges among participants.[18] Enterprises are less likely to proceed misconducts and suffer stock price crashes at a high level social trust.[19] More sufficient finance demand and healthier transaction environments attract banks' entrance. We thus utilize participation in nongovernmental organizations (NGOs) as a proxy for local social capital[20] and observe a positive association between clan strength and NGO involvement. In addition, we use the survey data to associate clan with the trust index. The findings of this paper suggest that stronger clan ties may mitigate suspicion among individuals unfamiliar with one another, fostering a more trusting environment conducive to interpersonal transaction.

This study contributes to the literature in two ways. First, our findings identify novel determinants of banking competition. Although this study specifically examines the influence of clan culture on regional banking competition in China, the country shares most typical characteristics of emerging market economies. Consequently, insights derived from China can shed light on broader dynamics within emerging markets. For instance, China, like many emerging markets, features an underdeveloped legal environment characterized by weak enforcement.[21] Kinship-based relationships are pervasive across emerging markets, playing a crucial role on social support and

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[16] W. Li, and X. Hua, 'The Value of Family Social Capital in Informal Financial Markets: Evidence from China' (2023) Pacific-Basin Finance Journal 77 101,922.

[17] P. Cruz-García, and J. Peiró-Palomino, 'Informal, Formal Institutions and Credit: Complements or Substitutes?' (2019) Journal of Institutional Economics 15(4) 649–671.

[18] L. Gu, and others, 'Social Trust and Corporate Financial Asset Holdings: Evidence from China' (2022) International Review of Financial Analysis 82 102,170.

[19] C. Cao, C. Xia, and K. C. Chan, 'Social Trust and Stock Price Crash Risk: Evidence from China' (2016) International Review of Economics and Finance 46 148–65; and W. Dong, and others 'Social Trust and Corporate Misconduct: Evidence from China' (2018) Journal of Business Ethics 151 539–62.

[20] . Hasan, Q. He, and H. Lu, 'Social Capital, Trusting, and Trustworthiness: Evidence from Peer-to-Peer Lending' (2022) Journal of Financial and Quantitative Analysis 57(4) 1409–53.

[21] J. Lejeune, 'Weak Enforcement of Intellectual Property Rights in China: integrating political, cultural and structural explanations' (2014) Journal of Contemporary China 23(88) 698–714; and B. Ke, and X. Zhang, 'Does public enforcement work in weak investor protection countries? Evidence from China' (2021) Contemporary Accounting Research 38(2) 1231–73.

integration.[22] Our research demonstrates that within economies possessing an underdeveloped legal environment, cultural factors can serve as effective informal institutions that foster social capital, thereby promoting greater competition in banking sectors. Second, our study is also related to the role of clan culture in China's economic development.[23] By investigating how Chinese culture affects financial sectors and demonstrates its persistent effect of clan culture on the current banking industry, our study contributes to the literature on the determinant of China's banking market development in recent decades.[24]

The rest of this paper is arranged as follows. We first flesh out the background of Chinese clan culture and review the Chinese banking industry reforms in recent years, then put forward corresponding hypotheses in Institutional Background. Then Data and Research Design describes our data and variables and conducts summary statistics. We provide an empirical model, then give benchmark and heterogeneity results on different bank types, periods and regions in Empirical Results. Robustness examines the robustness and deals with the endogeneity. In Discussion: Mechanisms and Interpretations, we further examine possible mechanisms and Conclusion concludes this paper.

2. Institutional Background

2.1. Clan Culture

As one of the earliest civilizations in the world, China has developed a lineage-based kinship morality embedded in clan culture to foster cooperation among its people. The clan, defined by the consanguineous ties among families with common ancestors, emphasizes unity and collaboration among its members, forming cooperative groups that serve as fundamental units for social activities.[25] Key manifestations of clan culture include genealogy books, which document familial lineage and reproduction, and ancestral halls, which facilitate ancestor worship.[26] These elements are widespread at the grassroots level, with genealogy books codifying social norms and ancestral halls embodying reverence for ancestors and their notable traits.[27] Genealogy books meticulously record the names of all family members in a tree format, often accompanied by family instructions advocating virtues such as loyalty, filial piety, and diligence. Thus, the genealogy book serves as a microcosm of the clan's development and collective spirit.

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[22] C. Zhang, 'Family support or social support? The role of clan culture' (2019) Journal of Population Economics 32(2) 529–549.

[23] H. Fan, and others 'Clan Culture and Patterns of Industrial Specialization in China', Journal of Economic Behavior and Organization 207 457–478; and Y. Liu, and others 'Clan culture and digital transformation: Evidence from Chinese family firms' (2025) Accounting and Finance 65 971–1008.

[24] Z. Chen, C. Ma, and A. J. Sinclair, 'Banking on the Confucian clan: why China developed financial markets so late' (2022) The Economic Journal 132 1378–1413; and A. P. Fernandes, and J. L. Duanmu, 'Foreign banks and firms' export dynamics: Evidence from China's banking reform' Journal of Development Economics 174 103,474.

[25] Hsu, F. L. K., Clan, Caste and Club (London, Van Nostrand Reinhold Company Press, 1963).

[26] P Peng, Y., 'Kinship networks and entrepreneurs in China's transitional economy' (2004) American Journal of Sociology 109(5) 1045–74; and L. Tsai, Accountability Without Democracy: Solidary Groups and Public Goods Provision in Rural China (Cambridge, Cambridge University Press, 2007).

[27] J. A. Cohen, Chen, F. C. and Edwards, R. R., Essays on China's Legal Tradition (Princeton, Princeton University Press, 1981).

The Chinese clan culture is believed to have gained momentum during the Song Dynasty (960- –1279), when the establishment of genealogies and ancestral halls became prevalent within grassroots society, and it flourished during the Qing Dynasty (1636–1912). Although clan activities faced suppression in the early years of the People's Republic of China, particularly during the Cultural Revolution, their significance has resurged following the implementation of reform and opening-up policies in 1978. Practices such as the construction of ancestral halls and the compilation of genealogies reemerged during this period.[28] The influence of clans remains substantial to this day, affecting personal decisions and regional economies.[29] Furthermore, the profound social changes since the late twentieth century have endowed clan culture with varied implications, leading to both internal diversity and adaptations in response to societal shifts. A broader conception of clan culture has emerged, characterized by a pursuit of common interests among individuals sharing a surname and the inclusion of non-clan members in clan-based business and social activities. As a result, the nature of relationships among clan members has become increasingly diverse.

Two important features are worth noting. First, clans establish informal rules and norms that members are expected to adhere to, with individuals belonging to a particular clan required to follow its moral guidelines and behavioral standards.[30] Clan culture promotes cooperation among members, facilitating mutual assistance and charitable donations to individuals or groups outside the clan.[31] Those who make notable contributions to the clan's development are recognized and attain moral standing within the clan.[32] Conversely, individuals who damage the clan's reputation or violate its moral codes may face internal sanctions, including expulsion.[33] Consequently, an interpersonal network of connections operates among clans. In this context, clans fulfill various local functions within a region, such as conflict resolution, tax collection, and security, positioning themselves as social or autonomous organizations.

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[28] Y. Peng, 'Kinship networks and entrepreneurs in China's transitional economy' (2004) American Journal of Sociology 109(5) 1045–74; and F., Su, and others 'Clans, Electoral Procedures and Voter Turnout: Evidence from Villagers' Committee Elections in Transitional China' (2011) Political Studies 59(2) 432–457; and A. Greif, and G. Tabellini, 'The Clan and the Corporation: Sustaining Cooperation in China and Europe' (2017) Journal of Comparative Economics 45 1–35.

[29] L. Tsai, Accountability Without Democracy: Solidary Groups and Public Goods Provision in Rural China, Cambridge University Press (2007); and C. Zhang, Clans, entrepreneurship, and development of the private sector in China (2020) Journal of Comparative Economics, 48, 100–123; and , C. Tang, Z. Zhao, Informal institution meets child development: Clan culture and child labor in China (2023) Journal of Comparative Economics 51(1) 277–294.

[30] Z. Chen, C. Ma, and A. J. Sinclair, Banking on the Confucian clan: why China developed financial markets so late (2022) The Economic Journal 132, 1378–1413.

[31] F. L. K. Hsu, Clan, Caste and Club (London, Van Nostrand Reinhold Company Press, 1963); and , A. Greif, and G. Tabellini, 'The Clan and the Corporation: Sustaining Cooperation in China and Europe' (2017) Journal of Comparative Economics 45 1–35.

[32] E. M. Ahern, *The Cult of the Dead in a Chinese Village* (California, Stanford University Press, 1973); and Y. Xu, and Y. Yao, 'Informal Institutions, Collective Action, and Public Investment in Rural China' (2015) American Political Science Review 109(2) 371–391.

[33] J. Watson, 'Chinese Kinship Reconsidered: Anthropological Perspectives on Historical Research' (1982) The China Quarterly 92 589–622; and Y. Peng, 'Kinship networks and entrepreneurs in China's transitional economy' (2004) American Journal of Sociology 109(5) 1045–74; and A. Greif, and G. Tabellini, 'The Clan and the Corporation: Sustaining Cooperation in China and Europe' (2017) Journal of Comparative Economics 45 1–35.

Second, the formation of clan culture has diversified and transcended its original lineage-based structure in recent times. An obvious trend is the broadened concept of clans, which now includes individuals with the same surname, establishing connections based on general kinship rather than strict lineage. For instance, firms are increasingly inclined to engage with supply chain partners sharing the same surname, leveraging the stable ties formed through blood relationships and the unity derived from clan origins.[34] The reasons for this phenomenon can be categorized into historical and political factors. Historically, clan divisions often arose as a means of escaping poverty, famine, war, or political persecution. Members from different clans, even with different surnames, may share a common ancestry. Furthermore, the notion that 'Chinese certainly desires a glorious ancestry and also does his best to make his ancestry glorious whenever possible'[35] has resulted in numerous inaccuracies in ancestral records, a trend that persists today.

Political demand reveals that clans are typically well-organized and exhibit a tendency toward regional governance.[36] Officials are willing to establish folk autonomous organizations to enhance local management. Throughout the process of clan transformation, external individuals have been integrated, often adopting new surnames to foster regional cohesion. These factors contribute to a redefined clan concept, expanding its role into a social and economic entity. This modernized form of the clan, as a significant component of Chinese society, is gradually transcending traditional familial constraints and evolving into a more inclusive social group that functions as a business or political intermediary.[37]

Although clan organizations are not formally recognized in modern Chinese society, the informal rules and norms inherent in clans exert a significant influence on contemporary social dynamics.[38] Specifically, clan culture plays a vital role in shaping the local economy by alleviating financing constraints and administrative challenges faced by private enterprises, thereby fostering values that facilitate government regulation of local businesses.[39]Fan et al.[40] illustrate that clans contribute to current industrial specialization patterns in China by enhancing the contracting environment for local firms. Executives in areas with robust clan cultures tend to adopt more conservative strategies,

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[34] H. Li, H. Liu, and H. Zhao, 'Traditional culture echoes? The impact of clan culture upon partner surname sharing: Evidence from Chinese supply chains' (2021) Industrial Marketing Management 99 40–53.

[35] F. L. K. Hsu, *Clan, Caste and Club* (London, Van Nostrand Reinhold Company Press, 1963).

[36] F. L. K. Hsu, *Clan, Caste and Club* (London, Van Nostrand Reinhold Company Press, 1963); and H. Fan and others 'Clan culture and patterns of industrial specialization in China' (2023) Journal of Economic Behavior and Organization 207 457–478; and R. Li, 'When democratic deliberation encounters Confucian moral governance: Rethinking consultative politics in rural China' (2023) Economic and Political Studies 12(3) 267–284.

[37] F. Liu, X. He, and T. Wang, 'In the name of the family: The effect of CEO clan culture background on firm internationalization' (2023) Journal of Business Research 161 113,837.

[38] J. Zhang, and Z. Zhao, 'Social-family network and self-employment: evidence from temporary rural—urban migrants in China' (2015) IZA Journal of Labor and Development 4(4) ; and H. LiFan, C., Xue, C, M. Yu. 'Clan culture and patterns of industrial specialization in China' (2023) Journal of Economic Behavior and Organization 207 457–478.

[39] C. Zhang , 'Clans, entrepreneurship, and development of the private sector in China' (2020) Journal of Comparative Economics 48 100–123.

[40] H. Fan, and others 'Clan culture and patterns of industrial specialization in China' (2023) Journal of Economic Behavior and Organization 207 457–478.

prioritizing clan stability and reputation over innovation and risk-taking.[41] Furthermore, clan culture is linked to social development and pressing issues, such as support arrangements for the elderly and the likelihood of adults raising children, particularly sons, for future support.[42] Finally, clan culture facilitates local governments in providing public goods and services, enhancing overall utility for the populace. Martinez-Bravo et al.[43] find that regions with strong clans tend to offer more public goods, a view echoed by Xu and Yao,[44] who argue that local governors can leverage clan networks to address public goods financing challenges.

2.2. China's Banking System and Regulations

China's financial system is predominantly bank-centered, characterized by the dominance of the five major state-owned commercial banks.[45] According to China Banking and Insurance Regulatory Commission (CBIRC) report of 2022, the total assets of them amount to RMB 156.3 trillion, constituting 42.41% of the overall banking industry in China.[46]

The People's Bank of China (PBC, i.e. the central bank) controlled 93% of the total banking assets when China initiated the economic reform in 1978. Since 1983, PBC shifted its focus to core central banking functions, including the management of monetary supply, inflation, and economic growth. Concurrently, the four state-owned banks were established to take over commercial banking operations. The Bank of Communications (BComm), the fifth largest state-owned bank, was founded in 1987, marking a pivotal milestone as the first national shareholding commercial bank. In 2007, the transformation of original postal office reserves across China ended up with the establishment of the Postal Savings Bank of China (PSBC). This development solidified the structure of the six state-owned banks that exist today.

Competition in the Chinese banking sector was relatively low during the 1980s and 1990s[47] (Demirgüç-Kunt and Levine, 2001). The 'Big Five' state-owned banks commanded nearly 94% of branches, demonstrating absolute dominance in the market. Despite the emergence of numerous joint-stock commercial banks, along with a significant number of regional banks, rural credit cooperatives, and urban credit cooperatives during the 1990s, these institutions collectively operated only 9,707 branches, which constituted just over 10% of the total.

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[41] L. Huang, and others 'Clan culture and risk-taking of Chinese enterprises' (2022) China Economic Review 72 101,763.

[42] C. Zhang, 'Family support or social support? The role of clan culture' (2019) Journal of Population Economics 32(2) 529–549.

[43] M. Martinez-Bravo, and others 'Political Reform in China: Elections, Public Goods and Income Distribution' (2014) SSRN available: http://dx.doi.org/10.2139/ssrn.2356343.

[44] Y. Xu, Y. Yao, 'Informal Institutions, Collective Action, and Public Investment in Rural China' (2015) American Political Science Review 109(2) 371–391.

[45] Q. He, C. Xue, and C. Zhu, 'Financial development and patterns of industrial specialization: evidence from China' (2017) Review of Finance 21 1593–1638; and I. Hasan, Q. He, and H. Lu, 'Social Capital, Trusting, and Trustworthiness: Evidence from Peer-toPeer Lending' (2022) Journal of Financial and Quantitative Analysis 57(4) 1409–53.

[46] The CBIRC was established in April 2018 by a merger of China Banking Regulatory Commission (CBRC) and China Insurance Regulatory Commission (CIRC).

[47] A. Demirgüç-Kunt, and , R. Levine, Financial Structure and Economic Growth: A Cross Country Comparison of Banks, Markets, and Development (Massachusetts, The MIT Press, 2001).

Following China's accession to the WTO in 2001, the country implemented several waves of regulatory reforms aimed at enhancing the operational efficiency of its banking industry. Since 2003, a series of deregulation policies have facilitated the opening of new branches. A significant milestone in this process was the introduction of the 'Measures for the Administration of City Commercial Banks' Offsite Branches' by the China Banking Regulatory Commission (CBRC) in 2006. This regulation permitted joint-stock and city commercial banks to expand into other provinces, provided they met specific criteria, including total assets exceeding 50 billion yuan, registered capital above 1 billion yuan, a non-performing loan rate below 6% for three consecutive years, assets per capita over 20 million yuan, and a return on assets exceeding 0.45% and return on equity above 10% after accounting for loan loss provisions. Prior to this measure, cross-provincial expansion required authorization from host prefectures and was contingent on local economic development and capital requirements.

Several significant reforms followed. In 2009, the CBRC issued the 'Opinions on the Adjustment of the Market Entry Policy of Small and Medium-sized Commercial Bank Branches (Trial)', which allowed joint-stock and city commercial banks with branches in provincial capitals to open new branches in all prefectures within the province. In 2013, the CBRC introduced the 'Implementation Measures for the Administrative Licensing Items concerning Chinese-Funded Commercial Banks', completely lifting restrictions on branch establishment and reducing the establishment period to one year. The 'Guide to the Establishment, Change, Termination, and Approval of Business Scope of Chinese Banking Financial Institutions and Their Branches', published in 2019, granted city commercial banks the right to establish new branches within their provinces, contingent on satisfactory supervisory rankings and capabilities. Additionally, city banks registered in municipalities were permitted to open branches in areas with limited financial services. These regulatory changes significantly enhanced the competitive landscape of the banking sector by lowering entry barriers for medium and small banks. As a result of these deregulation efforts, the number of branches owned by joint-stock, city commercial, and rural commercial banks increased dramatically, from 92,622 total branches in 2001, of which state-owned banks held 79,560 (85.89%) to 198,454 branches in 2020, where these banks collectively owned 94,248 branches, causing the proportion of state-owned bank branches to decline to half.

Despite the boom of NSOBs, the entry of foreign banks remains tightly regulated. The expansion of foreign bank branches is subject to authorization by the CBRC and depends on the operational status of the foreign institutions. In the late twentieth century, foreign banks were permitted only to establish representative offices in special economic zones, with branch operations not allowed until the introduction of the 'Regulations on the Management of Foreign-Funded Financial Institutions' in 1994. Following this regulation, the number of foreign bank branches began to increase at a modest pace. Over the past two decades, the Chinese regulators have gradually removed various requirements related to capital, assets, and operational periods, facilitating a more favorable environment for foreign bank expansion.

2.3. Hypothesis Development

Chinese clans have significantly shaped the mindset of local citizens toward interpersonal relationships and collective decision-making, particularly in regions with

strong clan influences, and hence are likely to be an important determinant of regional banking competition.

First, clan culture fosters local organizations that function as a system of informal rules and norms governing member behaviors. These informal institutions, encompassing behavioral norms, conventions, and self-imposed codes of conduct, complement formal institutions by enhancing property rights protection and law enforcement.[48] Robust property rights protection, bolstered by this cultural framework, incentivizes banks to enter markets, as it reduces the costs associated with providing financial services. Furthermore, clan culture strengthens internal local networks, facilitating initial relationship-building between banks and local communities or businesses. For new entrants, these informal norms significantly lower transaction costs and mitigate information asymmetries inherent in market entry. Consequently, such cultural institutions increase banks' willingness and likelihood of successful market entry, and heighten competition within the banking sector.

Second, clan structures enforce behavioral codes and norms among members while fostering shared beliefs that facilitate collective action-two fundamental components of social capital. Banking systems demonstrate heightened competitiveness in environments where information acquisition costs are lower, a condition particularly prevalent in regions with strong social capital foundations. Social capital substantially reduces the trust-building expenditures and information asymmetries typically associated with market entry, thereby reducing operational costs for new businesses establishing themselves in previously untapped regions. Incumbent banks likewise benefit from environments with high social capital, as social capital restrains borrowers' opportunistic behaviors and leads to lower default rates.[49] When confronted with competitive threats from new market entrants, these incumbents exhibit competitive advantages in customer retention through strategic pricing, enhanced service quality, or financial product innovation. This dynamic creates market conditions particularly conducive to vigorous competition within the banking sector.

Finally, if clan culture fosters robust informal institutions and enhances social capital, it would increase the demand for financial services and subsequently intensified banking competition. As Allen et al.[50] demonstrate, China's economic development has historically relied on financial services underpinned by social relationships and reputational mechanisms, particularly in contexts with limited formal legal protections and standardized financing alternatives. This observation is reinforced by a bunch of literature that argues that informal institutions and social capital can effectively bolster local enterprises and stimulate economic expansion.[51] Regions exhibiting strong clan

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[48] P. Cruz-García, and J. Peiró-Palomino, 'Informal, formal institutions and credit: complements or substitutes?' (2019) Journal of Institutional Economics 15(4) 649–671.

[49] A. Jha, and Y. Chen, 'Audit fees and social capital' (2015) The Accounting Review 90 611–639; and J. Y. Jin, and others 'Social capital and bank stability' (2017) Journal of Financial Stability 32 99–114; and J. M. Martin-Flores, 'Is bank misconduct related to social capital? Evidence from US banks' (2024) Journal of Banking and Finance 167 107,256.

[50] F. Allen, J. Qian, and M. Qian, 'Law, finance, and economic growth in China' (2005) Journal of Financial Economics 77(1) 57–116.

[51] C. R. Williamson, and C. B. Kerekes, 'Securing private property: formal versus informal institutions' (2011) Journal of Law and Economics 54(3) 537–572; and , D. Javakhadze, S. P. Ferris, and D. W.French, 'Social capital, investments, and external financing' (2016) Journal of Corporate Finance 37 38–55; and R.

cultures demonstrate enhanced local economic vitality and greater demand for financial services. For instance, clans facilitate coordinated community action, enabling greater investment in public goods and facilitate the investment of venture capital.[52] Clan-based informal institutions reduce business uncertainty, thereby lowering risk and stimulating investment.[53] To meet the growing customer demand, banks are racing to innovate and upgrade services, fueling fierce competition in the financial services market.

Based on the above discussion, our first hypothesis can be summarized as follows:

H1: Banking competition would be intensified in regions with a strong clan culture.

A distinctive feature of the Chinese banking industry is the dominant role played by several large state-owned banks (SOBs). These primary SOBs operate under stringent control by the central government, with their activities largely aligned with governmental economic policies, such as economic stimulus and industrial support. Consequently, the influence of clan culture and other localized factors on the competitive dynamics among these major state-owned banks is likely to be minimal. In contrast, non-state-owned banks (NSOBs), which encompass a variety of banking types, are expected to be more significantly affected by clan culture. The second hypothesis can be summarized as follows:

H2: Clan culture plays a stronger role in improving the competition among NSOBs, compared with that among SOBs.

Clans, as informal organizations founded on kinship ties, could have a profound impact on local state governance. On the one hand, clans possess the capacity to regulate and even punish their members according to established norms, thereby partially fulfilling governance functions of the government. In this context, the weaker the government's governance capabilities in a region, the more extensive the operational space for clans, paralleling other types of autonomous organizations that complement the functions of government.[54] On the other hand, there is a conflict between the clan governance and that of the government. Extant research has found that a key role of clan in China is to resist the predatory actions of the government.[55] Therefore, when the government's governance capabilities in a region are stronger, its role as a 'predatory hand' may also become more pronounced. In this scenario, the function of clans in resisting this predatory behavior may become even more prominent. Based on this, we propose the following two hypotheses:

Cull, and others 'Social capital, finance, and consumption: Evidence from a representative sample of Chinese households' (2022) Journal of Banking and Finance 145 106,637.

[52] Y. Xu, and Y. Yao, 'Informal institutions, collective action, and public investment in rural China' (2015) American Political Science Review 109(2) 371–391.

[53] S. Xue, and others 'Clan culture and corporate cash holdings: Are private companies supported by informal institutions?' (2024) Pacific-Basin Finance Journal 86 102,452.

[54] J. R. L. Sancho, 'The Autonomous Communities: Politics and Economics' (1987) Environment and Planning C: Government and Policy 5(3) 251–256; and D. Guzina, 'Federalism and Regional Autonomy' (2010) The International Studies Encyclopedia 4 2023–2042.

[55] C. Zhang, 'Clans, entrepreneurship, and development of the private sector in China' (2020) Journal of Comparative Economics 48 100–123.

H3a: Clan culture presents a complementary effect on the governmental management.

H3b: Clan culture presents a supplementary effect on the governmental management.

3. Data and Research Design

3.1. Measures of Clan Strength

Clans have historically served as the primary medium through which individuals made decisions and took actions, functioning as vital mechanisms for cooperation since the Song dynasty.[56] To measure the strength of the clan in a prefecture, we use the number of genealogy books in a prefecture across our sample period. Genealogy books document the lineage members and their relationships, and specify clan rules and moral guidelines for member[57]s. As a result, more genealogy books are associated with more efforts in clan activities in a region.

Table 1
Prefecture distribution and time series mean of genealogy density from 2001–2020.

[56] A. Greif, and G. Tabellini, 'Cultural and institutional bifurcation: China and Europe compared' (2010) American Economic Review 100(2) 135–140; and A. Greif, and , G. Tabellini, 'The Clan and the Corporation: Sustaining Cooperation in China and Europe' (2017) Journal of Comparative Economics 45 1–35.

[57] P. K. Bol, Neo-Confucianism in History (Cambridge, MA, and London, Harvard University Press. 2008).

Province	Prefectures	Mean of genealogy density
Beijing	1 (Municipality)	0.041
Tianjin	1 (Municipality)	0.055
Hebei	11	0.033
Shanxi	11	0.085
Inner Mongolia	12	0.001
Liaoning	14	0.091
Jilin	9	0.009
Heilongjiang	13	0.008
Shanghai	1 (Municipality)	0.313
Jiangsu	13	0.803
Zhejiang	11	2.859
Anhui	16	0.626
Fujian	9	0.655
Jiangxi	11	0.721
Shandong	16	0.124
Henan	17	0.093
Hubei	13	0.152
Hunan	14	1.233
Guangdong	21	0.331
Guangxi	14	0.033
Hainan	4	0.064
Chongqing	1 (Municipality)	0.095
Sichuan	21	0.079
Guizhou	9	0.019
Yunan	16	0.283
Tibet	7	0
Shaanxi	10	0.058
Gansu	14	0.029
Qinghai	8	0.020
Ningxia	5	0.001
Xinjiang	14	0

The genealogy data are obtained from the *Catalog of Chinese Genealogy* (2009, Zhongguo Jiapu Zongmu), published by the Shanghai Library, which encompasses 52,603 clans and 608 surnames across 301 prefectures. Each genealogical entry records the surname and native place of its host according to the administrative divisions as of 2003. After excluding genealogy records outside Mainland China or lacking clarity regarding native places and edition years, a total of 44,497 genealogies remain. Due to administrative division changes since 1990, we further eliminated prefectures with significant alterations, resulting in 34,382 records for prefecture-level analysis. We define genealogy density as the number of genealogy books per 10,000 residents in a given prefecture (*clan*). Resident data are drawn from the registered population from *China Statistical Yearbook*. While historical changes may have led to the destruction or loss of some genealogy books, potentially introducing statistical bias regarding true genealogy intensity, this bias may also enhance the validity of our genealogy proxy, as books are more likely to be preserved in regions with a stronger adherence to clan culture and a greater emphasis on clan inheritance.[58] Table 1 presents the summary statistics of genealogy density across Chinese provinces (including municipalities) during our sample

[58] Z. Chen, C. Ma, and A. J. Sinclair, 'Banking on the Confucian clan: why China developed financial markets so late' (2022) The Economic Journal 132 1378–1413.

period. Prefectures in southeastern provinces exhibit higher genealogy density than those in inland provinces. For instance, prefectures such as Jinhua, Lishui, and Shaoxing in Zhejiang province demonstrate the highest level of genealogy density. Notably, certain prefectures in central regions, like Xiangtan in Hunan and Xuancheng in Anhui, also reflect high genealogy density. To alleviate the potential concern regarding the stability of genealogy records and the growth and mobility of population on provincial distribution, we also present in Appendix 1 the genealogy density in years 1953, 1982, and 2010, corresponding to the first, third, and sixth national population census. These years provide accurate provincial data of permanent residents with relatively consistent time intervals between them. While population growth during these periods results in a fierce decline of the genealogy density, our analysis indicates that the overall distribution of genealogy density remains inherently stable, suggesting the persistence of clan across generations over extended periods.

3.2. Measures of Banking Competition

Banking competition measure is the dependent variable in our analysis. A widely used measure is the centration ratio in the banking industry, as higher concentration is generally associated with lower competition in the banking industry.[59] For instance, Berger et al.[60] have used the share of the top five banks in total bank deposits to measure banking concentration. Note that bank deposits at prefecture-level are not available in China, we therefore rely on the number of bank branches in a prefecture. Bank branches serve as the foundational elements of commercial banking institutions within specific regions, providing an important role in credit allocation.[61]

We draw bank branch data in the period 2001–2020 from the China Industrial and Commercial Enterprise Registration Information Database. This database provides detailed information on the establishment, withdrawal, and modification of each bank branch across 288 prefectures in China. We further exclude policy banks, rural banks and internet banks from our sample based on the following considerations: (i) policy banks primarily operate in non-competitive markets with nonprofit objectives, and their funding relies on government bond issuance rather than deposit-taking[62]; (ii) rural banks are small and restrictedly localized with heavy reliance on local government support[63]; (iii) internet banks operate with branchless banking models that have few physical branches. We use Herfindahl-Hirschman Index (HHI) as the indicator of banking competition at the

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[59] A. N. Berger, and others 'Bank Concentration and Competition: An Evolution in the Making' (2004) Journal of Money, Credit, and Banking 36(3) 433–451; and J. A. Bikker and others 'Assessing Competition with the Panzar-Rosse Model: The Role of Scale, Costs, and Equilibrium' (2012) The Review of Economics and Statistics 94(4) 1025–1044.

[60] A. N. Berger, and others, 'Bank Concentration and Competition: An Evolution in the Making' (2004) Journal of Money, Credit, and Banking 36(3) 433–451.

[61] M. R. Goetz, L. Laeven, and R. Levine, 'Does the geographic expansion of banks reduce risk?' (2016) Journal of Financial Economics 120 346–362; and K. R. Cortés, and P. E. Strahan, 'Tracing out capital flows: How financially integrated banks respond to natural disasters' (2017) Journal of Financial Economics 125 182–199; and I. Lim, and D. D. Nguyen, 'Hometown Lending' (2021) Journal of Financial and Quantitative Analysis 56(8) 2894–2933.

[62] H. Ru, 'Government credit, a double-edged sword: Evidence from the China Development Bank' (2018) The Journal of Finance 73(1) 275–316.

[63] Z. Jing, and others 'Does local government debt regulation improve rural banks' performance? Evidence from China' (2024) Journal of International Financial Markets, Institutions and Money 91 101,914.

prefecture level, which is the sum of the squares of the market shares (branches) of each individual bank in a prefecture in a given year. Specifically, HHI is defined as:

$$HHI_{it} = \sum_{j=1}^{N_{it}} \left(\frac{Bank\_Branch_{ijt}}{Branch\_Sum_{it}} \right)^2 \quad (1)$$

where $Bank\_Branch_{ijt}$,$Branch\_Sum_{it}$ and N_{it} respectively represent the number of branches owned by bank j, the total number of bank branches and the type number of banks in the prefecture i in year t. HHI_{it} ranges from 0 to 1 with a higher value indicating a greater banking competition structure. In addition, we also use the share of the bank branches held by the three largest banks in a prefecture (CR3) as an alternative measure of bank concentration.

As the concentration measures primarily reflect the existing market structure, they may not capture the competition from potential entrants and other non-bank financial institutions. For a robustness check, we also use the measures of banking market power by directly examining the relationship between factor input and output price. Panzar and Rosse[64] developed H-statistic, which examines how changes in input prices affect total revenue. In a perfect competition environment, an increase in input prices results in the same amount increase in both marginal costs and revenues ($H = 1$), while under a monopoly environment, an increase in input increases the marginal costs but reduces the outcome, as a result, total revenue declines ($H < 0$). Following Claessens and Laeven,[65] we construct H-statistic by estimating a reduced-form bank revenue equation:

$$\ln(P_{it}) = \beta_0 + \beta_1 \ln(W_{1,it}) + \beta_2 \ln(W_{2,it}) + \beta_3 \ln(W_{3,it}) + \gamma Controls_{it} + \varepsilon_{it} \quad (2)$$

where P_{it} is the ratio of gross interest revenue to total assets (proxy for output price of loans), $W_{1;it}$ is the ratio of interest expenses to total deposits and money market funding (proxy for input price of deposits), $W_{2;it}$ is the ratio of personnel expense to total assets (proxy for input price of labor), and $W_{3;it}$ is the ratio of other operating and administrative expense to total assets (proxy for input price of equipment/fixed capital). Control variables used in baseline regressions (*gdpg*, *pop*, *gap*, *deposit*, *loan*, *bond*, *value*, *regu*, *inv*, *bank*) are also added in. The subscript i and t respectively denote bank and year. H-statistic is calculated as the sum of the elasticity of bank revenue to the three inputs ($H = \beta_1 + \beta_2 \ \beta_3$).

Estimating the H-statistic necessitates sufficient sample observations of banks primarily operating in an individual region. As a result, we estimate the H-statistic by using a small sample of local banks operating within the province where their headquarters are located.[66] Note that for some regions, the sample size is not big enough to estimate our H-statistic. We therefore use HHI as our main measure throughout this study, and use CR3 and H-statistic for a robustness check in Alternative Measures.

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[64] J. C. Panzar, and J. N. Rosse, 'Testing for "Monopoly" Equilibrium' (1987) Journal of Industrial Economics 35 443–456

[65] S. Claessens, and L. Laeven, 'What Drives Banking competition? Some International Evidence' (2004) Journal of Money, Credit, and Banking 36(3) 563–583.

[66] We exclude banks with significant cross-prefecture operations by dropping those whose branches exceed 10% outside their home province.

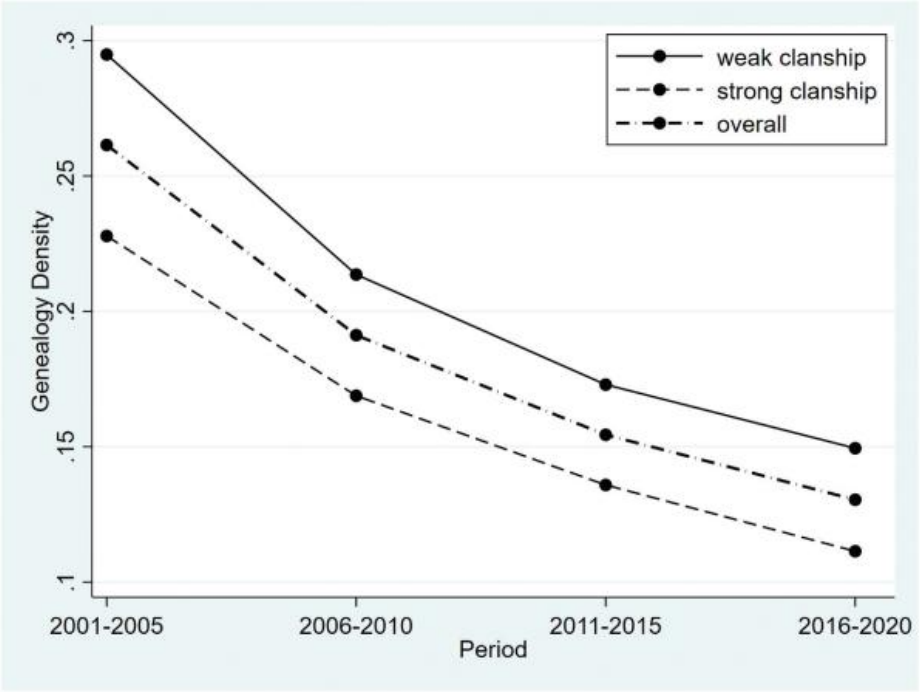

Fig.1. Average hhi in regions with different genealogy density. Source: Calculated by authors.

Figure 1 illustrates the time varying of banking competition by simply dividing the sample prefectures into strong and weak clan regions based on the sample median and comparing their respective extent of banking competition over a five-year period between 2001 and 2020. Clearly, we observe an upward trend in banking competition, with banks experiencing more intense competition in the strong clan regions.

3.3. Research Design

To empirically examine whether clan intensity shapes the pattern of banking competition, we employ a panel regression framework, with the following specifications:

$$HHI_{ip} = \beta_0 + \beta_1 clan_{ip} + \beta_2 Controls_{ip} + \varepsilon_{ip} \quad (3)$$

Note that genealogy density is relatively stable across prefectures, we estimate this regression using five-year intervals between 2001 and 2020, namely four periods, 2001–2005, 2006–2010, 2011–2015 and 2016–2020, respectively. HHI_{ip} is the average HHI and $clan_{ip}$ is the average genealogy density of prefecture i in period p. $Controls_{ip}$ are the control variables of prefecture i in period p. The control variables include different dimensions of prefecture characteristics. We add regional GDP growth (*gdpg*) to measure the economic development and log of regional population (*pop*) to measure the prefecture scale. The gap ratio of local fiscal revenues and expenditures (*gap*) is used to measure the fiscal condition of local governments. Local fixed asset investment (*fixed_inv*) is also included to control regional infrastructure construction, which accounts for a large proportion of banks' operations. The ratio of deposits and loans of financial institutions to

GDP (*deposit*, *loans*) is also included to control financial sector interindustry competition. The banking industry has a tight relationship with the stock market and bond market, so we use the ratio of values of local listed corporations (*value*) and outstanding corporate bonds (*bond*) to GDP to evaluate the development of the two markets. Besides, log of numbers of administrative regulations issued by the local government (*regu*) is used to measure the regional legal services capability. We also control for the overall number of local bank branches (*bank*) to avoid the doubt that more bank branches lead to intense competition. We use control variables of the year prior to the corresponding period to depict the economic situation before the banks start to adjust their competition strategy. εip is the error term. Considering the possible relationship of clan culture in prefectures within a province, the standard errors are clustered to the province level. Appendix 2 describes variable definitions and data sources.

3.4. Summary Statistics

Panel A in Table 2 presents the summary statistics for our key variables. The regional banking competition index (HHI) is estimated at the prefecture level using Equation (1). The HHI values range from 0.05 to 0.88, with an average of 0.17, indicating significant variation in banking competition environments across Chinese prefectures. The mean and median genealogy density are 0.30 and 0.06, respectively, indicating a right-skewed distribution. We also observe a large variation of the distribution of bank branches across prefectures. For example, Sansha has the lowest ranking, with only 23 bank branches in 2020, while Chongqing ranks highest, with over 5,000 branches.

Panel B in Table 2 provides univariate comparisons of clan intensity during four subperiods of our sample between regions with strong and weak clan strengths. Consistently, we observe more intense competition in regions with strong clan over the four different time periods. Compared with regions with weak clan strength, competition is at least 12.04% higher in regions with strong clan strength, which presents preliminary empirical support for our hypothesis.

4. Empirical Results

4.1. Main Results

The results from estimating Equation (3) are reported in Table 3. We begin by examining the univariate clan effect on banking competition in Column 1 before controlling for other variables. The OLS estimation indicates that clan has a significantly negative effect on the HHI, and these effects remain statistically significant after accounting for a variety of traditional determinants (Column 1–6). The economic impact is also substantial. Based on the results in Column 5, a coefficient of -0.01 for clan culture suggests that a one-unit increase in the standard deviation of genealogy density is associated with a decrease in the HHI by 9.75% of a standard deviation of the HHI. Our results of the control variables accord with intuition. The fiscal gap shows a significantly positive correlation with the HHI. Chinese banks, particularly large SOBs, are the primary creditors to local governments. The fiscal pressure from the local government could deteriorate the performance of bank lending.[67] The negative relationship between bank loans and competition indicates a positive circulation of the banking industry.

[67] N. Gennaioli, A. Martin, and S. Rossi, 'Banks, government Bonds, and Default: What do the data Say?' (2018) Journal of Monetary Economics 98 98–113.

Competition of the banking industry decreases the loan spread, and reduces the firms' borrowing costs.[68] In return, an increase in loan demand leads to intensified banking competition. Finally, we observe a negative association between regulation and HHI index, indicating that a better regulatory environment is associated with intensified banking competition.

Table 2
Summary statistics and univariate analysis

Panel A: Summary statistics

Variable	N	Mean	Median	SD	Min	Max
HHI	1143	0.17	0.16	0.08	0.05	0.88
clan	1143	0.30	0.06	0.78	0.00	7.79
gdpg	1141	11.13	11.30	5.07	−39.80	37.00
pop	1141	5.81	5.88	0.74	2.64	8.12
gap	1141	1.60	1.04	2.08	−0.69	38.03
deposit	1140	1.23	1.08	0.64	0.25	9.95
loan	1140	0.85	0.70	0.50	0.11	6.07
value	1143	0.03	0.01	0.05	0.00	0.83
bond	1143	0.04	0.00	0.15	0.00	3.21
regu	1143	3.32	4.01	2.30	0.00	9.43
inv	1141	0.57	0.53	0.34	0.00	2.98
bank	1143	4.68	3.28	5.00	0.19	52.98
gov_intv	1143	4.48	4.56	2.52	−1.69	11.52
fin_mktz	1143	8.90	7.81	5.13	−0.14	22.80
mkt_legal	1143	3.99	3.90	1.97	−1.62	9.99

Panel B: Univariate analysis

Period	Weak clan culture		Strong clan culture		Difference	t-Value
	Obs.	Mean HHI	Obs.	Mean HHI		
2001–2005	143	0.266	142	0.225	0.041	4.623***
2006–2010	143	0.191	143	0.168	0.023	2.984***
2011–2015	143	0.156	143	0.136	0.020	2.701***
2016–2020	143	0.134	143	0.111	0.022	3.545***

Notes: Panel A presents summary statistics for key variables, while Panel B conducts univariate analysis of clan culture strength and average HHI across four five-year intervals.

4.2 Different Types of Banks

To test the second hypothesis, we further decompose the banks to SOBs, NSOBs and foreign banks and conduct additional analyses by investigating the impacts of clan on the competition in different types of banks.

The results in Column 1 of Table 4 indicate that clan has a negative effect on the percentage of SOBs in a prefecture. This effect may be attributed either to the rapid expansion of city and rural commercial banks or to a slowdown in the growth of state-owned banks. To further clarify this scenario, we examine the internal competition between SOBs and NSOBs. As indicated by the results in Columns 2 and 3, SOBs appear to maintain stability in regions with stronger clan culture, while more intense competition among NSOBs emerges.

[68] Y. Lian, 'Bank competition and the cost of bank loans' (2018) Review of Quantitative Finance and Accounting 51 253–282.

Large SOBs are less likely to be influenced by clan culture. On the one hand, clan culture represents regional autonomy and, at times, serves as a substitute for local government authority.[69] On the other hand, SOBs primarily expand their branches based on administrative divisions (Chinese Financial Yearbook, 1999). As NSOBs grow rapidly, the branches of SOBs are bound to represent a smaller proportion of the overall market. In fact, the number of SOB branches has remained quite stable across most prefectures in recent years, supporting our second hypothesis.

Additionally, we investigate the relationship between clan culture and the percentage of foreign bank branches. Column 4 demonstrates a significant negative correlation between clan culture and the percentage of foreign bank branches. Overall, our findings indicate that strong clan culture primarily contributes to the expansion of NSOBs rather than SOBs or foreign banks.

Table 3
Baseline results

	(1) Full Sample	(2) Full Sample	(3) Full Sample	(4) Full Sample	(5) Full Sample	(6) *clan*>0
clan	−0.017***	−0.014***	−0.011***	−0.010***	−0.010***	−0.010***
	[−6.94]	[−9.11]	[−6.39]	[−6.19]	[−5.52]	[−5.74]
gdpg		−0.001**	−0.001*	−0.001*	−0.001	−0.001*
		[−2.57]	[−2.04]	[−1.89]	[−1.18]	[−1.77]
pop		−0.028**	−0.025**	−0.026**	−0.024	−0.008
		[−2.29]	[−2.24]	[−2.29]	[−1.61]	[−1.60]
gap			0.007**	0.007**	0.006**	0.005*
			[2.40]	[2.35]	[2.05]	[1.97]
deposit			−0.004	−0.002	0.000	−0.009**
			[−0.62]	[−0.18]	[0.02]	[−2.18]
loan			−0.019***	−0.019***	−0.013**	−0.009**
			[−3.91]	[−3.67]	[−2.14]	[−2.52]
value				−0.125**	−0.107*	−0.048
				[−2.41]	[−1.95]	[−0.86]
bond				0.033***	0.026	0.034**
				[3.13]	[1.64]	[2.29]
regu					−0.007***	−0.005***
					[−2.80]	[−2.98]
inv					−0.015	−0.017
					[−1.55]	[−1.33]
bank					0.000	−0.000
					[0.14]	[−0.64]
Constant	0.178***	0.353***	0.345***	0.348***	0.355***	0.270***
	[30.67]	[4.90]	[5.61]	[5.69]	[4.27]	[9.86]
Observations	1,143	1,141	1,140	1,140	1,140	1,010
R-squared	0.358	0.422	0.472	0.476	0.492	0.554
Period FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the OLS regressions of the relation between the strength of local clan culture and banking competition. The dependent variable is the average Herfindahl-Hirschman index within a five-year period in a specific prefecture. *clan* is the cumulative genealogy book number per 10,000 persons in a prefecture. Control variables include GDP growth, logarithm of regional population, logarithm of GDP per capita, gap ratio of local fiscal revenues and expenditures, local fixed asset investment, the ratio of deposits and loans of financial institutions to GDP, values of local listed corporations, outstanding

[69] J. Watson, 'Chinese Kinship Reconsidered: Anthropological Perspectives on Historical Research' (1982) The China Quarterly 92 589–622; and C. Zhang, 'Clans, entrepreneurship, and development of the private sector in China' (2020) Journal of Comparative Economics 48 100–123.

corporate bonds, logarithm of numbers of administrative regulations issued by local government and overall number of local bank branches. Column 6 reports the results using the sample with non-zero genealogy books. All regressions include period fixed effect. Clustered t-values are reported in parentheses. *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

4.3 Subperiod Analysis

The findings above indicate that clan culture encourages banking competition from 2001 through 2020. However, during this period, China experienced significant regulatory changes regarding bank branches. Initially, the CBRC imposed stringent restrictions on the establishment of new branches. Since 2006, waves of deregulation have occurred, with new policies emerging approximately every five years. For instance, following the 2009 *Opinions*, restrictions on joint-equity and commercial banks were partially lifted. Subsequent regulatory policies continue to encourage commercial banks to establish their branches in other prefectures.

To examine the time-varying effect of *clan* on banking competition, we run Equation (3) for each subperiod. Table 5 illustrates that the positive effect of clan strength on banking competition remains in each subperiod. It suggests that clan has persistent impacts on bank lending markets.

Table 4

Influence of clan culture on different type of banks

	(1)	(2)	(3)	(4)
clan	−0.019**	−0.004	−0.032***	−0.001***
	[−2.37]	[−1.59]	[−3.86]	[−2.79]
Controls	Yes	Yes	Yes	Yes
Observations	1,140	1,140	1,140	1,140
R-squared	0.471	0.334	0.201	0.400
Period FE	Yes	Yes	Yes	Yes

Notes: This table reports the competition under SOBs, NSOBs and foreign banks. The dependent variables in Column 1 and 4 are the proportion of SOBs and foreign banks, and in Column 2 and 3 are HHI of SOBs and NSOBs respectively. Control variables are the same as those in Table 3. All regressions include period fixed effect. Clustered t-values are reported in parentheses. *p < 0.1; **p < 0.05; ***p < 0.01.

4.4 Institutional Environment

Legal and institutional environments are critical to a country's financial and economic outcomes.[70] Improved legal and institutional frameworks enable firms to increasingly rely on external financial markets. To examine the effects of the institutional environment on the relationship between clan culture and banking competition in China, we utilize the Marketization Index of China compiled by Wang et al.[71] to analyze the influences of the external environment. We compare the impact of clan strength on banking competition across regions categorized into low and high quintiles based on median values of various components of the marketization index. Specifically, we employ three criteria for this

[70] R. La Porta and others 'Law and Finance' (1998) Journal of Political Economy 106(6 1113–55.

[71] X. Wang, L. Hu, and G. Fan, Marketization Index of China's Provinces: NERI Report 2021 (Beijing, Social Science Academic Press, 2021).

categorization: (1) government intervention in corporations, which reflects the complexity of governmental review processes and the degree of interference; (2) financial industry marketization, encompassing competition within the financial sector and the marketization of credit resources; and (3) the legal environment, which indicates the protection of producers' legitimate interests. These indices collectively provide insights into the legal and institutional environment and the development of financial markets from diverse perspectives.

We then test Hypothesis 3 that whether clans have a complementary or supplementary effect on institutional environments. The results in Table 6 indicate a complementary effect that institutional environments play a crucial role in the functioning of clan. Columns 1 and 2 demonstrate that less government intervention stimulates banking competition. In regions with higher administrative intervention, corporations may incur additional costs related to communication with the government or delays in obtaining project approvals, ultimately leading to deadweight loss. A marketoriented reform in the financial market can enhance the efficiency of both firms and banks. The findings in columns 3 and 4 align with this expectation, revealing that higher financial marketization reduces financing costs for banks and increases available capital. Consequently, banks can allocate their funds more effectively and have greater profitability. Columns 5 and 6 illustrate a more pronounced increase in competition in regions with a more favorable legal environment. A possible explanation for this is that improved legal frameworks enhance competition among firms and encourage local business activities, which, in turn, strengthen the roles of reputation and relationships in monitoring alternative financing channels.

Table 5
Cross section regression in different subperiods

	(1) 2001–2005	(2) 2006–2010	(3) 2011–2015	(4) 2016–2020
clan	−0.012***	−0.012***	−0.008**	−0.007***
	[−4.09]	[−3.81]	[−2.71]	[−3.88]
Controls	Yes	Yes	Yes	Yes
Observations	282	286	286	286
R-squared	0.291	0.276	0.297	0.369

Notes: This table reports the competition in four different subperiods: 2001–2005, 2006–2010, 2011–2015, and 2016–2020. The dependent variable in each column is the average HHI within associate period. Control variables are the same as those in Table 3. Clustered t-values are reported in parentheses. *p < 0.1; **p < 0.05; ***p < 0.01.

Table 6
Heterogeneity analysis

	(1)	(2)	(3)	(4)	(5)	(6)
	Intervention of government to corporations		Financial industry marketization		Legal environment of the market	
	Low	High	Low	High	Low	High
clan	−0.009***	0.009	−0.001	−0.009***	−0.009	−0.009***
	[−9.30]	[0.93]	[−0.14]	[−6.74]	[−1.69]	[−7.27]
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	569	571	572	568	578	562
R-squared	0.575	0.460	0.473	0.553	0.444	0.615
Period FE	Yes	Yes	Yes	Yes	Yes	Yes
	(7)	(8)	(9)	(10)	(11)	(12)
	Geographical regions		Urbanization		Primary industry GDP	
	North	South	Low	High	Low	High
clan	−0.010***	−0.088***	−0.009	−0.008***	0.006	−0.010***
	[−4.47]	[−3.39]	[−1.35]	[−5.95]	[1.01]	[−7.45]
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	609	531	594	546	595	545
R-squared	0.510	0.603	0.482	0.584	0.481	0.598
Period FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the relationship between strength of clan culture and average HHI in regions with different levels of government intervention, financial industry marketization and legal environment of the market, and displays geographical discrepancy. Provincial data are collective from Marketization Index of China's Provinces: NERI Report 2021 (Wang et al., 2021). Geographical regions are separated by "*Qinling-Huaihe*" line, and the urbanization ratio and proportion of GDP in the primary industry are collected from CNRDS database. Control variables are the same as those in Table 3. All regressions include period fixed effect. Clustered t-values are reported in parentheses. *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Note that clan culture inherently exhibits exclusivity in interactions with out-group members, a tendency that can create transaction costs in cross-group cooperation,[72] and robust formal institutions (e.g. effective legal frameworks) could act as corrective mechanisms. For instance, formal institutions could reduce clan-based barriers by standardizing inter-clan transaction protocols, curbing regional protectionism, and establishing neutral dispute-resolution channels.[73] Consequently, under better institutional environments, clan culture is likely to play a more important role in shaping cooperation and reducing transaction costs. To examine this, we use the local residents' frequency of ancestral worship and the degree of local protectionism to respectively proxy operational costs of clan culture and the local exclusivity. Specifically, local residents' frequency of ancestor worship is collected from CGSS question 'Did your families participate in ancestor worship and tomb visiting last year?'. According to 'Law of One Price', identical goods should have the same price across regions in the absence of transaction costs or trade barriers. The relative price disparities of goods across regions can reflect

[72] Z. Chen, C. Ma, and A. J. Sinclair, 'Banking on the Confucian clan: why China developed financial markets so late' (2022) The Economic Journal 132 1378–1413.
[73] J. L. Carr, and J. T. Landa, 'The economics of symbols, clan names, and religion' (1983) Journal of Legal Studies 12(1) 135–156.

trade barriers or market segmentation induced by local protectionism.[74] As only provincial-level data is available, we construct provincial-level measures of visit frequency and the relative price disparities across Chinese provinces, and report the results in Appendix 3.[75] Our analysis reveals that stronger clan culture is associated with increased ancestor worship and reduced protectionism, particularly in regions with a better legal system. This suggests that formal institutions play an important role on mitigating the negative effects of clan culture. Taken together, our findings indicate that a better formal institutional environment may mitigate the adverse effects of clan culture while simultaneously amplifying its positive influence on banking sector competition.

Moreover, if our hypothesis holds, clan culture's influence on banking competition should be more pronounced in regions with better institutional environments. To test this proposition, we split the samples into the northern and southern parts of China according to the boundary of '*QinlingHuaihe*' line as a glance at the geographical difference. We also split the sample into two groups by the median of the urbanization ratio and the proportion of GDP in the primary industry, respectively. As southern regions and urban centers typically demonstrate better institutional quality,[76] we posit that clan culture will exert a more pronounced impact on banking competition in these institutional environments, particularly in: (a) southern territories, (b) highly urbanized zones, and (c) regions with reduced agricultural economic dependence. The results are exhibited in Column 7 to 12 of Table 6. Consistent with our expectation, we find that clan culture exhibits a significantly stronger influence in southern China compared to the north (Columns 7–8). Furthermore, Columns 9–12 demonstrate that the effect of clan culture is particularly pronounced in regions with higher urbanization rates and reduced agricultural reliance.

5. Robustness

5.1. Alternative Measures

We employ alternative measures to assess the banking competition landscape. A typical indicator is the concentration ratio, commonly used to evaluate competition within an industry. In this analysis, we specifically utilize the combined branch share of the three largest banks (CR3) in a region as an alternative measure of banking competition. Column 1 of Panel A in Table 7 presents the results, while Column 2 only includes prefectures with non-zero genealogy books, similar to our previous approach. The findings indicate that the concentration ratio decreases as clan strength increases, consistent with our previous findings.

China has designated four municipalities as special administrative regions, which are directly regulated by the central government. These cities function at the provincial level rather than as typical prefectures, despite having similar areas and populations. To maintain consistency in our sample, we further exclude these four provincial-level municipalities—Beijing, Shanghai, Tianjin, and Chongqing. The results are reported in Column 3 of Panel A. After excluding these municipalities, our conclusions remain

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[74] N. Zhang, and others 'Locked in tradition? Clan culture and network closure: Evidence from China' (2025) Journal of Business Research 200 115,617.

[75] We provide a detailed explanation on methodology and variable construction in Appendix 3.

[76] C. P. Yew, 'Pseudo-Urbanization? Competitive government behavior and urban sprawl in China' (2012) Journal of Contemporary China 21(74) 281–298; and R. L. Moomaw, and A. M. Shatter, 'Urbanization and economic development: a bias toward large cities?' (1996) Journal of Urban Economics 40(1) 13–37.

unchanged; however, the coefficient slightly declines, suggesting that residents in these municipalities place a greater emphasis on clan culture.

In previous literature, genealogy density is defined as a function of the number of genealogy books and the population in a specific year.[77] This definition treats genealogy density as a fixed, time-invariant value. However, population growth typically does not impact the distribution of clan given that population growth tends to occur uniformly across provinces, as illustrated in Appendix 1. Rather, changes in genealogy density are primarily driven by population mobility. To refine our evaluation of genealogy density, we propose using the ratio of the number of genealogy books to the population in 1992, the earliest year for which complete population data for each prefecture is available. We select 1992 as the reference year because, during the 1990s, there was minimal population mobility, thereby minimizing disruptions to clan structures. The estimation results are presented in Column 4 of Table 6. To ensure consistency in our results, we also present the cross- sectional regression results of the average HHI calculated from 2001 to 2020 in Column 5.

Someone may concern that excluding policy banks, rural banks and internet banks may limit the generalizability of findings and fail to fully capture banking competition dynamics. To examine this possible bias, we include additional branch information from policy banks, rural banks, and internet banks in our analysis. We then reconstruct our competition measure by using HHI index. Column 6 shows that our primary finding remains qualitatively unchanged, clan culture is still significantly negatively related to the HHI index. A possible explanation is that policy banks, rural banks and internet banks occupy a small proportion of bank branches. Inclusion of their bank branches has a limited impact on regional banking competition.

While our main specification has controlled for several regional variables, it is possible that the measure of clan culture is still related to other macroeconomic factors and regional cultural development indicators. To further isolate the clan's impacts on banking competition, we include three additional commonly used proxies, namely the natural logarithm of regional GDP, the number of colleges and universities per 10,000 residents, and the number of books in public library collections per 10,000 residents as control variables. The first indicator reflects regional economic development, and the rest of two reflect educational resource distribution and cultural factor, respectively. Column 7 of Table 7 still reports a significant negative relationship between clan culture and banking industry HHI persists.

Note that our measure of clan strength may not fully capture clan culture's influence. For instance, in regions with poorly preserved genealogies, clan strength may be underestimated, while areas with active clan activities but no genealogies may be misrepresented. To alleviate this possible measure bias, we incorporate three additional indicators. First, ancestral halls, originally constructed as sacred gathering spaces for clan members to worship their ancestors, are typically named after the lineage's founder and serve as the cultural and ritualistic heart of the clan. Beyond their religious significance, these halls function as communal decision-making centers where internal regulations are

[77] Z. Chen, C. Ma, and A. J. Sinclair, 'Banking on the Confucian clan: why China developed financial markets so late' (2022) The Economic Journal 132 1378–1413; and H. Fan, and others 'Clan culture and patterns of industrial specialization in China' (2023) Journal of Economic Behavior and Organization 207 457–478.

formulated, and misconducts and financial issues are addressed.[78] The number of recognized ancestral halls (*hall*) could serve as a measurable indicator of clan strength. Second, Chinese clan and its functioning structure have been deeply shaped by Confucius and Confucian followers.[79] Under Confucian influence, clans formalized their governance through codified rules in genealogy books, standardized ancestor-worship rituals, and established hierarchical social norms. All clan members were socially regulated within this Confucian framework, which determined their status and behavioral expectations. These institutionalized practices were further reinforced since the Song Dynasty, when Confucian temples and academies emerged as pivotal cultural and educational centers. These institutions not only commemorated Confucius and disseminated his teachings but also served as important spaces for transmitting clan-specific values and cultural identity[80]. We thus employ the number of Confucian temples and academies in a given region as additional metrics, alongside the ancestral hall. We source the data of ancestral halls, Confucian temples (*kongmiao*), and Confucian academies (*shuyuan*) in a city from the China Ancestral Hall Web and CNRDS database. These variables are normalized per 10,000 residents.

These cultural institutions consolidate kinship connections and facilitate the intergenerational transmission of cultural heritage, particularly clan-based cultural norms and practices.[81] As each of these measures capture a latent factor, clan culture, with noise, we also combine the *clan strength* and the three additional indicators into a composite clan strength index (*clan_index*) by applying principal-component analysis (PCA). Appendix 4 shows the results of the factor analysis for our four components in PCA. All four components have positive loadings and closely correlate with the index. Our composite index gives roughly equal weighting to *clan*, *hall* and *shuyuan*, but a lower weight to *kongmiao*. This method shows that only the first component has an eigenvalue larger than one (2.097). We thus use the first component of these four measures as our measure of *clan_index*.

Panel B of Table 7 shows the result using each of the three additional proxies and *clan_index* while keeping the same full set of controlling variables. The OLS regressions show that each of the four measures is negatively and statistically significantly related to HHI index.

To perform a more accurate measure of competitive strength relative to other entities in the banking industry, we conduct bank-level analysis to examine the relationship between clan culture and the competitiveness of banks. Panel C in Table 7 presents the regression results with H-statistics estimated from Equation (2) as the dependent variable. The results indicate a positive correlation between H-statistics and genealogy density, after controlling for the same regional variables. To verify this finding, we conduct regressions on prefectures with positive genealogy density, mirroring the previous approach. Consistent with our prefecture-level analysis, banks in regions with stronger

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[78] J. P. McDermott, The Making of a New Rural Order in South China: Volume 2, Merchants, Markets, and Lineage (Cambridge, Cambridge University Press, 2020).

[79] Z. Chen, C. Ma, and A. J. Sinclair, Confucianism with its diverse institutional elements has evolved since the era of Confucius. These innovations transformed Confucianism from a loose collection of norms into an institution that organized daily life ‘ Banking on the Confucian clan: why China developed financial markets so late’ (2022) The Economic Journal 132 1378–1413.

[80] R. Jia, and J. K. S. Kung, ‘The Culture and Institutions of Confucianism’ (2025) NBER Working Paper.

[81] E. Feng, Ancestral hall and clan in Ancient China (Beijing, The Commercial Press, 2013).

clan culture demonstrate greater contestability, suggesting that clan culture enhances competition within the banking industry.

Table 7
Robustness analysis

Panel A: Alternative specifications				
	(1) Full sample	(2) *clan*>0	(3) Exclude municipalities	(4) Fixed population
clan	−0.026***	−0.026***	−0.007***	−0.009***
	[−6.32]	[−6.47]	[−3.67]	[−4.82]
Controls	Yes	Yes	Yes	Yes
Observations	1,140	1,010	1,124	1,139
R-squared	0.583	0.582	0.509	0.490
Period FE	Yes	Yes	Yes	Yes
	(5) Cross-section	(6) Including additional branches	(7) Additional controls	
clan	−0.007***	−0.008***	−0.006***	
	[−3.12]	[−4.74]	[−3.14]	
lnGDP			−0.037***	
			[−5.04]	
univ			0.420***	
			[8.56]	
book			0.060	
			[0.13]	
Controls	Yes	Yes	Yes	
Observations	286	1,140	1,140	
R-squared	0.407	0.510	0.549	
Period FE		Yes	Yes	

Panel B: Other measures of clan culture				
	(1) Full sample	(2) Full sample	(3) Full sample	(4) Full sample
hall	−0.571**			
	[−2.40]			
kongmiao		−1.500**		
		[−2.18]		
shuyuan			−0.135**	
			[−2.16]	
clan_index				−0.011***
				[−3.44]
Controls	Yes	Yes	Yes	Yes
Observations	1,140	1,140	1,140	1,140
R-squared	0.491	0.492	0.495	0.500
Period FE	Yes	Yes	Yes	Yes

Panel C: Bank level analysis		
	(1) Full Sample	(2) *clan*>0
clan	0.136***	0.139***
	[2.90]	[2.96]
Controls	Yes	Yes
Observations	1,820	1,762
R-squared	0.030	0.031
Year FE	Yes	Yes

Notes: Panel A of this table reports results using the bank level data for competition power. The dependent variable is H-statistics calculated from Equation (2). Banks' financial statements data are collected from CSMAR database. Column 2 reports the results using the sample with non-zero genealogy books. Column 3 and 4 report the HHI

results excluding municipalities and using fixed population as the measurement of *clan*. Column 5 presents the cross-section result in overall sample period. Column 6 reports the result of HHI that is reconstructed after including branch samples of policy banks, rural banks and internet banks. Column 7 includes additional control variables. Panel B investigates various alternative indicators about clan culture, namely ancestral halls, Confucian temples and academies per 10,000 residents and their first principal component in Column 1–4, respectively. Panel C of this table reports the robustness check. The dependent variable in Column 1 and 2 is the average concentration ratio of the three banks who own the most branches (CR3) in a specific prefecture. Control variables are the same as those in Table 3 except Column 7 in Panel A. Column 1–4 include period fixed effect. Clustered *t* values are reported in parentheses. $*p < 0.1$; $**p < 0.05$; $***p < 0.01$.

5.2. Instrumental Variable Regressions

The competition within the banking industry in a prefecture can be influenced by various factors, including the internal dynamics of the banking system, other financial sectors, and external political or macroeconomic conditions. A significant concern is the potential for omitted variable bias, which could lead to inaccurate estimation. To address this concern, we implement an instrumental variable (IV) regression approach with three valid instruments.

Zhu Xi, a pioneer of neo-Confucian thought, significantly popularized Confucian culture during the Song Dynasty.[82] He established formal institutional frameworks for clan and disseminated clan culture primarily through his teachings at three academies: *Yuelu* Academy in Hunan Province, *Hanquan* Academy in Jiangxi Province, and *Bailudong* Academy in Fujian Province. In ancient China, travel was costly and time-consuming, so proximity to these academies facilitated easier access to Zhu Xi's lectures and clan culture, thereby enhancing the influence of clan. Consequently, we use the minimum distance from a prefecture to these three academies as our first instrumental variable. Utilizing Baidu Map, we can obtain the latitude and longitude of each academy's location and subsequently calculate the spherical distance from each prefecture.

Another significant historical event in the Northern Song Dynasty was the *Jingkang* Incident, during which the government was overthrown and the emperors were taken hostage. This incident resulted in the capture of northern territories by the Jurchens and prompted a mass migration to the south. According to Fan et al.[83] and Bai,[84] this event likely strengthened clan by increasing the number of descendants within clans and directing more educational resources toward the *Keju* (imperial examination) and government connections. Therefore, we use migration data from *History of Migration in China*[85] as our second instrumental variable to capture the effects of this historical

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[82] Z. Chen, and C. Ma, and A. J. Sinclair, 'Banking on the Confucian clan: why China developed financial markets so late' (2022) The Economic Journal 132 1378–1413.

[83] H. Fan, and 'Clan culture and patterns of industrial specialization in China' (2023) Journal of Economic Behavior and Organization 207 457–478.

[84] Y. Bai, 'The struggle for existence: migration, competition and human capital accumulation in historic China'(2022) International Economic Review 63 1239–1269.

[85] S. Wu, History of Migration in China (Zhongguo Yimin Shi) Vol. 4 (Fuzhou, Fujian People's Publishing House, 1997).

migration. This source provides detailed records of departure and settlement locations for each migration instance.

Note that the complexity of historical population movements and challenges in data collection and matching may introduce measurement errors. To address this concern, we carefully compare the administrative boundaries of the Northern Song Dynasty with those of contemporary China. The late Northern Song dynasty employed a three-level administrative structure comprising Lu (路), Fu/Zhou (府/州), and Xian (县), comparable to today's province-city-county administrative structure. We further take the following steps to refine our migration data. First, for migration records specifying county-level origins/destinations (Xian), we have meticulously mapped documented Xian to corresponding modern cities. Second, for migration records documenting only prefecture (Fu or Zhou) data, we assign the corresponding administrative seat (府城/州城) as the origin/destination location, mapping these to modern cities. Third, some migrants relocated multiple times. We utilize movement annotations in migration records to identify their ultimate settlement locations, and repeat the first two steps.

Although the *Jingkang* Incident tremendously influenced clan migration patterns, subsequent movements of migrations may change over time. Fortunately, clan culture continues to exert a persistent influence, reinforcing residents' mental and material ties to their ancestral homelands and native villages in contemporary China.[86] Clans, as kinship-based groups deeply rooted in specific geographic locations, particularly traditional villages, which exhibit rich traditional attributes in architectural styles, social structures, and cultural heritage.[87] In such villages, households are united by shared surnames and kinship ties, with clan leadership often assuming village governance roles. Clan symbols are typically positioned at the village center,[88] reflecting their cultural significance. The clan plays a pivotal role in maintaining local stability, enhancing grassroots governance, mitigating conflicts, and facilitating resource allocation and public goods provision. As traditional villages preserve the defining features of clans and have existed since remote and uncertain periods in history,[89] we thus use the number of preserved traditional villages officially authenticated by China's Protection and Development Committee for Ancient Villages in a city as our third instrumental variable. These villages are designated according to rigorous criteria, including historical significance, architectural integrity, and cultural heritage preservation, which collectively portray the succession of ancestral spirits and serve as a reliable proxy for clan settlement distribution. With documented precise locations, we can accurately map villages to their corresponding cities.

We also include the additional control variables, i.e. the natural logarithm of GDP, the number of colleges and universities per 10,000 residents and the number of books in public library collections per 10,000 residents, in the IV regressions to enhance estimation validity. Table 8 reports IV estimates using the three instruments. The first-

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[86] Z. Tang, 'Changes with Chinese characteristics: rural clan culture, clan communities, and kinship relations during urbanization' (2017) China's Urbanization and Socioeconomic Impact 161–198.

[87] T. Long, and others 'Promoting the sustainable development of traditional villages: Exploring the comprehensive assessment, spatial and temporal evolution, and internal and external impacts of traditional village human settlements in hunan province' (2024) Heliyon 10(11) e32439.

[88] M. Freedman, Lineage Organisation in South-Eastern China. (London, Routledge, 1958); and G.Zeng, 'Adaptation, revival, and reconstruction: Clan organizations and rural power structures: Two case studies from southern Jiangxi and eastern Guangdong' (2004) Chinese Sociology & Anthropology 37(1) 34–50.

[89] A. H. Smith, Village life in China: A study in sociology (New York, Fleming H. Revell Company, 1899).

stage results (Column 1) confirm validity of our instruments: increases in migration numbers and traditional villages significantly positively associate with local clan development, while a greater distance to Zhu Xi Academy significantly reduces genealogy density. After implementing the multiple instrumental variables approach and controlling for comprehensive economic controls, clan strength continues to exert a statistically significant influence on banking competition (Column 2). The results remain consistent when we limit our sample to prefectures that exhibit positive genealogy density (Columns 3 and 4). Additionally, the test results validate our IVs. The LM and F-statistics indicate that the instruments are neither under-identified nor weakly identified, while the Hansen J-statistic confirms that they pass the over-identification test.

6. Discussion: Mechanisms and Interpretations

In this section, we investigate the possible mechanisms through which clan culture affects regional banking competition. Drawing upon the two important features of clan culture in Clan Culture, we examine whether clan culture facilitates banking competition by functioning as informal institutional environments, or by enhancing local social capital. We also take a further step to examine how clan culture influences the dynamics between new entrants and existing banks, including changes in branches and market share, thereby demonstrating its role in shaping the banking sector's competitive structure in practice.

Table 8
Instrumental variable regression

	(1)	(2)	(3)	(4)
	Full sample		*clan*>0	
clan		−0.016**		−0.016**
		[−2.52]		[−2.62]
mindist	−0.000**		−0.000**	
	[−2.51]		[−2.17]	
migration	0.013***		0.012***	
	[4.05]		[3.29]	
village	0.022*		0.021*	
	[1.67]		[1.73]	
Controls	Yes	Yes	Yes	Yes
Observations	1,140	1,140	1,010	1,010
R-squared		0.317		0.269
Period FE	Yes	Yes	Yes	Yes
Kleibergen-Paap rk LM statistic	6.703		7.123	
Kleibergen-Paap Wald rk F statistic	19.225		19.881	
Hansen J statistic (p-value)	0.8914		0.9785	

Notes: This table reports the instrument variable (IV) estimations between HHI and strength of clan culture. The first IV is the number of migrants settled in the prefecture after *Jingkang* Incident (*migration*), the second is the minimum distance to any Zhu Xi academies in the Southern Song Dynasty (*mindist*), and the third is the number of traditional villages (*village*). The data of migrants are collected from History of Migration in China (Wu, 1997). Column 1 and 3 report the first-stage results, while Column 2 and 4 report the second-stage results. Column 3 and 4 report the results using the sample with non-zero genealogy books. The control variables include those used in Table 3. Additionally, we control for the natural logarithm of GDP, the density of colleges and universities per 10,000 residents, and the density of public library books per

10,000 residents. All regressions include period fixed effect. Clustered t-values are reported in
parentheses. *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

6.1. Informal Institutional Environments

Clan culture plays a crucial role in establishing social networks among individuals. In the absence of formal institutions that support market order, clans become essential for resource distribution and private enterprise by providing alternatives for external financing and facilitating information sharing.[90] Boisot and Child[91] argue that China's private sector operates through clan-type networks based on personal connections, contrasting with the Western market system. This suggests that contemporary Chinese economic organization reflects a reemergence of traditional social structures and behavioral patterns. Consequently, stronger clan networks can enhance regional informal institutional environments, leading to an intensified banking competition and reduced financing costs.

We use the number of People's Mediation Committees in each prefecture as a measure of local informal institutional environments. These committees, established by grassroots residents' groups and guided by local courts, are dedicated to mediating disputes among citizens. Unlike formal courts, Mediation Committees address civil conflicts and minor criminal cases in a less rigid context, effectively fostering community cohesion and alleviating the litigation burden on the court system. An increase in the number of these committees indicates a stronger community-driven administrative presence and enhanced informal institutional environments.

Our data are sourced from the China Legal Service Web, which provides the locations and contact numbers for each People's Mediation Committee. However, some provinces have not fully registered their committees on this website, resulting in gaps in the data. To address this concern, we apply the multiple imputation method to train a regression model using existing data, then impute missing values for cities' mediation committee numbers.[92] The regression results are presented in the first two columns in Table 9. Column 1 displays the results from the original city-level data, while Column 2 presents estimates augmented with imputed data. Both columns indicate a positive correlation between genealogy density and the number of People's Mediation Committees. A stronger clan culture enhances civil regulation and management, leading to the establishment of more mediation organizations. Consequently, a more robust informal institutional environment is created, allowing the banking industry to operate more aggressively and develop more rapidly, thereby accelerating the formation of a competitive structure.

6.2. Social Capital

The compilation of genealogy books requires significant, sustained effort from clan members. This mutual commitment to maintaining genealogy records reflects a cohesive

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[90] C. Zhang, 'Clans, entrepreneurship, and development of the private sector in China' (2020) Journal of Comparative Economics 48 100–123.

[91] M. Boisot, and J. Child, 'From fiefs to clans and network capitalism: explaining China's emerging economic order' (1996) Administrative Science Quarterly 41(4) 600–628.

[92] Kofman, P., and Sharpe, I. G., 'Using multiple imputation in the analysis of incomplete observations in finance' (2003) Journal of Financial Econometrics 1(2) 216–249.

clan and can be viewed as a high level of social capital.[93] Social capital, as defined by Bourdieu,[94] refers to the advantages and opportunities that individuals gain through membership in specific communities. An abundance of social capital fosters collaboration among residents, which, in China, contributes to increased credit availability and reduced default rates.[95]

We use the logarithm of the number of NGOs in each province and the degree of trust in strangers to proxy social capital. Data on NGO establishments come from the *Chinese Civil Affairs Statistical Yearbook*, which includes the number of social organizations and foundations at the provincial level. NGOs, typically operated by volunteers and independent of government agencies, enjoy greater freedom of action. Increased NGO participation often provides residents with informal social assistance within regions. Additionally, we access data from the China General Social Survey (CGSS) for the years 2003, 2010, 2013, and 2018. This survey includes questions such as, 'To what extent do you trust strangers?' and 'In general, do you believe that most people in society are trustworthy?'. Responses range from 1 (least trust) to 5 (most trust), and we calculate the average score to represent social trust within each province.

Columns 3 and 4 in Table 9 present the results. In Column 3, the dependent variable is the logarithm of the number of NGOs in a province, while Column 4 focuses on the average trust score. The findings indicate a significant positive correlation between genealogy density and both the number of NGOs and the degree of trust in strangers. This suggests that clan fosters a better institutional environment, enhancing local social capital. Such improvements can reduce financing costs, facilitate external financing, and boost local financial investment,[96] ultimately providing banks with more opportunities to develop and compete.

Table 9
Informal institutions and social capital

	(1)	(2)	(3)	(4)
	Informal Institutions		Social Capital	
	Number of mediation institutions	Number of mediation institutions Imputed	Number of NGOs	Trust degree
clan	0.855***	0.800***	0.155***	0.019**
	[4.04]	[4.16]	[4.10]	[2.32]
Controls	Yes	Yes	Yes	Yes
Observations	742	1,140	1,140	1,140
R-squared	0.111	0.057	0.566	0.136
Period FE	Yes	Yes	Yes	Yes

Notes: This table reports the possible mechanisms through which clan culture may influence banking competition. The dependent variables in Column 1 and Column 2 are the number of mediation institutions in a specific prefecture. Mediation institutions data

[93] J. Cao, Y. Xu, and C. Zhang 'Clans and Calamity: how social capital saved lives during China's Great Famine' (2022) Journal of Development Economy 157 102,865.
[94] P. Bourdieu, 'The Forms of Capital', in: *Handbook of Theory and Research for the Sociology of Education*, ed. J.G. Richardson (New York, Greenwood Press, 1985) 241–258.
[95] I. Hasan, Q. He, and H. Lu, 'Social Capital, Trusting, and Trustworthiness: Evidence from Peer-to-Peer Lending' (2022) Journal of Financial and Quantitative Analysis 57(4) 1409–1453.
[96] A. Gupta, K. Raman, and C. G. Shang, 'Social Capital and the Cost of Equity' (2018) Journal of Banking and Finance 87 102–117; and H. Hong, J. D. Kubik and J. C. Stein, 'Social Interaction and Stock Market Participation' (2005) Journal of Finance s59(1)137–163.

are collected from *China Legal Service Web*. Column 1 displays the results from the original prefecture-level data, while Column 2 presents estimates augmented with imputed data. The dependent variable in Column 3 is the number of NGO establishment in a specific prefecture. The NGO establishment data are collected from *Chinese Civil Affair Statistical Yearbook* in various years. The dependent variable in Column 4 is the trust degree calculated from CGSS survey in 2003, 2010, 2013 and 2018. Control variables are the same as those in Table 3. All regressions include period fixed effect. Clustered t-values are reported in parentheses. *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

6.3. Disentangling the Channels

In this section, we perform a mediation model to further examine and better understand the mechanisms through which clan culture influence the banking competition. To quantify these indirect effects of clan culture on bank competition (HHI) through informal institutions and social capital, we use the methodology that requires estimating the following three equations[97]:

$$HHI = f(clan, controls) \quad (4)$$

$$mediators = f(clan, controls) \quad (5)$$

$$HHI = f(clan, mediators, controls) \quad (6)$$

We have performed the first step (Eq. 4) of this analysis in Table 3 by showing the significant impacts of clan culture on banking competition. The results of the second step (Eq. 5) are presented in Table 9, where we show the positive relationship between clan culture and mediating variables (mediation institutions, NGOs and social trust). Here, we conduct the final step (Eq. 6) by incorporating mediators into the regression of clan culture on HHI. We aim to quantify the impacts of mediating variables on the relationship between clan culture and banking competition.

Table 10 presents the results of the mediation model regression analysis, which systematically examines the indirect pathways through which clan culture influences banking competition. The analysis sequentially incorporates mediating variables across three models (Columns 1–3), and includes all channel variables in Column 4. The findings reveal a consistent pattern: the inclusion of mediating variables progressively reduce effect of clan culture on banking competition, with reduction rates 29.25% for mediation institutions, 33.89% for NGOs, and 11.71% for social trust. Notably, when all mediating variables are included, the total reduction effect amounts to 61.52%,[98] rendering the effect of clan culture statistically insignificant. These results collectively demonstrate that clan culture primarily operates as informal institutions and social capital to shape banking competition, with NGOs emerging as the most robust mediating channel. The study thus suggests that the influence of clan culture on banking competition is predominantly indirect, mediated through informal institutional and social

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[97] S. P. Ferris, D. Javakhadze, and T. Rajkovic, 'CEO social capital, risk-taking and corporate policies'(2017) Journal of Corporate Finance 47 46–71.

[98] The channeling effect is estimated by the changes in clan culture's impact on HHI, measured as the difference in coefficient estimates between the specified regression models (as shown in Column 6 of Table 3).

capital mechanisms.

Table 10
Mediating effects

	(1)	(2)	(3)	(4)
clan	−0.008***	−0.007**	−0.009***	−0.004
	[−3.55]	[−2.22]	[−3.67]	[−1.34]
Mediation Institutions	−0.004***			−0.003***
	[−3.72]			[−3.15]
NGOs		−0.021**		−0.018**
		[−2.60]		[−2.56]
Social Trust			−0.058***	−0.044***
			[−3.81]	[−3.34]
Channeling effect	−0.003	−0.004	−0.001	−0.007
% of total effect channeled	29.25	33.89	11.71	61.52
Controls	Yes	Yes	Yes	Yes
Observations	1,140	1,140	1,140	1,140
R-squared	0.298	0.329	0.297	0.359
Period FE	Yes	Yes	Yes	Yes

Note: This table reports the estimates of mediating effects regression. The dependent variable in Column 1 is the number of mediation institutions in a specific prefecture. Mediation institutions data are collected from *China Legal Service Web*. The dependent variable in Column 2 is the number of NGO establishment in a specific prefecture. The NGO establishment data are collected from *Chinese Civil Affair Statistical Yearbook* in various years. The dependent variable in Column 3 is the trust degree calculated from CGSS survey in 2003, 2010, 2013 and 2018. In Column 4, the three mediating variables are simultaneously put into the regression. The channeling effect is the changes in the effects of clan culture on HHI, estimated as the change in the coefficient estimates of clan culture from the Column 6 in Table 3. Control variables are the same as those in Table 3. All regressions include period fixed effect. Clustered t-values are reported in parentheses. *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

6.4. Bank Entry

The above evidence has shown that clan enhance both regional informal institutional environments and local social capital, leading to a more competitive environment in the banking sector. However, how clan culture shapes the banking sector's competitive structure in practice is still unclear. We thus take a further step to examine how clan culture influences the dynamics between new entrants and existing banks, including changes in branches and market share. A number of literatures have shown bank entry, by the establishment and operation of new banks within a previously unserved or underserved geographic market, significantly change competitive behaviors among incoming and incumbent institutions.[99] If clan culture facilitates new entrants to start business, incumbent bank should respond competitively, such as lower price, better service or increased efficiency, to retain customers and market share, leading to heightened competition in the local bank sector.

To capture the impacts of bank entrants, we employ several indicators. Specifically, we quantify the extent of bank entry using: (i) the number of new bank entrants in a region, (ii) the number of incumbent banks expanding their branch networks over previous year

[99] R. Sengupta, 'Foreign entry and bank competition' (2007) Journal of Financial Economics 84(2) 502–528.

in that region, (iii) the total branches established by new entrants, and (iv) new entrants' regional branch share.

The results are reported in Table 11. Columns 1 and 2 present the impacts of clan culture on the first two indicators. It is clear that the number of both types of banks increase in regions with strong clan culture, suggesting a heightened competition in the local bank sector. The results in Columns 3 and 4 are consistent with our expectations, showing that the newly entered banks significantly establish more branches in regions with strong clan culture, and capture more market share in the local market.

Noting that each indicator may not fully capture the extent of banking competition. We implement principal component analysis (PCA) to construct a composite competition index (*competition_index*) by integrating the Herfindahl-Hirschman index (HHI), concentration ratio (CR3) and (1 minus new entrants' regional branch share).[100] Column 5 shows that the clan culture is still significantly negatively related to *competition_index*.

This figure plots the time trend of the average Herfindahl-Hirschman Index in regions with strong and weak clan culture and in overall China. Herfindahl-Hirschman Index in regions with strong clanship is significantly lower compared with in regions with weak clanship and in overall China.

Table 11
Bank entry

	(1) Numbers of new bank entrants	(2) Numbers of expanded banks	(3) Branches of new bank entrants	(4) Share of new bank entrants	(5) *competition_index*
clan	0.044*	0.300***	0.761**	0.002***	−0.145***
	[2.03]	[3.33]	[2.11]	[4.09]	[−5.91]
Constant	−0.547**	−0.935	−10.058**	0.015	1.974***
	[−2.17]	[−1.02]	[−2.12]	[1.52]	[2.98]
Controls	Yes	Yes	Yes	Yes	Yes
Observations	1,140	1,140	1,140	1,140	1,140
R-squared	0.466	0.787	0.170	0.250	0.556
Period FE	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the results about bank entrants. The dependent variables are the number of new bank entrants, the number of incumbent banks who expand their branches (expanded banks), the total branches established by new entrants, and new entrants' regional branch shares. The results are shown in Column 1–4, respectively. We also construct an integrated indicator of HHI, CR3 and 1 minus branch share of new entrants via principal component analysis method to illustrate the composite effect of various competition proxies. The result is in Column 5. Control variables are the same as those in Table 3. All regressions include period fixed effect. Clustered t-values are reported in parentheses. *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

7. Conclusion

Clan culture, a deeply rooted tradition in China, has received limited scholarly attention despite its significant influence on modern Chinese society. Unlike Western cultural standards, Chinese clan culture encompasses a broader range of moral restrictions. In this paper, we examine the effects of clan culture on competition within the banking industry. By analyzing branch data from Chinese banks at the prefecture

[100] We invert this indicator by subtracting new entrants' regional branch share from 1 (i.e. 1 - share), aligning it with HHI and CR3 as inverse proxies for local competition.

level, we assess how clan culture shapes banking competition. We measure clan strength through genealogy book density and find that banking competition is significantly influenced by this cultural factor.

Our analysis distinguishes between different types of banks, revealing that clan culture primarily intensifies competition among NSOBs. The negative correlation between banking competition and clan culture also persists over time in our sample periods.

This paper also explores the interactive effects of local institutional environments on clan culture, finding that the benefits of clan culture are more pronounced in regions with strong rule of law and free financial markets. Our results remain robust when employing three additional measures of clan culture, the H-statistics from bank-level data as an alternative measure of competitive power, and using instrumental variables regressions. Finally, we highlight and disentangle the roles of informal institutions and social capital as potential channels through which clan culture impacts banking competition. This paper introduces a new perspective, highlighting culture as a significant factor influencing the operations and distribution within financial institutions. Since the establishment of the modern banking industry, China has implemented numerous reforms aimed at easing restrictions on banks to enhance capital absorption and liquidity. Concurrently, there has been a resurgence of Chinese clan culture. Our research is situated within this context, providing evidence that clan culture significantly shapes banking competition in China, particularly in recent years.

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