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**SOCIAL NETWORKS AND INFORMAL  
FINANCIAL INCLUSION IN THE  
PEOPLE'S REPUBLIC OF CHINA**

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Shijun Chai, Yang Chen,  
Bihong Huang, and Dezhu Ye

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Shijun Chai is a lecturer at Xinyang Normal University, Xinyang, People's Republic of China (PRC). Yang Chen is a lecturer at Xi'an Jiaotong-Liverpool University in Suzhou, PRC. Bihong Huang is a research fellow at the Asian Development Bank Institute in Tokyo, Japan. Dezhu Ye is a professor at Jinan University in Guangzhou, PRC.

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Please contact the authors for information about this paper.

Email: [bihuang@adbi.org](mailto:bihuang@adbi.org)

Asian Development Bank Institute  
Kasumigaseki Building, 8th Floor  
3-2-5 Kasumigaseki, Chiyoda-ku  
Tokyo 100-6008, Japan

Tel: +81-3-3593-5500  
Fax: +81-3-3593-5571  
URL: [www.adbi.org](http://www.adbi.org)  
E-mail: [info@adbi.org](mailto:info@adbi.org)

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**Abstract**

Using the 2011 China Household Finance Survey (CHFS) database, we explore the heterogeneous impacts of social networks on informal financial inclusion for urban and rural households in the PRC. We find that social networks significantly increase the probability of households' participation in the informal financial market, augment the size of informal financial transactions, and raise the ratio of informal lending to total household assets. We also identify the mechanisms through which social networks affect households' participation in the informal financial market. By reducing the information cost, perceived risk, and precautionary saving, social networks play a larger role for urban households than for rural households. Notably, the effects of social networks on informal finance are strengthened by the development of the formal financial market.

**Keywords:** social networks, informal financial inclusion, perceived risk, precautionary saving, formal financial market

**JEL Classification:** D1, G2

## Contents

1.	THEORETICAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT.....	3
2.	DATA AND DESCRIPTIVE EVIDENCE .....	7
3.	SOCIAL NETWORKS AND INFORMAL FINANCIAL INCLUSION .....	12
3.1	Empirical Models and Main Results .....	12
3.2	Robustness Checks .....	14
3.3	Transmission Mechanisms: Information, Perceived Risk, and Cushion.....	20
3.4	Information Mechanism .....	21
3.5	Risk Mechanism .....	22
3.6	Cushion Mechanism .....	23
4.	INTERPLAY BETWEEN SOCIAL NETWORKS AND FORMAL FINANCIAL MARKET DEVELOPMENT .....	23
5.	CONCLUDING REMARKS.....	25
	REFERENCES .....	27

Social networks, an important indicator of social capital, are characterized by a particular relationship formed and maintained by interactive and stable kinship, friendship, neighborhood, or territorial ties (Putnam, Leonardi, and Nanetti 1993). They transcend institutionalized rules and formal prescriptions and are an efficient alternative to either the market or the hierarchy in economic transactions (Yee 2000, 326; Lew 2013, 54–57). As a special type of informal institution, they have played a non-negligible and unique role in allocating resources in the People's Republic of China (PRC). During the transition from a planned to a market-oriented economy, social networks<sup>1</sup> coexisted with the development of the market (He 1998; Allen, Qian, and Qian 2005). While a market system based on rationality and the enforcement of law offers structural protection for social and economic activities, social networks provide the structural support (Hwang 1987). They play a dominant role if social and economic activities cannot benefit from structural protection.<sup>2</sup> This argument gains support from the management literature, which shows that informal institutions shaped by social culture and norms are of particular importance whenever and wherever formal institutions are absent or ineffective (Peng et al. 2009). Despite the widespread consensus on the impacts of social networks on the market sector (Bian and Logan 1996; Knight and Yueh 2008), we have yet to answer an emerging question: with the further development of the market economy, whether and in which area will the power of social networks shrink, persist, or even strengthen? In this paper we investigate how social networks in the PRC alleviate financial constraints by promoting households' access to informal finance. In particular, we address three questions: (1) does *Guanxi* moderate credit constraints; (2) does the thriving of formal finance shrink the role of informal finance; and (3) does the impact of *Guanxi* on informal finance recede with the development of formal finance?

Our work is of particular practical relevance and has rich policy implications. Financial inclusion<sup>3</sup> has been embraced by policy makers as an important development priority in that greater access to financial services improves the population's welfare and spurs economic activities, particularly for those who are excluded from the formal financial market (Beck, Demirguc-Kunt, and Levine 2007; Akoten, Sawada, and Otsuka 2006). Households in developed economies generally obtain credit, against individual guarantees, from the commercial banking sector or government lending agencies that usually make loan decisions according to the readily available information on borrowers' credit risk. However, credit constraints are prevalent in developing economies due to the limited access to the guarantee mechanism and the overall lack of information regarding borrowers' creditworthiness (Stiglitz and Weiss 1981; Grant 2007). This is also true for the PRC. The commercialization of the country's state-owned banks and the reform of rural credit cooperatives resulted in the closure of tens of thousands of rural branches and entities, cutting off people's access to basic financial services (Sparreboom and Duflos 2012). In addition, most people in the PRC have never had credit scores. As of 2014 the People's Bank of China maintained credit histories for around 350 million citizens, less than one-third of the adult population,

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<sup>1</sup> Social networks in the PRC context, quite often termed social ties or *Guanxi*, serve as powerful instruments and an operational code for how best to accomplish tasks, for example to acquire and allocate scarce economic resources.

<sup>2</sup> For example, rational agents tend to trade within their social networks when the market transaction cost or the contract enforcement cost is higher. Similarly, when people have no or limited access to the formal financial market, social networks play a role in allocating financial resources.

<sup>3</sup> Financial inclusion means that "individuals and businesses have access to useful and affordable financial products and services that meet their needs—transactions, payments, savings, credit and insurance—delivered in a responsible and sustainable way." The definition comes from <http://www.worldbank.org/en/topic/financialinclusion/overview#1>.

while in America 89% of adults have credit scores (The Economist 2016). This makes access to formal credit become increasingly difficult for rural and low-income households as well as small- and medium-sized enterprises (Koivu 2009; Chong, Lu, and Ongena 2013). The emergence of the informal financial market fills the gap by providing alternative access to limited financial resources and thus alleviating the difficulties raised by credit constraints (Tsai 2004; Barslund and Tarp 2008).

In this paper we measure informal financial inclusion with households' borrowing and lending activity in the informal financial sector. Different from existing studies that examine the determinants of financial inclusion from the traditional perspectives of age, income, gender, education level, and perceived risk (Mwangi and Sichei 2011; Yaldiz, Altunbas, and Bazzana 2011), we consider three new drivers: social networks, proximity to formal institutions, and the interaction of the two. These new attempts extend our understanding of how *Guanxi* alleviates credit constraints, how the thriving of formal finance affects informal finance, and how the impact of *Guanxi* on informal finance changes with the development of formal finance. If the influence of social networks on informal finance is persistent, from policy perspectives this implies on one hand that recognizing the role of institutions is imperative and on the other hand that the removal of structural weakness and regulatory control in developing formal finance is pivotal in deepening the financial reform in the PRC.

Employing data from the 2011 China Household Finance Survey (CHFS) (Gan et al. 2014), we find that social networks significantly increase households' participation in informal finance, augment the size of informal financial transactions, and increase the ratio of informal lending to total household assets. In addition, we identify three mechanisms—information, perceived risk, and cushion—through which social networks change informal financial inclusion. Notably, the empirical results show that households are more likely to participate in informal finance through their social networks when formal finance thrives. This finding challenges the conventional view that informal institutions recede as formal institutions prosper (Peng 2003; Peng and Zhou, 2005).

As an exemplar of interdisciplinary study leading to cross-fertilization across the management and finance literature, our main contributions lie in several aspects. By answering the specific question of whether the influence of social networks persists with the development of the formal finance market, we capture and reveal the holistic link between informal and formal institutions and thus contribute to the emerging debate in management studies (Wilson and Brennan 2010; Horak and Klein 2016). The working mechanisms from social networks to informal financing are unexplored in the existing studies (Binswanger and Khandker 1995; Hu and Chen 2012). This research fills this gap by systematically examining the role of social networks in mitigating financial constraints and shaping informal finance. In addition, we divide our sample into two groups by households' registered residence and investigate the heterogeneous impacts of social networks on informal financial inclusion for both rural and urban households. Despite its substantial importance in reducing poverty and income inequality and thus improving social welfare (Beck and Levine 2002; Green, Kirkpatrick, and Murinde 2006), researchers can hardly reach an agreement on the measurement of social networks in various contexts (Guiso, Sapienza, and Zingales 2004; Zhang, Lu, and Zhang 2007). Considering the prevalent gift culture in both rural and urban areas of the PRC, we contribute to measuring the intensity of social networks at a disaggregate level using the ratio of gift expenses to a household's total daily expenditure.<sup>4</sup> Our measures not only depict the magnitude but also capture the

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<sup>4</sup> A detailed description of the gift expenses and total daily expenditures is given in the data section, and the summary statistics are provided in Table 1.

intensity and strength of households' social networks, underpinning one aspect of the core features of the use of gifts to maintain *Guanxi* in the PRC in comparison with the Western notions of social networks (Li 2007a, 2007b). We also use different instrumental variables as proxies for social networks, specifically a local big surname for rural households and the local *Hukou* for urban households, to address the potential endogeneity due to omitted variable biases and reverse causality.

In the next section, we present the theoretical framework and develop hypothesized arguments. Section 3 describes the 2011 CHFS database and the main variables of interest. Section 4 reports the main empirical results concerning the impacts of social networks on informal lending and borrowing and the robustness analyses. Section 5 highlights the mechanisms through which social networks shape households' participation in informal finance. Section 6 explores the holistic linkage between formal and informal institutions. The last section concludes with policy implications.

## 1. THEORETICAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT

Social networks (or *Guanxi*) are rooted in the PRC culture and economic activities and play an indispensable role in individuals' decision making (Bian 1997). They are used in different contexts and for all kinds of favors, such as job hunting, career promotion, and information gathering and dissemination (Ronald 1992; Ioannides and Datcher Lounsbury 2004). Biggart and Castanias (2001) argue that social networks can function as social collateral or assurance against risks by ensuring that agents fulfill their obligations. They believe that "actors knowledgeably and actively utilize social understandings in formulating and implementing economic strategies" and argue that "just as material assets can function as collateral to assure economic outcomes, collateralized social relations can also serve as a presumptive guarantee." Karlan et al. (2009) provide theoretical support for this view by developing a model of informal contract enforcement in social networks. In their model the social relations between individuals generate value, which can be used as social collateral to control moral hazard and spur informal borrowing. This collateral function of social networks is also interpreted by Coleman (1988) and Putnam (2001) as highlighting a dense network's ability to monitor and sanction any deviant behavior because of the reputation effect. Taking the theoretical argument into consideration, we develop our first hypothesis on the relation between social networks and informal financing.

**Hypothesis 1:** Social networks facilitate both informal lending and informal borrowing.

While the importance of social networks and financial inclusion is well documented (Allen, Qian, and Qian 2005; Ayyagari, Demirgüç-Kunt, and Maksimovic 2010), the channels through which they work receive relatively little attention. Samphantharak and Townsend (2010) note that network effects may arise due to altruism or signaling, whereby being a member of a social network provides valuable information and shapes incentives. Recent theoretical advances in modeling the roles of networks in consumption smoothing and informal borrowing add one more working channel: social ties act as "implicit collateral," enforcing risk sharing and loan repayment (Karlan et al. 2009; Kinnan and Townsend 2012; Ambrus, Mobius, and Szeidl 2014). Allen, Qian, and Xie (2013) argue that informal financing with differentiated working channels produces diversified economic implications. The clear identification of all these mechanisms is fundamental to understanding people's behavior in the network.

We first examine how social networks influence informal finance through the information channel. The basic theories of social capital (e.g., Coleman 1988; Putnam 2001) posit that strongly reinforced relationships and closure foster cooperative behavior. Anecdotal evidence and group-based informal finance practice suggest that social networks mitigate the consequences of adverse selection and moral hazard due to asymmetric information and reduce ex ante information searching and ex post monitoring costs (Huppi and Feder 1990; Ghatak 1999; Karlan 2007; Karlan and Morduch 2010). Detailed theoretical studies of how social networks facilitate, filter, and reinforce information flows, and thus provide incentives for behavior, have only recently emerged and are still in the infancy stage (Lippert and Spagnolo 2011; Jackson, Rodriguez-Barraquer, and Tan 2012; Ali and Miller 2013).

Providing an extensive and critical review of the economic consequences of the social-network structure, Jackson, Rogers, and Zenou (2017) point out that information can travel quickly within a tightly knit network. Besides, groups of individuals who have closer links are more likely to ostracize collectively an individual engaging in misbehavior, such as spreading false information, and hence improve information reliability. In a theoretical analysis of a repeated game in a network, Ali and Miller (2013) show that completely connected networks shorten the traveling time of information, which can quicken the punishment for deviations of behavior. Lippert and Spagnolo (2011) also argue, from a game theoretical perspective, that links forming and maintaining certain sorts of social relations work as an information carrier. They prove that the value of a network lies in its capability to enforce agreements that could not be sustained without information and the related sanctioning power provided by other network members. They extend the infinitely repeated Prisoner's Dilemma framework and find that transmitting "soft" information that is not publicly known but consists of privately observed defections to other agents in a close network relation sustains the cooperative equilibrium. Jackson, Rodriguez-Barraquer, and Tan (2012) argue that the extensive literature on social capital<sup>5</sup> struggles to provide firm theoretical foundations and that the term "social capital" has been used loosely and as a result has lost some of its bite. They theoretically characterize the nature and pattern of social interactions that sustain repeated favor exchange related to money transfers and loan repayments. They also provide empirical evidence that confirms their theory, indicating that the power of ostracism through information sharing should function most effectively within the narrowly defined social networks in which any pairs of link have common support.

Informal finance, as the focus of our study, is essentially one aspect of favor exchange or cooperative behavior. A household with strong social networks can quickly obtain information that is not publicly known but is available through the relationships with friends, relatives, and neighbors. Based on the information regarding the needs, incentives, credit, and trustworthiness of potential money borrowers, people are able to make financial decisions. Timely access to truthful information filtered by close social networks thus motivates informal lending. Similarly, in the context of informal borrowing, a household with close social ties may quickly identify a source of funding in the first instance. More importantly, misbehavior or deviation from social norms defined by the borrower's social networks, such as defaults, can be widely known and collectively punished. Such a borrower would be ostracized due to his contaminated reputation. In this way fast information transmission through a close social network serves as a signal of the borrower's credit and repayment capability, which is likely to raise the probability of gaining a loan from friends, relatives, and neighbors. Overall,

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<sup>5</sup> See for example Glaeser, Laibson, and Sacerdote (2002); Guiso, Sapienza, and Zingales (2004); and Tabellini (2010), among others.



the existing theory suggests that a closely connected social network spurs financial market transactions by shortening the information traveling path, reducing the information acquisition cost, improving the information quality, and thus enhancing the power to enforce agreements. Based on the above theoretical arguments, we propose **Hypothesis 2a** to test the role of social networks in facilitating informal finance through the information channel.

**Hypothesis 2a:** Social networks facilitate both informal lending and informal borrowing by lowering the information cost.

In addition to the information mechanism, we investigate whether social networks have an impact on informal finance through the risk mechanism. The debate over the risk mechanism is a shared concern among management scientists, psychologists, and economists. Risk perception comprising more than conceivable outcomes and associated probabilities is treated by the psychometric paradigm as a multidimensional construct (Slovic, Fischhoff, and Lichtenstein 1986). Pitt and Khandker (1998) and Weber and Morris (2010) point out that perceptions of risk in choice options are not just reflections of objective information; they are constructed judgments that depend on the implicit context of the decision maker's social network (Weber and Hsee 1999). Weber and Hsee (1999) argue that large networks of these economic support ties insure individuals against financial worst-case outcomes. In the economics literature, the channels through which networks facilitate consumption smoothing and investment financing are explored theoretically and empirically (Kinnan and Townsend 2012; Ambrus, Mobius, and Szeidl 2014). Kinnan and Townsend (2012) formulate a dynamic model in which a household's kinship-based social networks provide "implicit social collateral," permitting borrowing that cannot be collateralized with tangible assets through risk sharing. Ambrus, Mobius, and Szeidl (2014) show that the nature of informal risk-sharing arrangements is local: closer agents are more likely to insure each other; that is, people mainly help out close neighbors, relatives, and friends (also see Udry 1994).

In our context households' informal lending is a risky kind of financial investment, since there is no legal and binding constraint imposed on borrowers to enforce repayment. Kinship-based networks help to provide full or partial insurance against risks to the lender and compensate for his or her unpredicted financial losses. The expectation of covering the potential losses reduces the perceived risk for those who live in a safety network with other members (Tanaka, Camerer, and Nguyen 2010). Thus, we predict that a household with closer ties is more likely to lend in the informal financial market. Similarly, social networks can work as implicit collateral for borrowers, especially for those who demand large amounts of investments while lacking enough physical assets as collateral to access formal credit. In the case of delinquency or defaults, there are sufficient economic and social connections to facilitate renegotiation and resolutions (Allen, Qian, and Xie 2013). Thus, households with strong social networks are more likely to borrow and undertake risky activities.

**Hypothesis 2b:** Social networks facilitate both informal lending and informal borrowing by reducing individuals' perceived risk.

Furthermore, the "buffer stock" precautionary saving theory (Carroll 1997) predicts that households are willing to save more in the present in response to unexpected external shocks or increased future uncertainties, like health risk, business risk, unavoidable expenditures, risk of labor income change, and saving for retirement or a child's education (Carroll and Kimball 2001). To avoid adverse effects of future income fluctuations and retain a smooth path of consumption, people set aside a precautionary reserve, contributing to lower consumption and GDP growth. The precautionary saving

motive rises due to the lack of completeness of insurance markets. Social networks, as an intangible asset built on family ties and friendships, can offer insurance against income shocks (Kinnan and Townsend 2012; Ambrus, Mobius, and Szeidl 2014), provided that these shocks are not correlated among the participants (Bastelaer 2000). Accounting for the precautionary saving theory, we conjecture that a household with strong social ties as full or partial insurance reduces the need for precautionary saving for unexpected events. The reduced need for precautionary saving facilitates investment in informal lending, while the same argument cannot be applied to informal borrowing.

**Hypothesis 2c:** Social networks facilitate informal lending by reducing the need for precautionary saving.

Formal institutions (standardized protocols or procedures, contracts, and laws and their enforcement bodies) are applied to all individuals indiscriminately and are exogenous to the social apparatus (Horak and Klein 2016). Informal institutions, such as *Guanxi* (in the PRC), *Yongo* (in the Republic of Korea), or *Blat* (in the Russia Federation), based on cultural codes, behavioral norms, and ethical values, are endogenous to the society (North 1990; Pejovich 1999). Though important, research on the interaction and mutual influence between formal and informal institutions is scarce, and little clear-cut empirical evidence is available.

In the international business studies, sociology, and management literature, there are three main theoretical arguments underpinning the association between informal and formal institutions. One view held in various studies describes the exchange of favors and social interaction involved in *Guanxi* as the products of Confucian cultural influence (Yoon and Hyun 2010; Chang 2011). Some further claim that the strategic usage of informal social networks inherited from the PRC culture is instrumental in accessing resources (Tsang 1998; Park and Luo 2001). If relationships carry an implicit and ubiquitous expectation of socially defined norms and proper behavior due to the cultural traditions, either their role materializes through the exchange of social obligations or instrumental mutual exploitation will remain important in social and economic activities regardless of changes in the institutional environment (Nee 1992; Xin and Pearce 1996; Anderson and Lee 2008).

Another important body of literature examines the institutional conditions (Lovett, Simmons, and Kali 1999; Yong-Hak 2000; Peng and Zhou 2005). Institutionalists view informal social networks or *Guanxi* as an institutionally defined system and set of practices resulting from specific institutional conditions found in the “pre-reform” PRC (Fan 2002; Chang 2011). They argue that the roles of social networks are assumed to recede when formal institutions and a market-oriented economy develop further. The logic of this argument is that most social and economic resources are controlled and regulated by the central government before the reform due to the lack of formal legal and regulatory frameworks—known as “institutional voids” (Khanna and Palepu 2000). Individual agents or organizations have to rely on connections or relations to access otherwise unavailable resources imposed by political bureaucracy and economic inefficiency, especially under the communist system (Yang 2002; Ledeneva 2003). In this view the influence of informal social networks is a product of a particular institutional structure, and the role of *Guanxi* is predicted to change as the environment evolves. For this reason institutionalists hold general beliefs that, when formal institutions develop further, that is, the legal power is consolidated or properly applied and the formal market is further developed, the role of *Guanxi* is weaker (Guthrie 1998; Hutchings and Weir 2006; Wang 2007; Wilson and Brennan 2010).

A recently emerging theory in the economics literature, though still in its infancy stage, recognizes the dynamic characteristics of informal social networks, which link the new function of social networks with information acquisition and exchange as well as risk sharing (Lippert and Spagnolo 2011; Jackson, Rodriguez-Barraquer, and Tan 2012; Ali and Miller 2013). This emerging view is echoed in the management literature (Li 1998, 2008), which finds that, in entrepreneurially driven industries, informal ties become important when the environment is full of uncertainty and tacit knowledge. From this viewpoint we argue that, if the dynamic nature of social networks is rooted in their capability of carrying and spreading the implicit information and tacit knowledge that cannot be identified and explored within formalized institutions and in their value of implicit collateral to provide full and partial insurance against systematic risks generated from the institutional environment, their role will not diminish even when formal institutions prosper.

Though important and interesting, the interaction dynamics and mutual influence between formal and informal institutions are insufficiently examined. Horak and Klein (2016), from the management perspective, make an attempt to provide empirical evidence through contextualization, suggesting that the correlation between general trust and in-group trust and tie strength and *Yongo* trust are still strong in the Republic of Korea—a country with well-developed formal institutions, but they do not provide direct empirical support for the ongoing debate (see also Lew 2013). Others in the sociology, economics, and finance literature provide mixed findings and inconclusive evidence (Bian and Logan 1996; Zhang, Lu, and Zhang 2007; Knight and Yueh 2008; Zhao and Lu 2010).

The advance of *Guanxi* theory requires solid empirical support and backup to test hypotheses derived from propositions. A careful examination of the theoretical proposition requires a proper research design including the construct of a social network variable, a measure of the specific form of formal institutions, and the consideration of the interaction effect, which will help to answer the question of whether the influence of social networks recedes, persists, or strengthens given different levels of formal institutional development. With the data support of the 2011 China Household Finance Survey and motivated by the ongoing debate, we propose the third hypothesis.

**Hypothesis 3:** The development of the formal financial market is complementary to social networks in promoting informal financial activities.

## 2. DATA AND DESCRIPTIVE EVIDENCE

The data used in this paper come from the 2011 China Household Finance Survey (CHFS) database,<sup>6</sup> which covers 8,438 households from 80 counties, urban districts, and county-level cities affiliated to 25 provinces (Tibet; Inner Mongolia; Xinjiang; Ningxia; Fujian; Henan; Hong Kong, China; Macau, China; and Taipei, China are excluded). Among them, categorized according to the types of Hukou division, 4,858 households are registered with rural Hukou while the remaining 3,580 households are registered with urban Hukou. The survey questionnaire contains detailed information regarding households' balance sheets, incomes and expenditures, assets and debts, demographics, and work characteristics.

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<sup>6</sup> The China Household Finance Survey (CHFS) database is provided by the Survey and Research Center of China Household Finance at the Southwestern University of Finance and Economics. For more details about the data set, please see Gan et al. (2014).

We gauge informal financial inclusion from both the supply and the demand perspective. We adopt three indicators to measure informal lending: “whether a household participates in informal lending,”<sup>7</sup> “the amount of informal lending,” and “the ratio of informal lending to the household’s current assets.”<sup>8</sup> Informal borrowing is measured by “whether a household has non-banking loans”<sup>9</sup> and “the amount of non-banking loans.”

Table 1 provides descriptive statistics of households’ informal borrowing. In total 3,026 households borrow from non-banking channels with a total amount of RMB 236.18 million and an average amount of RMB 78,049. In terms of the borrowing purpose, housing purchases, business start-ups, and education expenditures are the top three loan categories. Considering the ratio of each sub-category to the total loans, the needs of starting businesses rank in the first place (43.33%), followed by purchases of property (35.96%). The participation rate of informal borrowing in rural areas is higher than its urban counterpart.

Table 2 describes the distribution of households’ informal lending in the urban and rural subsamples by the types of social networks; 44.89% of the households lend to their close friends and colleagues, 25.05% lend to siblings, and 24.85% lend to other relatives. This implies that friendship, collegueship, and kinship are dominant components of households’ networks that shape their informal lending decisions.<sup>10</sup> We also find that 587 or 12.08% of households participate in informal lending in the rural sample compared with 391 or 10.92% of households in the urban sample. Among the rural households, 25.89% lend to their siblings, 2.11% higher than among the urban households; 12.06% lend to their relatives, 4.33% higher than among the urban households; and 41.74% lend to their friends or colleagues, 7.88% fewer than among the urban households. This implies the importance of blood relationships in rural areas.

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<sup>7</sup> The CHFS contains a question regarding “whether a household has lent money to others who are not living together with the household head.” If the answer is yes, we use 1 to denote that there is informal lending; if the answer is no, we use 0 to denote that there is no informal lending. There are 1,016 households that answer yes.

<sup>8</sup> The household’s current assets include banking deposits, cash, informal lending, stocks, funding, bonds, financial products, foreign exchanges, and financial derivatives.

<sup>9</sup> The CHFS includes questions regarding “whether a household has borrowed from non-banking channels for business startups, house purchases, vehicle purchases, stocks and funding purchases, education expenses and other expenses on medical services, marriage ceremonies and funerals.” If the answer is yes, we use 1 to denote that there is informal borrowing, and we use 0 to denote that there is no informal borrowing. In total 3,026 households answer yes.

<sup>10</sup> We find that financial lending between parents and children is very limited. The flow of funding could be explained as gifts rather than loans.

Table 1: Usages of Informal Borrowing

Usage of Informal Borrowing	Full Sample				Urban Sample				Rural Sample			
	Obs.	Average Loans (RMB)	Loans Ratio (%)	Participation Rate (%)	Obs.	Average Loans (RMB)	Loans Ratio (%)	Participation Rate (%)	Obs.	Average Loans (RMB)	Loans Ratio (%)	Participation Rate (%)
Business start-ups	971	105,382	43.33	11.51	122	157,915	26.5	3.41	849	97,833	50.81	17.48
House purchases	1,666	50,978	35.96	19.74	484	64,189	42.74	13.52	1,182	45,568	32.95	24.33
Vehicle purchases	283	41,031	4.92	3.35	89	59,742	7.31	2.49	194	32,447	3.85	3.99
Stock purchases	13	52,165	0.29	0.15	11	48,014	0.73	0.31	2	75,000	0.09	0.04
Education expenses	591	15,997	4	7	157	25,718	5.55	4.39	434	12,481	3.31	8.93
Other expenses	496	54,795	11.51	5.88	120	103,952	17.16	3.35	376	39,107	8.99	7.74

Note: Other expenses include expenditures on medical services, wedding ceremonies, funerals, and so on. The household is likely to use the loan for more than one purpose.

Table 2: Types of Social Networks and Distribution of Informal Lending

Social Networks	Full Sample				Urban Sample				Rural Sample			
	Obs.	Ratio of Aggregate Obs. (%)	Lending Amount (RMB)	Ratio of Lending Amount (%)	Obs.	Ratio of Aggregate Obs. (%)	Lending Amount (RMB)	Ratio of Lending Amount (%)	Obs.	Ratio of Aggregate Obs. (%)	Lending Amount (RMB)	Ratio of Lending Amount (%)
Parents	8	0.82	324,999	0.74	5	1.28	270,000	1.01	3	0.51	54,999	0.32
Children	16	1.64	518,700	1.18	4	1.02	363,000	1.36	12	2.04	155,700	0.89
Siblings	245	25.05	7,892,263	17.92	93	23.78	3,909,255	14.67	152	25.89	3,983,008	22.93
Relatives	243	24.84	8,606,568	19.55	87	22.25	5,640,384	21.16	156	26.58	2,966,184	17.07
Friends/colleagues	439	44.89	24,261,379	55.09	194	49.62	14,633,614	54.89	245	41.74	9,627,765	55.42
Private financial agencies	1	0.1	250,000	0.57	1	0.26	250,000	0.94	0	0	0	0
Other groups	26	2.66	2,178,213	4.95	7	1.79	1,592,500	5.97	19	3.24	585,713	3.37
Aggregates	978	100	4,4032,122	100	391	100	26,658,753	100	587	100	17,373,369	100

Note: "Other groups" refers to employees with wage defaults and commercial institutions with loan and construction cost defaults.

**Table 3: Descriptive Statistics for the Main Variables**

Variables	Definitions	Observations	Mean	S.D.	Min.	Max.
Inforbo_prob	Whether a household engages in informal borrowing	8,438	0.3586	0.4796	0	1
Inforbo_size	Amount of informal borrowing (10,000 yuan)	8,438	2.7990	55.4703	0	5,000
Inforle_prob	Whether a household engages in informal lending	8,121	0.1204	0.3255	0	1
Inforle_size	Amount of informal lending (10,000 yuan)	8,121	0.5422	7.0038	0	500
Inforle_ratio	Ratio of informal lending to current assets	8,121	0.0485	0.1664	0	1
Gift	Gift expenses (10,000 yuan)	8,438	0.1532	0.5058	0	19
Social network	Gift expenses/total daily expenses	8,427	0.1822	0.7476	0	0.7655
Gender	Gender of the householder (male=1, female=0)	8,438	0.5392	0.4985	0	1
Age	Age of the householder	8,438	48.9278	14.4873	18	87
Income	Income excluding capital gains (RMB 10,000)	8,438	5.3448	8.4936	0	353.45
Net assets	Total assets less total liabilities (RMB 10,000)	8,438	54.9150	147.8828	0	9,012.75
Education	Education level (1–9)	8,359	4.3792	1.7630	1	9
Perceived risk	Perceived risk (1–5)	8,433	3.9305	1.3868	1	5
Family size	Number of individuals living with the householder	8,438	3.4752	1.5476	1	18
Married	Whether the householder is married (control group)	8,342	0.8641	0.3427	0	1
Unmarried	Whether the householder is unmarried	8,342	0.0532	0.2245	0	1
Divorced	Whether the householder is divorced or living separately	8,342	0.0270	0.1620	0	1
Widowed	Whether the householder has lost his or her spouse	8,342	0.0557	0.2294	0	1
Civilian	Whether the householder is affiliated with any parties (control group)	8,313	0.7973	0.4020	0	1
CCP membership	Whether the householder is a member of the Chinese Communist Party (CCP)	8,313	0.1486	0.3557	0	1
Members of other parties	Whether the householder is a member of other parties	8,313	0.0541	0.2263	0	1

In the empirical analysis, we control for (1) a household's characteristics, such as wealth, income, and family size; (2) a householder's characteristics, including gender, age, education level, marriage status, political status, and perceived risk; and (3) the provincial effect using dummies. A household's wealth is measured by its net assets (total assets minus total liabilities). When calculating a household's income, we exclude interest, rents, stock market dividends, and other capital gains. The family size is measured by the number of individuals who are living with the head of a household.<sup>11</sup> A household head's education level is quantified by dummies ranging from 1 to 9, corresponding to never attending school, primary school, secondary school, high school, polytechnic, junior college, and university undergraduates, masters, and doctors, respectively. Additionally, we account for whether the householder is a member of the Chinese Communist Party or a member of other parties. His (or her) marriage status is categorized as unmarried, married, divorced, or widowed. The perceived risks<sup>12</sup> are gauged with discrete variables ranging from 1 to 5.

Table 3 provides the definition and statistical description of the key variables. A total of 35.86% of households are involved in informal borrowing, while 12.04% of households participate in informal lending. The mean of the ratio of informal lending to total assets is 4.85%, implying that the demands are far more than the supply of funds. The average age for a householder is around 49 and the average education level 4.38, somewhere between high school and polytechnic. The perceived risk for an average householder is 3.93, which indicates a greater sense of uncertainty. The average net assets and income for a representative household are RMB 549,150 and RMB 53,448 respectively. On average, 53.92% of householders are male, and most of them do not have party memberships.

### 3. SOCIAL NETWORKS AND INFORMAL FINANCIAL INCLUSION

#### 3.1 Empirical Models and Main Results

We study the impacts of social networks on informal financial inclusion from both the supply and the demand perspective. From the supply perspective, we specify the econometric model to examine the effects of social networks on a household's lending decision as

$$\text{Informal\_lending}_{iv} = \beta \text{SocialNetwork}_{iv} + \gamma X_{iv} + \lambda_v + \varepsilon_{iv}, \quad (1)$$

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<sup>11</sup> We do not take the number of registered family members as an accurate measure of household size, because labor relocation and migration lead to biased estimates.

<sup>12</sup> There is a survey question in the CHFS regarding a householder's perceived risk, asking "which type of project are you willing to invest in if you have an asset?" The choices are respectively: 1) projects with the highest risks and the highest returns; 2) projects with above-average and below-the-highest risks and the corresponding returns; 3) projects with average risks and average returns; 4) projects with below-average risks and the corresponding returns; 5) projects without risks. We use discrete variables ranging from 1 to 5 to denote a householder's perceived risk.



where  $SocialNetwork_{iv}$ , the main variable of interest, is the share of gift expenses of a household's total daily expenses for important events, gauging the intensity of the social network for household  $i$  in province  $v$ .  $X_{iv}$  is the matrix of household-specific control variables.  $\lambda_v$  is the provincial dummy variable controlling region-specific factors, and  $\varepsilon_{iv} \sim N(0, \sigma^2)$ . We use the Probit model to estimate the effects of social networks on a household's participation probability in informal lending (*inforle\_prob*). We adopt the Tobit model when the dependent variable is the amount of informal lending (*inforle\_size*) or its ratio to the household's assets (*inforle\_ratio*).

Table 4(a) presents the estimation results for the impacts of social networks on households' informal lending. Regardless of the dependent variables and the model specifications, the coefficients of the social networks are all positive at the 1% significance level. The average marginal effects calculated from the models estimated in columns (1)–(3) indicate that a 1% increase in the ratio of gift expenses is associated with a 0.012% increase in the probability of lending, a 0.005% increase in the ratio of informal lending to household assets, and a 0.105% increase in the amount of informal lending. To examine the regional disparities further, the full sample is divided into urban and rural subsamples. The estimation results for rural households are shown in columns (4)–(6), and the results for urban households are shown in columns (7)–(9). We find that a 1% expansion of social networks raises the probability of informal lending for rural (urban) households by 0.008% (0.014%), the amount of lending by 0.068% (0.120%), and the lending to asset ratio by 0.003% (0.005%). Intuitively, households living in urban areas with on average higher wealth stocks are more capable of lending money to friends, colleagues, and relatives through their social relation networks.

From the demand side, we examine how social networks affect households' informal borrowing with the following model:

$$Informal\_borrowing_{iv} = \beta LnSocialNetwork_{iv} + \gamma X_{iv} + \lambda_v + \varepsilon_{iv}. \quad (2)$$

We measure the dependent variable using “whether a household borrows from non-banking institutions (*Inforbo\_prob*)” or “the amount of borrowing from non-banking institutions (*Inforbo\_size*).” The control variables are similarly defined as in equation (1). Using the Probit model, the average marginal effect based on the regression in column 1 of Table 4(b) is 0.005, implying that the probability of informal borrowing increases by 0.005% as the size of social networks enlarges by 1%. The Tobit model predicts in column (2) that a 1% increase in social networks is associated with 0.057% growth in the amount of informal borrowing. Comparing the results in columns (3)–(4) with those in columns (5)–(6), we find that social networks have larger impacts on informal borrowing for urban than for rural households.

The results shown in Tables 4(a) and 4(b) support **Hypothesis 1**, which states that social networks are positively related to households' participation in the informal financial market. Tables 4(a) and 4(b) also imply that the age of a householder is negatively related to the participation probability and the size and the ratio of informal lending and borrowing. This is consistent with the finding of Ameriks and Zeldes (2004) that individuals tend to have a higher degree of perceived risk when they become older and are less willing to lend or borrow. A household's net assets are associated positively with informal lending but negatively with informal borrowing. These results are intuitive, since an increased amount of wealth enhances a household's lending capability while reducing its demand for loans. The perceived risk for a householder plays a negative role in forming his financial decisions. Interestingly, single people are

more willing to lend money to others but less likely to borrow, while married couples tend to borrow more through their networks and hold less risky assets. There is a U-shaped relationship between households' incomes and informal borrowing and an inverse U-shaped relationship between households' incomes and informal lending. One possible explanation is that, with the initial increase in cash flows, households are more capable of lending. However, wealthier households have more diversified financing needs, such as starting up their own businesses and investing in education, health, and medical services. Furthermore, we show that householders' education level is negatively linked to informal borrowing. This is consistent with Fungáčová and Weill's (2015) finding that education is positively associated with the usage of formal credit. Last but not least, we show that a male householder is more likely to participate in informal lending. Family size positively affects the probability and the size of borrowing but does not have significant impacts on lending.

## 3.2 Robustness Checks

### Instrumental Variable Estimations

Endogeneity is a major methodological challenge in inferring the causal effects of a social network on a household's participation in the informal financial market. On one hand, networks and informal lending might be correlated with omitted variables, such as a region's culture and a householder's capabilities and disposition. On the other hand, endogeneity could arise due to reverse causality. Informal lending can be seen as a sort of investment to maintain *Guanxi* with the expectation of a future return of favor. Therefore, a household's participation in informal lending might affect the intensity of its social network. To address these endogeneity concerns, we use "whether a householder has a local big surname" as an instrumental variable for the intensity of social networks for the rural subsample. In the PRC's history and cultures, clans are the basic units in which households build close ties with their relatives and friends with the same surnames. A local big surname is therefore positively associated with the network and is ascribed. For the urban subsample, the determinants of social networks differ from those of the rural community because of differences in personal capability, economic well-being, institutional arrangements, and information exchange (Zhao 1999; Meng and Zhang 2001; Knight and Gunatilaka 2010). Following Hu, Jiang, and Zhang (2015), we adopt "whether a householder has a local Hukou" as the instrument for urban households' social networks.

Table 5(a) reports the IV estimation results on the impacts of social networks on informal lending. The Wald test suggests that we can reject the exogeneity hypothesis at the 10% significance level. Following Stock and Yogo (2005), we find that there is no weak instrument problem.<sup>13</sup> The full-sample estimation results listed in columns (1) to (3) confirm our findings in Table 4(a). The average marginal effects of social networks on the participation possibility and the size and ratio of informal lending are 0.0405, 0.3687, and 0.0182, respectively. In the rural subsample, the results in columns (4)–(6) indicate that the average marginal effects are 0.0294, 0.2680, and 0.0115. Comparing these with the average marginal effects shown in the full sample, we find that social networks play a larger role for urban households.

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<sup>13</sup> The F statistics of Cragg–Donald tests for the whole sample, the rural subsample, and the urban subsample are respectively 190.83, 211.58, and 26.91, which are larger than the critical value of 16.38 at the 10% significance level.

Table 5(b) presents the impacts on informal borrowing of social networks estimated using the IV Probit and IV Tobit models. Columns (1)–(4) instrument the social network of rural households with “whether a householder has a local big surname” in the full and the rural sample. In columns (5) and (6), we adopt “whether a householder has the local Hukou” as the instrumental variable for social networks owned by urban households. The results shown in Table 5(b) are consistent with the findings in Table 4(b). In the full sample (column 1), the coefficient of networks is still positive and significant. We then divide the full sample into the urban and rural subsamples and use the IV Probit and IV Tobit models to rerun the regressions. Comparing columns (3)–(4) with columns (5)–(6), we find that social networks have positive impacts on informal borrowing for rural households at the 10% significance level. When the intensity of the social network increases by 1%, the probability of informal borrowing for rural households rises by 0.0223% and the size of informal borrowing enlarges by 0.1588%. The impacts are significant for urban households at the 1% significance level. Interestingly, social networks play a larger and more significant role for urban households, as shown by the comparison of the average marginal effects in the full sample and in the rural subsample. This might well be explained by labor migration from rural to urban areas. During the economic transition from traditional agricultural to industrialized societies, accompanied by large-scale urbanization and migration, social ties and their consequent influences on informal finance for rural households turn out to be weakened and unstable with the change in their social values, modes of thinking, and faith loss in their identities (Liu, Li, and Breitung 2012; Zhang and Xie 2013; Giulietti, Wahba, and Zenou 2014). Comparatively, the mobility of urban households is less intense and the relocation generally takes place within urban areas. Therefore, well-maintained social networks are expected to generate larger impacts on informal borrowing for urban households.

### **Alternative Measure of Social Networks**

In the previous subsections, we use the ratio of gift expenses in important events, for instance wedding, funeral, or birthday ceremonies, as a proxy for the intensity of a household's social networks. Gifts to some degree are given due to obligation or a courtesy demanding reciprocity and may not fully capture the strength of households' social networks. Accounting for the random attributes of such important events and the reciprocal nature of gift giving, we now use the cash flow of gift expenses on PRC traditional holidays as an alternative proxy for the intensity of social networks. The estimation results are presented in Panels A and B of Table 6. In Panel A, without adopting instrumental variables, we find that the coefficients of social networks for informal borrowing and informal lending are still positive and their magnitudes are similar to the results in Tables 4(a) and 4(b). When using “whether a householder has a local big surname” as an instrument for holiday gifts, the results in Panel B imply that social networks significantly increase households' probability of participation in the informal financial market. This confirms that our estimates of the impacts on informal financial inclusion are robust to different measures of social networks.

Table 4(a): Social Networks and Informal Lending

Variables	Full Sample			Urban Sample			Rural Sample		
	Inforle_prob (1) Probit	Inforle_size (2) Tobit	Inforle_ratio (3) Tobit	Inforle_prob (4) Probit	Inforle_size (5) Tobit	Inforle_ratio (6) Tobit	Inforle_prob (7) Probit	Inforle_size (8) Tobit	Inforle_ratio (9) Tobit
Social network	0.0649*** (0.0080)	0.9714*** (0.1228)	0.0468*** (0.0061)	0.0406*** (0.0072)	0.5947*** (0.1042)	0.0299*** (0.0055)	0.0813*** (0.0139)	1.2472*** (0.2238)	0.0560*** (0.0100)
Age	-0.0190*** (0.0018)	-0.2791*** (0.0271)	-0.0141*** (0.0013)	-0.0185*** (0.0023)	-0.2636*** (0.0351)	-0.0144*** (0.0019)	-0.0153*** (0.0029)	-0.2319*** (0.0447)	-0.0103*** (0.0020)
Income	0.1890*** (0.0448)	2.8369*** (0.6913)	0.1315*** (0.0349)	0.1835** (0.0734)	2.5876** (1.0537)	0.1370** (0.0565)	0.1955*** (0.0610)	3.0633*** (0.9704)	0.1253*** (0.0423)
Income squared	-0.0155*** (0.0057)	-0.2431** (0.0977)	-0.0119** (0.0050)	-0.0096 (0.0096)	-0.2492* (0.1476)	-0.0149* (0.0081)	-0.0158** (0.0079)	-0.2516* (0.1383)	-0.0101* (0.0059)
Education	0.0124 (0.0143)	0.2118 (0.2031)	0.0024 (0.0101)	0.0533** (0.0232)	0.7239** (0.3281)	0.0317* (0.0174)	0.0329 (0.0220)	0.5375* (0.3226)	0.0176 (0.0145)
Perceived risk	-0.0628*** (0.0150)	-0.9212*** (0.2248)	-0.0479*** (0.0111)	-0.0590*** (0.0188)	-0.8175*** (0.2733)	-0.0465*** (0.0145)	-0.0682*** (0.0249)	-1.0602*** (0.3865)	-0.0488*** (0.0173)
Family size	0.0118 (0.0139)	0.2177 (0.2015)	0.0112 (0.0100)	-0.0045 (0.0164)	-0.0273 (0.2282)	-0.0015 (0.0121)	-0.0028 (0.0295)	0.0529 (0.4462)	0.0021 (0.0200)
Unmarried	0.0609 (0.0828)	0.2177 (0.2015)	0.0088 (0.0587)	-0.0281 (0.1135)	-0.9066 (1.5312)	-0.0671 (0.0811)	0.1508 (0.1240)	1.8322 (1.8834)	0.0831 (0.0846)
Divorced	0.1327 (0.1096)	2.1436 (1.6563)	0.1290 (0.0814)	0.1562 (0.1873)	2.4484 (2.6867)	0.1193 (0.1425)	0.1638 (0.1376)	2.6813 (2.2157)	0.1644* (0.0978)
Widowed	-0.1424 (0.1263)	-2.3197 (1.8245)	-0.0797 (0.0888)	0.0038 (0.1580)	-0.1397 (2.1875)	0.0379 (0.1135)	-0.3695* (0.2203)	-5.9429* (3.3126)	-0.2556* (0.1474)
Gender	0.1139*** (0.0396)	1.6147*** (0.5764)	0.0849*** (0.0286)	0.1048** (0.0526)	1.4397* (0.7412)	0.0866** (0.0392)	0.0606 (0.0623)	0.9040 (0.9505)	0.0342 (0.0427)
Net assets	0.0261* (0.0141)	0.4617*** (0.1479)	0.0195*** (0.0075)	0.0911*** (0.0318)	1.4633*** (0.3763)	0.0675*** (0.0200)	0.0208 (0.0129)	0.3773** (0.1762)	0.0148* (0.0081)
CCP membership	0.0494 (0.0601)	0.7527 (0.8628)	0.0345 (0.0429)	0.1162 (0.0970)	1.7225 (1.3193)	0.0927 (0.0698)	0.0232 (0.0777)	0.3251 (1.1815)	0.0091 (0.0532)
Membership of other parties	0.1228 (0.0797)	1.6161 (1.1234)	0.0609 (0.0559)	0.1014 (0.1105)	1.3298 (1.4372)	0.0393 (0.0764)	0.1050 (0.1165)	1.4000 (1.8027)	0.0558 (0.0810)
Provincial dummies	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
N	7,978	7,978	7,978	4,559	4,559	4,559	3,419	3,419	3,419
Pseudo R2	0.1776	0.1394	0.1730	0.1821	0.1422	0.1778	0.1858	0.1431	0.1808

Notes: This table shows the estimation results from the Probit and Tobit regressions on the informal financial market lending of social networks and other control variables. In columns (1), (4), and (7), the dependent variable is whether or not a household engages in informal lending and the Probit estimates are reported. In columns (2), (5), and (8), the dependent variable is the amount of lending and the Tobit estimates are presented. In columns (3), (6), and (9), the dependent variable is the ratio of informal lending to the household's total assets and the Tobit estimates are presented. Robust standard errors are included in parentheses. The symbols \*\*\*, \*\*, and \* denote the 1%, 5%, and 10% significance level, respectively. The average marginal effects are available on request.

**Table 4(b): Social Networks and Informal Borrowing**

Variables	Full Sample		Rural		Urban	
	Inforbo_prob (1) Probit	Inforbo_size (2) Tobit	Inforbo_prob (3) Probit	Inforbo_size (4) Tobit	Inforbo_prob (5) Probit	Inforbo_size (6) Tobit
Social network	0.0145*** (0.0042)	0.1486*** (0.0413)	0.0094*** (0.0025)	0.0712** (0.0296)	0.0196* (0.0107)	0.2674* (0.1389)
Age	-0.0150*** (0.0013)	-0.1604*** (0.0134)	-0.0103*** (0.0017)	-0.0994*** (0.0149)	-0.0173*** (0.0022)	-0.2300*** (0.0303)
Income	-0.0690** (0.0334)	-0.5737* (0.3127)	-0.1118** (0.0540)	-0.7184* (0.3904)	-0.0382 (0.0474)	0.3373 (0.5768)
Income squared	0.0025* (0.0014)	0.0201 (0.0152)	0.0095** (0.0041)	0.0547* (0.03198)	0.0007 (0.0015)	0.0025 (0.0368)
Education	-0.1209*** (0.0118)	-1.1767*** (0.1158)	-0.0862*** (0.0190)	-0.6824*** (0.1622)	-0.0676*** (0.0176)	-0.8552*** (0.2313)
Perceived risk	-0.0233** (0.0115)	-0.2413** (0.1106)	-0.0306** (0.0140)	-0.2754** (0.1181)	-0.0079* (0.0046)	-0.1132* (0.0609)
Family size	0.1531*** (0.0106)	1.4982*** (0.0984)	0.1308*** (0.0123)	1.1295*** (0.0988)	0.1529*** (0.0221)	2.0379*** (0.2903)
Unmarried	-0.3714*** (0.0795)	-3.9970*** (0.7693)	-0.4624*** (0.1017)	-4.4974*** (0.8737)	-0.3226*** (0.1233)	-4.2370*** (1.5764)
Divorced	0.0561 (0.0920)	0.3486 (0.9192)	0.0487 (0.1448)	0.0134 (1.2756)	0.1378 (0.1221)	1.8170 (1.5534)
Widowed	-0.0311 (0.0709)	-0.4459 (0.7176)	0.0012 (0.0929)	-0.1598 (0.8128)	-0.0399 (0.1146)	-0.5293 (1.5041)
Gender	0.0625 (0.0505)	0.6765 (0.4991)	-0.0013 (0.0398)	0.0026 (0.3359)	0.0443 (0.0505)	0.6955 (0.6538)
Net assets	-0.1036*** (0.0198)	-0.8528*** (0.1693)	-0.0063* (0.034)	-0.3066* (0.1605)	-0.1651*** (0.0277)	-2.0273*** (0.3320)
CCP membership	0.0369 (0.0476)	0.4172 (0.4772)	-0.0673 (0.0747)	-0.4871 (0.6449)	0.1413** (0.0637)	1.7970** (0.8304)
Membership of other parties	0.0406 (0.0704)	0.2847 (0.6822)	0.0722 (0.0933)	0.5275 (0.7775)	-0.0486 (0.1111)	-0.8131 (1.4069)
Provincial dummies	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
N	8,281	8,281	4,785	4,785	3,496	3,496
Pseudo R <sup>2</sup>	0.1730	0.1268	0.1412	0.1148	0.1583	0.1247

Notes: This table shows the estimation results from the Probit and Tobit regressions on the informal financial market borrowing of social networks and other control variables. In columns (1), (3), and (5), the dependent variable is whether or not a household engages in informal borrowing and the Probit estimates are reported. In columns (2), (4), and (6), the dependent variable is the amount of borrowing and the Tobit estimates are presented. Robust standard errors are included in parentheses. The symbols \*\*\*, \*\*, and \* denote the 1%, 5%, and 10% significance level, respectively. The average marginal effects are available on request.

Table 5(a): Social Networks and Informal Lending—IV Probit and IV Tobit Estimates

Variables	Full Sample			Urban Sample			Rural Sample		
	Inforle_prob (1) Probit	Inforle_size (2) Tobit	Inforle_ratio (3) Tobit	Inforle_prob (4) Probit	Inforle_size (5) Tobit	Inforle_ratio (6) Tobit	Inforle_prob (7) Probit	Inforle_size (8) Tobit	Inforle_ratio (9) Tobit
Social network	0.1976*** (0.0428)	3.0759*** (0.7908)	0.1555*** (0.0393)	0.1870*** (0.0399)	2.8594*** (0.7192)	0.1356*** (0.0377)	0.2210** (0.1064)	3.9424* (2.0677)	0.1941** (0.0944)
Age	-0.0171*** (0.0019)	-0.2652*** (0.0279)	-0.0134*** (0.0014)	-0.0172*** (0.0023)	-0.2600*** (0.0358)	-0.0142*** (0.0019)	-0.0137*** (0.0034)	-0.2170*** (0.0470)	-0.0096*** (0.0021)
Income	0.1316*** (0.0485)	2.1119*** (0.7483)	0.0941** (0.0378)	0.0739 (0.0770)	1.0883 (1.1787)	0.0673 (0.0628)	0.1659** (0.0666)	2.6936*** (1.0268)	0.1063** (0.0453)
Income squared	-0.0123** (0.0055)	-0.2066** (0.0983)	-0.0100** (0.0051)	-0.0101 (0.0092)	-0.1697 (0.1499)	-0.0111 (0.0082)	-0.0141* (0.0078)	-0.2353* (0.1396)	-0.0093 (0.0059)
Education	0.0040 (0.0142)	0.0936 (0.2121)	-0.0037 (0.0106)	0.0376 (0.0235)	0.5404 (0.3442)	0.0233 (0.0181)	0.0234 (0.0229)	0.3916 (0.3484)	0.0101 (0.0158)
Perceived risk	-0.0472*** (0.0158)	-0.7336*** (0.2389)	-0.0382*** (0.0119)	-0.0435** (0.0191)	-0.6370** (0.2860)	-0.0382** (0.0151)	-0.0524* (0.0288)	-0.8314* (0.4317)	-0.0371* (0.0195)
Family size	0.0092 (0.0134)	0.1878 (0.2057)	0.0097 (0.0102)	-0.0033 (0.0157)	-0.0095 (0.2334)	-0.0006 (0.0123)	0.0041 (0.0285)	0.0284 (0.4570)	0.0009 (0.0206)
Unmarried	0.1688* (0.0874)	2.1128 (1.3716)	0.0974 (0.0682)	0.0919 (0.1168)	0.8771 (1.6976)	0.0153 (0.0893)	0.2451* (0.1349)	3.7523 (2.4346)	0.1816 (0.1106)
Divorced	0.2206** (0.1072)	3.6169** (1.7797)	0.2052** (0.0878)	0.2458 (0.1822)	3.9468 (2.8079)	0.1889 (0.1481)	0.2517* (0.1415)	4.4932* (2.6629)	0.2571** (0.1193)
Widowed	-0.0641 (0.1255)	-1.2308 (1.8883)	-0.0233 (0.0921)	0.0482 (0.1541)	0.5378 (2.2413)	0.0696 (0.1160)	-0.2426 (0.2381)	-3.9249 (3.6664)	-0.1521 (0.1642)
Gender	0.1123*** (0.0384)	1.6891*** (0.5893)	0.0887*** (0.0292)	0.1060** (0.0507)	1.5551** (0.7614)	0.0920** (0.0401)	0.0682 (0.0602)	1.1009 (0.9855)	0.0443 (0.0446)
Net assets	0.0311** (0.0146)	0.5601*** (0.1580)	0.0246*** (0.0080)	0.0860*** (0.0301)	1.4695*** (0.3912)	0.0678*** (0.0207)	0.0274* (0.0149)	0.5194** (0.2143)	0.0221** (0.0099)
CCP membership	0.0244 (0.0585)	0.4150 (0.8891)	0.0171 (0.0443)	0.1056 (0.0925)	1.6767 (1.3517)	0.0908 (0.0712)	-0.0169 (0.0809)	-0.4044 (1.3316)	-0.0283 (0.0604)
Membership of other parties	0.1115 (0.0776)	1.5529 (1.1540)	0.0578 (0.0575)	0.0865 (0.1058)	1.1905 (1.4863)	0.0328 (0.0785)	0.1018 (0.1152)	1.4420 (1.8604)	0.0580 (0.0844)
Provincial dummies	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
N	7,978	7,978	7,978	4,559	4,559	4,559	3,419	3,419	3,419
First-stage F statistics	38.49	38.49	38.49	30.60	30.60	30.60	13.88	13.88	13.88
Local big surname	0.7779*** (0.0552)	0.7779*** (0.0563)	0.7779*** (0.0563)	1.2768*** (0.0855)	1.2768*** (0.0876)	1.2768*** (0.0876)	0.9885*** (0.1561)	0.9885*** (0.1684)	0.9885*** (0.1684)
Local Hukou							3.74 (0.0531)	3.07 (0.0799)	2.18 (0.1398)
Wald test of exogeneity (p values)	8.02 (0.0046)	7.32 (0.0068)	7.90 (0.0049)	9.32 (0.0023)	8.67 (0.0032)	6.57 (0.0094)			

Notes: This table shows the instrumental variable estimation results from the IV Probit and IV Tobit regressions on the informal financial market lending of social networks and other control variables. In columns (1), (4), and (7), the dependent variable is whether or not a household engages in informal lending and the IV Probit estimates are reported. In columns (2), (5), and (8), the dependent variable is the amount of informal lending and the IV Tobit estimates are reported. In columns (3), (6), and (9), the dependent variable is the ratio of informal lending to the household's total assets and the Tobit estimates are reported. Whether or not a household has a local big surname is adopted as the instrumental variable in columns (1)–(6) for both the full sample and the rural subsample. Whether or not a household has a local Hukou is adopted as the instrumental variable in columns (7)–(9) for the urban subsample. Robust standard errors are included in parentheses. The symbols \*\*\*, \*\*, and \* denote the 1%, 5%, and 10% significance level, respectively. The average marginal effects are available on request.

**Table 5(b): Social Networks and Informal Borrowing—IV Probit and IV Tobit Estimates**

Variables	Full Sample		Rural		Urban	
	Inforbo_prob (1) IV Probit	Inforbo_size (2) IV Tobit	Inforbo_prob (3) IV Probit	Inforbo_size (4) IV Tobit	Inforbo_prob (5) IV Probit	Inforbo_size (6) IV Tobit
Social network	0.0799** (0.0399)	0.6705* (0.4073)	0.0596* (0.0333)	0.5181* (0.2885)	0.3295*** (0.0417)	0.8277*** (0.2265)
Age	-0.0144*** (0.0014)	-0.1571*** (0.0138)	-0.0102*** (0.0017)	-0.0987*** (0.0150)	-0.0094*** (0.0027)	-0.1813*** (0.0395)
Income	-0.0810** (0.0343)	-0.6727** (0.3239)	-0.1331** (0.0570)	-0.9045* (0.4930)	-0.0387* (0.0208)	-0.5918** (0.2815)
Income squared	0.0028* (0.0015)	0.0227 (0.0153)	0.0106** (0.0041)	0.0644* (0.0358)	0.0003* (0.0002)	0.0011 (0.0428)
Education	-0.1211*** (0.0117)	-1.1862*** (0.1169)	-0.0879*** (0.0191)	-0.6993*** (0.1641)	-0.0567*** (0.0158)	-1.0620*** (0.2938)
Perceived risk	-0.0164* (0.0098)	-0.1902* (0.1098)	-0.0268* (0.0145)	-0.2431** (0.1228)	-0.0286 (0.0179)	-0.5439 (0.3716)
Family size	0.1497*** (0.0112)	1.4840*** (0.0996)	0.1295*** (0.0125)	1.1228*** (0.0994)	0.1004*** (0.0253)	1.9634*** (0.3689)
Unmarried	-0.3100*** (0.0900)	-3.5495*** (0.8633)	-0.4256*** (0.1080)	-4.1957*** (0.9264)	-0.0386* (0.0205)	-0.7963* (0.4346)
Divorced	0.0961 (0.0947)	0.6656 (0.9619)	0.0686 (0.1462)	0.1853 (1.2901)	0.3128*** (0.1036)	1.0836*** (0.3161)
Widowed	-0.0007 (0.0740)	-0.2153 (0.7482)	-0.0120 (0.0939)	-0.0708 (0.8197)	0.1968* (0.1082)	0.8287* (0.4408)
Gender	0.0626** (0.0304)	0.6810** (0.3003)	0.0003 (0.0398)	0.0124 (0.3369)	0.1532 (0.1431)	1.1393 (0.8374)
Net assets	-0.0972*** (0.0202)	-0.8105*** (0.1726)	-0.0126* (0.0071)	-0.3377* (0.1876)	-0.0859*** (0.0286)	-1.5005*** (0.3793)
CCP membership	0.0241 (0.0482)	0.3225 (0.4861)	-0.0704 (0.0749)	-0.5136 (0.6468)	0.0033 (0.0590)	-0.0189 (1.1578)
Membership of other parties	0.0355 (0.0698)	0.2454 (0.6851)	0.0687 (0.0928)	0.4974 (0.7798)	-0.0388 (0.0936)	-0.9256 (1.7814)
Provincial dummies	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
N	8,281	8,281	4,785	4,785	3,496	3,496
First-stage F statistics	28.04	28.04	25.92	25.92	11.44	11.44
Local big surname	0.7547*** (0.0551)	0.7547*** (0.0563)	1.3138*** (0.0835)	1.3138*** (0.0869)		
Local Hukou					1.1118*** (0.1523)	1.1118*** (0.1661)
Wald test of exogeneity	2.11	2.63	7.57	8.24	21.25	13.05
(p values)	(0.1460)	(0.1051)	(0.0060)	(0.0041)	(0.0000)	(0.0003)

Notes: This table shows the estimation results from the (IV) Probit and (IV) Tobit regressions on the informal financial market borrowing of social networks and other control variables. In columns (1), (3), and (5), the dependent variable is whether or not a householder engages in informal borrowing. IV Probit estimates are provided in column (2) for the full sample, in column (4) for the rural subsample, and in column (6) for the urban subsample. Whether or not a householder has a local big surname is adopted as the instrumental variable for both the full sample and the rural subsample. Whether or not a householder has a local Hukou is adopted as the instrumental variable for the urban subsample. Robust standard errors are included in parentheses. The symbols \*\*\*, \*\*, and \* denote the 1%, 5%, and 10% significance level, respectively. The average marginal effects are available on request.

**Table 6: Robustness Checks Using an Alternative Measure of Social Networks**

Variables	(1) Inforbo_prob	(2) Inforbo_size	(3) Inforle_prob	(4) Inforle_size	(5) Inforle_ratio
<b>Panel A</b>					
Social network (festival)	0.0121** (0.0059)	0.1284** (0.0569)	0.0476*** (0.0073)	0.6766*** (0.1091)	0.0325*** (0.0054)
Control variables	Yes	Yes	Yes	Yes	Yes
N	8,281	8,281	7,978	7,978	7,978
Pseudo R <sup>2</sup>	0.1819	0.1305	0.1702	0.1370	0.1686
<b>Panel B</b>					
Social network (festival)	0.1051** (0.0465)	0.9155* (0.4947)	0.2246*** (0.0444)	3.7289*** (0.9986)	0.1885*** (0.0496)
Control variables	Yes	Yes	Yes	Yes	Yes
N	8,281	8,281	7,978	7,978	7,978
First -stage F statistics	24.77	24.77	23.87	23.87	23.87
Local big surname	0.6232*** (0.0562)	0.6232*** (0.0579)	0.6316*** (0.0574)	0.6316*** (0.0591)	0.6316*** (0.0591)
Wald test of exogeneity (p values)	3.77 (0.0521)	2.57 (0.1090)	11.21 (0.0008)	9.51 (0.0020)	10.07 (0.0015)

Notes: The choices of the control variables are the same as in Tables 4(a), 4(b), 5(a), and 5(b). The estimates for the control variables are available on request. The symbols \*\*\*, \*\*, and \* denote the 1%, 5%, and 10% significance level, respectively. Robust standard errors are included in parentheses.

### Alternative Estimation Approach

To correct for the potential selection bias, we adopt the Heckman two-step estimation, also termed the Type II Tobit model, to replace the Type I Tobit model for robustness checks. The first-stage selection equation specifies the Probit model, and we further control the effects of the householder's occupation, the provincial GDP, and the dependence ratio. We treat the variables as missing if there are no observations on the amount of lending or borrowing or the ratio of lending to the total household assets. The results obtained from the estimation of the Heckman two-step estimation also support our previous findings.<sup>14</sup>

### 3.3 Transmission Mechanisms: Information, Perceived Risk, and Cushion

Though the importance of social networks and informal financial inclusion is widely discussed (Allen, Qian, and Qian 2005; Ayyagari, Demirgüç-Kunt, and Maksimovic 2010), there is little debate on the transmission mechanism. Recent theoretical advances identify three main channels. First, the existing theory suggests that a closely knit social network promotes exchange of favors by shortening the information traveling path, reducing the information cost, improving the information quality, and enhancing the power to enforce agreements through punishment and ostracism (Samphantharak and Townsend 2010; Lippert and Spagnolo, 2011; Ali and Miller 2013; Jackson, Rodriguez-Barraquer, and Tan 2012; Jackson, Rogers, and Zenou 2017). In addition to the information channel, management scientists, psychologists, and economists share the same views on the value of social networks playing the role of “social collateral” in risk sharing, which directly influences agents' perceived risk and decision making (Pitt and Khandker 1998; Weber and Hsee 1999; Weber and Morris 2010; Ambrus, Mobius, and Szeidl 2014). The “buffer stock” precautionary saving theory (Carroll 1997)

<sup>14</sup> The estimation results are not reported due to space constraints but are available on request.



predicts that households have incentives to hold enough wealth to cope with uncertainties. If social networks provide full or partial insurance against risks (Kinnan and Townsend 2012; Ambrus, Mobius, and Szeidl 2014), we expect that this cushion mechanism directly moderates the saving incentives and indirectly facilitates lending as one sort of investment. Hereby, the precautionary saving mechanism or cushion mechanism discloses the indirect channel through which social networks affect the supply side of informal finance.

In this section we test how social networks work through the three channels in facilitating informal borrowing and lending and examine whether the empirical evidence might lend support to the three hypotheses developed in Section 2.

**Hypothesis 2a:** Social networks facilitate both informal lending and informal borrowing by lowering the information cost.

**Hypothesis 2b:** Social networks facilitate both informal lending and informal borrowing by reducing individuals' perceived risk.

**Hypothesis 2c:** Social networks facilitate informal lending by reducing the need for precautionary saving.

### 3.4 Information Mechanism

We construct a variable named *Information* to measure households' information accessibility.<sup>15</sup> The CHFS contains a question regarding the main sources of information for a household. Households can make multiple choices among the information sources of newspapers and magazines, TV programs, radio programs, the Internet, mobile phone messages, and relatives, friends, and colleagues. If a household's information is acquired from a public channel only—newspapers and magazines, TV programs, radio programs, the Internet, or mobile phone messages, the variable *Information* equals 0; if a household can also access “soft” information that is not publicly known but is available from relatives, friends, and colleagues, the variable *Information* equals 1. This variable does not only depict information diversity.<sup>16</sup> More importantly, as argued by Lippert and Spagnolo (2011), “soft information” captures implicit knowledge on the borrower's credit and trustworthiness and plays an efficient role in enhancing the power to enforce agreements. For example, in the context of informal borrowing, a household with strong social ties may quickly gain access to the source of funding. Misbehavior, such as defaults, can also be widely known and quickly punished within the social network through information sharing. The access to private information from friends, relatives, and colleagues provides signals of the borrower's credit and repayment capability, which are likely to raise the probability of obtaining a loan.

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<sup>15</sup> We thank one anonymous referee for making constructive comments on how to construct the information variable. The referee points out that the information is not any other kind of information but information about the lenders or borrowers within the network.

<sup>16</sup> Access to varied public information regarding macro social-economic conditions is also vital. For example, timely access to such information as economic growth, official rates of loans, stock market fluctuations, and business opportunities from various public channels helps borrowers (lenders) to understand the opportunity cost of informal finance and the impact on their incentives to engage in informal lending and borrowing. We create an alternative discrete variable to measure the number of information sources owned by a household to proxy for the information diversity. A higher value represents more information channels available to a household. We first estimate the relationship between social networks and information diversity with Poisson regression and examine how information diversity affects households' informal lending and borrowing. The results, which are available but not reported due to space limits, confirm that social networks facilitate households' participation in informal finance through access to diversified information.

Table 7 presents the results. Column 1 shows that, at the 5% significance level, households with intensified social ties have larger probabilities of accessing not only public but also private information. Columns (2)–(4) indicate that access to private information increases the probability of informal lending, the amount of informal loans, and the ratio of informal loans over net assets, though the impacts are not significant. Columns 5 and 6 find that information gained from social networks significantly improves borrowers' chance of obtaining an informal loan and increases the size of informal borrowing.<sup>17</sup> These results not only support Hypothesis 2a (Social networks facilitate both informal lending and informal borrowing by lowering the information cost) but also imply that “soft information” plays an asymmetric role in facilitating informal lending and borrowing.

**Table 7: From Social Networks to Informal Finance—Information Mechanism**

Variables	Information (1) Probit	Inforle_prob (2) Probit	Inforle_size (3) Tobit	Inforle_ratio (4) Tobit	Inforbo_prob (5) Probit	Inforbo_size (6) Tobit
Social network	0.0133** (0.0060)					
Information		0.0276 (0.0402)	0.3379 (0.5928)	0.0168 (0.0293)	0.0951*** (0.0312)	0.9217*** (0.3039)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
N	8,171	7,873	7,873	7,873	8,177	8,177
Pseudo R <sup>2</sup>	0.1131	0.1669	0.1338	0.1625	0.1725	0.1266

Notes: The choices of control variables are the same as in Tables 4(a), 4(b), 5(a), and 5(b). The dependent variable in column (1) is information. The dependent variables in columns (2)–(4) are about informal lending. The dependent variables in columns (5) and (6) relate to informal borrowing. The estimates for the control variables are available on request. The symbols \*\*\*, \*\*, and \* denote the 1%, 5%, and 10% significance level, respectively. Robust standard errors are included in parentheses.

### 3.5 Risk Mechanism

We measure a householder's risk perception using the CHFS question “which type of project are you willing to invest in if you have an asset?” The choices are: 1) projects with the highest risks and the highest returns; 2) projects with above-average and below-the-highest risks and the corresponding returns; 3) projects with average risks and average returns; 4) projects with below-average risks and the corresponding returns; and 5) projects without risks. To simplify the analysis, we define choices 1) and 2) as perceived risk taking, 3) as perceived risk neutral, and 4) and 5) as perceived risk averse. We assign them the values 1–3, respectively.

Using the multinomial Probit model, we examine the impacts of social networks on households' risk perception. The results reported in columns 1–3 of Table 8 reveal that social networks do not significantly affect households that are either risk taking or risk neutral. However, the perceived risk is lowered at the 1% significance level, which is consistent with the theoretical prediction. From Tables 4(a), 4(b), 5(a), and 5(b), we find that a high degree of perceived risk negatively affects informal financial inclusion. Therefore, these results lend support to **Hypothesis 2b**: Social networks facilitate both informal lending and informal borrowing by reducing individuals' perceived risk.

<sup>17</sup> Alternatively, we add the interactive term of social networks and information to the regression model. The results confirm our findings and are available on request.

**Table 8: From Social Networks to Informal Lending—Risk and Cushion Mechanisms**

Variables	Risk_averse			Precautionary Saving (4) Probit	Inforle_prob (5) Probit	Inforle_size (6) Tobit	Inforle_ratio (7) Tobit
	Risk_averse=1 (1)–(3) Multinomial Probit	Risk_averse=2	Risk_averse=3				
Social network	0.0075 (0.0066)	0.0013 (0.0062)	−0.0160*** (0.0061)	−0.0085* (0.0047)			
Precautionary saving					−0.1188*** (0.0459)	−1.0522* (0.5394)	−0.0444* (0.0237)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	8,281	8,281	8,281	4,300	4,195	4,195	4,195
Pseudo R <sup>2</sup>	0.1575	0.1445	0.1269	0.1151	0.1825	0.1370	0.1751

Notes: The choices of the control variables are the same as in Tables 4(a), 4(b), 5(a), and 5(b), excluding the dummy variable of risk perception in columns (1) to (3). The dependent variables in columns (4) to (6) relate to informal lending. The estimates for the control variables are available on request. The symbols \*\*\*, \*\*, and \* denote the 1%, 5%, and 10% significance level, respectively. Robust standard errors are included in parentheses.

### 3.6 Cushion Mechanism

We also test how social networks affect households' participation in informal lending by changing their precautionary saving incentive. Following Li and Chen (2014), we exploit the CHFS question on “saving for accidents, for retirement, for education or training expenses, for buying and constructing houses or renovations, for marriages and funerals” to construct the variable as a proxy for the precautionary saving incentive. We assign the value 1 to saving motives and 0 otherwise. We first test the impacts of social networks on precautionary saving incentives and then estimate the impacts of precautionary saving incentives on informal lending. The results in columns 4–7 of Table 8 elucidate that the expansion of social networks reduces the need for precautionary saving, thus increasing the probability, the size, and the ratio of lending.<sup>18</sup> The empirical evidence supports **Hypothesis 2c**: Social networks facilitate informal lending by reducing the need for precautionary saving.

## 4. INTERPLAY BETWEEN SOCIAL NETWORKS AND FORMAL FINANCIAL MARKET DEVELOPMENT

In this section we test **Hypothesis 3** focusing on the relation between social networks and a specific formal institution—the development of the formal financial market. The new economic geography theory emphasizes that distance matters in shaping economic activities (Krugman 1991, 1992). The empirical evidence shows that formal financial agencies, such as development banks, commercial banks, and credit cooperatives (*Xinyongshe*), and the corresponding financial activities tend to locate near the central business area within a jurisdiction to benefit from easy access to a large pool of professionals and the creation and diffusion of knowledge (Cook et al. 2007; Knight and Wójcik 2017). Hence, we use the traveling time to the nearest central business area as a proxy for the formal financial market development<sup>19</sup> where

<sup>18</sup> Alternatively, we add the interactive term of social networks and precautionary saving incentives to the regression model. The findings are similar. The results are available on request.

<sup>19</sup> The 2011 China Household Financial Survey discloses which province a household is living in, but it does not provide more disaggregate geographical information at the county or district level. We attempt to proxy for the development of the formal financial market in each province using the NERI Index (Fan and Wang 2011), as suggested by the referee, and find that the results are similar. As expected, the market index that measures the development of the market intermediary and law and regulations

a household is located. It helps to avoid the potential endogeneity issue raised by omitted variables or reverse causality between informal finance and formal financial market development.

The survey includes a question on “how long does it take from your place of residence to the nearest central business area with the most frequently used transport?” By controlling the type of transportation, the shorter the traveling time, the shorter the distance is between a household’s residential place and the central business area, and a higher level of formal financial market development is implied. When households can acquire formal credit from banks and other formal financial institutions, they are less likely to borrow or lend in the informal finance market. Hence, we expect a positive sign for the coefficient of the time variable. To see the interplay between social networks and formal finance, we also include the interactive term of time and social networks in both equation (1) and equation (2). The econometric specification is:

$$\begin{aligned} Informal\_finance_{iv} = & \beta_1 SocialNetwork_{iv} + \beta_2 SocialNetwork_{iv} \times Time \\ & + \beta_3 Time + \gamma X_{iv} + \lambda_v + \varepsilon_{iv}, \end{aligned} \quad (3)$$

where  $Informal\_finance_{iv}$  depicts a household’s participation in informal finance, measured by the probability of borrowing, the size of informal borrowing, the probability of lending, and the size and the ratio of lending, respectively. We use the ratio of gift expenses to a household’s total daily expenses as a proxy for the intensity of a household’s social network. Other control variables are similarly defined as in equations (1) and (2).

Table 9 reports the estimation results. As expected, the coefficients for time are positive across all the specifications. The longer the traveling time is from a household’s place of residence to the central business area, the less developed the local formal financial market is, and a household is more likely to participate in informal finance when the social network is absent. Consistent with the findings in previous sections, in the interaction model, social networks still play positive roles in informal finance, particularly in informal lending, when the formal financial market is missing. More interestingly, the coefficients of the interaction term are negative across all the specifications and significant at the 1% level in columns 3 to 5. This implies that the expansion of a household’s social network reduces the negative impacts of formal financial market development on informal finance. Interpreted alternatively, the development of the formal financial market (temporal proximity to the central business area) strengthens the positive impact of the social network on informal finance. These results reveal that the development of the formal financial market is complementary to social networks in promoting informal financial activities. Our findings hence support **Hypothesis 3**: The development of the formal financial market is complementary to social networks in promoting informal financial activities.

Social networks are an indispensable production input embedded in the growth of the PRC market economy, and the impacts are path dependent (Rona-Tas 1994; Bian and Logan 1996). The economic transition was born from the original political and social structure. The interest groups that have gained dominant power based on their historical networks are more likely to participate in the informal financial markets, making use of the networks that they built and expanded during the growth of formal

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reduces the probability of participating in informal finance. In addition, as the market intermediary and law and regulations become more developed, the positive role of social networks played in informal finance is strengthened. The results are available on request. Compared with the provincial-level market index, using the time measure accounts for heterogeneity within households’ place of residence.

institutions for more economic rents. The capabilities of managing, maintaining, expanding, and applying social networks have evolved with the development of formal institutions into a sort of human capital, which is important to convert past political power into economic advantage. In this sense the economic transition in the PRC, with the establishment and expansion of formal institutions, strengthens the roles of social networks.

**Table 9: Social Networks and the Development of the Formal Financial Market: Complementary or Substitutable?**

Variables	Inforbo_prob (1) IV Probit	Inforbo_size (2) IV Tobit	Inforle_prob (3) IV Probit	Inforle_size (4) IV Tobit	Inforle_ratio (5) IV Tobit
Social network	0.1542* (0.0934)	1.1394 (0.9792)	0.3415*** (0.0849)	0.7775*** (0.2747)	0.2907*** (0.1014)
Social network×time	-0.0016 (0.0010)	-0.0115 (0.0108)	-0.0033*** (0.0010)	-0.0548** (0.0228)	-0.0028** (0.0011)
Time	0.0060** (0.0028)	0.0440 (0.0298)	0.0083*** (0.0030)	0.1380** (0.0638)	0.0072** (0.0032)
Control variables	Yes	Yes	Yes	Yes	Yes
N	7,498	7,498	7,229	7,229	7,229
First-stage F statistics	76.07	75.75	49.97	49.97	49.97
Local big surname	0.3310*** (0.0447)	0.3280*** (0.0435)	0.3327*** (0.0456)	0.3327*** (0.0443)	0.3327*** (0.0443)
Wald test of exogeneity (p values)	1.81 (0.1782)	1.80 (0.1792)	6.73 (0.0095)	5.51 (0.0189)	5.79 (0.0161)

Notes: The choices of the control variables are the same as in Tables 4(a), 4(b), 5(a), and 5(b). The estimates for the control variables are available on request. The symbols \*\*\*, \*\*, and \* denote the 1%, 5%, and 10% significance level, respectively. Robust standard errors are reported in parentheses.

## 5. CONCLUDING REMARKS

Using the 2011 China Household Finance Survey (CHFS) database, we examine the impacts of social networks on households' participation in the informal financial market from both the demand and the supply perspective. In the empirical analysis, we distinguish the impacts between rural and urban households, explore the mechanisms through which social networks affect informal financial inclusion, and investigate the roles of social networks in the development of formal institutions in a transition economy.

We show that social networks promote both informal lending and informal borrowing. By reducing the information cost, changing the risk perception, and moderating the incentives for precautionary saving, social networks significantly improve the probability and size of informal financial inclusion. Moreover, we find that the impacts of social networks are higher for urban households. Interestingly, the empirical evidence suggests that the roles of social networks remain strong and persistent even with the development of formal financial institutions.

We contribute to the social network literature in several respects. First, we argue that, if the dynamic nature of social networks is rooted in their capability of carrying and spreading implicit information and tacit knowledge that cannot be identified and explored within formal institutions and in their value of implicit collateral to provide full and partial insurance against systematic risks generated from the institutional environment, their role will not diminish when formal institutions prosper. Second, we test this hypothesis rigorously by modeling the interaction effect between informal social networks and one specific form of formal institutions using a large secondary data set. The empirical evidence is robust to the alternative measure of the variable of interest and the alternative estimation approach and provides firm support for our theoretical hypothesis. Third, this study fills a gap by exploring the working mechanisms through which social networks influence informal financing. Fourth, we investigate the heterogeneous impacts of social networks on informal financial inclusion for both rural and urban households. Last but not least, we construct a measure of social networks using the ratio of gift expenses in households' total daily expenditure. This measure not only depicts the size but also captures the intensity and strength of households' social networks, underpinning one of the core features of the use of gifts to maintain *Guanxi* in the PRC. We also overcome one of the serious challenges that the literature identifies regarding the behavior and consequences of social networks; that is, the relationship between social networks and social-economic behavior is not unidirectional. To address this concern, we use different instrumental variables of social networks, a local big surname to depict *Guanxi* for rural areas and the local Hukou status to depict *Guanxi* for urban areas, to address potential endogeneity due to omitted variable biases and reverse causality.

These findings provide rich policy implications. Lacking formal financial inclusion, especially in the rural areas of the PRC, social networks play an indispensable role in rural households' access to informal credit. However, during the urbanization process, with fast economic growth and structural change, the social networks originally rooted in kin and territorial relationships gradually fade out with the large scale of population migration from rural to urban regions. Our research suggests that the nurturing and the maintenance of traditional culture, kinship, and identity recognition or parochialisms are still pertinent even with the development of formal institutions. Equally consequential is the development of diverse social security channels to reduce households' precautionary saving and perceived risk to encourage informal financial inclusion. We also suggest that close social networks are complementary to the development of formal institutions in facilitating informal financial inclusion, since the institutionalization in the PRC is imbued with path-dependent network-based rent seeking. Thus, recognizing the role of informal institutions is imperative, and the removal of regulatory control and structural weakness in developing formal finance is pivotal in deepening the financial reform in the PRC.

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