

Contracting without contracting institutions—The “trusted-assistant” loan in 19th century China*

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Abstract

This paper documents the emergence of a large bank-loan market in the absence of contracting institutions: the trusted-assistant loan market in nineteenth-century China. These loans were legally unenforceable, one-shot loans to poor scholars that funded the costs of assuming lucrative administrative appointments offering ample opportunities for corruption. The trusted-assistant loan’s distinguishing feature was a legally unenforceable stipulation that the borrower incorporate an agent of the creditor into his administrative cadre. We model the enforcement of these loans through expertise leverage and test the model’s predictions using data from officials’ diaries and a bank loan book.

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1 Introduction

Many “new institutional” economists have argued that institutions are an essential prerequisite for contracting. This perspective is perhaps most comprehensively developed in North (1990). North argues that (a) contracting requires contracting institutions and (b) that large scale, complex contracting arrangements that “extend across space and time and numerous individuals” (pp. 34, North, 1990), require third-party enforcement institutions, i.e., “a coercive force able to monitor property rights and enforce contracts effectively” (pp. 59, North, 1990).¹

In this framework, even smaller scale, less complex, and more localized contracting requires “rudimentary” contracting institutions: institutions based on personal relationships or impersonal arrangements without third-party enforcement.² In the context of financial markets, personal relationships constrain debtors through dependence on the creditor for financing a stream of future investment opportunities (e.g., staged financing) or by creditor/debtor economic co-dependency (e.g., trade credit). Impersonal institutions without third party enforcement constrain debtors through “kinship ties, bonding, exchanging hostages, or merchant codes of conduct” (pp. 34, North, 1990).

In this paper, we provide an example of a large-scale, impersonal financial market in which contracting arrangements were not supported by *any* neo-institutional contracting institution—trusted-assistant scholar-loans in nineteenth-century Qing China. As we discuss in more detail in Section 2, Chinese banks provided these loans to *scholars*, i.e., would-be government officials, to fund the costs related to undertaking their first administrative appointment outside Beijing.³ These loans stipulated that the scholar appoint a bank-selected agent as one of his assistants. This agent, typically an employee of the creditor, was referred to as the *trusted assistant*; he would work for the official (the borrower) for several years, until the loan was repaid (and sometimes afterwards).

Scholar loans had a number of features that made their enforcement through contracting institutions infeasible. First, third-party enforcement was impossible.⁴ Trusted-assistant loans were illegal, and thus, the loan agreement could not be enforced judicially. Even if the loans had been legal, because Qing law lacked a civil law component (Allee, 1994), how these loan agreements could have been legally enforced is unclear.

Second, scholar loans were almost always “one and done” transactions; therefore, the debtor’s need to maintain a reputation in order to receive future financing did not play an

¹Other researchers have also emphasized the essential role of coercive third-party contract enforcement, e.g., Demirgüç-Kunt and Maksimovic (1998), Levine (1998), Beck et al. (2003), Porta et al. (1998), Djankov et al. (2003), Rajan and Zingales (1998), Guiso et al. (2004), Cull and Xu (2005), Bae and Goyal (2009).

²“The degree of complexity in economic exchange is a function of the level of contracts [institutions] necessary to undertake exchange” (pp. 34 North, 1990).

³In general, the assertions made in this introduction about institutional features are documented in Section 2.

⁴Given the vast power imbalance between a private creditor and an official with the backing of the Qing empire, enforcement through lender coercion is even more improbable.

important role in enforcement. Conceivably, borrowers might have been creditor dependent before receiving their provincial appointments. However, once they assumed their duties, high salaries and ample opportunities for enrichment through taxation and bribery increased a scholar-officials' wealth by orders of magnitude, making bank funding for future appointments unnecessary. In our diary sample, which provides a chronological record of the borrowing behavior of officials, only three of the 99 loans were undertaken after a borrower had previously arranged financing.

Third, borrowers and lenders were rarely members of common social, cultural, or kinship "in-groups." Almost all trusted-assistant loans in our sample were advanced by bankers, who were members of a low social class which was not even eligible to take the Keju exam (for most of the period we consider), the center of aspiring scholars' lives. At the same time, traditional bonding mechanisms such as collateral and third-party guarantors were quite uncommon.

Despite the apparent lack of any sort of institutional support for scholar lending, the trusted-assistant loan market was quite large, both relative to many nineteenth-century financial markets and the Chinese economy. Many scholar loans were trusted-assistant loans (approximately one-half of the loans in our sample). We conservatively estimate that, in the mid-nineteenth century, the average outstanding balance of scholar loans was about 6.3 million taels.⁵

These facts raise an obvious question: how were trusted-assistant loans enforced? Enforcement requires some sort of creditor leverage over the borrower.⁶ We hypothesize that this leverage was provided by the dependence of scholar-officials on the expertise of their trusted assistants. Scholars, having devoted 60% of their lives to preparing for an exam chiefly focused on Confucian classics (Chen et al., 2017), had no time to develop the practical knowledge relevant to local-government administration. The central government imposed rigorous performance standards on provincial officials (e.g., collecting sufficient taxes without causing riots or uprisings). Failure to perform usually led to termination. The remedy for an official's inexperience was to acquire, upon appointment, capable assistants who could perform the requisite administrative tasks. For reasons we discuss in Section 2, identifying loyal and competent local substitutes for these assistants was difficult for inexperienced officials.

By assigning a trusted assistant to the borrower, lenders generated a viable threat against borrowers: the assistant could, at any time, withdraw his assistance. As long as the borrowing official was inexperienced, this threat created an incentive to repay. Through the trusted-assistant mechanism, creditors created endogenous dependency relations with previously unrelated

⁵To arrive at a rough estimate of the economic magnitude of 6.3 million taels, note that the median monthly salary of workers in Beijing during this period was around 2.5 taels of silver. Thus, if we use monthly worker salaries as our numeraire, 6.3 million taels convert to 2.5 million median monthly worker salaries. The median weekly salary of U.S. workers in 2018 was US\$866 (<https://www.bls.gov/cps/cpsaat39.htm>). Thus, 2.5 million units of median monthly salaries for U.S. workers (in 2018) converts to $866 \times 4 \times 2.5\text{million} = 8.6\text{ Billion US dollars}$.

⁶Unless debtors have ethical norms that make repayment imperative regardless of economic incentives. We explore this possibility in Section 6.4

borrowers who were not persistently financially dependent or linked with creditors through co-dependent production or cultural affinity. We hypothesize that the repayment trusted assistant was enforced through *expertise leverage*, i.e. these dependency relations alone, unaided by contracting institutions, were sufficiently strong to implement enforceable financial agreements and support a large lending market.

The viability expertise-leverage enforcement, of course, depends on assistant loyalty. Assistants, whose actions could not be monitored by creditors, could use their expertise leverage simply to enrich themselves rather than ensure loan repayment. In practice, this agency conflict between the assistants and the creditors appears to have been mitigated by the rewards and penalties creditors imposed on assistants, i.e., incentive contract payouts (cf., Morck and Yang, 2010), career-advancement rewards associated with successful loan collection, as well as the reputational/employment penalties triggered by unsuccessful collection.

There are many examples of dependency creation in more modern settings, e.g., creditors or investors appointing managers or demanding board representation as a condition for providing financing (e.g., Rasmussen, 2003; Kaplan and Strömberg, 2009; Ramirez, 1995; DeLong, 1991). However, in these settings, investors also had third-party enforceable legal rights. Consequently, separating the effects of endogenous dependency and contracting institutions on contract enforceability is difficult. The unique features of our setting—one-shot borrowing, creditor/debtor social distance, and illegality—essentially “turn off” contracting institutions and thus provide a clearer perspective on the viability of large-scale financial markets in their absence.

In order to develop the testable predictions from the expertise leverage hypothesis, we develop a formal model of expertise-leverage enforcement that conforms, at least roughly, with the fact patterns detailed above. Uninformed creditors extend legally unenforceable loans to scholar-officials, who are not connected to the creditors through any preexisting kinship, social, or reputational networks. Newly appointed officials are inexperienced, but can gain expertise over time and thus render the trusted assistant superfluous. Trusted-assistants, like officials are self-interested, but are incentivized by creditors to enforce repayment. Repayment, as well as the division of the rents from administration, is determined by period-by-period bargaining between the official and assistant.

We provide conditions under which repayment is enforced through expertise leverage: trusted assistants employ their bargaining power in negotiations with inexperienced officials to ensure efficient and effective loan repayment—repayment by the official in periods where economic conditions make extracting excess revenue from the jurisdiction fairly easy, and forebear when excess revenue extraction is very difficult. Because both officials and assistants are self-interested economic actors and can potentially gain from deviations from the efficient and effective loan repayment, trusted-assistant lending is only viable if the single-period gain from

opportunistic deviations is small relative to the present value of assistant/official relationship. This condition will be satisfied if the expected duration of the relationship is fairly long, economic conditions in the province are stable and thus are expected to provide ample future rent extraction opportunities, and the assistant's comparative advantage in managing rent extraction is large.

We test these hypotheses using debt transactions recorded in 28 diaries written by scholars between 1810 and 1911 and 66 loan records in a loan book of a Chinese bank dating from the 1840s.⁷ We found that, consistent with our hypotheses, trusted-assistants were very rarely utilized when the creditor was a relative/friend of the official, the use of assistants was positively correlated with asymmetric information, trusted assistants were more likely to be used when officials were more dependent, the risk of dismissal due to exogenous events was low, and local economic conditions were stable. Moreover, the use of trusted assistants was associated both with longer repayment periods and an increased likelihood of eventual repayment.

In order to assess the robustness of our results, we tried a number of alternative empirical specifications. Adopting these alternative specifications did not reverse the signs of any of the coefficients of the baseline model. In addition, we considered five alternative hypotheses for the origination and enforcement of trusted-assistant loans. These alternative hypotheses failed to explain the bulk of our empirical results and some suggested new empirical predictions that could not be confirmed in our sample.

Our analysis is, in some respects, closely related to Acemoglu and Johnson (2005). Acemoglu and Johnson provide evidence suggesting that economic development does not require the development of third-party contract enforcement institutions because contracting parties can “work around” ineffective third-party enforcement by reverting to more rudimentary institutions. Our analysis shows that working around ineffective third-party enforcement, in some cases, does not even require rudimentary contracting institutions.

However, our results do not provide additional confirmation of Acemoglu and Johnson's empirical results because our study does not consider the effect of trusted-assistant lending on economic development. In fact, *prima facie*, the very nature of trusted-assistant lending suggests that it had a neutral or negative effect on economic development. Trusted-assistant loans were typically repaid by increased extra-legal extraction from provincial subjects, and thus impeded the development of property-rights institutions, which, as shown in Acemoglu and Johnson (2005), are central to economic development.⁸ Thus, although trusted-assistant lending represents a rather unusual decoupling of financial market innovation from contracting institutions, it might also represent a rather usual, in the Chinese context, decoupling of financial development from economic development (Allen et al., 2005).

⁷Many details about the loan book and loan contracts are provided in Appendix Section C.

⁸The net effect of trusted-assistant lending on Chinese economic development is outside the scope of this paper. Arguments can also be made for positive effects, e.g., by providing essential financing to poor scholars, these loans fostered the social advancement of poor but talented subjects and thus increased social stability (Bai and Jia, 2016).

2 Institutional background

2.1 Scholar-officials

For 1300 years, until 1905, the Chinese civil service (or Keju) examination system was central to selecting civil officials in Imperial China (Bai and Jia, 2016). Passing the Keju made a scholar eligible for appointment to a government position. Despite its low pass rate (less than 1% (Elman, 2000)), the enormous wealth increase associated with government appointments attracted individuals willing to devote decades of their lives to passing the exam.

Prior to taking office, the majority of Keju exam candidates were impoverished, with no sources of income beyond fees for tutoring and handwriting services. In order to lobby for better appointments, successful examinees had to network with and give expensive gifts to senior officials in Beijing. Once appointed, an official had to recruit his cadre of assistants and pay for his own (and their) transportation to his assigned jurisdiction, up to 2,500 kilometers from Beijing.

Taking office could realistically be estimated to increase a scholar's income 400-fold.⁹ Even the lowest-level officials received salaries of at least 645 taels of silver, approximately 20 times the average yearly expenditure of a rural household (Xue, 1984).¹⁰ A substantial fraction of officials' incomes (95%) was from illegal but pervasive corrupt activities, such as extra taxation, bribery, and the extortion of suspects in jail (Chang, 1981).

2.2 The scholar-loan market

Scholar loans were illegal. The Qing court, concerned that this market fostered corruption, attempted on numerous occasions to suppress the scholar-loan market. In 1648, "lending to officials-to-be and accompanying the official to the jurisdiction" was made illegal, punishable by wearing shackles.¹¹ Acting as a co-signer or guarantor for a scholar loan was also illegal and subject to the same punishment. In practice, however, the law was rarely enforced (Tuojin, 1992). In the few cases in which the loans were exposed, the creditors typically received more severe punishment than debtors.¹²

Despite the illegality of scholar loans, they accounted for a significant segment of the Qing credit market. The Qing civil bureaucracy employed close to 60,000 officials at the county level

⁹Based on estimates of official's incomes in Chang (1981).

¹⁰The ratio between the salaries of high-level civil servants and agricultural workers in England in the 1850s was only 8:1 (Lindert and Williamson, 1983).

¹¹Other approaches to curtailing scholar loans were tried by the Qing court. For example, emperor Qianlong (1711-1799) tried to eliminate the need for private loans by providing public loans. However, this reform was ineffective Ye (1998).

¹²For example, in 1836, Shanqing, the governor of Jiangning city refused to repay his loan. After the case became known to the emperor, the creditors were punished severely while the official was only briefly suspended. Two years later, he was even promoted to Minister of Education of Jiangnan Province (Jiang, 2008).

or above. On average, in each year, more than 400 scholars received their first provincial (outside Beijing) appointment and thus required funding (Chang, 1955). Under the very conservative assumptions that 80% of newly appointed officials borrowed, the average size of a scholar loan was 1,800 taels, each scholar needed 3.5 loans, and that average loan maturity was about 3 years, outstanding loans on the market, in any given year, could have easily been upward of 6.3 million taels of silver.¹³ Primary and secondary sources also provide independent qualitative confirmations of the size of the scholar-loan market (Liu and Yang, 2015).

The vast majority of scholar loans were funded by Chinese banks. For the most part, Chinese banks in this era can be divided into two categories: draft banks, termed “Piaohao” banks, and lending banks, termed “Zhangju” banks.¹⁴

Piaohao banks specialized in handling long-distance remittances, delivering tax receipts from the provinces to Beijing, and lending or arranging loans to provincial authorities. The Piaohao banks were unlimited liability joint-stock companies and typically had many branches. Because of the Piaohao banks’ involvement in tax collection and inter-provincial funds transfers, their activities were important to imperial officials in Beijing.

Zhangju banks specialized in making loans and discounting accounts receivable. Although, most Zhangju banks were single-branch banks and all were smaller than the major Piaohao banks, they were also frequently organized as unlimited liability joint-stock companies (Liu and Yang, 2011).¹⁵

Because Shanxi province was the ancestral home of almost all the owners and managers of the Piaohao banks, Piaohao banks are frequently termed “Shanxi banks.” However, the owners/managers of many Zhangju banks also originated from Shanxi. In fact, the source of our loan book data, the YuShengJi bank, was mostly owned by a family named Zhou originating from Shouyang county of Shanxi. YuShengJi specialized in scholar loans. Its loan-book records approximately 27,000 taels of outstanding loans to local business and 102,000 taels of loans to scholars.

¹³Primary and secondary historical sources indicate that a very large portion of the officials accepting these positions borrowed from creditors. For instance, Zelin (1984) reports that almost every official in Jiangxi provinces took loans of between 4,000 to 10,000 taels. A report written by an official of the Ministry of Finance complained that scholar loans, hitherto received by a fraction of officials, were now universal (Wu, 1689).

¹⁴There were other types of banks as well, e.g., vendor-lending (Yinju) banks, and coin-exchange (Yinhao) banks (Huang, 2016). Also a number of different terms were used to describe the lending banks. The term we have selected, “Zhangju” was the most commonly employed term in northern China, the location where almost all scholar-loans were initiated. In the south, especially in Shanghai and Hankou, lending banks were termed “Qianzhuang banks.”

¹⁵The average assets of 52 Zhangju bank in 1911, as reported in their registration documents, were 21,000 taels. 28 of 52 of these banks had no branches. The maximum number of reported branches was 4. In contrast, the total silver transferred by one Piaohao bank, Hankong, in 1907 amounted to 1.6 million taels. The number of branches of major Piaohao banks varied between 30 and 50. (Huang, 2016).

2.3 Reliance on assistants

For a number of reasons, officials needed assistants. First, the Qing bureaucracy was very small relative to China's population. For a county with an average population of 150,000, the central government might appoint only one county magistrate. This magistrate was responsible for all civil and judicial administrative issues, e.g., levying taxes, hearing trials, rendering court verdicts, running the prison and local police force.

Second, newly appointed officials lacked the experience required to meet the demands of their office. Passing the Keju exam required scholars to master Chinese literary forms, memorize Chinese classical texts, and develop a deep understanding of neo-Confucian philosophy. Given the extreme difficulty of passing the exam, scholars had little time to learn anything else. Thus, a scholar's corpus of knowledge, though impressive, was not terribly relevant to the tasks required by his appointment—collecting taxes, handling provincial finances, adjudicating lawsuits, and administering public works.¹⁶

Third, the job requirements imposed on officials were very demanding and usually required significant administrative experience. Any failure to meet performance targets—such as ineffectively collecting the land tax—could cost an official his job. However, raising taxes was also risky, as it frequently resulted in local riots and rebellions which might also lead to dismissal. Different dialects made it difficult for magistrates to even communicate with their subjects without assistance. The high turnover rate of officials reduced officials' ability to establish their own local networks.¹⁷

Assistants, although they lacked classical education and originated from a low social class, were experienced in business, finance, and administration and therefore played a pivotal role in local administration. This specialized experience helped them judge how much revenue magistrates could extract without triggering local unrest. Irresponsible behavior by an assistant could cost an official his job.¹⁸

While, legally, the relationship between an official and their assistants was a private and flexible affair, neither protected by contract, nor by any legal redress for unjust termination, in practice, officials found assistants difficult to replace. Officials, operating in an unfamiliar environment were unsure whether provincials offering assistance were trustworthy or had ulterior motives. Firing a senior assistant might cause the assistant to divulge confidential information.

¹⁶Lin (1995), in fact, argues that the practical and scientific irrelevance of the syllabus for the Keju exam was an important cause of the very weak relative economic performance of China in the late Qing period.

¹⁷Zhang (2009) provides evidence showing that the average tenure of a county-level government official was only 1.3 years.

¹⁸For instance, the county governor Shihan Peng in the Guangxu period imposed an incorrect sentence because of falsified evidence provided by a lawsuit assistant, resulting in dismissal from his position (Jiang, 2008). Another case occurred in the 1850s, the county governor Kui Zhang was removed because his assistant Jizhou Meng secretly placed his friends in the local administration (Zhou, 2007).

2.4 Trusted-assistant loans

The defining feature of the trusted-assistant loan was the stipulation that the borrower/official incorporate a “trusted assistant” nominated by the creditor into his administrative cadre. Typically, the trusted assistant was an employee, relative, or business associate of the creditor. In most cases, the creditor sent only one trusted assistant. The trusted assistant would follow the official to his jurisdiction and work in his administration. The trusted assistant frequently remained with the official for some time after the loan was repaid (Du, 2008; Jiang, 2008). Thus, the trusted-assistant loan mechanism required three parties: a typically distant creditor to fund the loan, the creditor’s better informed local agent, the assistant, and a borrowing official, who was frequently quite inexperienced in practical administration.¹⁹

The repayment of trusted-assistant loans was essentially dependent on the ability of the official to use his jurisdiction to generate revenue. When officials left office, collection efforts ceased because the income of an ex-official would be insufficient to repay the loan.²⁰ Apart from the risk of the official being impeached for triggering local unrest or failing to collect taxes, an official could be forced to leave his position due to various exogenous performance-independent events, i.e., illness, death, or the required three-year mourning period following the death of a parent. Given the average age of officials was above forty, and their parents above sixty, such forced departures were not unusual.

2.5 Trusted assistant incentives

Although introducing a trusted assistant might provide a creditor with more leverage over the official, it also raised the possibility of collusion between the trusted assistant and the official, i.e., the assistant could cooperate with the official in extracting revenue without ensuring the revenue was earmarked for debt repayment. Thus, aligning the incentives of the creditor and trusted assistant was essential for the viability of trusted-assistant lending.

As the subsequent analysis documents, the vast majority of trusted assistants were bank managers. Monetary incentive systems for bank managers appear to have been fairly common in nineteenth and early twentieth century Chinese banks. Morck and Yang (2010) studied management compensation in Piaohao banks. They document the pervasive use of performance-based stock grants, which took the form of “expertise shares.” These stock grants were quite generous by any measure. Not infrequently, payouts related to these stock grants exceeded dividend payments to bank owners. Zhangju banks also frequently offered managers high

¹⁹Because assistants were better informed than distant creditors, and officials were dependent on their services, direct lending by assistants to officials was also quite convenient. However, direct lending was restrained by limited assistant wealth.

²⁰In one account book of “Yu-Sheng-Ji,” it was written that the bank did not pursue deposed officials and that “we keep the record just in case their descendants may become officials and we could ask them to repay more or less the debt of their ancestor” (Liu and Yang, 2015).

powered stock-grant performance rewards (Liu and Yang, 2011).²¹ In fact, even in the non-financial sector, performance-based stock compensation was quite common in nineteenth century China, especially in firms owned and managed by Shanxi merchants (Lu, 2008).

Loan collection also affected promotion decisions for bank managers. Several top bank managers, early in their careers, were recognized for their skillful debt collections. For instance, Juyuan Song's promotion to top management was based on his success in two large loan collections, one taking five years and another seven (Huang, 2002a). Thus the historical evidence suggests that, in many cases, the successful collection conferred significant monetary and career advancement rewards.

In addition to performance incentives, banks also followed employment policies that aimed to form closed communities in which reputational penalties could act as effective deterrents to opportunism (Greif, 1993). In many cases, banks only hired candidates whose families originated from the founder's province and forbade assistants' wives to travel with the assistant to the official's jurisdiction. Thus, an assistant who decided to cast his lot with the official, and eschewed enforcing loan repayment, risked losing contact with this wife, children, and relatives.²²

Employment required a recommendation from a trustworthy person close to the bank. Potential employees were often investigated to determine whether their family had any members whose conduct was disloyal within the last three generations. Any fault in the family record would lead to the candidate being rejected. Banks also spread the news of disloyal conduct to the rogue employee's village and to his colleagues, ruining the employee's reputation. Given the cultural disdain for disloyal conduct, villagers would shun the rogue and he might lose his right to be buried in the family tomb, a measure that was considered the ultimate punishment in this era (Peng, 1958).

2.6 One example of a trusted-assistant loan: Du Fengzhi

A fairly typical example of a trusted assistant financing is narrated in the diary of Du Fengzhi (Du, 2008). Du, after receiving his appointment in Guangning county, Guangzhou province, considered borrowing to finance a new wardrobe, travel to his post, and valedictory gifts for friends and senior officials in Beijing. At the time, the scholar-loan market was quite competitive; Du was visited by more than 50 potential lenders within one month. Some creditors recommended by senior officials were rejected because Du did not think their terms were sufficiently competitive. Du's problem was that he lacked collateral or a guarantor. One private creditor, Wang, almost lent to Du, only to have the deal fall through because of Wang's

²¹Also see Gui (1988). For example, Guihua Song, a middle-level staffer in Bao Feng Long bank, was rewarded with 0.20 expertise shares (equivalent to 100 taels per year) for successfully collecting a 10,000 tael loan (Huang, 2002b).

²²Tragic stories relating to disloyal assistants are narrated by Ji (2005).

requirement that a friend serve as a guarantor.

Du finally received a loan, when Zhao, an employee of a small bank, “Wanyiheng,” came on the scene. Zhao was a relative and personal assistant of Chen, the general manager of the bank. Zhao was a good trusted-assistant candidate because he understood Cantonese, the local dialect of Du’s jurisdiction. After signing the contract, Du obtained 2,000 taels of silver for a loan with a face value of 4,000 taels, with full repayment due in six months, the approximate travel time between Beijing and Guangzhou. Zhao then followed Du on to Guangning, the jurisdiction under Du’s administrative authority. Zhao was sent to collect taxes for Du, a critical assignment which required familiarity with the local dialect.

Some evidence from Du’s diary suggests that Zhao was closely acquainted with Du’s financial condition. Six months after taking office, Du was able to improve his financial condition through excess taxation, gratitude gifts, and extortion from criminals. At this point, Du’s accountant, presumably urged by Zhao, asked Du to pay back part of the loan. The repayment requested—500 taels rather than the 4,000 taels owed—suggests that the trusted assistant, Zhao, was taking into consideration the overall financial position of Du. Du agreed to the partial repayment without hesitation.

In his later diary entries, Du complained several times about Zhao’s laziness. Despite this complaint, Du distributed a great deal of excess taxation to Zhao, and stated that he would never replace Zhao. Du, in fact, never fired any of the trusted assistants charged with levying taxes. Over a three year period, Du managed to repay the loan and Zhao returned to the bank. Du never mentioned taking out any loans to fund his subsequent appointments. A reasonable conjecture is that the wealth he accumulated governing Guangning county was sufficient to fund expenses related to these appointments.

3 Hypotheses

As evidenced by the volume of the trusted-assistant loan transactions, the trusted-assistant lending market was viable—many creditors voluntarily extended fairly large loans to unrelated scholar-officials in the absence of any legal mechanisms for enforcing creditor rights. The viability of such an unusual financing mechanism naturally raises two questions: Can trusted-assistant lending be explained within a rational-choice framework, in which agents, motivated by material rewards, rationally pursue their own interests? Are the restrictions imposed by the framework consistent with observed issuance and loan repayment patterns for trusted-assistant loans?

To address these questions, we first develop a model of trusted-assistant lending. As one might imagine given the unusual institutional features of trusted-assistant lending, the structure of the model is quite different from most models of lender/borrower relationships. However, given the model’s assumptions, the characterizations produced by the model are not too surprising.

Thus, for the sake of brevity, we defer the formal analysis of the model to Appendix Section A and simply sketch the model and its implications below.

In the model, newly appointed officials are inexperienced, but can become experienced over time. In each period, the official, possibly with the assistant's cooperation, collects revenue from the official's jurisdiction. Some revenue must be delivered to the central government to meet a tax quota, but excess revenue can also be collected. If the official is inexperienced, collecting revenue with the cooperation of the assistant increases collection efficiency. The cost of extracting revenue from the jurisdiction also depends on local economic conditions, which are observed by the assistant and official but not by the creditor. Period-by-period Nash bargaining between the official and the assistant determines how excess revenue is split between the official, the assistant, and debt repayment.

We believe that this model structure reflects the stylized facts presented in primary and secondary historical source materials. In addition, we make two further key assumptions: *no-commitment* and *financial constraints*. The no-commitment assumption postulates that the agents, the assistant and official, are unable to commit, in a given period, to their actions in subsequent periods. The financial-constraint assumption postulates that the agents cannot borrow against the expected future income generated by rent extraction from the province. Given that rent extraction by officials was illegal, income from extraction was unverifiable, and third-party enforcement of agreements related to rent extraction was impossible, we believe these assumptions are reasonable.

We provide conditions under which trusted assistants will employ their bargaining power to ensure efficient and effective loan repayment—repayment by the official in periods where economic conditions make extracting excess revenue from the jurisdiction fairly easy, and forbearance when excess revenue extraction is very costly. Based on this analysis, we propose the following hypotheses:

Hypothesis I. Trusted-assistant loans will be employed when

- A. the asymmetry of information is between creditors and officials is large and/or creditors and officials are not connected by kinship or affiliation bonds,
- B. the dependence, i.e., the difference between revenue extraction skills of assistant and the inexperienced official, is large.
- C. the expected duration of the official/assistant relationship is long,
- D. the economic condition of official's jurisdiction is relatively stable,

Hypothesis II. Trusted-assistant provisions in scholar loans will be associated with longer effective loan maturities and larger recovery rates.

The logic behind these hypotheses is fairly straightforward. Hypothesis I.A follows because sending an assistant is costly, when lenders are informed or connected to the official through a

network, they can monitor and/or enforce repayment without employing a trusted-assistant.

Hypotheses I.B, I.C, and I.D, all follow from financing constraints and no commitment. Both agents, the official and the assistant, might gain from unraveling effective and efficient enforcement. The official might gain from bribing the assistant to forgo repayment enforcement. The assistant might gain from bribing the official to agree to raising funds for loan repayment even when economic conditions are adverse and rent extraction is risky and costly.

However, because of the no-commitment assumption, an agent cannot bribe the other agent by promising to accept a smaller share of the rents in future periods than the agent can attain through period-by-period bargaining. Thus, any bribe must take the form of a payment in the current period.

Because of financial constraints, the bribe must be no larger than current-period rents. In order for a bribe to be attractive to the other party, it must compensate that party for all future losses from deviation from efficient and effective repayment. These losses will be larger when the present value of continuation of the assistant/official relationship is larger, Continuation value will be large when the degree of dependence is large, Hypothesis I.B, the expected duration of the assistant/official relationship is long, Hypothesis I.C, and the provincial economy is stable, Hypothesis I.D.

Hypothesis II results from the nature of the solution: the trusted assistant follows a policy of forbearing when economic conditions are adverse to rent extraction and enforcing repayment when conditions are favorable. Because this policy specifies forbearance in some states of nature, it should increase the effective maturity of the loans. Because this policy is the efficient policy, it should lead a larger fraction of the loan balance being eventually repaid.

4 Statistical Description

4.1 The diary sample

One source for our loan records is a collection of diaries written by government officials during the Qing dynasty. The custom of officials, and other intellectuals, keeping diaries dates from the Tang dynasty (618-907), but became ubiquitous during the later Qing Dynasty.²³ Even the most conservative estimate concludes that there are more than 1,000 extant Qing-dynasty diaries.

Publication of diaries was very uncommon, at least during the diarists' lifetimes. Diaries were thought of as both private and confidential. Diarists therefore had no incentives to falsify diary records. On the contrary, a truthful account would be more useful when later trying to recall the details of previous financial transactions. Corrections of diary entries were also extremely

²³See Chen (2004) for a more detailed description of diary keeping in the Qing dynasty.

rare, and, when they occurred, they were largely motivated by political considerations.²⁴

We gathered a sample of 54 digitized diaries. We employed keyword searches using descriptors such as “Borrow (Jie),” “Debt (Zhai),” “Owe (Qian),” or “Repay (Huan).” After identifying the locations of these debt descriptors, we then asked a research assistant from our history department, who specializes in the study of the Qing Dynasty, to mark relevant information for further analysis. Through this process, we obtained 99 loan records from 28 of the sampled diaries. We then attempted to identify debtor characteristics and debt contract characteristics, including interest rates, maturities, and collateral, as well as information relating to debt repayment. Biographical information relating to the authors of the 28 diaries containing loan records is provided in Table 6.

A concern raised by our approach is that our sample could be biased. Most digitized diaries were authored by higher-level officials. However this bias will only affect our results if the borrowing behavior of these officials, at the time they borrowed, was different from other officials. The loans in our sample were targeted at scholars who had to travel to take up appointments early in their careers. It is plausible that the early careers of these subsequently high-ranking officials were quite similar to those of officials whom they would ultimately outrank. Of course, it is possible that some creditors could identify scholars who were destined for success at the time of their first appointment in the provinces. Because of the impersonal bank-centered character of most trusted-assistant loans, we believe such identification, even if it ever occurred, was unlikely for the vast majority of loans in our sample. In Section 5.3 we consider this issue in more detail.

The 99 loans in our dairy sample were issued between 1830 and 1911, in the late Qing period. The geographic distribution of the borrowing officials’ jurisdictions is quite uniform. Our diary sample includes all of China’s eighteen provinces. The total number of loan records is larger than the total number of borrowers. This does not indicate that officials borrowed from the same creditor more than once to finance different sojourns. In almost all cases, loans were taken out before the borrower’s first sojourn out of Beijing, or were part of a package of loans used to finance the borrower’s first sojourn out of Beijing. For instance, one diary writer, Du Fengzhi, mentioned that he borrowed several times before leaving Beijing (Du, 2008). Banks frequently attempted to limit their exposure to a single borrower either by requiring the borrower to find other creditors or by syndicating the loan.

4.2 The loan-book sample

To provide additional insight, especially into loan performance, we also report evidence from an 1843 bank loan book of a bank, Yu-Sheng-Ji. The bank appears to be a typical lending bank operating in the fairly competitive scholar-loan market. The loan book records borrowers’

²⁴For instance, Tonghe Weng, one of the top ministers in the late Qing period, appears to have revised his diary after a failed anti-government revolt. All of his revisions concerned political, non-financial activities. (Weng, 1998)

repayments. Despite their illegality, the loans issued to scholars produced the bulk of this bank's revenue. Thus, keeping an accurate record of repayments was an essential element of bank operations.

The loan book contains records for 66 loans, 18 of which were trusted-assistant loans. The loan book contains less personal information about the borrowers than the diaries. However, the loan book does provide the following information: (a) the names, positions, jurisdictions, and loan repayments for each borrower, (b) whether the bank dispatched a trusted-assistant, (c) whether the loan was syndicated, and (d) whether collateral or guarantors were used. The names of the borrowers enable us to search for some of the bibliographic information missing from the loan book, such as whether the official's home town contained a Confucian temple.

The loan book also provides some loan performance information that the diaries lack—notably the bank's qualitative rating of loan performance—loans are rated “good,” “bad,” and “worst.” We therefore use this information to estimate the recovery rate for loans in the loan book sample. Based on the analysis of Liu and Yang (2015), we assign a recovery rate 70% to good loans, 30% to bad loans and 15% to worst loans.

We combine our diary sample with our loan-book sample in order to make the best use of our limited data. The combined sample includes 165 loans in total, and 70 trusted-assistant loans.

4.3 Loan characteristics

Some observations about the scholar loan are fairly obvious after inspecting Table 2. As indicated by Panel A, borrowers were overwhelmingly scholars, who had previously not held administrative appointments outside of Beijing.

Second, as shown by Panel B, the scholar-loan market was essentially a bank-loan market. As Table 2 reveals, only one of the trusted-assistant loans in our sample was provided by relatives or friends of the borrower. The rest were sponsored by domestic Chinese banks. This suggests, for reasons provided in Section 2, that the trusted-assistant loan market was impersonal. The bank dominance of trusted-assistant lending observed in our sample comports with both contemporaneous accounts and secondary historical sources. (Liu and Yang, 2015, 2011; Du, 2008).

Third, the scholar loan market was an unsecured loan market. As shown in Panel E of Table 2, only 5% of the scholar loans in our sample featured either collateral provisions or guarantors. None of the trusted-assistant loans featured either collateral or guarantor provisions.

Trusted-assistant loans were, on average, granted to officials whose jurisdictions were further from Beijing, the most common locale for the funding banks. This suggests, consistent with Hypothesis I.A, that trusted assistants were employed when the degree of information asymmetry between the creditor and debtor was large. Consistent with Hypothesis II, panel

F shows that trusted-assistant loans, on average, featured longer actual maturities and larger recovery rates.

Trusted assistant borrowers, on average, were associated with higher-level positions, better Keju exam results, and higher salaries. In short, on average, trusted assistant borrowers appear to be a bit “higher quality” than other borrowers in the sample. Although, this association between official quality and trusted assistant lending will not prove to be statistically significant in our subsequent analysis, it does suggest the possibility that trusted assistants might be sent not for the purpose of assuring collection, but rather to curry favor with important officials. In the subsequent analysis, we mitigate this concern in two ways. First, in our regressions, we control for the salary of officials. Second, in Section 6.2 we explicitly address the hypothesis that trusted-assistant loans were “soft loans.”

5 The Empirical analysis

5.1 Determinants of the propensity to use trusted-assistant financing

We estimate the determinants of incorporating a trusted-assistant provision into a scholar loan, through the following baseline probit model:

$$\mathbb{P}[\textit{Trusted-assistant loan}_i = 1] = \mathbb{P}\left[\alpha + \chi \textit{Chinese Bank}_i + \delta \textit{Distance to Beijing}_i + \xi^T X_i + \zeta^T Z_i + \theta^T T_i > 0\right]. \quad (1)$$

Trusted-assistant loan_i is a dummy variable that equals one when loan *i* is a trusted-assistant loan. *Distance to Beijing_i* measures the physical distance (in 1000 km units) between the jurisdiction of the official receiving loan *i* and Beijing. *Chinese Bank_i* is a dummy variable equal to one if the creditor issuing loan *i* is a Chinese Bank, and zero otherwise. The vector *X_i* includes characteristics of the jurisdiction assigned to the borrower of loan *i*, such as the ruggedness of the jurisdiction and the distance between the jurisdiction and the coast or the Yangtze River. The vector *Z_i* includes the characteristics of loan *i*, such as the total amount of the loan and whether the loan is secured by collateral or co-signed by guarantors. *T_i* is a vector of dummy variables, one for each decade in our sample period. We cluster the standard errors at the debtor level. In the tables, we report the marginal effects of the variables and, in parentheses, the *p*-values of the associated coefficients. A complete description of the variables and their sourcing is provided in Table 1.²⁵

In Column 1 of Table 3, we report the marginal-effect estimates for the baseline specification. Two types of creditors were involved in the scholar loans, impersonal creditors, i.e., banks, or the personal creditors, i.e., the relatives and friends of the debtors. Not surprisingly, given the

²⁵for continuous variables, the marginal effect of a given variable is the derivative of the estimated probit equation with respect to that variable, evaluated at the mean values of the variables. For dummy variables, the marginal effect is the result of shifting the value of the variable from 0 to 1, evaluated at the mean values of the other variables.

summary statistics provided in Table 2, the marginal effect of *Chinese bank* on the probability that the loan is a trusted-assistant loan is positive, confirming that domestic banks were more likely to assign trusted assistants to borrowers than other creditors. The predominance of banks in the trusted-assistant loan market is consistent with the central conclusion of this paper—impersonal financing can be provided on a large scale even in the absence of third party enforcement mechanisms. This result is also consistent with Hypothesis I.A because it shows that trusted-assistant lending was used by creditors who could not enforce repayment through network connections.

As is common in the literature (e.g., Butler, 2008), we use distance as a proxy for information asymmetry. The specific measure we use is distance from Beijing, the most common locale of the banks funding trusted-assistant loans.²⁶ Increasing debtor/creditor distance by one standard deviation increases the probability of sending an assistant by 0.212—or 0.42 times the standard deviation of the dependent variable. These results are also consistent with anecdotal descriptions of the problems associated with collecting loans to distant debtors (Ye, 1998). The marginal effect associated with *Distance to Beijing* is positive, and both economically and statistically significant. The sign of this coefficient is consistent with Hypothesis I.A, i.e., trusted assistant lending is used to resolve the information asymmetry between lenders and borrowers.

Next, we introduce, seriatim, proxy variables that capture the determinants of the viability of the trusted assistant mechanism identified in Section 3. Our results are presented in columns 2–5 of Table 3. In each of the regressions in columns 2–5, we label the column containing the augmented specifications with the name of the variable introduced and label the row containing estimates for the introduced variable’s marginal effect *Key indicator*.

Greater dependence on the trusted assistant First, we test Hypothesis I.B trusted assistants were used more frequently when officials were more dependent on trusted assistants. We therefore construct two proxy variables to capture officials’ dependence.

The first variable is *Rebellious tradition* which equals one if the central government classified the jurisdiction has “Nan,” a violent region or a region with a history of rebelling against the government, and zero otherwise. In jurisdictions where the populace was hostile to the central government, local substitutes for the trusted assistant would be harder to find and potential substitutes would be less likely to be trustworthy. The second proxy variable is *Different dialect*, which equals one if the local dialect of the jurisdiction of the official differs from the official’s dialect, and zero otherwise. Not understanding a local dialect increased reliance on assistants.²⁷ We extract relevant information regarding the dialects of each region of China from the Language

²⁶We also tried other proxies for distance: cost-weighted and time-weighted distance to Beijing, distance to Shanxi, Shanghai and Guangzhou. These other proxies produced similar results. See Appendix Table D-3 and Section D.2 of the Appendix.

²⁷Numerous studies confirm the role of dialect in hindering the spread of technology and fostering market fragmentation Lin and Zhao (e.g., 2017); Liu and Xu (e.g., 2017).

Atlas of China.²⁸

Consistent with our predictions, the results presented in Column 2 and 3 of Table 3 indicate that officials were more likely to be accompanied by a trusted assistant when officials were more dependent. Increasing the *Rebellious tradition (Different dialect)* variable from 0 to 1 increased the likelihood of using a trusted assistant by 0.433 (0.398). Given that the unconditional likelihood of trusted-assistant assignment was 0.424, these effects are quite economically significant.

Tenure of assistant To test Hypothesis I.C, we take advantage of the fact that officials had to undertake a compulsory mourning interlude of three years after one or both of their parents passed away. As a result, officials whose parents were both dead would, in expectation, hold their current appointment for a longer period. In fact, anecdotal evidence suggests that bankers often asked whether an official's parents were alive when making loan decisions (Xiaoyao, 1985). Leaving their position during the mandated three-year mourning period would have entailed a total loss of income, making repayment impossible.

Our proxy for the probability that an official would remain in their position in the next period, is *Parents alive*, which represents the risk of being forced to resign because of the mandatory mourning period associated with the death of a parent. For observations from the diary sample, we can determine, from the diary entries, whether an official's parents were alive. Thus, for the diary sample, *Parents alive* equals 1 if at least one of the official's parents was alive at the time the loan is contracted, and 0 otherwise.

For observations from bank-loan book, whether the parents of the officials were alive or not was harder to track. For observations in the loan book, we estimated *Parents alive* using the following procedure: Because military officials (all in the loan-book sample) were exempted from the compulsory mourning, all military officials were treated as if they were associated with no risk from parents' death, i.e., *Parents alive* = 0. For the civil officials recorded in the bank-loan book, we looked for three year or longer gaps in their political careers. If such a gap existed, we set *Parents alive* = 1 and set *Parents alive* = 0 otherwise. Admittedly, the way we construct the dummy variable is likely to underestimate the risk of parents' death, as it could be the case that the official was impeached for other reasons before his parent's death. However, the significance and direction of the effect of *Parents alive* are robust to replicating our regression using only the diary sample.

Column 4 of Table 3 presents the results of this regression. The marginal effect of *Parents alive* is negative and statistically significant. Consistent with the model's predictions, having at least one parent alive decreased the likelihood of using a trusted assistant by 0.469, a very large value compared with the mean value of 0.424.

²⁸<https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/QPUONU>

Economic stability To test Hypothesis I.D we employ *Rice price volatility*, the yearly volatility of the local rice prices in each county during the Qing period, as a proxy for economic stability.²⁹ Unaffected by the industrial revolution happening elsewhere, Qing China was mainly an agricultural economy, with agriculture accounting for a very substantial part (66% in 1840 (Broadberry et al., 2018)) of the country's whole output. The price of rice (along with other crops) was an important indicator of social stability. Higher rice prices were associated with a shortage of food, increased violence due to starvation, and, most importantly from our perspective, the difficulty of enforcing taxation without triggering unrest. Column 5 of Table 3 presents our results. Consistent with our predictions, increasing *Rice price volatility* by one standard deviation decreased the likelihood of using a trusted assistant substantially, by 0.218.

5.2 Determinants of the recovery rates

To test Hypothesis II, we consider the effect of the trusted assistant mechanism on the effectiveness of repayment enforcement. We estimate the following OLS regression:

$$Recovery\ rate_i = \alpha + \delta Trusted\ assistant_i + \xi^T X_i + \zeta^T Z_i + \theta^T T_i, \quad (2)$$

where *Recovery rate_i* is the total amount of silver repaid as a percentage of the total amount owed for each loan in the dairy and loan book samples, i.e.,

$$Recovery\ rate = 100 \times \frac{\text{Amount Repaid}}{\text{Amount Owed}}.$$

We do not use the default rate to measure effectiveness because very few scholar loans, with or without trusted-assistant provisions, were repaid when due. *Trusted assistant_i* is a dummy variable that equals one when the loan is a trusted assistant loans. The control variables, *X*, *Z*, and *T* are described in Section 5.1.

In the recovery rate regression, equation (2), we exclude from the sample borrowers who subsequently suffered exogenous shocks: death, incapacitating illness, or (most commonly) a parent's death (which triggered the three year mourning period). Our sample is small. Hence, these exogenous shocks need not average out. At the same time, these shocks had a profound effect on loan recovery. Including the shocked borrowers in the sample would lead to estimates of differences in recovery rate largely determined by the differences in the proportions of borrowers whose parents died during the period the loans were outstanding.

We report the result of this regression in Table 4.³⁰ Consistent with Hypothesis II, the coefficient of *Trusted assistant* is positive and statistically significant. Its economic scale is also quite large. Having a trusted assistant companying the creditor increased the recovery rate of

²⁹We obtain the local rice prices from Feng and Wang (2009)

³⁰Because the dependent variable in the recovery rate regression (equation 2) is limited, we also estimated the recovery regression using a logit specification. The results were quite similar to the results in the baseline OLS specification. We present the OLS results because the OLS coefficients are easier to interpret.

by 13%, or 54% of the standard deviation of the recovery rate. If we had included the shocked borrowers, the coefficient would have been even larger.

5.2.1 Omitted variable and selection bias

The conclusions obtained from the OLS estimates specified by equation (2) are potentially subject to two sorts of misspecification: omitted variables and selection bias. An omitted variable bias might arise if, for example, banks also use other methods, e.g., collateral, to enforce the repayment and *Trusted assistant* captured the effects of these omitted variables. Selection bias could arise if applicants for trusted assistant loans, which are typically larger than other scholar loans, were screened more thoroughly than applicants for other scholar loans. In this case, selection bias alone could lead to higher recovery rates for trusted-assistant loans even in the absence of any causal effect of the trusted assistant on loan repayment.

Omitted variable concerns To address the missing variable concern, we explore the impact of two alternative debt enforcement methods: guarantees and the family reputation. In Table 4 (and Table D-2 in the Appendix), we introduce two new variables: *Guaranteed loan*, a dummy variable that equals to one if the loan is guaranteed either by a guarantor or by pledging collateral and *Family reputation*, a dummy variable that equals to one if the family of the borrower lived in Beijing or Shanxi, the two largest banking centers in this era. Proximity of the borrower's family enabled creditors to threaten to publicize the borrower's default and thus shame the borrower's family. The introduction of these controls has little appreciable effect on our results, as can be seen from columns 2–3 of Table 4. In columns 4–6 we control for other potential omitted variables. Again, these controls do not have an appreciable effect on our results.

Selection bias As documented in Table 2, trusted-assistant loans were typically larger than other scholar loans. Thus, it seems reasonable to conjecture that banks employed stricter screening criteria for approving these loans. Assuming that their screening criteria had predictive validity, this extra screening would imply higher recovery rates for trusted-assistant loans even if the assistants themselves had no effect on recovery. Screening criteria might be based on observable characteristics in our data set or on unobservable characteristics. The obvious candidate for an unobservable characteristic used for screening is soft information about the “character” of the applicant scholar-official. Banks specializing in trusted assistant loans employed managers who had been involved in the collection of other scholar-loans and thus had interacted with many officials. These officials might have information about the performance and personal habits of the applicant official. So, screening based on unobservables is plausible.

Ideally, the selection problem generated by screening should be addressed by an identification strategy, such as instrumental variable regression. However the limited number of observations in our sample makes it nearly impossible to identify strong instruments for the independent variables.

Hence, we address the selection problem in a less than ideal fashion: we control for observables that might affect the loan approval decision and use a subsample of officials in which the problem of selection on unobservables is less acute, “rookie officials.” Rookie officials are officials who, before borrowing, had never held any government post, either provincial or in the capital, Beijing. Although the vast majority of trusted-assistant borrowers had never held provincial administrative posts, many held posts in Beijing prior to borrowing and thus worked with other Beijing officials.

Prior to borrowing, rookie officials, had never worked in any official capacity. Thus, the amount of soft information circulating about rookie officials’ abilities was likely to be less than the soft information circulating about more seasoned officials. Consequently, if increased screening based on soft information was the driver of the excess recovery rate for trusted-assistant loans, the effects of trusted assistants on the recovery rate should be much smaller in the rookie-official sample.

As reported in Panel F of Table D-2 in the Appendix, after controlling for observables and restricting the analysis to a subsample where the problem of selection on unobservables is likely to be less acute, the rookie sample, the coefficients for the trusted assistant are still positive and significant. In fact, the coefficients are larger than the coefficient estimates in our baseline analysis, Table 4.

5.3 Robustness tests

Diary selection bias In our previous estimations, we use a combined sample including both the diary entries and loan book records. One concern is that diary sample might generate selection bias: diaries from successful diarists, high-level officials and reputable scholars, were more likely to be kept, compiled, published, and digitalized, and thus to appear in our sample. As discussed above, the fact that scholar loans are usually taken out early in a scholar’s career partially alleviates this concern.

To further mitigate the possible effects of selection bias, we conduct a robustness test that uses only the loan book sample. The loan book provides us with a snapshot that includes all of the borrowers who borrowed from the bank in 1843. Officials listed on these account records covered almost all types of government positions. Many military officials, who were less likely to appear in the diary sample due to the military officials being less literate, were also included in the bank’s list of accounts. Thus, the sample from the bank loan book is, plausibly, less likely to suffer from selection bias.

After we exclude the observations from the diaries, the sample size shrinks to 66. In Panel A of Tables D-1 and Table D-2 in the Appendix, we replicate our baseline regression (presented in Table 3) excluding observations from the diaries. The scale of the coefficients is mostly unchanged despite a decrease in significance due to the reduced sample size. The stability of the

signs of the coefficients suggests that the selection bias, perhaps engendered by using the diary sample, is unlikely to account for our results.

Endogenous matching Our estimations were based on the assumption that an official's distance to their jurisdiction was predetermined and exogenous. In practice, the decision to match officials to their jurisdictions was an important decision involving serious consideration of many factors, including an official's characteristics. The decision to appoint a trusted assistant might be based on the same characteristics. This consideration raises an endogeneity concern. For example, if the central government frequently appointed lazy officials to far-away jurisdictions as a punishment, a banker, reasonably deducing that the official is lazy from his jurisdiction assignment, might be more likely to appoint the trusted assistant to monitor him.

To address this endogeneity concern, we take advantage of the institutional setting in Qing China, where the jurisdictions assigned to officials, especially those at low levels, were frequently determined by lottery. On a fixed date of each month, The Ministry of Appointments would organize the lottery ritual at Tiananmen (The main gate of the Forbidden City) to match officials with newly vacated positions.³¹ Scholars believed that assignments were indeed random (Zhang, 2009). We therefore use a subsample of officials whose positions were determined by lottery to overcome the endogeneity problem. The identification assumption is that the lottery severed any potential links between the observable features of the jurisdiction and the unobservable features of the officials.

The lottery sample consists of 88 loans. We re-run the regressions presented in Table 3 using the lottery sample. The results are presented in Panel B of Table D-1 and Table D-2 in the Appendix. The scale of the coefficients remained unchanged, although the significance was reduced, again, due to the drop in sample size.

Military officials 14% of the loans in our sample (all from the loan book) were to military officials. The appointment and promotion process for these officials was somewhat different than the appointment and promotion process for civil officials described in Section 2. Military officials took the "Martial Keju" examination, which consisted of a written examination on military strategy as well as a physical examination, e.g., weightlifting, archery, and horsemanship. Military officials were much less erudite than civil officials. The civil and military career tracks were completely distinct: a military official could never be admitted to the civil bureaucracy and vice versa. We include military officials in our sample because the differences between the education of military and civil officials provides some cross-sectional variations which are quite useful for testing the alternative hypotheses discussed in the next section. Because of the differences between the selection mechanism and career tracks for military officials and civil officials, their inclusion in our sample might raise the concern that our results are driven

³¹ After 1786 reform, the power to fill low-level positions was partially decentralized, and the Department of Appointments used a lottery only for centrally appointed low-level positions.

by the military-official subsample. To address this concern, we replicated the hypothesis tests reported in Table 3 with a sample that excluded military officials. The results of this exercise are reported in Panel C of Table D-1 and Table D-2 in the Appendix. The sign and significance of the estimates were the same as those in Table 3, and the estimated marginal effects were nearly identical.

Selective recording in the diary sample For borrowers in the diary sample, our estimates of the loan recovery rate and the dispatch of a trusted assistant are based on the information provided by the diarists. The accuracy and completeness of this information depends on how diligently the diarists recorded financial transactions. If diligence varies across diarists and this variation is correlated with our covariates, it might bias our inferences.

Because the bank-loan book records payments and the dispatch of a trusted assistant for all borrowers, the persistence of our findings in the loan-book sample provides some assurance that our results are not primarily driven by selective reporting by diarists. To provide further assurance, we exclude from our overall (diary + loan book) sample diarists who seemed to be negligent with respect to recording loan information. We categorize the diarist as negligent if he ever failed to record, in a narrative concerning a debt transaction, the principal of the loan. Failure to record this basic information is an indicator that the diarist was less likely to record repayment information. We then perform the baseline regression, equation (1), excluding those negligent diarists. The results presented in Panel D of Table D-1 and Table D-2 in the Appendix are quite similar to our baseline results, suggesting that selective reporting is not an important driver of our results.

Assignment of recovery rates in the loan book sample As noted in Section 4, for the loans in the loan-book sample, we estimated recovery rates. To assess whether our analysis of the effect of trusted assistants on loan recovery is driven by these estimates, in Panel F of Table D-2 in the Appendix, we estimate recovery rates using only the diary sample. The coefficient representing the dispatch of a trusted assistant is, again, positive and economically significant.

6 Alternative hypotheses

While our empirical evidence generally supports the expertise-leverage hypothesis, clearly it is conceivable that other hypotheses might better account for the regularities observed in our data. In this section, we consider the most plausible alternative hypotheses.

6.1 The bank power hypothesis

As discussed in Section 2, legal enforcement scholar loan repayment was impossible. However, officials clearly were subject to pressure from their superiors. The plausibility of enforcement through superior pressure depends on identifying some motivation for this pressure. Officially, the state was hostile to scholar loans and, as discussed in Section 2, punished banker

caught offering such loans more severely than borrowing officials. During the first half of our sample period, the Qing state ran budget surpluses, and did not face any peer-level military rivals or major civil unrest. In this period, the resources of the state dwarfed the resources of even the largest banks. Thus, for much of our study period, the hypothesis that bankers were able to pressure the imperial court into hounding delinquent official borrowers appears quite implausible.

However, for a subset of banks in the second half of our study period, the hypothesis that loans were enforced by *bank power*, i.e., banks utilizing their leverage over the imperial government to force scholar-officials to repay, is quite plausible. In the latter half of nineteenth century, the Qing Dynasty suffered from three major rebellions, the Taiping Rebellion, the Nian Rebellion, and the (perhaps less significant) Dungan Rebellion. During these rebellions, rebel-held territory separated Beijing from large, tax-rich provinces. The preservation of the financial viability of the state required remitting revenue from the cut-off provinces to Beijing. Thus, the state became dependent on remittance services that could only be provided by the major Piaohao banks, who were able to transport silver to Beijing through or around the rebel-held provinces. During this period, Piaohao banks took over many of the financial functions of the state, collecting taxes and funding ministries and government officials throughout China (Wei, 1994; Morck and Yang, 2010). The huge indemnity payments associated with the Boxer rebellion (1899–1901) further increased the dependence of the dynasty on the Piaohao banks.

Thus, in the case of Piaohao banks in the latter part of the nineteenth century, enforcement through bank power appears to be a plausible alternative to the expertise-leverage hypothesis. If repayment is enforced by bank power, the role of the trusted assistant becomes purely consultative. Because only Piaohao banks could enforce lending contract through political power, they would have a significant competitive advantage over other lenders. As noted in Section 3, enforcement through expertise leverage imposes incentive constraints on the scope of trusted assistant financing, bank power would lift these constraints and thus permit effective use of trusted assistants in many situations where trusted assistant lending would not be viable under the expertise-leverage hypothesis.

The bank power hypothesis cannot provide a complete explanation for the viability of the scholar-loan market. The scholar-loan market was well developed by the mid-18th century. The Piaohao banks were formed in the mid-19th century. However, the bank power hypothesis does make predictions about the inter-bank competition in the scholar loan market and about time-series variation in the frequency of trusted assistant lending. Because of the comparative advantage of Piaohao banks in enforcing scholar loan agreements, the bank power hypothesis predicts that, starting in the mid-nineteenth century, Piaohao banks would become ever bigger players in the scholar-loan market. Also, because the power of these banks over the dynasty waxed when the dynasty was weak and waned when the dynasty was strong, and enforcement

depends on bank power, we would expect that scholar lending would expand in periods where the dynasty was challenged by crises.

Neither of these predictions is confirmed in our data. First, only 4 of the 165 loans in our diary sample were made by Piaohao banks (Table 2). Obviously given that our loan book originates from a Zhangju bank, none of its loans were Piaohao bank loans. The dominance of Zhangju banks in our sample comports with archival and secondary historical sources which report that the Zhangju banks were the main providers of scholar loans (Huang, 2016; Liu and Yang, 2015). Second, as documented in Figure 1, the frequency of scholar loan issuance and the mix between trusted assistant and non-trusted assistant loans does not appear to vary in any obvious fashion between crisis and non-crisis periods.

Thus, although it appears that in certain time periods, the Piaohao banks could have used their political power to enforce scholar loans and perhaps other loans, and thus, given the absence of creditor rights in nineteenth century China, would have had a comparative advantage in lending over other banks, they apparently did not attempt to exploit this advantage. One possible explanation for this failure is that, although the joint-stock form of organization was well developed in China by the start of the nineteenth century, public equity and debt markets were not. Joint-stock firms were effectively owned by their founders and managers and could not raise new capital through secondary equity or debt offerings. Thus, bank expansion may have been limited by capital constraints. Consequently, although the rising power of the Piaohao banks in the nineteenth may have generated profitable opportunities to compete with the Zhangju banks in the scholar loan market, it may have also generated other new opportunities that were even more profitable.

6.2 The soft loan hypothesis

The next alternative we consider is the *soft loan hypothesis*: trusted-assistant loans and the dispatched trusted assistant are disguised bribes intended to curry political favor with powerful officials. Officials receiving these loans “repay” the creditor, not by repaying their loans, but rather by making official decisions that favor the creditor. Some anecdotal evidence suggests that this hypothesis is plausible. For instance, when Empress Dowager Cixi fled to Shanxi during the Boxer Rebellion, she “borrowed” 300,000 taels of silver from Shanxi merchants. In return, she assigned to the Piaohao banks the very profitable task of administering the reparations associated with the Boxer Protocol.

This example illustrates the necessary conditions for political soft lending. First, an agent receiving a soft trusted-assistant loan must have the power to make significant policy decisions. Thus, under the soft loan hypothesis, trusted-assistant lending should be positively correlated with the power of the official. If a substantial fraction of trusted-assistant loans were soft, this positive correlation would imply lower recovery rates on trusted assistant loans or loans to

powerful officials.

Second, for soft lending to benefit the creditors providing the loan, the official must be able to use his power to materially benefit creditors. National level decisions, such as determining which banks would handle remittances, were made in Beijing. The officials in our sample were local officials whose authority did not extend beyond their jurisdictions, usually a county. As discussed earlier, most of those banks that specialized in the scholar loans were Zhangju banks (Liu and Yang, 2015) operating over a very limited geographic region. Thus, for these banks, the favor of proximate officials would be much more valuable than the favor of distant officials. Consequently, the soft-loan hypothesis predicts that, if a significant fraction of trusted-assistant loans are soft loans, recovery rates on loans to proximate officials should be lower and that proximity should be positively associated with trusted-assistant lending.

Third, the favors purchased by the soft loan need to benefit *all* of the creditors providing the loan. It is rather unlikely that private investors included in a syndicate formed by a bank could capture economic benefits from the favors provided to the bank by the official. Hence, soft trusted-assistant loans should not be syndicated. Thus, if a substantial fraction of trusted-assistant loans were soft, the soft loan hypothesis predicts that syndicated loans will have higher recovery rates.

In Panel A of Table 5 we test these predictions. We use the seniority of the official, *Official's rank*, as a proxy for officials' power. We also try an alternative proxy for power, *Keju result*, the Keju examination score of the official. The positive correlation between the Keju examination scores and career advancement has been confirmed by numerous studies: candidates who performed better on their Keju examinations were smarter, had an easier time building up political networks, and faced shorter waits for appointments. Geographic distance is proxied by *Distance to Beijing*. Syndication is measured by a syndicate dummy variable, *Syndicated loan*. Estimated coefficients from these regressions, both for the probability of trusted assistant lending and loan recovery rates, were insignificant or inconsistent with the predictions of the hypothesis.

6.3 The political threat hypothesis

The third hypothesis we consider is the *political threat hypothesis*: loans are enforced by the political power of senior officials, who are also large shareholders in the lending banks. Under this hypothesis, trusted-assistant loans are disguised bribes paid by junior to senior officials, i.e., loans are issued to scholars at unfavorable terms (to the scholar). Scholars contract at these loans in anticipation of the senior official's patronage and political protection. The bank is essentially a "cut-out" to disguise profiteering by the senior official. The trusted assistant acts as a consultant to the official, and thus ensures that sufficient revenue can be extracted from the jurisdiction to satisfy the onerous terms of the loan.

A famous case that seems consistent with the political threat hypothesis relates to Li

Hongzhang, a prime minister and very powerful figure during the late Qing period. His family controlled several banks. These banks lent to officials at high interest rates. Scholar-officials accepting loans from Li Hongzhang might have believed that default on their loans would cause Li to interfere with their advancement through the bureaucracy.

Enforcement through political threats requires that the enforcer has the ability to interfere with the appointments and advancement of more junior borrowing officials. In practice, this condition was rarely satisfied. The vast majority of junior official appointments were made by the Ministry of Appointment via lottery at Tiananmen. Some provincial governors did have the power of appointment, but only for a small fraction of subordinate officials within their province. Most of the remaining appointment decisions were made directly by the emperor. Only a few cases are recorded in which a minister was granted full control over subordinate appointments. In most of these cases, these ministers were ministers associated with illustrious military campaigns. In fact, Li Hongzhang was one of these exceptional cases.³² The wealth of these senior ministers was primarily accumulated during their administrative service. Consequently, it is doubtful whether a few very senior ministers had sufficient personal financial capital to fund a significant fraction of the large scholar-loan market.

If a substantial fraction of trusted-assistant loans were enforced through political threat, trusted assistant lending should be more likely when senior officials have appointment power and when borrowers are politically weak. Recovery rates should also be positively associated with the satisfaction of these conditions.

To test these predictions, we proxy for senior official appointment power with a dummy variable, *Decentralized province*, for provinces where the provincial governor had appointment power. We proxy for the political weakness of borrowers with two measures. The first measure, *Low official* is a dummy variable for the official being junior. The second, *Han ethnicity*, is based on whether the official's ethnicity is Han or Manchu. In the Qing empire Manchus (only 0.2% of the whole population) constituted the ruling class and the rest of the population was Han. Han officials were much less likely to have connections to patrons in elite circles. Thus, we use Han ethnicity as another proxy for political weakness.

In Panel B of Table 5, we test these predictions. We find no significant differences in the probability of sending a trusted assistant or in recovery rates for appointments more subject to interference or for officials with more political power. Thus, although clearly political threats played some role in some trusted-assistant loans, the hypothesis that political threat enforcement was a primary means of repayment enforcement is both implausible based on institutional considerations and not verifiable in our data sample.

³²Other examples: Nian Gengyao under the Yongzheng emperor, Zeng Guofan under the Tongzhi emperor. In contrast to the West, generals in Qing were usually civilian officials.

6.4 The Confucian ethics hypothesis

Another alternative hypothesis is the *Confucian ethics hypothesis*: scholar-officials, imbued, through their long study of Confucian classics, with Confucian ethics, felt morally obligated to repay their debts; no enforcement mechanism is required. Under this hypothesis, like the political threat hypothesis, the trusted assistant acts as a consultant to the official, providing the expertise the official requires to fulfill obligations that the official desires to fulfill based on his internal ethical code. The plausibility of this hypothesis rests on the state's motivation for focusing the Keju examination on the Confucian classics—the belief that the study of the Confucian classics would raise the ethical standards of local elites, and foster trust and social capital development in the population at large, hereby reducing the government's need to control anti-social behavior through laws and coercion (Chang, 1955; Kung and Ma, 2014).

Repayment based on Confucian ethics does not conflict with the central conclusion of our analysis—large scale financial markets can develop even when contracting institutions are absent. If the Confucian ethics hypothesis is correct, any society whose members have absorbed Confucian ethics can contract without contracting institutions, knowing that contracting counterparties will fulfill their obligations. Although both expertise leverage and Confucian ethics are consistent with our central conclusion, we believe that the expertise-leverage hypothesis is a much more plausible explanation for the enforcement of trusted-assistant loans.

First, it is not clear that adherence to Confucian ethics ensures loan repayment. Confucian ethics centered on cultivating the five virtues: Ren (Benevolence), Yi (Righteousness), Li (Propriety), and Zhi (Wisdom). Ren (Benevolence). Ren requires officials to treat their subjects humanely and with as much benevolence as possible. Given that, in practice, loan repayment involved extracting excessive taxes from subjects, repayment, although perhaps consistent with Yi, would frequently be inconsistent with Ren.

Second, the degree to which scholar-officials were constrained by Confucian ethics is also unclear. As discussed earlier, although corruption was illegal and thus almost surely viewed as being inconsistent with Confucian norms, corruption in practice was ubiquitous. Consequently, *prima facie*, it appears that a substantial proportion of officials were not constrained by Confucian norms.

Finally, trusted-assistant loans were frequently offered to military officials, who typically did not take the Keju examination, and thus were much less likely to be imbued with Confucian norms. Consequently, it is unlikely that the enforcement mechanism for all, or almost all, trusted-assistant loans was the ethical norms of officials.

A more reasonable framing of this alternative hypothesis is that some trusted-assistant loans were enforced through Confucian ethical standards and others were enforced through the sort of expertise leverage modeled in our analysis. In which case, the marginal gain from dispatching a trusted assistant would be higher for those loans where the borrower was not constrained by

Confucian norms, as, in this case, the trusted assistant would perform both enforcement and consulting functions. Under this framing, the probability of trusted assistant lending should be higher, and the loan recovery rate should be lower, if the official is not constrained by Confucian norms.

In Panel C of Table 5, we test these predictions. We proxy for Confucian ethics using two proxies: *Civil official*, whether the borrower was a civil official, and, *Confucian temples*, the average number of Confucian temples per county in officials' birthplaces. The second proxy is motivated by Kung and Ma (2014), who documents that the number of Confucian temples is correlated with less local violence. Our tests relating these proxies for Confucian norms and the likelihood of trusted assistant lending and the loan recovery rate yield insignificant coefficients.

6.5 The blackmail hypothesis

The last alternative hypothesis we consider is the blackmail hypothesis: the trusted assistant is sent to collect information about the official's illicit actions. The threat of revealing this information is used as leverage by creditors to enforce repayment. Under the blackmail hypothesis, the assistant does not add value as a consultant. The official can find honest and competent assistants or can manage revenue collection without assistance.

Although this sort of leverage is different from expertise leverage, the economic mechanism for enforcement is actually quite similar to the expertise-leverage mechanism considered in this paper. Like the expertise-leverage hypothesis, under the blackmail hypothesis, the assistant has a threat point in negotiations with the official. The challenges to formulating an economic model that supports the blackmail hypothesis are the same as those faced by the expertise-leverage hypothesis: providing conditions under which period-by-period bargaining between the assistant and official can implement efficient and effective repayment.

Since the information used to blackmail the official is unearthed by the trusted assistant *after* the official has been financed by the creditor, enforcement through blackmail does not require any ex ante network relationship between the creditor and borrower, nor does it require dependence on the lender for future financing. Thus, theoretically, blackmail enforcement represents another mechanism consistent with large-scale financing in the absence of contracting institutions.

Moreover, historical research has unearthed a case in which an assistant kept a special diary full of scandals relating to different officials he had served (Ji, 2005). Thus, the conjecture that some assistants had damaging information about some officials is quite plausible. However, it is less obvious that blackmail was a practically viable means of enforcing trusted-assistant loan repayment.

In order to enforce repayment through blackmail, the assistant must be able to make a credible threat of revealing damaging information. Such a threat would be credible only if the

assistant can reveal the information without incriminating himself. However, any investigation of the official's conduct would almost surely reveal the existence of the trusted-assistant loan. As discussed earlier, funding, accepting, and participating in trusted-assistant lending was illegal. In the few cases trusted-assistant loans came to the attention of the court, creditors were punished severely.

Abstracting from this issue, what are the implications of enforcement through blackmail? The assistant's threat point, information revelation, is stronger when the scope for egregious corruption, which, if revealed, might result in the official's termination, is larger. The scope for egregious corruption is limited by the jurisdiction's ability to resist extremely corrupt officials. Thus, under the blackmail hypothesis, the likelihood of trusted assistant lending and the recovery rate on trusted-assistant loans should be higher for officials who govern provinces where the populace is less able to coordinate resistance.

To test this prediction, we construct two proxies related to coordinated resistance. The first is a dummy variable, *Easy to tax*, a dummy variable equal to one if the official's jurisdiction is *not* categorized as "Pi," hard to tax. The second proxy, *Non-clan area*, is the dummy variable equal to 1 if county is a non-clan area, as indicated by genealogy books (which recorded family trees over several generations) being relatively uncommon.³³

In Panel D of Table 5, we test these predictions. We find that regions where it is harder to collect taxes were associated with *more* trusted assistant lending and *higher* recovery rates. This result is consistent with our expertise-leverage hypothesis but inconsistent with the blackmail hypothesis. The remaining coefficients were not significantly different from zero.

In summary, each of these alternative hypotheses has some plausibility. However, from the perspective of predicting the issuance and repayment behavior in our cross-section of scholar loans, they appear to be less satisfactory explanations for trusted assistant financing than the expertise-leverage hypothesis.

7 Conclusion

In this paper, we provided a counterexample to the assertion that the development of large-scale impersonal financial markets requires contracting institutions. Our counterexample was the trusted-assistant loan in nineteenth-century Qing China. We provided a reasonable explanation, buttressed by a theoretical analysis, for the viability of this novel contracting mechanism—expertise leverage. The results of our empirical analysis were roughly consistent with our theoretical predictions.

³³Clans were a significant restraint on excess taxation. For instance, Du Fengzhi, the magistrate of Guanning county, Guangdong province, was almost impeached because the local clan organized rural petitions to higher government officials against his attempts to raise taxes (Du, 2008).

Variable names	Definition	Resource
Baseline regression		
Trusted assistant	=1 if the loan specified a trusted assistant	1
Recovery rate	Total repayment collected as percentage of the sum of nominal principal and interest	1
Distance to Beijing	The distance between Beijing and the official's jurisdiction	2
Path cost	log(Energy Spent) traveling from Beijing to the official's jurisdiction	2
Path time	log(Travel Time) between Beijing and the official's jurisdiction	2
Distance to Shanxi	The distance between Taiyuan (capital of Shanxi) and the official's jurisdiction	2
Distance to Shanghai	The distance between Shanghai and the official's jurisdiction	2
Guaranteed	=1 if the loan is guaranteed (by collateral or guarantor)	1
Family reputation	=1 if official's family was from Beijing or Shanxi	3
Control variables		
Salary	The annual salary for the official	4
Ruggedness	Ruggedness of jurisdiction's topography, as measured by Nunn and Puga (2012)	2
Distance to Yangtze	Distance from the jurisdiction to the Yangtze river	2
Distance to Coast	Distance from the jurisdiction to the coast	2
Latitude	The latitude of the official's jurisdiction	2
Alternative explanations for the role of distance		
Loan amount	The total amount of the loan as mentioned by the official	1
Heavy workload	=1 if the central government classified official's jurisdiction as "Fan," heavy workload. [†]	5
Conjunction	=1 if the central government classified official's jurisdiction as "Chong," at the conjunction of major roads.	5
The predictions of the model		
Rebellious tradition	=1 if the central government classified the official's jurisdiction as "Nan," violent/rebellious	5
Dialect	=1 if the dialect of official's jurisdiction was significantly different than his native dialect	6
Parents alive	=1 if either of the parents of the official was alive [*]	3
Rice price volatility	Standard deviation of the prefecture's monthly rice price (10 years preceding the loan).	7
Alternative hypotheses		
Official's rank	Bureaucratic rank of the official (1–9)	3
Keju result	0, if the official did not obtain any Keju result; 1, if he succeeded at the prefectural level; 2, if he succeeded at the provincial level; 3, if he succeeded at the national level.	3
Syndicated loan	=1 if the loan was syndicated by more than one creditor.	1
Low official	=1 if the rank of the official was equal or lower than 4 (covers all officials below the city level)	3
Decentralized province	=1 if the provincial governor partially controlled appointments	8
Han ethnicity	=1 if the official's ethnicity was Han.	3
Civil official	=1 if the official was NOT a military official	3
Confucian temples	The total number of Confucian temples in the hometown of the official	9
Easy to tax	=1 if the central government did NOT classify the official's jurisdiction as "Pi," hard to tax	5
Non-clan area	=1 if the total number of the local genealogy books (i.e., charts) was less than the average number in China during this period	10

^{*} For observations in bank-loan sample, we construct a proxy for Parents alive as follows: For military officials, Parents alive = 0; for civil officials, Parents alive = 1 if in there was a 3 year or longer gap in the official's political career, and Parents alive = 0 otherwise.

[†] The designations "Fan," "Chong," "Nan," and "Pi" were assigned by the central government to some of China's counties in 1728.

¹ Diaries of officials and the account of Yu-Sheng-Ji bank

² The China Historical Geographic Information System: <http://www.people.fas.harvard.edu/~chgis/>

³ Qian, Shifu (2005), A Chronological Table of Qing Officials

⁴ Feng, Yuan-Kui, "On the Qing dynasty's system of supplementary salary." Journal of Fudan U.: Social Sciences 2 (1991): 62-70.

⁵ Liu, Cheng-Yun (1993), "Chong, Fan, Pi, and Nan: An exploration of the ranking of Qing administrative units"

⁶ The Language Atlas of China (1987).

⁷ The historical rice price of Qing: <http://mhdb.mh.sinica.edu.tw/databaseinfo.php?b=006>

⁸ Collection and examples of official statutes of Qing: <https://ctext.org/wiki.pl?if=en&chapter=648772>

⁹ County chronicles and the website of China Confucian Temples: <http://www.chinakongmiao.org/templates/T.FocusTopics/index.aspx?nodeid=487>

¹⁰ The genealogy database of Shanghai library: <http://search.library.sh.cn/jiapu/>

Table 1: Variable construction and data resources. The table specifies the constructions of the variables used in this study as well as the resources sourced for the data.

	Total Loans (N=165)		With Assistant (N=70)		Without Assistant (N=95)	
	(1)	(3)	(4)	(6)	(7)	(9)
Panel A. Purpose of financing						
Diary Sample: First sojourn out of Beijing/ Total	97/99		52/52		45/47	
Bank-loan sample: First sojourn out of Beijing/Total	63/66		18/18		45/48	
Panel B. Creditor composition						
Relatives	17		1		16	
Chinese banks	148		69		79	
Piaohao	4		2		2	
Zhangju	144		67		77	
Panel C. Officials						
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Official's rank	3.2	2.26	3.35	2.30	3.09	2.07
Salary	3874	3921	4659	4121	3297	3413
Keju result	1.96	1.03	2.07	0.98	1.88	1.06
Han ethnicity	0.84	0.37	0.87	0.34	0.82	0.39
Family reputation	0.19	0.39	0.19	0.39	0.19	0.39
Parents alive	0.55	0.48	0.45	0.32	0.61	0.49
Civil official	0.86	0.35	0.86	0.35	0.86	0.35
Confucian temples	0.9	0.16	0.88	0.17	0.91	0.14
Panel D. Officials' jurisdictions						
Distance to Beijing	1.02	0.57	1.24	0.48	0.86	0.49
Distance to Shanxi	0.79	0.92	0.84	0.94	0.76	0.91
Distance to HongKong	1.61	0.49	1.51	0.51	1.68	0.48
Rebellious tradition	0.46	0.25	0.69	0.26	0.29	0.24
Different dialect	0.34	0.37	0.5	0.45	0.23	0.20
Volatility of Local Rice Price	0.13	0.03	0.11	0.03	0.14	0.02
Decentralized province	0.21	0.41	0.2	0.40	0.22	0.42
Non-Clan area	0.78	0.39	0.85	0.30	0.72	0.43
Panel E. Debt contract						
Loan Amount	1852	1435	2494	2065	1380	1569
Maturity	0.73	1.79	1.06	0.38	0.48	2.29
Contract interest rate (%)	20.47	0.57	19.73	0.16	20.28	0.48
Syndicated loan	0.23	0.42	0.13	0.33	0.3	0.46
Collateral	0.04	0.19	0	0.00	0.075	0.25
Guarantor	0.01	0.22	0	0.00	0.025	0.28
Panel F. Resolution						
Number of Repayment(s)	1.19	0.37	1.3	0.39	1.11	0.35
Actual Maturity	1.79	0.23	2	0.23	1.63	0.23
Recovery Rate	72.42	24.49	62.21	11.93	86.28	20.34

Table 2: Summary statistics. This table presents the summary statistics for the for the scholar loans constituting our sample, including the characteristics of the officials, the officials' jurisdiction, the debt contracts, and the resolutions of the loans. "Contract interest rate" represents the nominal interest rate associated with the loan. "Actual Maturity" is the length of time (in years) between origination and the last payment made by the official. "Number of Repayment(s)" represents the number of payments made by the official to the creditor. The definitions of the other variables (those used in the formal analysis) are provided in Table 1.

Dependent variable		Pr (Having trusted assistant)			
Key indicator		Rebellious tradition	Different dialect	Parents alive	Rice price volatility
	(1)	(2)	(3)	(4)	(5)
Chinese bank	0.254* (0.099)	0.254* (0.096)	0.259* (0.096)	0.249* (0.097)	0.240* (0.094)
Distance to Beijing	0.372*** (0.002)	0.372*** (0.002)	0.371** (0.002)	0.364*** (0.001)	0.345*** (0.001)
Key indicator		0.433** (0.015)	0.398*** (0.001)	-0.469*** (-0.000)	-7.25*** (0.003)
Control and decade dummy	Yes	Yes	Yes	Yes	Yes
N	165	165	165	165	165
Pseudo R ²	0.247	0.285	0.323	0.378	0.352

Table 3: Determinants of using trusted-assistant finance. This table presents the regression analysis of the determinants for using a trusted assistant. Probit regressions are estimated using information of the identities of the creditors and characteristics of the debtors and their jurisdictions. The control variables are *Salary*, *Ruggedness*, *Distance to coast*, *Distance to Yangtze River*, and *Latitude*. The definitions of the variables are provided in Table 1. The marginal effect of a variable is measured at the mean values of the other variables. For continuous variables, the marginal effect is the derivative of the estimated probability with respect to the variable. For dummy variables, marginal effect is the effect of shifting the value of the variable from 0 to 1. The *Key indicator* is *Rebellious tradition*, *Different dialect*, *Parents alive*, and *Rice price volatility* for columns 2-5, respectively. The *p*-values, calculated using standard errors clustered at the borrower level, are reported in parentheses. *, **, *** indicate significance at the 10%, 5%, and 1% level respectively.

Dependent variables		Recovery rate				
Key variable		Guaranteed loans	Family reputation	Distance to Beijing	Size of the loan	Dialect differs from Official's
	(1)	(2)	(3)	(4)	(5)	(6)
Trusted assistant	13.230*** (0.009)	11.929** (0.012)	10.211** (0.022)	14.931*** (0.004)	11.106** (0.010)	13.984*** (0.002)
Key variable		10.752** (0.048)	30.889** (0.043)	-6.501* (0.060)	1.016 (0.287)	-12.687* (0.071)
Control and decade dummy variables	Yes	Yes	Yes	Yes	Yes	Yes
N	147	147	147	147	147	147
Pseudo R ²	0.363	0.372	0.379	0.381	0.368	0.391

Table 4: Determinants of recovery rate. This table presents the regression analysis of the determinant of recovery rate of scholar loans recorded in the bank loan book. OLS regressions are estimated using information of the identities of the creditors and characteristics of the debtors and their jurisdictions. The control variables are *Salary*, *Ruggedness*, *Distance to coast*, *Distance to Yangtze River*, and *Latitude*. The definitions of the variables are provided in Table 1. The dependent variable is the recovery rate. The *Key indicator* is *Guaranteed loans*, *Family reputation*, *Distance to Beijing*, *Loan amount*, and *Different dialect* for columns 2-6, respectively. The *p*-values, calculated using standard errors clustered at the borrower level, are reported in parentheses. *, **, *** indicate significance at the 10%, 5%, and 1% level respectively.

Dependent variables	Pr (Trusted Assistant)			Recovery rate		
	(N=165)			(N=147)		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Soft loan hypothesis						
<i>Key indicator</i>	Official's rank	Keju result	Syndicated loan	Official's rank	Keju result	Syndicated loan
Key indicator	0.549 (0.282)	0.564 (0.225)	0.55 (0.871)	−0.191 (0.886)	2.346 (0.776)	−8.672 (7.438)
Trusted assistant				17.620*** (0.001)	15.554*** (0.002)	17.171*** (0.001)
Pseudo R ²	0.253	0.287	0.243	0.354	0.415	0.354
Panel B. Political threat hypothesis						
Low official	−0.0969 (0.593)	0.0141 (0.945)	0.299 (0.188)	−1.628 (0.782)	−5.865 (0.377)	−2.028 (0.858)
Low official x Decentralized province		−0.831 (0.186)			12.06 (0.225)	
Low official x Hanzu			−0.473 (0.107)			−1.856 (0.886)
Trusted assistant				10.868** (0.039)	10.123** (0.017)	11.940** (0.019)
Pseudo R ²	0.245	0.275	0.259	0.343	0.404	0.364
Panel C. Confucian ethics hypothesis						
<i>Key indicator</i>	Civilian official	Confucian temples		Civilian official	Confucian temples	
Key indicator	0.119 (0.471)	−0.192 (0.581)		9.817 (0.164)	2.508 (0.836)	
Trusted assistant				10.616** (0.040)	10.972** (0.037)	
Pseudo R ²	0.245	0.244		0.357	0.342	
Panel D. Blackmail hypothesis						
<i>Key indicator</i>	Easy to collect tax	Non-clan area		Easy to collect tax	Non-clan area	
Key indicator	0.624 (0.132)	−0.312 (0.117)		3.014 (0.808)	11.896 (0.196)	
Trusted assistant				11.713** (0.033)	13.823*** (0.003)	
Pseudo R ²	0.292	0.261		0.343	0.356	

Table 5: *Determination of using a trusted assistant: Alternative hypotheses.* Columns 1-3 report the marginal effect of having a trusted assistant, estimated from the probit model. Columns 4-6 report the OLS estimate of the loans' recovery rates. The total number of observations is 165 for columns 1-3 and 147 for columns 4-6. For all estimates we include the control variables and decade dummy variables. Except for Panel B, the coefficients associated with the Key indicator, as described at the very top of the panel, are reported. The control variables are *Salary*, *Ruggedness*, *Distance to coast*, *Distance to Yangtze River*, and *Latitude*. The definitions of the variables are provided in Table 1. The *p*-values, calculated using standard errors clustered at the borrower level, are reported in parentheses. *, **, *** indicate significance at the 10%, 5%, and 1% level respectively.

Name of the Book	Author	Birth and Death	The Place of Origin	Year and Level in Keju exam	Highest Official Position
Observations in the Upper-Class Circle in Qing Dynasty	Jixin Zhang	1800-1878	Yizheng, Jiangsu	1829, Imperial	Magistrate of a Prefecture
Letter and Diary of Deyu Pan	Deyu Pan	1785-1839	Shanyang, Jiangsu	1829, Jiangsu Provincial	Magistrate of a County
Diary of Huaxi Deng	Huaxi Deng	1826-1916	Shunde, Longshan	1851, Imperial	Governor of a Provincial
Diary of Rongbao Wang	Rongbao Wang	1878-1933	Wu County, Jiangsu	1898, County	Head of Staff: Ministry Of Civil Affairs
Diary of Zenghan Weng	Zenghan Weng	1837-1878	Changshu, Jiangsu	1858, Jiangsu Provincial	Secretary of Cabinet
Diary of Youzhi Mo	Youzhi Mo	1811-1871	Dushan, Guizhou	Not Known	Not Known
Diary of Baozhen He	Baozhen He	1978-1949	Shenzhou, Zhili	Not Known	Not Known
Diary From Lu Mountain	Baoxuan Sun	1874-1924	Qiantang, Zhejiang	Not Known	Supervisor of Customs, Ningbo
Diary of House of Anachronism	E Liu	1857-1909	Dangtu, Jiangsu	None	Magistrate of a Prefecture
Diary of Guofan Zeng	Guofan Zeng	1811-1872	Changsha, Hunan	1838, Imperial	Governor of Zhili Provincial
Diary of Visiting Yunnan	Shana Hua	1806-1859	Mongolia	1833, Imperial	General of Heilongjiang Provincial
Diary of Visiting Western Countries in 1900	Yong Wu	1865-1936	Wuxing, Zhejiang	Not Known	Vice Governor of Jiaodong Provincial
Diary of Visiting Korea	Yinhui Xu	Not Known	Shangyuan, Jiangsu	Not Known	Ambassador to Korea
Diary of Kunying	Jingchen Shi	1873-1955	Changle, Fujian	1897, Provincial	Sanate Secretary of Beiyang Government
Diary of Xingyuan Li	Xingyuan Li	1797-1851	Ziangyin, Hunan	1832, Imperial	Governor of Zhejiang And Jiangsu Province
Diary of Xingrui Li	Xingrui Li	1827-1904	Liuyang, Hunan	Not Known	Governor of Zhejiang And Jiangsu Province
Diary of Zexu Lin	Zexu Lin	1785-1850	Fuzhou, Fujian	1804, Provincial	Governor of a Provincial
Diary of Travelling in London and Paris	Songtao Guo	1818-1891	Xiangyi, hunan	1837, Province	Governor of Guangdong Provincial
Note of Qinghe	Degang He	1855-1936	Min County, Fujian	1877, Imperial	Magistrate of a Prefecture
Dairy of visiting Shu area	Xiangying Fang	1631-1683	Suian, Zhejiang	1667, Imperial	Secretary of Cabinet
Diary of Taiwan Sea Defence and Exploration	Dachn Luo	1833-1891	Shibing, Guizhou	Not Known	Vice General of Henan Provincial
Dairy from Taiwan	Zhuan Hu	1841-1895	Jixi, Anhui	1858, Prefecture	Magistrate of a Prefecture
Diary of Rangqing Wang	Kangnian Wang	1860-1911	Qiantang, Zhejiang	1894, Imperial	Assistant of Zhidong Zhang, Member Of Cabinet
Diary of Tao Wang	Tao Wang	1823-1897	Wu County, Jiangsu	1841, County	Head of School of Gezhi
Diary of Tonghe Weng	Tonghe Weng	1820-1904	Changshu, Jiangsu	1856, # 1 Imperial	Member of Cabinet
The complete work of Qian Zhang	Qian Zhang	1853-1926	Changshu, Jiangsu	1894, # Imperial	Head of Shanghai Sea University
Diary of Wenhui Zhang	Wenhui Zhang	1808-1885	Nanhui, Shanghai	Not Known	Head Lecturer in Jinling Bookstore
Diary of Fengzhi Du	Fengzhi Du	1814-1882	Shaoxing, Zhejiang	1855, Zhejiang Provincial	County Magistrate

Table 6: Resources from the archives. This table presents the primary sources of the historical archive containing the descriptions of the loans. The sample consists of 28 diaries written by high-level intellectuals who were living in Qing Dynasty (1616-1912). The Level of Keju examination is referred to the highest level of Keju examination the diary author passed.

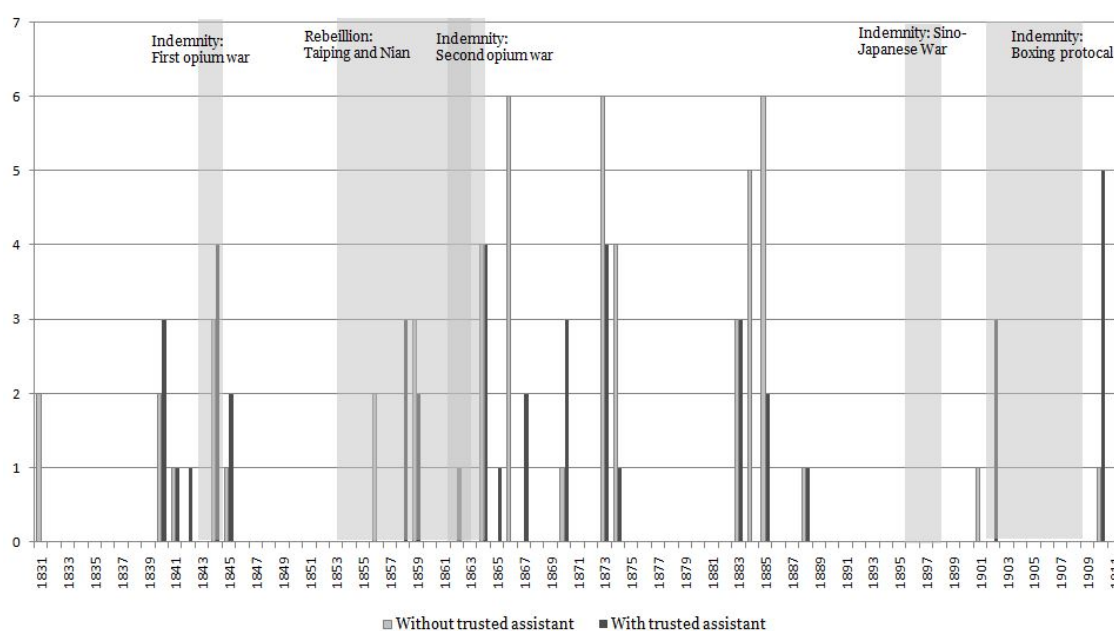


Figure 1: This figure illustrates the distribution of scholar loans with and without trusted assistants in the diaries.

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