The Value of Social Capital as an Informal Institution:

Evidence from Firms' Debt Financing in China

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Abstract: The paper studies the effect of social capital on the firms' debt capacity and capital structure in China. We measure the social capital of China's 31 provinces through four indexes: the number of NGOs per capita, the index of trust among peoples, the volunteer blood donation ratio of civics, and the money and material donation of civics. The results show that in those areas with more social capital, the firms are more likely to have higher debt ratio and longer debt maturity, and the firms can get debt financing with less tangible assets. And in those districts, the firms are easier to obtain bank credits and trade credits. The paper has two contributions to the economics literature: first, it confirms the economic value of social capital from a micro view; second, it provides a new perspective to understand the firms' capital structure choice.

Keywords: social capital, capital structure, debt maturity, bank credits, trade credits

JEL: G3; H25; H26

1. Introduction

From the perspective of an informal social institution – social capital, this paper tries to explain why the development level of debt market in one district is systematically different from that in another (Rajan and Zingales, 1995; Booth et al., 2001).

Social capital refers to features of social organization, such as trust, norms, and networks, which can improve the efficiency of society by facilitating coordinated action (Putman, 1993). Since the concept of social capital was introduced by sociologists into the research field of economics in 1980s, it has been quickly accepted by economists. Social capital is charged with a range of potential benefits including: facilitating cooperation and coordination, making sure transaction institutions well function, lowering transaction costs, and enhancing other capital's efficiency (Woolcock and Narayan, 2000; Guiso et al, 2004). Consistent with these theoretic expectations, abundant of empirical studies have confirmed the positive role of social capital in pushing local economic development (Helliwell and Putnam, 1995; Knack and Keefer, 1996) and financial development (Guiso et al., 2004). Based on existing literature, we further argue that social capital also helps to promote the development of debt market. Though debt is a compulsory contract and needs the effective support from laws, debt market will develop more healthily with better social capital. According to Fukuyama (1995), China is a low-trust country in whole. There are big differences, however, between the different provinces in aspects of geographic and culture environments within China, leading to their social capital also

remarkably different from each other (Zhang and Ke, 2002). Therefore, we try to address one question: whether the provincial social capital exerts an influence on firm's debt capacity or debt structure? Our results will shed more light on the determinants of firm's capital structure. Besides, this paper helps us to understand how social capital play roles in the micro level.

Our study based on data from Chinese market shows that in the districts with better social capital firms are easier to obtain debt and long-term debt and can get debt financing with less tangible assets. Besides, in those districts, firms are easier to get bank credits and trade credits.

This paper contributes to the literature in the following aspects. First, we use the framework of social capital, an informal social institution, to explain the differences in firm's debt structure between different districts within one nation. This is a totally new research perspective, giving us more ideas about the influence of institutional factors, especially informal ones, on firm's financial behaviors. Second, it is at the firm level that we explore the role of social capital, and this micro-perspective analysis combines with previous studies based on macro views and gives us a comprehensive picture about the role of social capital in economic development. Third, we measure social capital with four dimensions: the number of social organizations per capita, social trust among people, and social involvement (including volunteer blood donation and money or material donation). Compared to previous studies (Guiso et al., 2004), our multi-dimensional methodology makes our results more reliable and avoids the critique about the measurement issue in a more degree.

Last but not least, we use the data from different districts within one nation so that we can better control the institutional factors like laws which are invariable in one nation, avoiding the bias caused by different institutional factors across different nations.

The remainder of this paper is organized as follows. Part 2 reviews the concept of social capital and its application in economics, Part 3 proposed our research hypothesis, Part 4 measures the key variables, Part 5 presents empirical results and discussions, and Part 6 concludes.

2. The Concept of Social Capital and Its Application in Economics

Neo-Classical Theory of Economic Growth developed rapidly during the 20th century. Despite the theoretic enrichment, however, one question remains a puzzle: why those nations (or districts) with similar natural resources and physical capital have quite dissimilar economic growth and per capita income? (Grootaert and Bastelaer, 2002). During the 1960s, some economist, like Becker (1962) and Schultz (1963), proposed the importance of human capital. Gradually, however, people find that human capital is only a partial explanation for economic growth. Since 1980s, another capital besides physical and human capital has received a lot of attention from research institutions. That is social capital.

The concept of social capital originated from sociology. The three founders of sociology have contributed great ideas to the concept, such as the idea of enforceable trust of Weber, reciprocal exchange of Simmel, and collective conscience of Durkheim. The modern development of the concept came from three key authors:

Pieere Bourdieu, James Coleman and Robert Putnam. According to Putman, social capital refers to features of social organization, such as trust, norms, and networks, that can improve the efficiency of society by facilitating coordinated actions. So, social capital will be manifested by peoples' trust, reciprocity, civicness and social connectedness.

As we have mentioned above, the role of social capital has been noticed and approved since 1980s. It is thought that social capital plays a role in economic development through information sharing and reciprocal collective-acting and decision-making mechanisms. Social capital can enhance the trust level between groups, thus increasing the economic efficiency (Guiso et al., 2004). In those societies with better developed social capital, people trust each other in a higher degree, and they depend more on each other's promises. Using the framework of economics, Fukuyama (1995), a Japanese-American scholar, analyzed the relationship between trust (an important component of social capital) and economic prosperity. He proposed that high trust and therefore spontaneous society easily breed developed social intermediate organizations, such as church, chamber of commerce, labor union, nongovernmental charity and education organizations. Those social intermediate organizations are the foundation of a civil society. Without them, the society looks like a saddle, where one side is an extremely powerful government, and the other is atomic individuals and families. Fukayama argued that if a society is unable to breed general social intermediate organizations, then it is also unable to breed private companies based on non-blood relationships. From this view, Fukayama concluded

the important relation between trust and economic prosperity. The name of his famous book, *Trust: The Social Virtues and the Creation of Prosperity*, told us his main idea. Fukayama found that China, Southern Italy, and France are low-trust cultures, while Japan, Germany, and U.S are high-trust cultures.

Later a lot of empirical studies confirmed the explanatory role of social capital in economic growth. For example, Helliwell and Putman (1995) focused on the various districts in Italy, and found that the difference of social capital between districts leads to that of economic development. La Porta et al. (1997) and Knack and Keefer (1996) used the data from *World Value Survey* and found that the infancy mortality rates are lower in higher-trust societies and that the size of big companies is related with trust between people rather revenue and is negatively related with trust between families. The empirical study of Knack and Keefer (1996) concluded that if trust degree increases by 12%, annual revenue increases by 1%. Guiso et al. (2004) also found that social capital could powerfully explain the difference of financial development level in various districts of Italy.

3. Research Hypotheses

3.1 Social capital and leverage

Debt, a main form of corporate financing, can be regarded as a compulsory contract, which states the rights and obligations of debtors and creditor, the maturity and cost of borrowing, and the preferred claim right of creditors in case of debtor's bankruptcy. Compared to equity financing, debt has the advantages of low costs and

tax-destructing interests and it doesn't diffuse the corporate control right. Interestingly, debt rate and structure are not only different at firm level but also systematically different between different districts. Rajan and Zingales (1995) and Booth et al. (2001) compared the determinants of public companies' capital structure in developed countries with those in developing countries. They found that not only corporate size, growth and profitability, but also national institutions have important influence on corporate capital structure decisions.

As an informal social institution, social capital can lower the negative influence on financial development of distrust between people. Bourdieu thinks that social capital has a high productivity, and with it the actors can directly obtain the economic resources like debt. So, in a district with more developed social capital, companies are more willing to use the lower-cost debt financing, and corporate managers are more likely to use debt to transfer positive signals that they are willing to accept the monitoring role of debts. Thus, we propose the first research hypothesis:

Hypothesis 1a: Firms' financial leverage is higher in districts with more developed social capital.

Pecking order theory of Myers and Majluf (1984) argues that there is information asymmetry between outside investors and corporate insiders. If a company uses tangible assets to get debt financing, the tangibility of assets can reduce the degree of information asymmetry between outsiders and insiders, thus facilitating debt financing. Agency cost theory of Jensen and Meckling (1976) and Myers (1977) considers that agency costs of debt caused by asset substitution and under-investment

hinders debt financing. The tangibility of assets, however, can partly solve the problems of asset substitution and under-investment, thus lessening debt's agency costs. Obviously, both pecking order theory and agency cost theory think that the more tangible assets the company has, the more easily it can obtain debt financing. Empirical studies also found that corporate debt ratio increases with the tangibility of assets (Bradley et al. ,1984; Smith and Watts ,1992; Rajan and Zingales, 1995).

Social capital is mainly composed of a series of attitudes and values related with trust, mutual benefit and cooperation. In a district with developed social capital, people tend to trust and cooperate with each other. Social capital, as a moral resource, can expand itself in constant using. It is a common property rather a private one. Numerous socially-interacted networks and voluntary associations relieve the problems of opportunism and free-rider, and produce the mechanisms by which reputation is brought up. Fukuyama (1995) argues that social capital is in fact a kind of social norm that promotes social trust. So we can expect that in a district with developed social capital, firms can obtain debt financing only with or even without tangibility of assets. Thus, our next hypothesis is:

Hypothesis 1b: Firms can obtain debt financing with less tangibility of assets in districts with more social capital.

3.2 Social capital and debt maturity structure

Though the key point of capital structure is the ratio of debt to equity financing, another decision firms have to make is debt maturity. With same debt ratios, different debt maturity structures will exert different influence on firms. In the capital market

with information asymmetry, the lender can not fully know the conditions of the borrower. If information asymmetry is serious, the lender tends to lend capital in a short run for the sake of safety. Compared to long-term debt, short-term debt is easier to monitor. Even though some firms can transfer signals to markets through excellent financial reports, low trust between individuals in districts with weak social capital harms the effectiveness of information-signaling. In districts with strong social capital, however, the social atoms like individual or firm trust each other and believe each other's information. In the process of social capital being used and strengthened, the problem of information asymmetry is partly relieved. Accordingly, the probability that firms obtain long-term debt is enhanced. Also, the tangibility of assets that firms need to obtain long-term debt is reduced or even non-necessary. Therefore, we propose the following hypotheses:

Hypothesis 2a: Firms are easier to obtain long-term debt in districts with more social capital.

Hypothesis 2b: Firms can obtain long-term debt with less tangibility of assets in districts with more social capital.

3.3 Social capital and bank credits

Firms have various kinds of liabilities, including loans from banks and other financial institutions, trade credits offered by suppliers, and other liabilities like wages payable and tax payable. Among those liabilities, bank loans and trade credits, based on trust, are most likely to be influenced by social capital. Then we analyze the effects of social capital on firm's bank loans and trade credits offered by suppliers.

First we look into bank loans. Generally, bank loans include credit loans and secured loans. If a firm wants to obtain bank credits, it has to have a good credit and healthy financial condition as well. Bank loans and especially bank credits, as one type of financial contracts, must involve trust issue. It was found that social capital is helpful to resolve the moral hazard problem of financial contracts (Millo and Pasini, 2007), and play a positive role in constituting financial contracts (Guiso et al., 2004). For example, Gramme Bank, set up by the Nobel Prize Winner Muhammad Yunus, owes its success to the construction of social capital (Dowla, 2006). Thus, we propose that:

Hypothesis 3a: Firms are easier to obtain bank credits in districts with more social capital.

Hypothesis 3b: Firms can obtain bank credits with weaker financial conditions in districts with more social capital.

4. Social capital and trade credits

Trade credits are a main financing method of firms. Firms give clients trade credits through accounts receivable on one side, and receive trade credits from suppliers through accounts payable on the other. One report of U.S Federal Reserve shows that 20% of liabilities in small-size firms and 15% in big-size firms are accounts payable (Elliehausen and Wolken, 1993). Accounts payable, as a spontaneous financing, needs a series of credit standards, such as the so-called 5Cs: Character, Capital, Capacity, Collateral, and Condition. It is sure that only those firms with good reputation and financial condition as well can get trade credits.

In districts where social capital develops well, people take an active part in social activities, care about other people, and trust each other. In this atmosphere, keeping a good reputation is a key point for one person or firm's sustainable development. Once a firm breaks his credit, it is extremely difficult to get credits. Then, we propose that:

Hypothesis 4a: Firms are easier to obtain trade credits in districts with more social capital.

Hypothesis 4b: Firms can obtain trade credits with weaker financial conditions in districts with more social capital.

4. Variable Measurement and Sample Selection

4.1 Measurement of social capital

It is extremely difficult, even though not impossible, to directly measure social capital, like human capital. Empirical studies need proxy indexes. Unfortunately, researchers did not reach an agreement about the proxy variable for social capital. We find that the common-used variables representing social capital include trust degree (Isham and Kähkönen, 2003), number and type of relationships (Fafchamps and Minten, 2003), and number of culture organizations (Helliwell and Putnam, 1995). The politicians represented by Putman (1993) examined whether the citizens in a district were civic-minded to measure this district's social capital. Generally the variables of civicness include involvement rate in election and commitment to social group organizations or charity causes. Guiso et al. (2004) used citizen's involvement in election and non-remunerated blood donation to directly measure a district's social

capital in Italy.

The purpose of this paper is to empirically examine the relationship between a district's social capital and firms' debt financing in this area, and the core part of research design is the measurement of social capital. Based on existing economic literature and characteristics of social capital, we measure a district's social capital from three dimensions: social organization structure, social credit, and organization involvement. Specifically, we use the following three variables in each district: the development of non-governmental organizations, the degree of trust, and volunteer blood donation rate.

4.1.1. Variable of social organization structure — development of non-governmental organizations (NGO)

Our first index for social capital is the development of non-governmental organizations in each district. From the perspective of economics, the function of NGO is a helpful remediation to market failure and government failure. In some degree, NGOs are nurseries which can culture social capital. Their importance lies not only on providing common products, but also on breeding social capital their members comply with. Putman (1993) argued that the stock of social capital of a district was the level that people participate in association activities. He observed that there were numbers of association organizations in those districts with high institution performance in Italy. People there concern common affairs, abide laws and trust each other. To reflect each district's development of non-governmental organizations, we use per capita NPO, equal to the ratio of the number of NGOs to total population in

each district. The data about number of NGOs comes from the website: www.chinanpo.gov.cn, which is sponsored by National NGO Administration Bureau of China. The data about population of each district comes from statistics annuals from 2002 to 2006.

4.1.2 Variable of social involvement一volunteer blood donation (VBD) and money and materials donation (DONA)

Blood Donation Law of China says "The nation practices the system of blood donation without compensation. We encourage voluntary blood donation by healthy citizens between ages 18 and 55" (article 2). Blood donation without remuneration is thought to reflect the citizens' civicness or so-called "civism" of a district. This variable was adopted in Guiso et al. (2004). The VBD data of each district in this paper is from the website of Chinese Society of Blood Transfusion (CSBT): www.csbt.org.cn. CSBBT has colleted the data of blood transfusion in 30 districts of China except Tibet in 2000. Those data include the total number of donators, number of blood transfused, commanded non-remunerated blood donation and volunteer non-remunerated blood donation etc. Among those data, volunteer non-remunerated blood donation is more suitable for representing people's civicness. So we use it as the second index for social capital.

It is a pity that we have only one-year data for blood donation, potentially influencing the reliability of our results[1]. To relieve this problem, we add another variable indicating social involvement: social donation, including money and

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[1] We wrote a letter to the Chinese Society of Blood Transfusion, asking for the donation data across years, and the response is "there is no such data".

materials contribution. Similar with blood donation, social donation indicates people's care about each other, reflecting the development degree of social capital. The Ministry of Civil Affairs of China collects the data of social donation for each district and each year. Considering the different economic development of different districts, we calculate the social donation index using the following formula:

$$DONA_{it} = \frac{(\text{Money donation} + \text{Money value of materials donation})_{it} \, / \, \text{Total population}_{it}}{\text{Per capita disposable income}_{it}}$$

From the annual statistics of the Ministry of Civil Affairs of China, we get the data of society donation from 2002 to 2006. The data of per capita disposable income is from the Stats Bureau of China.

4.1.3 Variable of social credit—trust (TRUST)

Our third index for social capital is the degree of trust. Trust is an important component of social capital and has been widely applied in sociology and economics. Both theory and application show that high social capital is closely related with high trust. So far, researchers have measured trust degree mainly through questionnaires. For example, *World Value Survey* is one of the world-wide famous questionnaire systems, and Knack and Keefer (1996) use its trust data. In China, Zhang and Ke (2002) entrusted "Chinese Entrepreneur Survey System" with investigating trust degree in 15,000 firms of mainland China and ranking the 31 districts of China according to their trust. We use their data to measure trust degree of various districts in China.

Figure 1 depicts the average DONA and NPO during 2002-2006. We can see that these two indexes perform better in Beijing and Tianjin, Northeast, Northwest, and

eastern areas. DONA and NPO are lower in the middle and southern areas. There are apparent geographic differences. Figure 2 depicts the volunteer blood donation and trust in 2000. The figure shows that these two indexes in Beijing, Guangdong, Shandong, and the delta of Yangzi River perform much better.

[Insert Figure 1 and Figure 2]

The above four variables reflect social capital from three dimensions: social organization structure, social credit and organization involvement. Their correlation test is showed in table 1. According to the Pearson correlation coefficients, they are positively related.

[Insert table 1]

4.2 Measurement of debt financing

According to research design, the debt financing variables we need are debt ratio, debt maturity structure, bank credits and trade credits. The calculation methods are the following:

Leverage (LEV) = total debt divided by total assets, reflecting the proportion of debt financing in firm's total assets.

Debt maturity structure (MATURITY) = long-term debt divided by total debt, reflecting the proportion of long-term debt in firm's total debt.

We use LBC and SBC to measure the bank credits.

$$\text{LBC} = \frac{Long\ Term\ Bank\ Credit}{Loan\ Term\ Bank\ Loan},$$

$$SBC = \frac{Short\ Term\ Bank\ Credit}{Short\ Term\ Bank\ Loan}$$

The study uses the following method to measure the trade credit for certain firm:

$$TC = \frac{(Accounts\ Payable + Deposit\ Re\ ceived)}{Total\ Assets}$$

4.3. Sample selection and descriptive statistics of main variables

Our sample is the companies listed in Shanghai and Shenzhen Stock Exchanges in 2000 and during 2002-2006. The reason for two time periods is that we only have one year's (2000) data of VBD and TRUST, while the time period of NGO and DONA data is from 2002 to 2006.

In selecting firms, we first exclude the firms in financial industry, since those financial firms have quite different capital structure from other firms. Then, we exclude the firms owned by the central government, for those firms have not clear geographic characteristics and we cannot exactly judge which districts they belong to. Third, we drop the firms whose listing time is less than two years, because those firms had just financed a huge equity fund, making their capital structure quite special. Fourth, we exclude the ST or PT firms, and firms with abnormal financial data. Last, there is no VBD data for Tibet, so we exclude firms from this district. Finally, we get 847 observations in 2000 and 4,629 observations during 2002-2006. All financial data of sample firms comes from the RESSET database. Table 2 gives us the descriptive statistics of debt financing variables.

[Insert table 2]

5. Empirical Tests and Results Discussion

5.1 Testing the relationship between social capital and financial leverage

Hypothesis 1a and 1b propose that firms' debt ratios are higher and they can obtain debt financing with less tangibility of assets in districts with more social capital. Considering we have three indices for social capital and two indices (VBD and TRUST) only have one year's data, while NPO and DONA have five years', we use the following two models to simultaneously test these two hypotheses. The models are:

$$LEV_i=\beta_0+\beta_1 TANG_i+\beta_2 VBD \text{ (or TRUST)}_i+\beta_3 VBD \text{ (or TRUST)}_i \times TANG_i+\beta_4 Size_i$$

$$+\beta_5 Growth_i+\beta_6 Profit_i+\beta_7 ED_i+\sum_{j=8}^{18}\beta_j IND_Y+\varepsilon_i, \quad （Y=1, …,11; k=1,…,4） \qquad （1）$$

$$LEV_{it}=\beta_0+\beta_1 TANG_{it}+\beta_2 NPO \text{（or DONA）}_{it}+\beta_3 NPO \text{（or DONA）}_{it} \times TANG_{it}+\beta_4 Size_{it}$$

$$+\beta_5 Growth_{it}+\beta_6 Profit_{it}+\beta_7 ED_{it}+\sum_{j=8}^{18}\beta_j IND_Y+\sum_{j=19}^{22}\beta_j YEAR_k+\varepsilon_{it}, （Y=1,…,11; k=1,,4）（2）$$

Where, TANG reflects the firm's tangibility of assets, calculated by the sum of inventory and fixed assets divided by total assets. If hypothesis 1a is supported, β_2 should be significantly positive. If hypothesis 1b is supported, β_3, the coefficient of interaction, should be significantly negative.

Obviously, we need control other determinants of capital structure in the models. Lots of empirical studies have found that firms' financing decisions are influenced by some factors, such as firm's size, growth, profitability and asset structure (Bradley et al., 1984, Kim and Sorensen, 1986, Titman and Wessels, 1988, Smith and Watts, 1992, Lu and Xin, 1998). Based on those studies, we add three control variables in the

model: SIZE, Growth, and Profit. SIZE is the natural log of total assets, Growth is the growth rate of sales, and Profit is firm's return on equity.

Besides, we need control industry and year dummies. We adopt the industry classification method of China Securities Regulatory Commission, and our sample firms are distributed in 12 industries. So we have 11 industry dummies. The data of NGO and DONA range from 2002 to 2006, so we include year dummies. Last, we control districts' economic development (ED), considering that the difference of social capital between districts may be the result of difference of economic development level. We calculate a district's per capita GDP as ED.

[Insert table 3]

Table 3 presents the regression results with three proxy indexes of social capital. The results show that leverage is positively related to firm's size and negatively related to profitability, consistent with previous studies. But, the tangibility of assets has no significantly positive effect on leverage. Most important, β_2 is always positive and β_3 is always negative in our three models. This means firms are easier to obtain debt financing and they can obtain debt financing with less tangibility of assets in districts with more social capital, supporting hypothesis 1a and 1b. Specifically, in the model using TRUST, NGO and DONA indicating social capital, both β_2 and β_3 are statistically significant, while β_2 and β_3 are not significant in the model using VBD indicating social capital. To sum up, the development of social capital is helpful for firms to get debt financing. This result is especially meaningful for the

fund-insufficient districts. For those districts, the development of debt market not only needs the support from formal institutions like government policies, but also needs the cultivation for social capital.

5.2 Testing the relationship between social capital and debt maturity structure

Hypothesis 2a and 2b propose that firms' long-term debt ratios are higher and they can obtain long-term debt financing with less tangibility of assets in districts with more social capital. Similarly, since VBD and TRUST only have one year's data, while NPO and DONA have five years', we need two models to test hypothesis 2a and 2b. The models are:

$$\text{MATURITY}_i=\beta_0+\beta_1\text{TANG}_i+\beta_2\text{VBD (or TRUST)}_i+\beta_3\text{ VBD (or TRUST)}_i\times\text{TANG}_i+\beta_4\text{Size}_i$$

$$+\beta_5\text{Growth}_i+\beta_6\text{Profit}_i+\beta_7\text{ED}_i+\sum_{j=8}^{18}\beta_j\text{ IND}_Y+\varepsilon_i,\quad(Y=1,\ldots,11;\ k=1,,4)\qquad(3)$$

$$\text{MATURITY}_{it}=\beta_0+\beta_1\text{TANG}_{it}+\beta_2\text{NPO}(\text{or DONA})_{it}+\beta_3\text{NPO}(\text{or DONA})_{it}\times\text{TANG}_{it}+\beta_4\text{Size}_{it}$$

$$+\beta_5\text{Growth}_{it}+\beta_6\text{Profit}_{it}+\beta_7\text{ED}_{it}+\sum_{j=8}^{18}\beta_j\text{ IND}_Y+\sum_{j=19}^{22}\beta_j\text{ YEAR}_k+\varepsilon_{it},\quad(Y=1,\ldots,11;$$

$$k=1,,4)\qquad(4)$$

Where, Maturity$_i$ is firm i's debt maturity structure, equal to the ratio of long-term debt to total debt. Also we need control firm's size, growth, profitability (Guedes, and Opler, 1996, Stohs and Mauer, 1996), industry and economic development. The meaning and calculation of variables are the same as in hypothesis 1. If hypothesis 2a is supported, β_2 should be significantly positive. If hypothesis 2b is supported, β_3 should be significantly negative.

Table 4 reports the regression results. Whether we use VBD, TRUST, NGO or

DONA as indicating variable for social capital, β_2 is always positive and β_3 is always significantly negative, supporting hypothesis 2a and 2b. To sum up, this part of analysis indicates that firms are more inclined to long-term debt and can obtain long-term debt with less tangibility of assets in those districts with better-developed social capital in China. The availability of long-term debt provides firms with great convenience of arranging capital structure and managing financial risk.

[Insert table 4]

5.3 Testing the relationship between social capital and bank credits

It is like a black box when banks make lending decisions, and the outsiders are difficult to observe the decision process (Firth et al. 2009). Generally, researchers infer this process through observing the ultimate effects of some variables on bank loans (Cull and Xu, 2003; Firth et al., 2009). Here, we divide firm's borrowing from banks into short-term and long-term borrowing. LBC and SBC mean the percentage of firm's long-term and short-term credits loans in total long-term debts.

We use Z-score from Altman model to reflect firm's whole financial condition. Altman model is broadly used in rating corporate credit, since it comprehensively represents corporate financial conditions.

$$Z = 3.3 \times \frac{EBIT}{TA} + 1.0 \times \frac{Sales}{TA} + 0.6\frac{Equity}{Debt} + 1.4 \times \frac{Re\,tained\ Earnings}{TA}$$
$$+ 1.2 \times \frac{Working\ Capital}{Ta} \qquad\qquad （5）$$

To test hypothesis 3a and 3b, we use the following models:

SBC$_i$（or LBC$_i$）=β_0+β_1Z$_i$+β_2VBD (or TRUST)$_i$+β_3 Z$_i$×VBD (or TRUST)$_i$

$$+ \beta_4 ED_{it} + \sum_{j=5}^{15} \beta_j \ IND_Y + \varepsilon_i, \quad （Y=1,\ldots,11; k=1,,4） \qquad （6）$$

$$SBC_{it} （or \ LBC_{it}） = \alpha + \beta_1 Z_{it} + \beta_2 NPO （or \ DONA） _{it} + \beta_3 Z_{it} \times NPO （or \ DONA） _{it} + \beta_4 ED_{it}$$

$$+ \sum_{j=5}^{15} \beta_j \ IND_Y + \sum_{j=16}^{19} \beta_j \ YEAR_k + \varepsilon_{it} \quad （Y=1,\ldots,11; k=1,,4） \qquad （7）$$

If hypothesis 3 is supported, β_2 should be significantly positive and β_3 should be significantly negative. Table 5 and Table 6 are the regression results. The signs of β_2 and β_3 are consistent with our hypothesis. However, in the models using VBD and TRUST, β_2 and β_3 are not statistically significant. The reason may be these two indexed for social capital have only one year's data. In the models [3] and [4] , however, NPO and DONA both have significantly positive effects on LBC and SBC, and the coefficients of the interaction between NPO (or DONA) and Z score are significantly negative. These results suggest that firms are easier to get credit loans from banks and can obtain bank credits with weaker financial condition in districts with more social capital, supporting our hypothesis 3a and 3b.

[Insert table 5 and table 6]

5.4 Testing the relationship between social capital and trade credits

Similar with the condition of bank credits, we have no direct knowledge about firm's decisions of providing trade credits to business partners. One research method is infer this decision process through observing the ultimate effects of some variables on the number of trade credits. Since the issue we care is whether social capital influence firm's trade credits, we use the number of accounts payable indicating trade

credits, calculated by $\dfrac{AP_{it}}{TA_{it}}$, where AP_{it} is the sum of firm i's accounts payable and

deposit received in year t, and TA_{it} is firm i's total assets in year t.

Besides firm's whole financial condition (like Z score), bank credits also influence firm's trade credits. For example, Antov (2005) and Alphonse et al. (2004) argue that if firms have bank loans they are also easier to get trade credits. And their empirical data confirmed the positive relationship between trade credits and traditional loans. Considering this, we add BC in our next regression model, where BC equals to the sum of firm's bank loans to total assets.

In order to test hypothesis 4a and 4b, we use the following models:

$$TC_i = \alpha + \beta_1 Z_i + \beta_2 (VBD \text{ or } TRUST)_i + \beta_3 (VBD \text{ or } TRUST)_t \times Z_i + \beta_4 BC_i$$

$$+ \beta_5 ED_i + \sum_{j=6}^{16} \beta_j \, IND_i + \varepsilon_i \quad （Y=1,\ldots,11; \, k=1,,4） \qquad (8)$$

$$TC_{it} = \alpha + \beta_1 Z_{it} + \beta_2 (NPO \text{ or } DONA)_{it} + \beta_3 (NPO \text{ or } DONA)_t \times Z_{it} + \beta_4 BC_{it}$$

$$+ \beta_5 ED_{it} + \sum_{j=6}^{16} \beta_j \, IND_i + \sum_{j=17}^{20} \beta_j \, YEAR_k + \varepsilon_i \quad （Y=1,\ldots,11; \, k=1,,4） \quad (9)$$

Table 7 shows the regression results. It is worth to note that the coefficients of Z in these four models are significantly negative, quite different from the results in table 5 and table 6. This may indicates that in China the firms with better financial condition prefer bank credit to trade credits. The coefficients of BC in these four models are significantly negative, suggesting the relationship between trade credits and bank credits in China is substitution, not synergy found by Antov (2005) and Alphonse et al. (2004).

In the models using VBD and TRUST, β_2 and β_3 are not statistically significant.

The reason may be these two indexed for social capital have only one year's data. In the model [3] and model [4], however, NPO and DONA have significantly positive effects on trade credits, and the coefficients of the interaction are significantly negative. These results suggest that firms are easier to get trade credits and can obtain trade credits with weaker financial condition in districts with more social capital, supporting our hypothesis 4a and 4b.

[Insert table 6]

6. Conclusions

North (1990) argued that institutions are composed of formal rules, informal constraints and their enforcement characteristics, where informal constraints are made up of conventions, behavioral norms, and self-imposed constraints on conduct. These informal rules were unconsciously developed in the long process of people's contact, have persistent vitality, and have passed from one generation to the next. Social capital, as one typical kind of informal rules, has attracted more and more attention from economist since 1980s. It is not clear, however, that what the role of social capital is and how we should measure social capital. With data from China, this paper analyzes the influence of social capital on firm's debt capacity and structure from a micro-based view. We measure social capital of various districts with three dimensions: the number of social organizations (denoted by per capita NGO), social credit (denoted by TRUST degree), and social involvement (denoted by volunteer blood donation and the money and material donation of civics). Then we construct

models to examine the effect of social capital on firm's capital structure, debt maturity and tangibility of assets needed in debt financing. Our results indicate that it is easier for firms to get debt and long-term debt and firms can obtain debt financing with less tangibility of assets in districts with better-developed social capital in mainland China. And in those districts, the firms are easier to obtain bank credits and trade credits. The paper confirms the economic value of social capital as an informal institution from a micro view.

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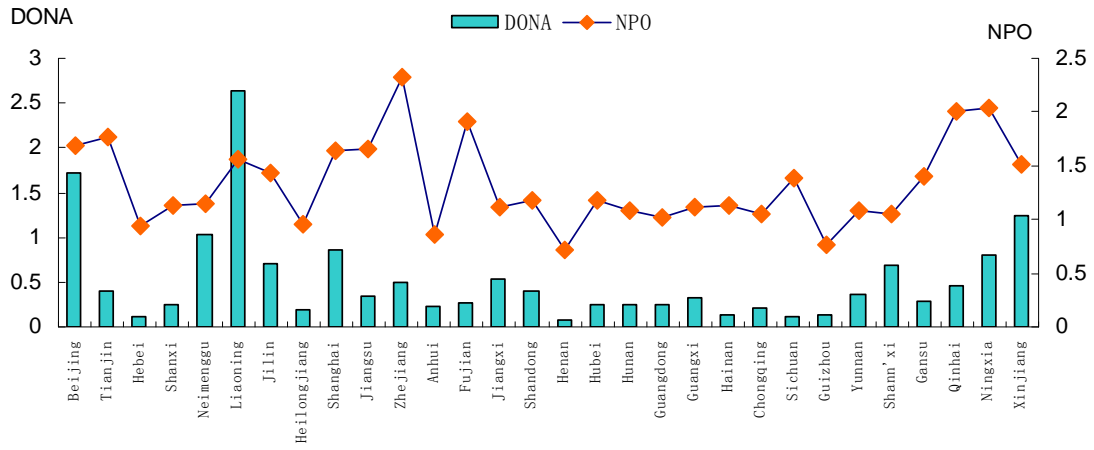
DONA

Figure 1 DONA and NPO in 30 districts during 2002-2006

VBD
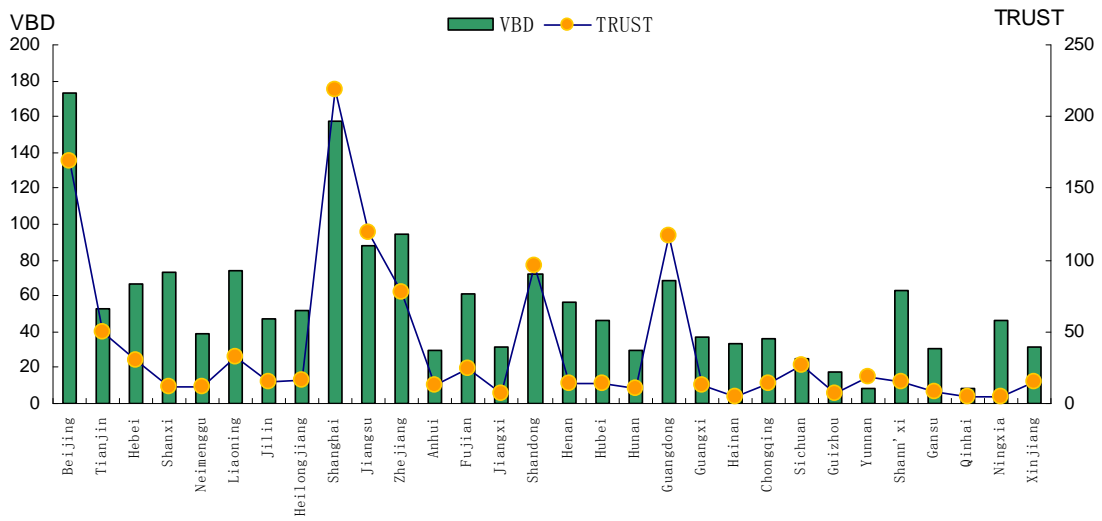
Figure 2 VBD and Trust in 30 districts in 2000

Table 1 Descriptive statistics of four proxy indexes of social capital

	Descriptive Statistics			
	Mean	S.D	Min	Max
NPO（‰）	1.327	0.404	0.715	2.322
DONA	0.526	0.546	0.078	2.640
VBD（‰）	54.975	37.054	7.940	173.310
TRUST	39.320	53.113	4.100	218.900
	Pearson correlation analysis			
	NPO	DONAT	VBD	TRUST
NPO	1			
DONA	0.356* （0.053）	1		
VBD	0.327* （0.078）	0.414** （0.023）	1	
TRUST	0.305* （0.101）	0.263 （0.160）	0.865*** （0.000）	1

Note: NGO is the number of non-governmental organizations per capita in each district; DONA reflects the money and material donation inclination of civics in each district; VBD means the volunteer blood donation rate in each district; and Trust is the trust degree index. The p values of Pearson correlation test are in parentheses.

Table 2 Summary statistics of key liability variables

Definition of variables	Symbol	Mean	Std.	Min	Max
$\dfrac{Debt}{Total\ Assets}$	LEV	0.496	0.185	0.033	0.917
$\dfrac{Long\ Term\ Debt}{Debt}$	MATURITY	0.152	0.165	0	0.955
$\dfrac{Long\ Term\ Bank\ Credit}{Loan\ Term\ Bank\ Loan}$	LBC	0.174	0.329	0	1
$\dfrac{Short\ Term\ Bank\ Credit}{Short\ Term\ Bank\ Loan}$	SBC	0.278	0.364	0	1
$\dfrac{(Accounts\ Payable + Deposit\ \mathrm{Re}\,ceived)}{Total\ Assets}$	TC	0.111	0.088	0.000	0.693

Table 3 Regression results of social capital on leverage

	[1]	[2]	[3]	[4]
constant	-0.200	-0.317	-0.648	-0.132**
	（-0.615）	（-0.826）	（-0.990）	(-2.317)
TANG	0.060	0.003	0.367	0.156
	（0.288）	（0.019）	（0.621）	(1.018)
VBD	0.141			
	（0.894）			
VBD×TANG	-0.145			
	（-0.882）			
TRUST		0.005		
		（1.541）		
TRUST×TANG		-0.005*		
		（-1.697）		
NPO			0.031**	
			（2.186）	
NPO×TANG			-0.003*	
			（-1.668）	
DONA				0.025***
				(2.985)
DONA×TANG				-0.002*
				(-1.732)
SIZE	0.041***	0.042***	0.044***	0.033***
	（3.647）	（3.732）	（3.851）	(12.102)
Growth	0.006	0.005	0.006	0.007
	（1.063）	（0.930）	（1.186）	(1.011)
Profit	-0.314***	-0.316***	-0.332***	-0.243***
	（-7.055）	（-7.112）	（-8.603）	(-5.060)
ED	-0.019	-0.013	-0.017	-0.014
	（-1.032）	（-0.441）	（-0.910）	(-0.706)
Industry dummy	controlled	controlled	controlled	controlled
Year dummy	—	—	controlled	controlled
Number of Observations	847	847	4629	4629
Adjusted R^2	0.207	0.212	0.307	0.358

Note: the t values of coefficients are in parentheses. ***, **, and * mean significant at 1%, 5% and 10% respectively.

The dependent variable is firm's leverage, which equals to the ratio of debt to total assets; NGO is the number of non-governmental organizations per capita in each district; VBD means the volunteer blood donation rate; DONA reflects the money and material donation inclination of civics in each district, and Trust is the trust degree; TANG is the tangibility of assets, calculated by the sum of inventory and fixed assets divided by total assets; SIZE is the natural log of total assets; Growth is the growth rate of sales; Profit is firm's return on equity; and ED means economic development, measured by per capital GDP.

Table 4 Regression results of social capital on debt maturity

	[1]	[2]	[3]	[4]
constant	-0.920**	-1.289***	-0.925*	-0.835***
	（-2.570）	（-3.048）	（1.974）	(4.871)
TANG	0.421*	0.337**	0.387***	0.327***
	（1.742）	（1.926）	（2.374）	(3.102)
VBD	0.281			
	（1.062）			
VBD×TANG	-0.296			
	（-1.145）			
TRUST		0.007		
		（1.357）		
TRUST×TANG		-0.006*		
		（-1.795）		
NPO			4.312*	
			（1.821）	
NPO×TANG			-3.001*	
			（-1.690）	
DONA				0.010**
				(2.037)
DONA×TANG				-0.003**
				(-2.207)
SIZE	0.059***	0.058***	0.024***	0.039***
	（4.722）	（4.725）	（3.721）	(5.297)
Growth	0.005	0.004	0.005	0.007
	（0.854）	（0.651）	（0.974）	(1.215)
Profit	-0.014	-0.011	0.283***	0.227***
	（-0.266）	（-0.218）	（4.203）	(5.637)
ED	-0.063***	-0.064***	-0.023***	-0.016***
	（-3.175）	（3.189）	（-3.248）	(-3.604)
Industry dummy	controlled	controlled	controlled	controlled
Year dummy	—	—	controlled	controlled
Number of Observations	847	847	4629	4629
Adjusted R^2	0.130	0.143	0.147	0.249

Note: the t values of coefficients are in parentheses. ***, **, and * mean significant at 1%, 5% and 10% respectively.

The dependent variable is firm's debt maturity; NGO is the number of non-governmental organizations per capita in each district; VBD means the volunteer blood donation rate; DONA reflects the money and material donation inclination of civics in each district, and Trust is the trust degree; TANG is the tangibility of assets, calculated by the sum of inventory and fixed assets divided by total assets; SIZE is the natural log of total assets; Growth is the growth rate of sales; Profit is firm's return on equity; and ED means economic development, measured by per capital GDP.

Table 5 Regression results of social capital on LBC

	[1]	[2]	[3]	[4]
constant	0.009	-0.021	0.204	0.131***
	(0.133)	(-0.246)	(4.602)	(8.167)
Z	0.053***	0.069**	0.021**	0.017**
	(2.585)	(2.073)	(2.423)	(2.371)
VBD	2.096			
	(1.034)			
VBD× Z	-0.012			
	(-1.459)			
TRUST		0.001		
		(1.515)		
TRUST×Z		0.000		
		(-0.593)		
NPO			0.664**	
			(2.322)	
NPO× Z			-0.091*	
			(-1.664)	
DONA				0.024*
				(1.682)
DONA×Z				-0.015**
				(2.059)
ED	0.467	0.421	0.142	0.088*
	(0.918)	(0.458)	(1.003)	(1.722)
Industry dummy	controlled	controlled	controlled	controlled
Year dummy	—	—	controlled	controlled
Number of Observations	452	452	2514	2524
Adjusted R^2	0.018	0.019	0.019	0.021

Note: the t values of coefficients are in parentheses. ***, **, and * mean significant at 1%, 5% and 10% respectively.

The dependent variable is LBC; NGO is the number of non-governmental organizations per capita in each district; VBD means the volunteer blood donation rate; DONA reflects the money and material donation inclination of civics in each district, and Trust is the trust degree; TANG is the tangibility of assets, calculated by the sum of inventory and fixed assets divided by total assets; SIZE is the natural log of total assets; Growth is the growth rate of sales; Profit is firm's return on equity; and ED means economic development, measured by per capital GDP.

Table 6 Regression results of social capital on SBC

	[1]	[2]	[3]	[4]
constant	0.185***	0.132**	0.165***	0.128***
	(3.660)	(2.310)	(5.266)	(9.457)
Z	0.054***	0.042**	0.080***	0.059***
	(2.825)	(2.214)	(5.472)	(11.273)
VBD	32.604			
	(1.216)			
VBD×Z	-13.359			
	(-1.133)			
TRUST		0.001		
		(0.963)		
TRUST× Z		-0.000		
		(-0.157)		
NPO			0.395*	
			(1.717)	
NPO× Z			-0.152*	
			(-1.605)	
DONA				0.012**
				(1.922)
DONA×Z				-0.006
				(-1.186)
ED	-0.543	-0.765	0.325	0.021***
	(-1.577)	(-0.119)	(1.525)	(4.502)
Industry dummy	controlled	controlled	controlled	controlled
Year dummy	—	—	controlled	controlled
Number of Observations	639	639	3586	3586
Adjusted R^2	0.065	0.034	0.055	0.067

Note: the t values of coefficients are in parentheses. ***, **, and * mean significant at 1%, 5% and 10% respectively.

The dependent variable is firm's SBC; NGO is the number of non-governmental organizations per capita in each district; VBD means the volunteer blood donation rate; DONA reflects the money and material donation inclination of civics in each district, and Trust is the trust degree; TANG is the tangibility of assets, calculated by the sum of inventory and fixed assets divided by total assets; SIZE is the natural log of total assets; Growth is the growth rate of sales; Profit is firm's return on equity; and ED means economic development, measured by per capital GDP.

Table 7 Regression results of social capital on trade credits

	[1]	[2]	[3]	[4]
constant	0.148***	0.158***	0.169***	0.188***
	(5.962)	(5.910)	(14.723)	(43.107)
Z	-0.030***	-0.024***	-0.027***	-0.021***
	(-3.442)	(-2.791)	(-4.995)	(-17.038)
VBD	14.501			
	(1.487)			
VBD×Z	11.181			
	(1.102)			
TRUST		0.002		
		(1.179)		
TRUST×Z		0.000		
		(1.262)		
NPO			0.235***	
			(3.494)	
NPO×Z			0.047*	
			(1.629)	
DONA				0.008***
				(3.779)
DONA×Z				0.004***
				(3.649)
ED	0.0177	-0.026	0.040***	0.007***
	(1.589)	(-1.283)	(2.827)	(9.421)
BC/TA	-0.134***	-0.133***	-0.142***	-0.245***
	(-2.748)	(-2.704)	（-2.910）	(-25.767)
IND	controlled	controlled	controlled	controlled
YEAR	—	—	controlled	controlled
Number of Observations	847	847	4629	4629
Adjusted R^2	0.064	0.052	0.142	0.154

Note: the t values of coefficients are in parentheses. ***, **, and * mean significant at 1%, 5% and 10% respectively.

The dependent variable is firm's trade credits, which equals to the sum of firm's accounts payable and deposit received to total assets; NGO is the number of non-governmental organizations per capita in each district; VBD means the volunteer blood donation rate; DONA reflects the money and material donation inclination of civics in each district, and Trust is the trust degree; TANG is the tangibility of assets, calculated by the sum of inventory and fixed assets divided by total assets; SIZE is the natural log of total assets; Growth is the growth rate of sales; Profit is firm's return on equity; and ED means economic development, measured by per capital GDP.