# SOCIAL CAPITAL, MARKET TRANSITION, AND LOAN ACQUISITION: THE IMPORTANCE OF NETWORK EMBEDDEDNESS FOR CHINESE FIRMS

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ABSTRACT

Research confirms that social networking is a significant predictor of firm financing in capitalist economies, but little is known about its effect in transition economies. This paper examines the role of market network ties in 3,263 firms in securing banks loans in China's transition economy. The results demonstrate that social networking is a significant predictor of a firm's success in securing loans. Surprisingly, it has the same positive impact on both state-owned and nonstate enterprises' financing outcomes. These results suggest that social capital influences firms' abilities to acquire financing regardless of ownership form in China's transition economy.

## BIOGRAPHICAL SKETCH

Miles Garrett has a Bachelor of Arts from the University of Kansas in physics and philosophy. He is currently studying economic sociology at Cornell University.

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# INTRODUCTION

A key question in economic sociology is how social structure affects financial markets (Uzzi 1999; Keister 2002; Light 2005; Stearns and Mizruchi 2005). The availability and cost of financing are important concerns for firms in competitive markets. Empirical research has demonstrated that social networking improves firms' financial opportunities. Well-connected firms enjoy material and informational privileges which enhance their adaptability and survival (Podolny et al., 1996; Smith-Doerr and Powell 2005). Furthermore, networking grounds firms within a field's standards of acceptability and increases their legitimacy (Stuart et al., 1999).

Most of the literature on the link between social ties and financing, however, is based on research conducted in capitalist economies. Little is known about the impact of firm embeddedness on finance in socialist or transition economies (Keister 2004). In socialist economies, political ties or hierarchical relations between the distributor of funds (the state) and the producer of goods (the state-owned enterprise) overshadow horizontal market ties (Nee 1989). Market transition theory suggests that economic transition will reduce the importance of political capital and increase the importance of market mechanisms (Nee 1989). As China transitions away from command economy and towards free markets, firms adopt standards that mirror those of Western firms. Market incentive structures induce competition, innovation, and growth. As the market increasingly pressures firms to be efficient and profitable, the financial impact of market R&D and interfirm ties may begin to overshadow the influence of political ties. This should be the case for both state-owned and private enterprises that are competing for financing. That said, the effects of embeddedness on financing outcomes are expected to be significantly less pronounced for state-owned enterprises

(SOEs) than nonstate enterprises due to the lingering effects of political capital within state-owned organizations.

This paper begins by reviewing research on the importance of various kinds of market network connections for firm financing in capitalist economies. I then consider the importance of network connections from the standpoint of market transition theory, and discuss China's transition economy as an important case study. I present an empirical analysis of the relationship between social capital and firm financing for both state-owned and nonstate enterprises in the context of China's transition economy. Using data from the World Bank's Investment Climate Survey, I test the impact of firm networks on finance acquisition in China in 2002 and 2003. Results suggest that R&D and interfirm network ties translate into greater success in financial markets, in the same way that they do in free market economies. Moreover, the effects of this embeddedness on financing are robust across ownership forms. This suggests that state-owned enterprises are subject to the same expectations of the market which are applied to private firms. I close by discussing the importance of these results for existing theories on firm embeddedness, market transition, and financial markets.

## BACKGROUND

### NETWORK EMBEDDEDNESS AND FINANCIAL MARKETS

In financial markets, the borrower-lender relationship involves inherent information asymmetries (Leland and Pyle 1977; Campbell and Kracaw 1980; Diamond 1984). Banks attempt to minimize these asymmetries by collecting information about potential borrowers and assessing credit-worthiness (James and Wier 1990). Social capital is important in this context because it signals information about a firm's investability to banks. In capitalist financial markets, the benefits to firms of social

capital or network embeddedness are well documented (Lincoln et al., 1992; Uzzi 1999; Smith-Doerr and Powell 2005). The standard finding is that network ties improve the financial market's evaluation of firms (Smith-Doerr and Powell 2005). Broadly speaking, network embeddedness increases firm performance and survival (Uzzi 1996; Stuart 2000). A closer look at specific types of ties (interfirm, R&D, and firm-bank ties) helps clarify the specific mechanisms linking network connectedness to firms' abilities to acquire financing.

Interfirm ties serve as repositories of information and resources (Powell et al., 1996; Gulati and Gargiulo 1999). Furthermore, they help cultivate mutual trust between firms, and increase perceived legitimacy to outsiders (Granovetter 1985; Powell et al., 1996; Stuart 2000; Rauch 2001; Cornwell and Harrison 2004; Smith-Doerr and Powell 2005). A new venture's exchange relationship with established organizations, for instance, signals organizational status to third parties (Stuart 2000). Well-connected, visible firms are kept informed by their allies and honest by their critics (Stuart et al., 1999). Signaling firm stability and access to resources, interfirm ties thus help reduce uncertainty over financing (Stuart et al., 1999).

The interlocking directorate is a common example of the interfirm tie (Pfeffer and Salancik 1978). Interlocking directorates demonstrate closeness to and cooperation with leaders of sister organizations. They are used by organizations to manage competition and uncertainty and to gain legitimacy. Research demonstrates that corporate profits are shaped not only by competitive market transactions but also by the strategic creation of directorate ties (Burt 1983). Other examples of interfirm ties include exchange relationships, contractual arrangements, and participation in business groups.

R&D ties similarly inform banks' assessments of firms. These are relationships between organizations designed to exchange or develop new technologies (Stuart

1998). Examples of R&D ties include strategic technology alliances and contractual relationships with research institutions or universities. Participation in the R&D process increases firm innovativeness. Particularly in rapidly developing industries, firms exploit relations with universities, research institutions, and other firms (to include rival firms) in order to keep up with ever-changing technologies and stay competitive. Isolated firms cannot keep pace with rapid advancements, leaving them vulnerable to failure by being out-competed (Powell and Owen-Smith 1998). Firms active in R&D also have higher absorptive capacities—increased ability to absorb and exploit knowledge relevant to competitive survival (Cohen and Levinthal 1990). R&D ties situate firms in the locus of innovation, increasing their legitimacy and performance in evolving fields and competitive markets (Powell et al., 1996).

Ties between firms and their banks also directly affect lending relations and financial outcomes. Firms that capitalize on the amount and duration of their banking ties enjoy increased access to and decreased costs of bank financing (Baker 1990; Petersen and Rajan 1994; Uzzi 1999). Research shows that organizations manipulate the quality and the quantity of market ties with investment banks in order to reduce dependence and increase relational power (Baker 1990). Strong ties with banks convey private information and establish trust, both of which can reduce the risks associated with loans (Ferrary 2003). Banks, through maintaining ongoing relationships with firms, refine their judgment of firm credit-worthiness (Lummer and McConnell 1989; Petersen and Rajan 1994). Increasing a firm's quantity of bank ties induces competition among banks and provides ability to scan the market for competitive loan structures and rates (Baker 1990; Uzzi 1999).

This paper's focus is on the role networks have in acquiring loans. The general consensus is that social network embeddedness within free-market economies has positive effects on firms' abilities to acquire financing. The benefits of social network

embeddedness within transition and socialist economies, however, have been scarcely examined.

## THE ROLE OF NETWORKS IN TRANSITION ECONOMIES

Sociological research demonstrates that credit market networks function differently under different market settings (Granovetter 1993; Guseva and Rona-Tas 2001; Keister 2001; Keister 2004). For example, granting credit in primitive economies (i.e., peasant societies, open-air markets) hinges on interpersonal relations; enforcement of credit terms occurs through face-to-face interaction rather than legal institutions (Granovetter 1993). The Russian credit card market, lacking the impersonal enforcement mechanisms seen in American markets, hinges on interpersonal relations and trust (Guseva and Rona-Tas 2001). The American credit card market, by contrast, replaces interpersonal relations with the formal institutions of guaranteed contracts, credit bureaus, cooperation between banks, and rational bookkeeping in order to enforce loan terms.

In centrally planned economies, money is channeled through the central government. Broadly speaking, political capital trumps social capital. The state prioritizes full employment, health and social services, and total output rather than productivity. Funds are distributed by grant rather than by loan. Soft budget constraints forgive poor management decisions and poor business practices (Walder 1995; Kornai 2003). Financial incentive structures under socialist economies are hierarchical and political. Resources flow from the top down. Organizations do not rely on horizontal (interfirm or R&D) ties for resources and legitimacy; rather, they rely on vertical (governmental) ties (Nee 1989). In other words, the social mechanisms securing a firm's access to financial capital in capitalist economies are not present in centrally planned economies. Firms in this context have little incentive to join business

organizations, establish relationships with research institutions, or share resources and information with other firms.

In transition economies, network ties increase in importance (Nee 1989; Keister 2004). Ties to the market begin to overshadow ties to the state (Nee 1989; Cao and Nee 2000). The market increasingly pressures firms, state-owned or otherwise, to be efficient and profitable. More funds are distributed by loan rather than by grant, through the market rather than government channels (Keister 2004). Budget constraints harden, and the market provides increasing incentives to establish various interfirm and R&D ties. In this context it is less clear what role forms of social capital—political or social—will play in helping firms secure financing.

I extend existing finance theory of social capital to the case of market transition in China. Formally, I propose that social network embeddedness increases the ability of firms to acquire financing in early 21st century China.

## China's State-Owned Enterprises

The narrative of market transition with respect to financial markets is one of decreasing reliance on state grants and increasing reliance on private loans (Keister 2004). Reflecting this shift is the funding structure of state-owned enterprises in particular. SOEs fill a certain niche in the Chinese economy. Prior to reform (1978), SOEs dominated China's industries. Emphasis was on full employment and production quotas rather than efficiency and profitability. Through the reform period, performance, profitability, and innovation have all gained prominence in SOE incentive structures (Jefferson and Rawski 1994). This is due in no small part to the fact that funding to SOEs has gradually shifted from direct grants to loans, either from private firms or the state (Cull and Xu 2000). Firm borrowing from nonstate entities (e.g., private or foreign banks) has increasingly taken a more prominent role, but little

research has been done on how social factors influence these lending decisions (Keister 2002).

Progress notwithstanding, many factors have stunted the free market development of Chinese SOEs. Contrary to private enterprises, concerns of efficiency continue to share the spotlight with concerns of full employment, resource distribution, and social services to employees and the general population. SOE managers have been tasked with providing housing and social services for most of their employees as well as for a significant chunk of urban residents. Also stunting development is the relative softness of budget constraints, which reduces incentives to perform according to market standards (Jefferson and Rawski 1994; Kornai et al., 2003). Soft budget constraints increase organizational survival at the expense of efficiency and profitability (Kornai et al., 2003). Nonstate enterprises, without the benefits of soft budget constraints, are forced to value their resources more highly and thus tend to be more efficient. I am not concerned with smaller government-owned organizations, such as township-village enterprises (TVEs), because the complexity of issues faced by SOEs does not extend to TVEs, collectives, and the like (Walder 1995).

Compared with their contribution to the country's economy, SOEs have received a disproportionate share of the country's lending resources. By the mid- to late-1990s, SOEs were receiving some 70-80 percent of the nation's credits, while contributing less than half of its industrial net asset growth (Steinfeld 2002, pp. 381). This is partly explained by banks' preferences to lend to established organizations; startups present greater risks. However, it is also partly explained by the continued role of political capital in banks' lending decisions. The state often imposes its will on bank lending decisions while simultaneously providing insufficient oversight of financial markets, particularly hindering private development of China's financial

sector (Jefferson and Rawski 1994; Steinfeld 2002; Keister 2004). Resource misallocation, bad loans, and nonperforming debt have all flourished under this system (Jefferson 1998). Private banks enforce stricter budget constraints than bureaucrats on transition era SOEs. And by the late 1990s, banks were increasingly loaning to private firms rather than SOEs because the former proved to be better investments. SOEs had developed a reputation for not performing well on loans (Cull and Xu 2000).

This leads to my second fundamental research question: Does the importance of social capital vary with ownership form? The answer to this question will inform us on the extent of SOE marketization in transitional China. There is a disconnect between free market interests and the interests of the government. Through maintaining control over SOEs, the government imposes its interests on them and, subsequently, assumes responsibility for their continued performance (Lin et al., 1998). The importance of political ties is expected to linger longer for SOEs than for nonstate enterprises, because SOEs remain arms of the state. Conversely, I predict that social network embeddedness is less important for SOEs' financing outcomes than it is for nonstate enterprises.

In summary, early 21st Century China offers us the opportunity to test the growing importance of firms' social network ties in a transition economy. There is preliminary evidence that social network embeddedness in transition China provides benefits similar to those in capitalist economies. For instance, participation in business groups in transition China (circa 1990) increases a firm's financial performance and productivity; this happens through decreased transaction costs and increased information and resource flows (Keister 1998). My central thesis is that these ties in China should also: 1) enhance the ability to acquire information and resources; 2) enforce established and evolving field-level standards, ensuring that firm behavior will

not stray too far into untested, risky territory; and 3) signal quality and investability to banks. This is because R&D ties, university ties, and market ties all inform firms (and banks) about changing environments (Smith-Doerr and Powell 2005).

## DATA AND METHODS

My focus is on assessing the importance of firm network ties on financing outcomes in the context of China's transition economy. The data for the analysis come from the World Bank's Investment Climate Survey (ICS). This survey has addressed productivity, investment, innovation, product certification, market setting and competition, client and supplier relations, ownership form, networking, and employment in firms of 110 developing countries throughout the world. The data were collected through face-to-face interviews, according to a written questionnaire, with each firm's senior manager and accountant or personnel manager. Two waves of the ICS were conducted in China, one in 2002 and the other in 2003. The first wave reached 1,548 firms, the second 2,400. However, no firms from the 2002 survey were included in the 2003 survey, making this a strictly cross-sectional dataset.

The firms included in the survey were located in twenty-three cities across China, spanning nineteen of China's thirty-three provincial-level regions.[1] The ICS was designed to be representative of China's main industrial sectors and regions of economic activity. Therefore, firms of many different types were included in the ICS, ranging from manufacturing firms specializing in electrical and electronic products to service firms engaged in accounting services to retail trade. Firm eligibility for

[1] The 23 cities were the following: Beijing, Benxi, Changhun, Changsha, Chengdu, Chongqing, Dalian, Guangzhou, Guiyang, Haerbin, Hangzhou, Jiangmen, Kunming, Lanzhou, Nanchang, Nanning, Shanghai, Shenzhen, Tianjin, Wenzhou, Wuhan, Xian, and Zhengzhou.

participation was determined based on having at least a minimum number of employees (fifteen for service firms and twenty for manufacturing firms), being roughly proportionate in size to the other firms that fall under the same sector and province, and being categorized into one of nine broadly categorized sectors.[2] Additionally, the survey was designed so that one-third of the firms in each city were in service sectors and two-thirds were in manufacturing sectors. Under these constraints, the sampling technique was stratified random. For a more complete description of the data, see Cull and Xu (2005) or Nee and Opper (forthcoming).

### FINANCING MEASURE

The dependent variable is dichotomous, measuring whether or not a firm had a loan from a financial institution when the survey was taken. It is possible that a firm had more than one loan from one or more financial institutions, but this survey only provides information on the presence of at least one loan, which is an appropriate measure of bank-determined investability.

### FIRM NETWORK EMBEDDEDNESS

The key predictor variables focus on firm networking and ownership form. I include five measures of firm network ties. The first two capture interfirm ties: (1) Is the firm a member of a business association? (2) Does the firm have a contractual or longstanding relationship with other firms? These ties may signal legitimacy and access to information and resources from other firms. The third captures R&D ties: (3)

[2] The requirement of having at least fifteen or twenty employees was relaxed in cities where there were not enough eligible firms to complete the survey based on these criteria. The nine target sectors were the following: apparel and leather goods; electronic equipment; electronic components; consumer products; vehicle and vehicle components; information technology services; accounting, auditing, and non-banking financial services; advertising and marketing; and business logistics services.

Does the firm have a contractual or longstanding relationship with a local university or research institution? R&D ties, along with interfirm ties, enhance a firm's ability to acquire information, an ability that is particularly important in rapidly changing environments (such as transition economies). The last two capture the embeddedness of firms within financial markets: (4) What is the duration (in years) of the firm's relationship with its primary financial institution? (5) How many financial institutions does the firm do business with? Firm-bank ties establish trust and confidence between lender and borrower over time, and ties to multiple financial institutions increase a firm's knowledge of and access to the credit market. Each of these five networking measures is considered separately in the analysis because there are different benefits for these different types of ties, and also because they do not scale together ($\alpha$ =0.08).[3]

### Ownership Form

The measure of ownership form is dichotomous, indicating whether or not the firm is legally registered as a state-owned enterprise. The interaction of this with the networking variables informs this paper on how the importance of networking varies with ownership form. One present hypothesis is that state ownership reduces the effect of networking on financial outcomes. Summary statistics for this and the other key variables in the analysis are presented in Table 1.

### Covariates

Decades of research demonstrate the importance of basic firm characteristics on financial outcomes. I include the firm's age (in years), average education of managerial personnel (measured as a single, ordinal variable), and size (average

[3] The two variables that scale the closest are R&D ties and interfirm ties, but the alpha reliability coefficient for these two is only 0.42.

number of employees). I include the debt-asset ratio to control for financial health (Baker 1990; Nee and Opper forthcoming) and the log of the firm's sales change to

**Table 1. Summary Statistics of Main Variables.**

| Description | mean | S.D. | N |
|---|---|---|---|
| *Dependent Variable* | | | |
| Has firm acquired a loan from a financial institution? 1= Yes, 0=No | .210 | .407 | 3948 |
| *Networking Variables* | | | |
| Duration (in years) of relationship with main bank. Range: 0-60. | 11.076 | 10.217 | 3817 |
| Number of banks or financial institutions the firm does business with. Range: 0-200. | 3.126 | 4.109 | 3854 |
| Is the firm a member of a business association? 1=Yes, 0=No. | .568 | .495 | 3879 |
| R&D ties: Does the firm have a contractual or longstanding relationship with a local university or research institute? 1=Yes, 0=No | .163 | .369 | 3852 |
| Interfirm ties: Does the firm have a contractual or longstanding relationship with another firm? 1=Yes, 0=No | .122 | .328 | 3844 |
| *Ownership Form* | | | |
| Is the firm a state-owned enterprise (SOE)? 1=Yes, 0=No | .243 | .429 | 3948 |
| *Firm Characteristics* | | | |
| Age of firm. Range: 0-100 | 14.036 | 14.686 | 3899 |
| Average number of employees. Range: 1-83542 | 568 | 2708 | 3896 |

control for recent growth (Uzzi 1999). I control for whether or not the firm is located in an industrial park or export processing zone, because these zones carry certain legal and tax idiosyncrasies (Nee and Opper, "Political Connections in China's Market

Economy"). To account for regional, legal, and competitive differences across contexts, I also include a set of 22 dummy variables representing the firm's city and a set of 14 dummy variables representing the firm's industry.[4] Guangzhou is used as the reference city, and electrical and electronic products is the reference industry, as these categories contain the most observations.[5]

## ANALYTIC STRATEGY

Because the dependent variable is dichotomous, I use logistic regression models for the analysis. Equation 1 formalizes the initial model:

$$\text{logit}(p) = \alpha + \beta X + \gamma Y + \lambda Z + \varepsilon \qquad \text{Eq. 1}$$

In this model, $p$ is a binary variable indicating the absence or presence of bank financing. $\alpha$ is the intercept. $X$ is the set of social networking variables, $Y$ the variable for state ownership, and Z the set of covariates. $\beta$, $\gamma$ and $\lambda$ are the corresponding vectors of regression coefficients. Finally, $\varepsilon$ is the vector of residuals.[6]

The first step of the analysis is to examine the behavior of state ownership and the control variables before including the social networking variables. This allows me

[4] By controlling for city we implicitly control for the wave of the survey, since no city appears in both waves.

[5] I ran a separate regression that includes the firm's "acid ratio," which is defined as assets minus inventories divided by liabilities. Details are given in the appendix.

[6] Data are available for most firms, but 685 firms are not included in the main analysis due to missing data. To ensure that sample selection was not a major problem, I carried out a supplementary set of analyses using a propensity score weighting technique described by Morgan and Todd (2008). This involves several steps. First, I created a dichotomous variable indicating whether a given firm was included in the final analysis. I then predicted this variable using various firm-level characteristics, including state ownership and each of the dummy city variables. This provides a predicted probability that a given firm made it into the final analysis. I then reran the main regression analyses using the inverse of this predicted probability as an importance weight. This technique effectively weights more heavily those cases that were least likely to make it into the final analysis. With this technique, the results, which are available from the author upon request, remain unchanged.

to assess the importance of state ownership apart from social capital. Next, I add all of the social networking variables simultaneously, which allows me to assess the overall contribution of network connectedness to a firm's ability to acquire financing.

The remaining steps of the analysis make it possible to examine if and how the importance of social networking varies with ownership form. To do this, I add the interaction between state ownership and each of the five social networking variables separately into the model. Equation 2 expands on Equation 1 by adding the appropriate interaction terms.

$$\text{logit}(p) = \alpha + \beta X + \gamma Y + \varphi_i X_i Y + \lambda Z + \varepsilon \qquad \text{Eq. 2}$$

In Equation 2, $X_i Y$ is the interaction of the $i^{\text{th}}$ social networking variable with state ownership, and $\varphi_i$ is the corresponding coefficient. The interactions of network connectedness with state ownership are taken sequentially rather than simultaneously to maximize the interpretability of the coefficients and to prevent multicollinearity. All regression analyses are restricted o those cases which have non-missing data on all of the variables used in the analysis (N=3,263).

## RESULTS

There are early indications that a firm's need for and access to market financing are not dominated by its ownership form. Of all firms in the data set, 828 firms (21.0%) had at least one loan from a financial institution. The zero-order difference in likelihood of an SOE having a loan as compared with a nonstate enterprise is nonsignificant (t = .92; p = 0.36). Specifically, of all SOEs, 191 (19.9%) had a loan, compared to 637 (21.3%) nonstate enterprises.

The network variables are well represented in our data. 2,205 of the firms (56.8%) belong to a business association. 626 (16.3%) have contractual or

longstanding relationships with local universities or research institutions. 470 (12.2%) have contractual or longstanding relationships with other firms. Firms have an average of 3.13 banks (s.d. = 4.11) and an average relationship of 11.07 years (s.d. = 10.22) with their primary bank.

The network embeddedness of SOEs is similar but not identical to that of non-SOEs (see Figure 1). SOEs are about 9 percent more likely to be members of business associations ($p < .001$). SOEs are equally likely to have ties to local universities, to research institutions, and to other firms as are non-SOEs. SOEs are marginally more likely than non-SOEs to have more banks ($p = .052$). Finally, SOEs on average have a much longer relationship with their primary bank (16.8 years vs. 9.2 years, $p < .001$). This is to be expected since SOEs existed prior to the reform (1978), whereas nonstate enterprises were all founded after the reform.

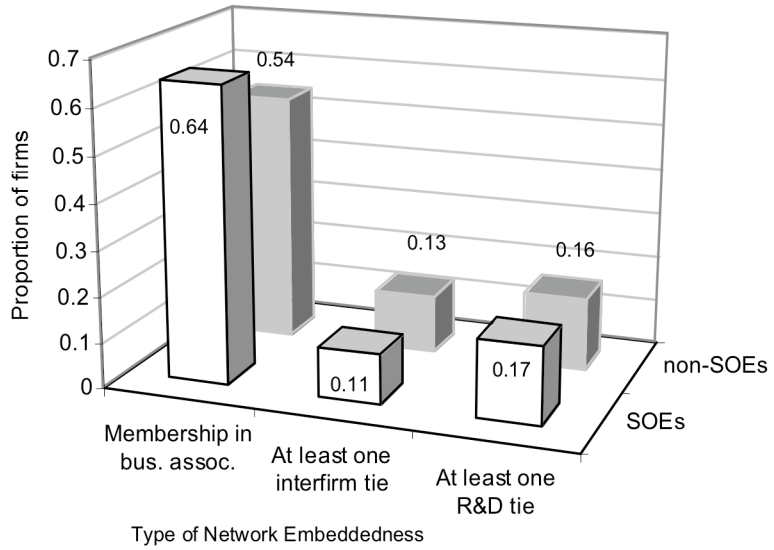


**Figure 1. Interfirm and R&D ties of SOEs and nonSOEs.**

Preliminary evidence suggests that interfirm, R&D, and firm-bank ties all inform the lending process. Figure 2 shows that loan acquisition is much more common in firms that are members of business associations, have at least one R&D tie, and have at least on interfirm tie. Also, the size of a firm's bank network is positively related to its loan acquisition. Firms that do not have a loan have, on average, 2.83 ties with banks, compared with an average of 4.21 for banks that have received a loan (t=-8.63, p<.001). Similarly firms that do not have a loan have, on average, a relationship with their main bank extending 10.76 years, compared with 12.22 for banks that have received a loan (t=-3.65, p=.0001).

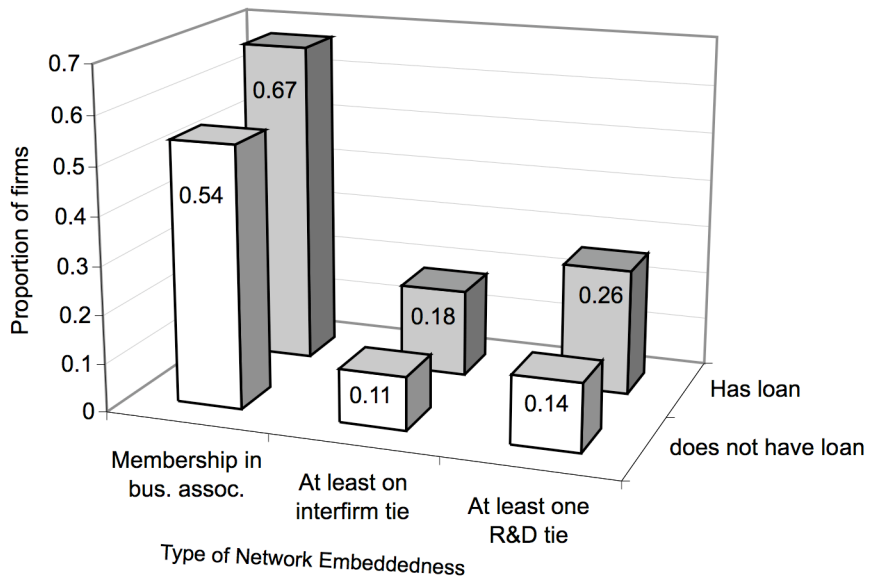


**Figure 2. Interfirm and R&D Ties Stratified by Loan Acquisition.**

Table 2 presents the regression results, which examine the effects of 1) networking on loan acquisition, and 2) the interactions of networking and state

ownership on loan acquisition for 3,263 firms in our survey.[7] As predicted, network embeddedness is a significant predictor of loan acquisition. Model 1 excludes interaction terms and social networking variables, providing a sense of how SOEs fare with respect to loan acquisition before considering their network connectedness. It is notable that ownership form is not a significant predictor of financing. This reaffirms that SOEs have as much need for and access to loans as nonstate enterprises.

Model 2 adds the networking variables. The duration of a firm's relationship with its main bank is the one embeddedness predictor which is not significantly associated with financing. This may be due to the rapidly changing banking environment in transition China. More will be said about this in the discussion. All other networking variables are significant in all models. The size of the firm's bank network (firm-bank ties), having a relationship with a local university or research institution (R&D ties), being a member of a business association (interfirm ties), and having a contractual or longstanding relationship with other firms (interfirm ties) are significant, positive predictors of loan acquisition. This is strong evidence that social network embeddedness at the firm level informs the lending process, confirming this paper's prediction as well as evidence from more capitalist economies.

Models 3-7 examine how each of the networking variables interacts with state ownership. Owing to the fact that all interactions are nonsignificant, each of these models tells us the same thing: The importance of social capital does not vary with ownership form. Some point estimates might ease the interpretation of these findings.

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[7] The models include cases only for which there are data on all variables. A close look at the ICS data reveals an extreme case where a firm is recorded as having 200 banks. This is at least one order of magnitude larger than 99.8% of all other cases, and it is 344% larger than the next largest case. Excluding this case from the basic social networking model (Model 2) changes Hosmer and Lemeshow's goodness-of-fit test substantially—calculating with 10 groups, the Hosmer-Lemeshow $\chi^2$ changes from 9.88 to 14.18 (43.5%), and the p-value changes from 0.273 to 0.077. Based on this point's influence, I exclude it from all models.

**Table 2. Logistic Regression Results (N=3,263).[a]**

| *Variables* | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| *Ownership Form* | | | | | | | |
| Is firm a state-owned enterprise SOE? | -.165 | -.237 | -.147 | .032 | -.061 | -.160 | -.202 |
| | (.120) | (.123) | (.182) | (.188) | (.195) | (.136) | (.130) |
| *Network Connectedness* | | | | | | | |
| Duration of relationship with main bank (years) | | -.005 | -.002 | -.004 | -.005 | -.005 | -.005 |
| | | (.006) | (.007) | (.006) | (.006) | (.006) | (.006) |
| Number of banks firm does business with | | .158*** | .158*** | .182*** | .158*** | .157*** | .157*** |
| | | (.020) | (.020) | (.024) | (.020) | (.020) | (.020) |
| Is firm member of business association? | | .262** | .261** | .260** | .318** | .258** | .262** |
| | | (.098) | (.098) | (.098) | (.110) | (.098) | (.098) |
| R&D ties | | .373** | .372** | .363** | .369** | .459*** | .374** |
| | | (.120) | (.120) | (.120) | (.120) | (.136) | (.120) |
| Interfirm ties | | .301* | .305* | .301* | .302* | .300* | .354* |
| | | (.132) | (.132) | (.132) | (.132) | (.132) | (.147) |
| *Interactions* | | | | | | | |
| SOE*firm-bank duration | | | -.006 | | | | |
| | | | (.009) | | | | |
| SOE*number of banks | | | | -.073 | | | |
| | | | | (.039) | | | |
| SOE*bus. assoc. membership | | | | | -.257 | | |
| | | | | | (.224) | | |
| SOE*R&D ties | | | | | | -.343 | |
| | | | | | | (.260) | |
| SOE*interfirm ties | | | | | | | -.246 |
| | | | | | | | (.305) |
| *Covariates* | | | | | | | |
| Age of firm | .010** | .009* | .009* | .009* | .009* | .009* | .009* |
| | (.003) | (.004) | (.004) | (.004) | (.004) | (.004) | (.004) |
| Is firm located in industrial park or export processing zone? | .390*** | .268* | .273* | .270* | .268* | .268* | .266* |
| | (.104) | (.107) | (.108) | (.108) | (.107) | (.107) | (.107) |
| Constant | -9.897 | -5.050 | -5.099 | -4.751 | -5.092 | -5.064 | -5.060 |
| | (18.642) | (9.145) | (9.112) | (8.671) | (9.031) | (9.162) | (9.157) |

*a.* * p<0.05; ** p<0.01; *** p<0.001. Standard errors are in parentheses. All models control for the
firms' size, industrial sector, city, debt/asset ratio, sales change (log), and average education of
managerial personnel.

The odds ratio of having a loan for an average firm that is not an SOE but that is maximally socially embedded (at least one R&D tie, one interfirm tie, and one membership a business group), assuming average firm-bank connectedness, is .69; the odds ratio for an equivalent SOE is statistically indistinguishable at .55. By comparison, the odds ratio of having a loan for an average firm that is not an SOE and that is minimally socially embedded with no R&D ties, interfirm ties, or memberships in business groups is .27; the log odds for an equivalent SOE is statistically indistinguishable at .21.

To check the robustness of this finding, I included all interaction terms simultaneously in separate regressions. As expected, each interaction remained nonsignificant, and each social networking variable that was previously significant remained so (duration of relationship with main bank remained nonsignificant).[8] This suggests that the evolving expectations for SOEs (e.g., performance incentives) have created an environment in which the importance of social capital on financing becomes as significant as it is to nonstate enterprises.

## DISCUSSION AND CONCLUSION

The results above provide evidence that, as in developed capitalist economies, social network embeddedness has a significant positive relation with firm financing in China's transition economy. This lends credence to market transition theory's thesis that transition economies will see an increasing importance of market mechanisms (Nee 1989; Cao and Nee 2000). The positive effect of horizontal networking on financial outcomes demonstrates that the market rewards firms for associating with

[8] Specific values are available upon request to the author.

other firms. Theory permits us to propose the mechanisms involved in the relation between social capital and financing. Firms that develop associations with other firms reduce uncertainties and transaction costs. Interfirm ties increase a firm's access to resources and information (Powell et al., 1996; Gulati and Gargiulo 1999), and they increase perceived legitimacy to external organizations (Stuart 2000). R&D ties increase a firm's innovativeness (Powell and Owen-Smith 1998), learning capacity (Cohen and Levinthal 1990), legitimacy and performance (Powell et al., 1996). Having multiple firm-bank ties induces competition among banks, informs firms on financial markets, and increases firm relational power (Baker 1990; Uzzi 1999). In China's transition economy, each form of social tie informs the lending process. Taken together, social capital situates firms within organizational fields, increases the flow of information and resources, and signals investability to potential lenders.

Longevity of firm-bank ties in China does not prove to be as consistently beneficial. The one measure of network connectedness that turned out to be nonsignificant to finance acquisition was the duration of a firm's relationship with its main bank. This is probably attributable to the relative newness of private banking in the Chinese economy. Whereas at one point the state bank distributed all funds, as the free market has taken shape, newly formed private banks have increasingly become the intermediaries between investors and loan recipients. As noted above, the Chinese state has been particularly resistant to the development of the country's private financial sector. This has delayed the entry and growth of private banks. Longevity of firm-bank ties should gain importance as the financial sector develops. However, number of bank ties is robustly significant in all of our models. Firms are thus able to capitalize on multiple banking relationships to get financing.

Contrary to expectations, network connectedness does not vary with ownership form. This means that social capital matters as much to SOEs as to nonstate

enterprises. Social capital cuts across ownership form in 21st century China. This is consistent with research that underscores the market pressures facing SOEs (Jefferson and Rawski 1994). State ownership does not exclude enterprises from competitive forces. Even though political capital functions prominently in the survival of SOEs, social network embeddedness remains positively relevant to loan acquisition. Previously dominated by political capital, SOEs under market transition become subject to the market mechanisms which apply to nonstate enterprises.

The findings of this paper confirm that social network embeddedness carries financial benefits to firms in early 21st century China and that these benefits extend across ownership form. The implications of this research are promising for social network analysts. This paper expands the scope social network theory to an additional institutional context: the transition economy. Less than three decades after the onset of reform, this formerly socialist economy is demonstrating the relevance of social ties to business transactions. Economic incentive structures are replicating those of more capitalist economies.

What is unclear from this cross-sectional data is if the importance of social capital grows over time in transition markets. One of the central claims of market transition theory is that horizontal market ties will increasingly replace vertical political ties as an economy distances itself from socialism (Nee 1989). Future research with longitudinal data would inform the literature on the extent to which social capital increases in importance as a function of time away from socialist institutions. Longitudinal data would also tease out the direction of causality between social capital and acquisition of finance.

Another useful extension of these findings would be to apply the same theory of network embeddedness to other developing economies. Does embeddedness increase firm financing or, more generally, firm performance in contemporary Russia?

What about the Congo? Or Cuba? I suspect that social capital will have a positive effect on firm financing and performance in each of these countries through the same mechanisms discussed in this paper. Future research of this kind will broaden our understanding of social capital's role in diverse market settings.

# APPENDIX

Research demonstrates the significance of a firm's acid ratio in securing bank financing (Uzzi 1999). The acid ratio is defined as assets minus inventories divided by liabilities. Many firms in the ICS, due either to lack of knowledge or confidentiality concerns, did not provide complete information on assets, inventories, or liabilities. Thus, inclusion of this variable reduces the number of cases included in the analyses from 3262 to 2336 (a drop of 28.4%). This appendix repeats the analyses with acid ratio included.

As shown in Table A, all independent social capital variables (Models 2-7) other than contractual or longstanding ties with a local university or research institution (R&D ties) maintain their significance at the 0.05 level if they were significant before. R&D ties fall to marginal significance (p=0.053), which is probably a consequence of selection issues. All interaction effects of social capital and state ownership remain nonsignificant with the exception of state ownership interacting with number of banks. The significant negative interaction between state ownership and number of banks suggests that SOEs benefit less from having numerous bank ties. But due to the instability in China's transition banking environment, this provides little concrete evidence without evidence of significant interactions with other embeddedness measures. Overall, including the acid ratio confirms the robustness of this paper's findings that social network embeddedness positively affects firm loan acquisition in early 21st century transition China, and that this effect does not vary with ownership form.

**Table A. Logistic Regressions with Acid Ratio (N=2,336).[a]**

| *Variables* | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| *Ownership Form* | | | | | | | |
| Is firm a state-owned enterprise SOE? | -.176 | -.261 | -.024 | .122 | .000 | -.239 | -.237 |
| | (.143) | (.146) | (.222) | (.219) | (.242) | (.165) | (.156) |
| *Network Connectedness* | | | | | | | |
| Duration of relationship with main bank (years) | | -.005 | .002 | -.004 | -.004 | -.005 | -.005 |
| | | (.007) | (.008) | (.007) | (.007) | (.007) | (.007) |
| Number of banks firm does business with | | .158*** | .158*** | .192*** | .158*** | .157*** | .157*** |
| | | (.023) | (.023) | (.028) | (.023) | (.023) | (.023) |
| Is firm member of business association? | | .265* | .261* | .256* | .330** | .264* | .264* |
| | | (.112) | (.112) | (.112) | (.122) | (.112) | (.112) |
| R&D ties | | .258 | .255 | .249 | .255 | .279 | .259 |
| | | (.134) | (.134) | (.134) | (.134) | (.152) | (.134) |
| Interfirm ties | | .424** | .428** | .425** | .420** | .423** | .456** |
| | | (.149) | (.149) | (.149) | (.149) | (.149) | (.166) |
| *Interactions* | | | | | | | |
| SOE*firm-bank duration | | | -.015 | | | | |
| | | | (.010) | | | | |
| SOE*number of banks | | | | -.099* | | | |
| | | | | (.043) | | | |
| SOE*bus. assoc. membership | | | | | -.366 | | |
| | | | | | (.276) | | |
| SOE*R&D ties | | | | | | -.083 | |
| | | | | | | (.290) | |
| SOE*interfirm ties | | | | | | | -.148 |
| | | | | | | | (.341) |
| *Covariates* | | | | | | | |
| Acid ratio | -.047* | -.042* | -.042* | -.041* | -.042* | -.042* | -.042* |
| | (.019) | (.019) | (.019) | (.019) | (.019) | (.019) | (.019) |
| Age of firm | .008* | .007 | .006 | .006 | .007 | .007 | .007 |
| | (.004) | (.005) | (.005) | (.005) | (.005) | (.005) | (.005) |
| Is firm located in industrial park or export processing zone? | .374** | .293* | .304* | .300* | .295* | .294* | .292* |
| | (.115) | (.118) | (.119) | (.119) | (.118) | (.118) | (.118) |
| Constant | -5.639 | -4.591 | -4.743 | -4.354 | -4.667 | -4.592 | -4.589 |
| | (8.373) | (7.818) | (7.815) | (7.533) | (7.748) | (7.817) | (7.816) |

*a.* * p<0.05; ** p<0.01; *** p<0.001. Standard errors are in parentheses. All models control for the firm's size, industrial sector, city, debt/asset ratio, sales change (log), and average education of managerial personnel.

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