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The impact of social capital on bank risk-taking

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THE IMPACT OF SOCIAL CAPITAL ON BANK RISK-TAKING

by
XIE Wenjing

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ABSTRACT

The Impact of Social Capital on Bank Risk-Taking

by

Xie Wenjing

Master of Philosophy

The concept of “social capital” has received considerable attention these years. Yet, few studies have explored the connections between social capital and bank risk-taking. In this study, I discuss the theory of social capital and its relevance to financial market behavior, and then I analyze the relationship between social capital and bank risk-taking across countries. To measure social capital, I follow Knack and Keefer (1997) and use the data of trust and civic norms collected from the World Values Survey. My measure of bank risk-taking is the nature logarithm of Z-score of each bank. Empirical results show that bank risk-taking is lower in countries where social capital is higher. It is also shown that the impact of social capital is stronger when the level of education in the country is lower. This paper investigates the negative impact of social capital on non-performing loan as well.

Keywords: social capital; bank risk-taking; trust

DECLARATION

I declare that this is an original work based primarily on my own research, and I warrant that all citations of previous research, published or unpublished, have been duly acknowledged.

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Xie Wenjing

Date:

CERTIFICATE OF APPROVAL OF THESIS

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Chapter 1 Introduction

The financial system of the recipient country plays an important role of its economic growth. Schumpeter recognized the importance of well-developed financial intermediaries on economic development almost a century ago. In a nutshell, the argument goes that well-functioning financial markets, by lowering costs of conducting transactions, ensure capital is allocated to the projects that yield the highest returns, and therefore, enhance growth rates.

From 1980s, there was a profusion of banking crises in a variety of countries. Japan suffered the largest losses at that time, with official estimates putting non-performing loans in 1995 at about $400 billion (unofficial estimates reach $1 trillion, or about 25 percent of GDP)[1]. Argentina in the early 1980s likely saw the largest relative loss (estimated variously at 20-55 percent of GDP). U.S. suffered the collapse of the subprime mortgage market in 2007 and ensuing financial instability. These cases attracted economists to banking insolvency issues. Caprio, Derard, and Klingebiel (1996) analyze the factors that have caused bank insolvency, and how governments have responded. Demirguc-Kunt and Dtragiache (2002) find the relation between the existence of explicit deposit insurance and the likelihood of banking crises. Boyd, DeNicolo, and Loukoianova (2009) study the formulate a theoretical model of a banking industry, and use both country-level and firm-level samples to examine the impacts of macroeconomic factors, market structure, deposit insurance, and external shocks on the likelihood of banking crisis.

A growing literature demonstrates the linkage between the regulatory architecture, political environment and financial market. Kim and Santomero

[1] Data Source: Caprio, G., & Klingebiel, D., 1996. Bank insolvency: bad luck, bad policy, or bad banking? Annual World Bank conference on development economics (Vol. 79). Washington: The World Bank.

(1988) investigate the role of bank capital regulation in risk control using the mean-variance model. LaPorta, Lopez-de-Silanes, Shleifer, and Vishny (1998) examine the link laws governing investor protection, the quality of enforcement of laws, and ownership concentration, with financial market. Laeven and Levine (2009) show that the relation between bank stability and bank regulations on bank activities depends on each bank's ownership concentration. Houston, Lin, Ma (2011) find that strong protection and limited regulation can help attract international bank flow with a sample of international bank flows from 26 source countries to 120 recipient countries over a few decades.

Meanwhile, the concept of "social capital" has received considerable attention these years. There is even a World Bank's workshop – social capital: Integrating the Economist's and the Sociologist's Perspectives held in 1997. Some scholars began to concern the effect of social capital on global economic growth and industry growth. La Porta et al. (1996) document a remarkable correlation between the trust prevailing in a country and the presence of large organizations, and find that trust is lower in countries with dominant hierarchical religions. Knack and Keefer (1997) find trust and civic norms are stronger in the countries with faster economic growth. Guiso, Sapienza, and Zingales (2004) examine the role of social capital in financial development.

More literatures study the effect of the social structure of individuals or small groups on economic outcomes. Besley and Coate (1995) relate social collateral to group lending programs; Hong, Kubik and Stein (2004) study the relationship between social interaction and sock market participation.

Yet, few existing studies have explored the connections between social

capital and banking market, especially for the social capital of the whole community. Zingales et al. (2004), one of few studies that investigate the connection between social capital and financial market, pays more attentions on the households' choice, and the data used are limited in Italy. In my paper, I investigate the relationship between social capital and bank risk-taking. My main motivation is to advance a neglected theoretical position. It is also my main contribution to the literature.

My second motivation of this paper is to test whether social capital at the country level is unambiguously good. Previous studies suggest that the social capital within a small group will bring both benefits and costs to the group and the social capital across groups only have positive effects (Guiso, Sapienza, Zingales, 2004). However, I argue that people may be over confident and make a decision careless because of the high social capital in the whole country, and the ratio of non-performing loan will be higher in high social capital countries.

Since there is no unique definition of social capital, the measures of social capital aren't uniform either. In my research, I mainly study the social connection across at the community level and not in any subgroup. Based on the methodology of Knack and Keefer (1997), I use the response from the World Value Survey in the 2005 wave to capture the level of social capital in a country. Both trust and civic norm are used as the indicators of social capital. Trust is across 51 countries and Civic is across 53 countries.

To examine bank risk-taking, I use the Z-score of each bank, which indicates the probability of bankruptcy and is widely used in the empirical banking literature. Following Laeven and Levine (2009), I use the natural logarithm of the Z-score instead of the raw Z-score, since the raw Z-score is highly skewed

(see, Figure 1). Totally, 2093 banks from 161 countries are included in the sample.

My main finding shows that social capital has positive relationship with bank stability. When the country-level mean of education is low, the effect of trust may be stronger. As my empirical result showing, social capital may increase the percentage of non-perform loan by gross loan as well. It means there are both a “bright” side and a “dark” side to social capital. In high social capital area, banks are farther away from bankruptcy, but they will get more non-performing loan because of the high confidence of the whole society and careless decision. To do the robustness test, I use the subsample which excludes the banks in U.S.A. and the results is similar to the main regression, indicating the both trust and civic norms have positive effects on bank stability.

This paper is organized as follows. Chapter 2 provides the literature review on the factors which may influence bank risk-taking, the theories of social capital, and the measures of bank risk-taking and social capital. Chapter 3 develops the hypotheses about how social capital affects bank risk-taking. Chapter 4 introduces the data source, and summarizes dependent and independent variables. Chapter 5 describes empirical results. Chapter 6 concludes and concerned some further extensions of this study.

Chapter 2 Literature Review

This chapter provides the literature review both on the bank risk-taking and social capital. I show the studies about the impacts of other important variables on bank risk-taking. I discuss the definitions, the measures and the roles of social capital as well. Both these two parts are meaningful to the hypotheses that I present in Chapter 3 and the model that I formulate in Charter 5.

2.1 The Factors Influencing Bank Risk-Taking

Before the nineteenth century, government safety nets were uncommon. However, at the end of the twentieth century government intervention (before and especially after episodes of bank insolvency) has become commonplace, suggesting a belief that bank solvency is important. Economists have also been interested in this issue and tested which factors influence the likelihood of bankruptcy from that time.

According to Boyd, Runkle (1993) and DeNicoló (2000) study that bank size is an important factor which influences bank risk of failure, I include it in my model. These are some different theories about the relationship between bank size and bank risk. Some studies predict that large firms can get size-related diversification benefits, economies of scale and are less likely to fail than smaller ones. However another theory supports that since the large-banks are viewed as more likely to result in macroeconomic externalities, they are more likely to be instable and to fail. Boyd and Runkle (1993) suggest that there is no support for an inverse relationship between bank size and bank stability and prove it with an annual data over 1971-1990 from COMPUSTAT. DeNicoló (2000) also indicates that medium–to–large

banks don't get the benefits above and take higher risk through a sample of publicly traded banks in 21 countries over 1988-1998. Houston, Lin, Lin and Ma (2010) find an inverse U-shape relationship between bank size and risk-taking when they examine the relationship between creditor rights and bank risk-taking. In my paper, my results support the later opinion. Although the coefficients of bank size in my regressions are not all significant, they are all negative, which implying the larger size of banks tends to increase the risk of banks.

Competition is also one of important control variables in my regressions. Like size, economists have different ideas about the relationship between market concentration and bank stability. If banks with greater market power tend to charge higher interest rates to firms to gain more returns, banks may induce firms to assume greater risk and then banks' own risk-taking become higher. To this extent, the concentration is positively associated with banks enjoying greater market power. Jayaratne and Strahan (1996), DeNicoló et al. (2004), Dick (2006) provides some evidence to prove this idea. However, some economists object this idea. Keeley (1990) argues that increases in competition caused bank charter values to decline, to increase banks' asset risk and reduce capital holdings and then increase the probability of bankruptcy. Beck, Demirguc-Kunt, and Levine (2003) have similar result, arguing that the concentration ratio is negatively related with the likelihood of a banking crisis. I use HHI as an index of market concentration, and find the relationship between concentration rate and bank stability is positive but not significant. The result of Boyd, DeNicoló and Jalal (2006) may explain why my result is not significant. They consider there is no empirical evidence to support that concentration ratio is positively associated with banks' probability of failure, and that the relationship between market concentration and bank risk depends on which model the market structure and the way of competition

are similar to. Since I analyze the impact of social capital across different countries, and different banking markets may work as different financial models, the impact of market concentration in my sample may play different role across different countries which leads to the non-significant coefficients.

Besides bank's characteristics and market concentration, national regulation and macro-environment also affect the performance of banks and, of course, affect bank risk-taking as well. It is easy to understand, healthy and stable macroeconomic environment is good for bank to develop, so I conclude macroeconomic factors – inflation and GDP per capita as macro-environment controls. Meanwhile, advanced legal system can limit bank to take too high risk asset and avoid contract violation, efficient social network will help bank to get true information about firms and make a smart decision. According to Calomiris (2008), Maddaloni and Peydro (2010), I include indicator of capital regulation to my model. However, as Kim and Santomero (1988) demonstrate that simple capital regulation isn't effective enough to control the probability of bank insolvency, other regulation controls should be used in reality. I include diversification index, official supervisory power and provisioning stringency to control the impact of nation bank regulation, with the database from Barth, Caprio and Levine (2006), which was also used by Laeven and Levine (2009) and Houston, Lin, Lin and Ma (2010).

Some economists consider that deposit insurance leads to relatively high cost and incentive effects (moral hazard) and increases bank risk-taking. Keeley (1990), Demirguc-Kunt, Dtragiache (2002) and Laeven (2002) support this idea and analyze empirical evidence with panel data. The first deposit insurance system was established in the U.S. in 1934 -- after the Great Depression to protect bank depositors. However, depositors monitor banks to take relatively high risk since they feel safe because of protection of deposit

insurance. The incentive is due to a payoff structure in which large gains go to bank shareholders and large losses to the government. On the other hand, the cost of insuring also gives banks the pressure to increase their risk-taking to pursue high return. And the effect of deposit insurance becomes stronger when bank interest rates have been deregulated and when the institutional environment is weak as a result of limited moral hazard. However, Gorton and Rosen (1995) test the data for large U.S. banks during 1980s and argue that the effect of moral hazard as a result of deposit insurance was not a significant problem, and increase risk slightly. And my empirical results seem to prove the last idea.

2.2 The Measure of Bank Risk-Taking

The literature on bank risk-taking includes different measures of bank risk. For example, Anderson and Fraser (1999) measure the standard deviation of the bank's daily returns and the stock price volatility, Salas and Saurina (2003) use the proportion of loan losses over total loans as an indicator of bank risk, Gonzalez (2005) and Jimenez, Lopez, Saurina (2010) use the ratio of non-performing loans to total bank loans as a measure of bank risk-taking. Since what I am interested in is the risk of bankruptcy, I analyze the effect of social capital on bank risk-taking by using the z-score of each bank, as measured by return on assets plus the capital-asset ratio divided by the standard deviation of asset returns. The Z-score is a measure of bank stability and indicates the likelihood of bank insolvency and has been widely used in the empirical bank risk-taking literature. Boyd, Runkle (1993), DeNicoló (2000), Boyd, DeNicoló, Jalal (2006), Laeven, Levine (2009); Houston, Lin, Lin, Ma (2010) all utilize Z-score as a measure of bank risk.

Based on these studies, I include bank size, too-big-to-fail, loan loss reserves,

market concentration ratio, deposit insurance coverage and national bank regulation as control variables and add another important factor – social capital as the key variable to analyze what will affect the risk of bank. Based on previous researches, I use the nature logarithm of Z-score to test the distance of insolvency of each bank.

2.3 The Concept of Social Capital

Social capital became a hot topic in the end of last century, and a lot of literatures study the function of social capital. Scholars define or follow different concepts of social capital according to the topic or field they want to analyze.

The term of social capital was initially coined in sociology. Jacobs (1961) may be the first one to identify social capital, and he depicts social capital as “neighborhood networks”. Bourdieu (1985) defines social capital as the advantages and opportunities accruing to people through membership in certain communities. Coleman (1990) refers social capital as resource of individuals that emerges from social ties. Burt (2009) defines social capital as “the resources contacts possess and the structure of contacts in a network”.

The concept of social capital has also been adopted and adapted by political scientists and economists. Putnam (1993) says that social capital is “feature life – networks, norms, and trust – that enable participants to act together more effectively to pursue shared objectives”. Both Knack and Keefer (1997) and Guiso, Sapienza and Zingales (2004) espouse this definition in their papers. In their view, social capital has value for the persons, who are in the same community, and both public and private will be influenced by its externalities. In my paper, I also follow Putnam’s definition, and refer social

capital as trust and civic norms that influence citizen's behaviors.

2.4 The Measures of Social Capital

Generally, sociologists mainly study small groups, like families, and firms. Economists study large communities and nations, and focus on the level of social capital across groups, rather than within small groups. Because of the difference on understanding, they usually use different way to measure social capital.

Coleman (1990) uses physical presence of adults, the number of siblings, mother's expectation and the frequency of talking with parents about personal experiences to show the level of social capital in the family, the number of family moves and variation among the schools to show the social capital outside the family to test the effect of social capital on dropping out of school before graduation. Putnam (1995) measures social capital through electoral turnout, newspaper readership, participation in associations, and level of charity. Fukuyama (1995) equates trust with social capital. Knack and Keefer (1997) report an aggregate measure of trust and civic norms by country, derived from the World Values Survey (WVS). Guiso, Sapienza and Zingales (2004) focus on the two measures: voter turnout for referenda and blood donations.

Concerning that what I want to analyze is the impact of social capital on country level, the measures of social capital used by sociologists are not suitable for this research. And voter turnout, blood donations, and newspaper readership may influenced by laws or other requirements, it is difficult to tell the volunteer rate from the all sample.

2.5 The Role of Social Capital

From Banfield's book – "The Moral Basis of a Backward Society", more and more economists recognize that social trust and other social network play an important role on economic performance, which had been ignored for a long time. For sociologists, they are more interested in how social capital affects the performance of a small group, as the drop rate of school, the cooperation in company. Economists are more interested in the role in big groups. Some focus on the effect of social capital on the growth of one industry, some interest in the influence of social capital on the development of economy.

For firms' growth, LaPorta, Lopez-de-Silaries, Shleifer and Vishny (1996) and Fukuyama (1995) present that high level of trust helps increase the probability of becoming a large organization. Trust or social capital can reduce the asymmetry of information, produce socially efficient outcomes and to avoid inefficient non-cooperative traps such as that in the prisoners' dilemma, and then be helpful to cooperation. This impact of social capital not only affects the presence of large company but also affects the safety of a firm, which I want test in this thesis.

For financial market, social capital plays an important role in the degree of financial development. Guiso, Sapienza and Zingales (2004) support this theory by the data across different parts of Italy. In high social capital area, the community's networks provide better opportunity to punish deviants, the moral attitudes of a community is better, and the members of communities are more likely to trust other members to behave obeying the social norms. This indicates that the use and available of financial contracts is positively correlated with social capital. In my paper, I insist the this effect of social capital will influence the stability of bank as well, and as mentioned by Guiso,

Sapienza and Zingales (2004), the effect of social capital is stronger where citizens are averaged low educated.

There are also a lot of researches about the role of social capital in global economy. Social capital may reduce the cost of written contracts substitute missing or expensive legal institutions, which is important for economy developing healthily and stably. Knack and Keefer (1997) find that the global income is higher and more equal in higher level of trust nation with the data from WVS. The correlation exists even after controlling for quality of governance. In my thesis, I add variables of quality of governance as additional control variable in Table 8.

According to previous study, social capital can remarkably facilitate local financial development, encourage households to invest and make firms more likely to have multiple shareholders. What I expect to analyze is the impact of social capital on banks' choice, especially on bank risk-taking. In my thesis, I find that higher social capital would be associated with lower bank risk-taking, higher level of bank stability. Because I am interested in the role of country level social capital rather than the social capital in any other subgroups. I follow Putnam's definition of social capital, and apply trust and norms of civic cooperation to the term of social capital with WVS data as Knack and Keefer do, to test the role social capital on the bank stability. Since the surveys that Knack and Keefer used are relatively outdate, I choose the latest wave – 2005 surveys. The questions about trust and civic cooperation in 2005 surveys are a little different the ones in 1981 surveys and in 1990 surveys, which are cited by Knack and Keefer. The question – "how much do you trust the people you meet for the first time" is used to assess the level of trust. And three of the questions which Knack and Keefer consider as assessments of civic cooperation are used in my paper to create the indicator of civic norms. To

examine whether the effect of social capital is stronger in the area with lower education, the constraint – education is also cited.

In the next chapter I develop the hypotheses, demonstrate the impacts of social capital on bank risk-taking and expect when the effect of social capital is stronger.

Chapter 3 Hypotheses

In the last chapter I reviewed the literature on the bank risk-taking and social capital, provided the background of them, showed different measures of these two items, introduced some factors may influence the bank risk-taking, and pointed the importance of social capital to economy. This chapter I develop the hypotheses on the relationship between social capital and bank risk-taking based on the foundation in Chapter 2.

3.1 Social Capital and Bank Risk-Taking

The main business of a commercial bank is gaining deposit and providing loans. It is something that provides of a sum of money today for a promise to get back money in the future. This exchange is a trust-sensitive transaction and will take place relying on not only the legal enforceability of contracts, but also upon the trust between the borrowers and lenders. Putnam (1993) refers social capital as networks, norms, and trust in one community or nation. Since trust among the members in a community is an important part of social capital in this community, social capital should affect both the behavior of borrowers and the behavior of lenders, as trust do.

Hypothesis 1:

In the country with higher social capital, the probability of insolvency of banks should be lower.

To borrowers, social capital may increase the cost of violation and then reduce the ratio of contract violation, finally reduce the risk of bank. If trust is an equilibrium outcome of a society (see Coleman (1990) and Spagnolo

(1999)), each firm will make its efforts to obey contracts as a result of high cost of violation in high social capital area. In high social capital area, firms operate more relying on social interactions. So when one firm betray its contracts, what it loss is really more than the expense it should pay as the law ruled. On the other hand, if trust is a moral attitude (see Banfield (1958)), each firm will limit its behavior as a result of its staff's moral attitude. In high social capital country, CEO, managers of a firm are educated to keep their promise, and behaving as moral norms has a larger coefficient in their utility function so banks are facing less risk of violation of contract.

To lenders, social capital may reduce the cost of financial contracts, improve the efficiency of cooperate which may increase banks' profit, help banks to go over the troubles and avoid bankruptcy. When the social capital in a group is high enough, written contracts may become relatively unimportant and inessential. High social capital will reduce the cost of employing lawyers and the time paying on understanding complex contracts. As the example showed in Guiso, Sapienza and Zingales (2004), Jewish diamond merchants in New York do their business without written contracts as a result of the extremely high social capital in their community. In financial industry, labor cost and cost of time are so high. If a bank can save labor and time from the establishing contracts, it could reduce its interest rate, which will reduce the risk of firms, and then reduce its own risk. Since high levels of social capital are associated with high levels of social interaction and high social cooperation induces people less selfish, more public – spirited, and lower levels of economic instability by repeated interaction (Rodrik, 2000), the cooperation inside banks and among banks and firms will be more efficient and the profit should be higher in the higher social capital area, which reduce the probability of insolvency.

Meanwhile, Houston, Lin, Lin and Ma (2010) claim that information sharing can increase bank profitability and the growth of economy, and reduce bank risk-taking. And social capital may increase the quantity and quality of information, which help banks to analyze the performance of firms and solve information asymmetry problem. In the areas with high levels of social interaction, information circulates more frequently, reducing the asymmetry of information among financial markets. In Lin (1999), social ties can provide useful information about opportunities and choices in the usual imperfect market situations. High social capital helps managers of banks to make right decisions and know the firms better. In low social capital country, the risk of bank should be higher than the one in high social capital country.

Hypothesis 2:

The percentage of non-performing loans divided by gross loans is higher if there is more social capital.

Except the role of social capital on the distance of bank insolvency listed above, some negative effects of social capital on the behavior of lenders may exist as well.

When the managers of banks make decision about providing loans, they may be over confident in their partners and decide careless as a result of high social capital. In high social capital area, banks are always facing the firms which obey the contracts. This recognition may influence the judgment of a bank and let mangers of banks classify poor performance assets to normal or good assets. Meanwhile, as Banfield's (1958) and Fukuyama's (1995) claim, in the low social capital areas, transactions take place more within narrow subgroups such as families and friends who they know better. For banks, they

may only provide loans to the firms they have already operated with, and know the performance of firms well through some private channels. Banks will reduce the non-performing loan ratio because of this careful and narrow choice in these low social capital areas.

Although the ratio of non-performing loan is one of the indicators of bank risk, it is still theoretically possible that lower probability of insolvency and higher ratio of non-performing loan exist simultaneously if the bank earns extra profits from the performing loans and/or other invest products that are more than to offset the losses caused by non-performing loans. In addition, banks still get benefits from high social capital, by reducing costs, improving the efficiency of cooperation and solving information asymmetry issue, the probability of insolvency should be lower in high social capital area, which is consistent with hypothesis 1.

To conclude, the likelihood of insolvency of a bank may decline because of high social capital by low cost of contracts, efficient cooperation, high information circulation, but the effect of social capital on non-performing loan ratio may be negative.

3.2 When Does Social Capital Matter More?

So far I have implicitly assumed that the social capital is important in bank risk-taking. The importance of social capital may be different across different countries. The role of social capital of shareholders' countries is what I am interested in as well.

Hypothesis 3:

In the countries with a low averaged education, the impacts of trust and civic norms on bank risk-taking are stronger.

Guiso, Sapienza and Zingales (2004) show the effect of social capital on the financial development is stronger where among less-education people. As their claim, it is impossible for the persons with less-education to fully grasp all the details of the contract involved, and it is hard for them to discriminate between legitimate investments and frauds. Of course, it is also difficult for persons with less-education to analyze the risk of assets. No matter for banks or for firms, risk control will become more rely on the social capital rather than technical analysis or sophisticated regulation. The impact of social capital, especially for the impact of trust, should be stronger where the country level education is lower.

Hypothesis 4:

The impact of social capital from the shareholders' country is much lower than the impact of social capital from registration country.

The level of social capital of the area in which one person lives, regardless of the one in which he was born influences his behavior (e.g. Guiso, Sapienza and Zingales (2004)). Coleman (1990) considers trust as an equilibrium outcome of a society, each individual choose obey his promise or not depends on the punishment if he betray what he should do. Since the punishment he will face is driven by the level of social interactions where he lives, managers and CEOs of firm behave reflecting the level of social capital in where the firms are located rather than the one in where they were from or the shareholders were from. As Banfield (1958) points that trust is a moral attitude imprinted with education, the level of social capital of the place where an

individual grew up will affect him more than the level of social capital of the province of birth will. Firms' and banks' behaviors reflect their staff's moral attitude. Although bank shareholders' moral attitudes also influence the behaviors of a bank, the impact should be indirectly and less strong as the impact of majority of staff.

All in all, banks tend to take less risk when there is more social capital. And the importance of social capital on bank risk-taking may be larger in areas where among less-educated people. Rather than the social capital in which the shareholders are from, the level of social capital in which the bank is located play an important role in bank risk-taking.

3.3 Other important constrains and bank risk-taking

According to the previous studies, banks are facing many important constraints suck as bank size, market competition and regulation. All of these constraints will influence their behaviors and lead to high or low level of risk.

For a large bank, it may increase its interest rate to gain more return to maintain its operation. The high interest rate increases the risk of the firms getting loans from these banks. And large banks are easier influenced by macroeconomics. All in all, large bank tends to have higher risk. However, according to Houston, Lin, Lin, Ma (2010), the relationship between bank size and risk-taking may be non-linear.

As argued by Keeley (1990) and Beck, Demirguc-Kunt, and Levine (2003), bank may take more risk when the market competition is more fierce, since competition increase the pressure to get more market power and then take higher risk asset and reduce capital holdings. However, the impact of market

concentration may be not same in different markets pointed by Boyd, and DeNicoló (2006). It is not easy to present a hypothesis about market concentration.

Generally saying, national bank regulations will limit the risk-taking of each bank, and reduce the probability of crisis. But the roles of bank regulations are also influenced by other bank characteristics or are not effective enough sometimes (Laeven and Levine (2009), Kim and Santomero (1988)).

And the role of deposit insurance is also complicated, it should be safety net of bank crisis as the motivation of the establishment of it, but it may be bad factor to bank safety as a result of moral hazard mentioned by Keeley (1990), Demirguc-Kunt, Dtragiache (2002) and Laeven (2002).

In Chapter 4, I will describe the data source, dependent variables, key control variables, and also other control variables.

Chapter 4 Data and Variables

In the last chapter I developed the hypotheses on the relation between bank risk-taking and social capital, the impact of social capital on non-performing loans, when the effects of social capital are stronger and whether the social capital of the shareholders' country is important as well. In this chapter, I will describe the data sources, dependent variables and the control variables.

4.1 Data Sources

The data used in this thesis are compiled from three main sources:

(1) Bank-level accounting information for about 2000 banks is obtained from the BankScope database provided by Bureau van Dijk and Fitch Ratings. The BankScope database has comprehensive coverage in most countries, accounting for over 90% of all banking assets in each country. Every bank report includes detailed spreadsheet data -- a balance sheet and income statement totaling up to 200 data items and 36 pre-calculated financial ratios up to 16 years. It also contains ownership information (shareholders and subsidiaries). In my paper, I use the data from 1999 to 2006;

(2) The World Value Survey (WVS) is a worldwide network of social scientists studying changing values and their impact on social and political life. The WVS is a worldwide investigation of sociocultural and political change, and conducted by a network of social scientist at leading universities all around world. It has executed five waves of surveys, from 1981 to 2007. I use the last wave: 2005. 73322 observations about trust in 2005 from 51 countries and 75766 observations about civic norms in 2005 from 53 countries can be obtained.

(3) The Barth, Caprio, and Levine (2006) data indicate that restrictions on the entry of new banks, government ownership of banks, and restrictions on bank activities hurt banking system performance. The database is based on a world bank survey in 152 countries over 1999-2007. Country-level bank regulation variables are compiled from it.

In addition to the three databases above, other data sources as following are relied on in my study as well. They supply the data for one or two control variables in my model.

To control macroeconomic environment, variables, such as logarithm of GDP per capita, logarithm of GDP and inflation rate are included. These data is obtained from the World Development Indicator (WDI). The primary World Bank collection of development indicators, compiled from officially-recognized international sources. It presents the most current and accurate global development data available, and includes national, regional and global estimates.

The deposit insurance coverage data, one of country-level control variables, across 89 countries over the time period 1960-2004 are obtained from the comprehensive deposit insurance database edited by Demirguc-Kunt, Kane, and Laeven (2008).

When I examine the regressions with additional control variables, I use the worldwide governace indicators (WGI) from Kaufmann, Karray and Mastuzzi (2009). It is a database about the quality of governance across about 200 countries[2].

[2] Daniel Kaufmann, Aart Kraay and Massimo Mastruzzi (2009). "The Worldwide Governance Indicators : A Summary of Methodology. The data is also available at www.govindicators.org.

Table 1 shows the summary statistics for all of the key variables. The definitions of variables are listed in Table A.

The correlation matrix in Table 1b and Table 1c show that banks take less risk when trust and/ or civic norms are higher. These two tables show that Z-score and national regulation of provisioning are positively correlated with a statistically significant, while the positive correlation between Z-score and log GDP per capita is also statistically significant.

4.2 Dependent Variable – bank risk-taking

I measure bank risk-taking using the Z-score of each bank, as measured by return on assets (ROA) plus the capital-asset ratio (CAR) divided by the standard deviation of asset returns (σ(ROA)). The z-score is a measure of bank stability and indicates the distance from insolvency and has been widely used in the empirical banking and finance literature after Roy's study in 1952. The definition of a bank Insolvency is when losses surmount equity. The probability of insolvency, therefore, can be expressed as prob (-ROA<CAR), where ROA is the return on assets and CAR is the capital assets ratio. If profits are normally distributed, then the inverse of the probability of insolvency equals (ROA+CAR)/σ(ROA), where σ(ROA) is the standard deviation of ROA (Laeven, Levine，2009). Z-score is monotonically associated with a bank's stability, and a higher Z-score means the bank is more stable. Since the Z-score is highly skewed, I use the natural logarithm of the Z-score as the risk indicator. For brevity, I use the label "Z-score" in referring to the natural logarithm of the Z-score in the remainder of this thesis.

The main sample is a cross-country data for one period, around 2005, and is composed of 2,093 commercial banks across 161 countries over the period

from 2004 to 2006 from the BankScope database. The ROA and CAR are therefore calculated as the mean over 2004 – 2006, and σ(ROA) is the standard deviation of ROA estimated over the time periods 2004 – 2006. The mean of Z-score is 3.647, the minimum is -2.806 and the maximum is 9.636. The standard deviation is 1.324. These summary statistics are similar to those reported by Houston, Lin, Lin, Ma (2010); in looking at a longer period sample (average over 2000 –2007), they report a mean Z-score of 3.240 and a standard deviation of 1.086. As they indicate the fairly high standard deviation and the wide range in Z-score imply that there is considerable cross—sectional variation in the level of bank risk.

4.3 Independent Variable – social capital

As I have mentioned, the indicator I use is the responses to the question about trust from the World Value Survey (WVS). The question used for Trust in 2005 survey is: how much do you trust the people you meet for the first time. Let the level – “trust completely” equals to 1, “somewhat” equals to 0.67, “not very much” equals to 0.33, and “not trust at all” equals to 0. The trust indicator is the average score of respondents in each nation (after deleting no responses). 73322 observations from 51 countries can be obtained. Since Inglehart (1994) argue that some groups, such as city—dwellers and the better—educated are oversampled in some countries, I follow Knack and Keefer (1997) using the weight variable provided in the data in computing country—level means. Then the trust indicator of 2005 covering 51 countries can be obtained, with a mean of 0.394 and a standard deviation of 0.064. Larger values indicate higher level of trust.

To create the indicator of civic norms, the question about whether each of the following behaviors “can always be justified, never be justified or something in

between" is used.[3]

1) "claiming government benefits which you are not entitled to"

2) "avoiding a fare on public transport"

3) "cheating on taxes if you have the chance"

Respondents chose a number from 1 (never justifiable) to 10 (always justifiable). To let the values positively related with civic cooperation, these scales are reversed and summed over the three items to create an index – Civic with a 30-point maximum. Of course, the weight variable is also used as Trust. Then Civic cover 53 countries, with a mean of 24.070 and a standard deviation of 1.219. Larger values indicate higher level of social capital.

Knack and Keefer (1997) indicate that nonrandom samples, translation problems, and discrepancies between professed attitudes and actual behaviors do not introduce severe noise into this measure of trust by testing the correlation between this trust indicator with the result of other famous experiments conducted by the Reader's Digest (as reported in The Economist, June 22, 1996). Some wallets containing some cash and the addresses and phone numbers of their "owner" were "accidentally" dropped in twenty cities from fourteen different western European countries and twelve U.S. cities. The percentage of wallets returned with their contents intact in each country is highly correlated with "Trust" at 0.67. This evidence indicates these survey-based measures of social capital are reasonable.

[3] In Knack and Keefer's work, other two behaviors: "keeping money that you have found" and "failing to report damage you've done accidentally to a parked vehicle" are also consider to assess the strength of norms of civic cooperation. Since these two behaviors are not included in 2005 surveys, they are not used in this thesis either.

And Knack and Keefer (1997) also argue that the relatively low correlation with trust in family members show that trust in a country is primarily capturing “generalized” trust as opposed to “specific” trust placed in people one has close and frequent interactions with, like relatives and friends. What I want analyze is the effect of country-level social capital but not the trust within a subgroup, so I choose the question about the trust to the person meet first time rather than to the family or friend to create the indicator of generalized trust.

I find that the standard deviation of Civic is relatively lower, compared with the one of Trust. The reason may be that respondents are more likely to be reluctant to admit the behaviors as cheating the government, taxpayers and avoiding the fare on public transport so that the variation across countries becomes low. This problem may introduce measurement error into Civic, so I use Trust as primary indicator but report results using both measures.

Using 2005’s data have two advantages. First, the data of 2005 shows the extent of trust more precisely since the answer contains four different level of trust instead of two. Second, the 2005 data is much more updated and across more countries than previous data which are usually used by previous literature. On the other hand, data from BankScope just cover the period over 1997 to 2013, and substantial data of return on asset are missing in the early year which limits the sample of banks. Meanwhile, I cannot assume trust and civic norms of all countries are consistent especially after big events like financial crisis in 1997, Iraq War in 2003. So I just test the data around 2005 and do not test any panel regression.

4.4 Other Country-level Control Variables

Besides social capital, a large number of country characteristics play a role on bank risk-taking. This paper controls for banking national regulation, market concentration, and macro-environment.

As measures of banking regulation, I examine Capital regulatory index, Diversification index, Official supervisory power, Provisioning stringency, and Deposit insurance coverage. The first five variables are from the banking regulation database compiled by Barth, Caprio, and Levine (2006). The last one is obtained from Demirguc – Kunt, Kane, and Laeven (2008).

Capital regulatory index is an index of regulatory oversight of bank capital. This measure takes into account whether the minimum required capital-to-asset ratio conform to the Basle guidelines; whether the minimum ratio vary with market risk; whether the market value of loan losses deducted from reported accounting capital; whether unrealized losses in the securities portfolio and unrealized foreign exchange losses deducted from reported accounting capital; whether initial and subsequent infusions of regulatory capital include assets other than cash or government securities; whether the initial infusion of capital be based on borrowed funds; and whether the sources of funds that count as regulatory capital verified by the regulatory or supervisory authorities. It is range from 3 to 10, and its mean is 6.144. Higher values indicate greater stringency.

Diversification index includes the information on whether explicit, verifiable, and quantifiable guidelines for asset diversification; whether banks prohibited from making loans abroad; and whether a minimum liquidity requirement exists. The mean of diversification index is 1.778, and the standard deviation is 0.432, with the range from 0 to 2. A higher value indicates greater liquidity and more bank asset diversification.

Official supervisory Power is an index showing whether the supervisory authorities have the authority to take specific actions to prevent and correct problems. This variable is based upon yes or no responses to 16 questions, including: whether supervisors meet with any external auditors to discuss their reports without bank approval; whether auditors are legally required to report any misconduct by managers or directors to the supervisory authorities; whether the supervisory authorities have the right to take legal action against external auditors for negligence, or force a bank to change its internal organizational structure and order a bank's directors / mangers to provide provisions to cover actual or potential losses; whether the deposit insurance agency can take legal action against bank directors or officers; whether off-balance sheet items are disclosed to the supervisory authorities; whether failure to abide by a cease-desist type order lead to the automatic imposition of civil and penal sanctions on the directors and managers of a bank; whether the supervisory authorities can suspend the directors' decision to distribute dividends, bonuses, or management fees; whether the supervisory authorities can supercede shareholder rights and declare a bank insolvent; whether the supervisory authorities can suspend some or all ownership rights of a problem bank; regarding bank restructuring and reorganization, whether the supervisory authorities can supercede shareholder rights, remove and replace management, or remove and replace directors. A higher value indicates more power. It is range from 4 to 14, with the mean of 12.158 and the standard deviation of 1.788.

Provisioning stringency measures the sum of the minimum required provisioning percentages when a loan is successively classified as sub-standard, doubtful, and loss, with higher values indicating more stringency. The mean is 168.515, and the standard deviation is 23.996.

Deposit insurance coverage is the ratio of deposit insurance coverage to deposits per capita. Data are obtained from the comprehensive deposit insurance database edited by Demirguc-Kunt, Kane, and Laeven (2008). The mean of deposit insurance coverage is 3.359 across 76 countries. The standard deviation is 23.544.

Regarding the banking market concentration, I examine Herfindahl-Hirschman Index, using the CR4 as a robust test during the analysis of the relationship between social capital and non-performing loan.

The Herfindahl-Hirschman Index (HHI) is the sum of the squared shares of bank deposits to total deposits within a given country. CR4 is equal to the sum of the deposits of the four largest banks to total deposits within a given country. I calculated these two variables from the BankScope database and averaged over 2004 – 2006. Higher values indicate higher concentration and lower level competition.

I also test other country – level data as macro-environment control variables: the natural logarithm of gross domestic product (GDP) per capita and inflation rate (GDP deflator). All these data are from the WDI, and averaged from 2004 to 2006. Inflation is obtained with a mean of 5.118 across 172 countries, and Log GDP per capita is obtained with a mean of 10.026 across 172 countries.

In Table 8, I use some governance indicators as additional controls, such as political stability, quality of regulation, control of corruption as well. Political stability measures the perceptions of the likelihood that the government will be destabilized or overthrown. Quality of regulation measures the ability of the government to formulate and implement sound policies and regulations. Control of corruption measures the extent to which public power is exercised

for private gain and private interests. The value of year 2005 is used in this thesis. Higher value indicates better governance performance.

4.5 Other Bank-level control variables

I also control for several bank – level variables: bank size, too-big-to-fail, and loan loss reserve. Bank size is the logarithm of total bank assets in US dollars, averaged over the period 2004 – 2006. Too-big-to-fail is a dummy variable that equals one if the bank's share in the country's total deposits exceeds 10%, averaged over the period 2004 – 2006. Loan loss reserve is the percentage of loan loss reserves divided by total loans, averaged over the period 2004 – 2006.

This chapter provides the data sources, describes the summary statistics of the data, and shows the measures of independent variables and control variables. The next chapter will present the model and report the empirical results.

Chapter 5 Empirical Analysis

In last chapter, I summarized the data sources, definitions and measures of bank risk-taking, social capital, and other control variables. In this chapter, I describe econometric methodology, test the hypotheses mentioned in the Chapter 3 and explain the regression results.

5.1 Main Model

My mainly regression model is expressed as follows:

$$Z_{ij} = \alpha+\beta_1 X_{1j}+\beta_2 X_{2ij}+\beta_3 X_{3j}+\varepsilon_{ij}$$

where the i and j subscripts indicate bank and country respectively. Z_{ij} is log Z-score; α is a constant; ε_{ij} is the random disturbance term; X_1 refers to the key variable: Trust or Civic. X_2 is a vector of bank level control variables, including bank size, too-big-to-fail, the rate of loan loss reserves; and X_2 is a vector of country level control variables, including market concentration, inflation, log GDP per capita, deposit insurance coverage, and bank national regulations – diversification index, capital regulation, official supervisory power, and provisioning stringency.

Table 2a and Table 2b present the result of the relation between social capital and bank risk-taking. The sample contains about 2000 banks across almost 20 countries. Key variables: trust and civic are from 2005 surveys of WVS. Dependent variable – Z-score and other control variables are from BankScope averaged over 2004-2006. Totally, I have four model specifications in Table 2. Model 1 is a simple OLS regression between bank risk-taking and social capital without putting any control variables. In Model 2,

3 and 4, I include groups of bank-level, industry-level and country-level control variables one by one. No matter which model specification I consider, the main results remain unchanged. In Table 2a, I can observe that there is a positive significant impact from Trust on the degree of bank risk-taking. Moreover, the results hold even when we replace Trust by Civic to represent the social capital (see Table 2b). However, the impact of Civic on the degree of bank risk-taking is relatively small in comparison with that of Trust, which may be due to the problem of calculation procedure. In sum, our empirical results fulfill our hypothesis in Chapter 3: the social capital can exert a positive and significant effect on the distance of bank insolvency. Since social capital may reduce the rate of violation of contracts, low the cost of financial contracts, increase the quantity and quality of information, and improve the efficiency of cooperate.

Banking crisis occurs when a large number of bank clienteles withdraw their deposits. The reason may be due to the strong belief that the bank might fail and become bankrupt. Based on our empirical results, we show that social capital could improve the degree of bank risk-taking, which means it improves the degree of safety of banks. Thus, countries with higher social capital would have the lower probability to witness a banking crisis. The high degrees of interpersonal trust would decrease the probability of withdraw from banks and finally decrease the probability of banking crisis. This reasoning may provide some implications for government and policy makers. To avoid the danger of banking crisis, it is better to improve the degree of social capital in the country, for example, construct a firm interpersonal network of people.

Examining the coefficients on the various control variables, I find some additional results. Consistent with DeNicoló (2000), I find that bank size tends to lead to higher bank risk-taking no matter whether market concentration and

country level control variables are included in the model not. Meanwhile, more stringent minimum requirement about provisioning percentages is correlated with lower risk-taking. As might be expected, macro-environment variables have a significant and positive effect on bank stability. Banks tends to take lower risk in one country with higher GDP per capita. Both in Table 2a and Table 2b, the coefficients of market concentration index (HHI) not significant no matter whether country-level control variables are included. It implies the competition among the banks may not influence bank risk-taking significantly. As Boyd and DeNicoló (2006) argue, the impacts of market concentration are not always consistent.

5.2 Subsample analysis: excluding banks in the United States

Since the results may be heavily influenced by some large banks in a few key countries, subsample robustness test and weighted OLS regression are necessary.

Firstly, concerning that the number of banks in the United States in the sample is the largest, I re-estimate the regressions after eliminating the data of banks in US as Houston, Lin, Lin, Ma (2010) do. Table 3a and Table 3b show the results of the impacts of trust and civic norms on bank risk-taking excluding banks in US respectively. As the main regressions, I include the different level control variables one by one.

Consistent with the main regression, the impacts of trust and civic norms on bank risk-taking are significantly negative even after eliminating the banks in the United States. Higher trust or civic norms tend to low bank risk-taking. Larger bank size is correlated with higher risk-taking. And bank regulation indicator – provisioning stringency tends to limit bank risk-taking.

From the coefficients in Table 3a and Table 3b, I find another interesting result. After controlling all variables, I find that both the coefficients of trust and civic norms in Table 3 are larger than the ones in Table 2. It implies that the roles of trust and civic norms may not play well in US as in other countries. It seems that bankers in the United States should be more serious when they try to analyze the probability of bankruptcy or do other decisions. The expected "dark" side to social capital may be stronger in US.

Secondly, I re-estimated the regressions weighted by total bank assets. To double robustness check, I also examine the results using the indicators of trust and civic norms without weighted by the Weight variable provided by WVS. No matter how I change the weight, the coefficients of Trust and Civic are still significantly negative. In fact, the key coefficients in robustness check are even higher, and more significant. The coefficients of trust in the weighted OLS regression are even statistically different from zero at the 1% level. The coefficients of other variables – log GDP per capita and provisioning stringency remain similar to the main regressions.

These results of robustness checks show that my conclusion about the relationship between social capital and bank risk-taking are reasonable and not driven by some large banks from a few key countries like the United States.

5.3 Impact of Education

According to Guiso, Sapienza and Zingales (2004), the effect of trust should be stronger among the persons with low level of education. In Table 4, I re-estimate the basic regression, using the sample of countries with relatively low education (education level in one country below the mean). To assess the

country level of education, the question “what is the highest educational level that you have attained?” is used. The answer should be chosen from the follow items:

1) No formal education

2) Incomplete primary school

3) Complete primary school

4) Incomplete secondary school: technical/vocational type

5) Complete secondary school: technical/vocational type

6) Incomplete secondary school: university-preparatory type

7) Complete secondary school: university-preparatory type

8) Some university-level education, without degree

9) University-level education, with degree

After marking these responses from 1 to 9, I create an indicator of education as the country mean of the values. The mean value for education is 5.838867, and the standard deviation is 0.7620957. The indicator – Education cover 55 countries. I also re-examine the indicators – Trust without weight variable provided by WVS as a robustness check.

It is easy to conclude that the impact of trust is stronger when citizens in one

country have a low average education. If we check the coefficients in detail, we will find that the coefficients of almost all other control variables except HHI and diversification index become less significant while the coefficient of trust become more significant. And the coefficients of control variables – bank size, too big to fail, inflation, log GDP per capita, official supervisory power, provisioning stringency are smaller than the ones in main regression. Consistent with the expectation, when the country level education is low, banks behave more according to the social interaction rather than technical analysis.

However, many scholars consider that trust is highly correlated with education (e.g. Coleman(1990), Helliwell and Putnam (1999)). In the countries with low education, the situations should be much worse than those in the countries with median or high education, since the level of trust is lower and the negative of low trust is stronger simultaneously. It implies that both the increase of the degree of social capital and the uplift of the education level are important for bank stability.

5.4 social capital and non-performing loan

As I mentioned in the Chapter 3, social capital can be both a “good” and a “bad”, especially for trust. For the firms and consumers, they may try more to obey the contracts because of their moral attitude or the close interaction with banks, which are part of elements of social capital. However, for the bankers, they may be over confident to receive the returns of loans and make a decision carelessly since they trust others. Moreover, there may be a moral hazard that some bad – performing firms perhaps take advantage of the trust within one country to get loans from banks and escape their duty when they need return money to the banks. To prove my hypotheses about the “dark”

side of trust, I estimate the effects of trust and civic norms on the percentage of non-preforming loans divided by total loans (NPL). To double confirm the bad impact of social capital, I replace HHI with CR4, another index of market concentration, as a robustness check.

From Table 5, I conclude that trust has a significantly positive relationship with NPL. After replace HHI with CR4, the coefficient of trust is still positive and significant. Both the coefficients of Trust controlled by HHI and CR4 are statistically different from zero at either the 1%.

Furthermore, the coefficients of Civic seem to be more relatively small compared by the coefficient of Trust[4] and not so significant. Consistent with my hypotheses, the bad effect of social capital influence the bank risk-taking mainly through trust. I cannot reject the hypothesis that civic norms haven't an effect on non-performing loan. Although I can't conclude that NPL are absolutely independent on civic norms since the t-values of Civic are not too small and the regressions may be influenced by the sample error I have mentioned in the Chapter 4, I expect that the role of civic norms on NPL is not important as the role of trust, or that civic norms may really do not affect NPL. Moreover, I find that the high level diversification of each bank can reduce NPL. Since diversification index is an indicator showing whether there are explicit, verifiable, quantifiable guidelines for asset diversification and banks are allowed to make loans abroad, it implies that diversifying assets and making loans abroad may reduce the rate of NPL.

5.5 social capital of shareholders country

[4] In the model 4 of main regressions, the coefficient of Trust is 3.527 and the coefficient of Civic is 0.105 (about 2.98% of 3.527). In the table 5, the coefficient of Trust control by HHI is 22.06 and the coefficient of Civic is 0.0427 (about 1.94%); the coefficient of Civic control by CR4 is about 1.36% of the coefficient of Trust, which is much less than 2.98%.

To test the hypothesis that bank risk-taking is mainly affected by the social capital of the registration country rather than of the country where the shareholders are from, I replace the social capital of the biggest shareholder's nation to the social capital of the registration country.

I obtain the information about shareholder from BandScope database. Totally 1831 banks information about their biggest shareholder's country is obtained. I re-estimated regressions and present the results in Table 6. The coefficients of trust and civic norms are much smaller than the ones of model 4 in main regressions. And the coefficients are even not significant any more, which prove my hypothesis 4. It shows that the social capital of shareholders' country don't affect the behaviors of banks significantly. That means that banks won't be safer or more dangerous just as a result of changing the biggest shareholder regardless of other environmental and individual characteristics.

To further robustness check my results, I replace bank size with bank size squared concerning previous literature show the impact of bank size may be nonlinear. All results are presented in Table 7. Model 1 to model 4 in Table 7 show the coefficients of Trust and Civic is still significantly positive even concerning nonlinear problem of bank size. Model 5 and model 6 in Table 7 suggest that the impact of trust is stronger among low educated people even after concerning the possibility that the impact of bank size on bank risk in nonlinear. Model 7 to model 10 in Table 7 document that social capital may increase the percentage of NPL while it reduces the probability of bankruptcy, and that the negative impact of social capital works mainly through trust rather than civic norms.

I also add some governance indicators as additional controls (see Table 8),

and the coefficients of trust are still significantly positive and even larger than the ones in the Table 2. It suggests that good performance of governance cannot replace the role of trust in bank risk taking. Higher level of trust is correlated with lower risk-taking. However, civic norms may be different from trust. The coefficients of civic norms are smaller than the ones in the Table 2 and become insignificant. There are some possible conditions: first, the coefficients of Civic are BLUE (best linear unbiased estimates). It means that civic norms do not play a role on bank risk taking and governance indicators should be included in the OLS regressions. Second, the impact of civic norms on bank risk taking can be replaced or influenced by governance performance, and Civic and governance indicators should not be included in the model at the same time. Third, the coefficients show insignificant just because of sample error I mentioned in the Chapter 4. In the countries with better performance of governance, people may be more willing to deny their immoral value orientation, which may lead the variance of the indicator of civic norms to become small and the coefficients of Civic to be not BLUE. Since lack of further evidence, it is hard to conclude the impact of civic norms on bank risk-taking after control governance performance.

This chapter presents the main model and reports the empirical results. Next chapter will conclude this thesis and describe the limitations of this thesis.

Chapter 6 Conclusion

This thesis analyzes the impact of social capital on bank risk-taking. By using the indicators of trust and civic norms from the data of WVS, I find that social capital has a positive impact on bank stability. And the coefficients of trust and civic norms are always significant after eliminating key country – US, weighted by gross assets or add some additional controls. The findings suggest that social capital tends to reduce the probability of bank insolvency and to increase the stability of banking industry. And the findings about the relation between bank size and bank risk are consistent with DeNicoló (2000), which presents that large banks don't get size-related diversification benefits or economies of scale and take higher risk.

I also find that social capital has a "dark" side as well. It tends to increase the percentage of NPL. The coefficient of Trust is still significant even when I replace CR4 to HHI as a robustness check. The findings about the relation between social capital and NPL also suggest that the "dark" side of social capital takes effect mainly by trust but not civic norms.

Thirdly, the results of empirical analysis show that the impact of trust on bank risk-taking is stronger when the citizens have an averaged low level of education. This finding is consistent with the theory that people's decisions and behaviors more rely on trust rather than technical analysis or sophisticated regulation when they aren't high-educated (Guiso, Sapienza and Zingales (2004)).

At last, I examine the relation between social capital of each bank's largest shareholder's country and the risk of this bank. According to the definitions of social capital in Coleman (1990) and Banfield (1958), I predict that the social

capital of bank's shareholders' country is not important as the one of registration country. The empirical results in this thesis prove my prediction as well.

My findings may provide some implications for government, policy makers and bank managers. For government and policy makers, it is better to improve the level of domestic social capital, especially when the averaged level of education in the country is low. For bank managers, they had better remind themselves to avoid careless decision or overconfidence as result of the high level of social capital in the country from time to time.

Of course, there are some limitations in my research. People's trust may be the result not only of the social capital present in their community, but also of prompt law enforcement. Using trust as the main indicator of social capital may be objected. That is one of the reason that Guiso, Sapienza and Zingales (2004) focus on other two measures: voter turnout for referenda and blood donations. However, this two measures are not suitable for cross-country test.

Meanwhile, since the indicator of social capital is collected by interview, the sample should face some problems. First, answers are influenced by the responders' definition of trust. For this problem, my paper has already improved compared with the previous literature. Previous literature using the surveys in 1990 or 1981, and the question about trust only has two choices to answer: Yes or Not. My data is from 2005 surveys, and the answer has four levels. It helps the responders to show their real feelings about trust others. Second, it is difficult to test the real degree of trustworthiness of the respondent if the person is not trustworthy. Third, it isn't measured on the entire population, so there may be some sampling error. Fourthly, as I mentioned in Chapter 4, the responses about civic norms may be not so

reliable. The problem of the data collecting is something that I can improve in the further research.

Next year, WVS will provide the newest surveys – 2010 on the internet. When the data open to the public, some further research can be done, such as the impact of social capital on bank risk-taking during the crisis.

Appendix

Figure 1 kernel density estimation of Z-score

Figure 1a presents the result of kernel density estimation of raw Z-score, and figure 1b presents the result of kernel density estimation of the nature logarithm of Z-score.

Figure 1a:

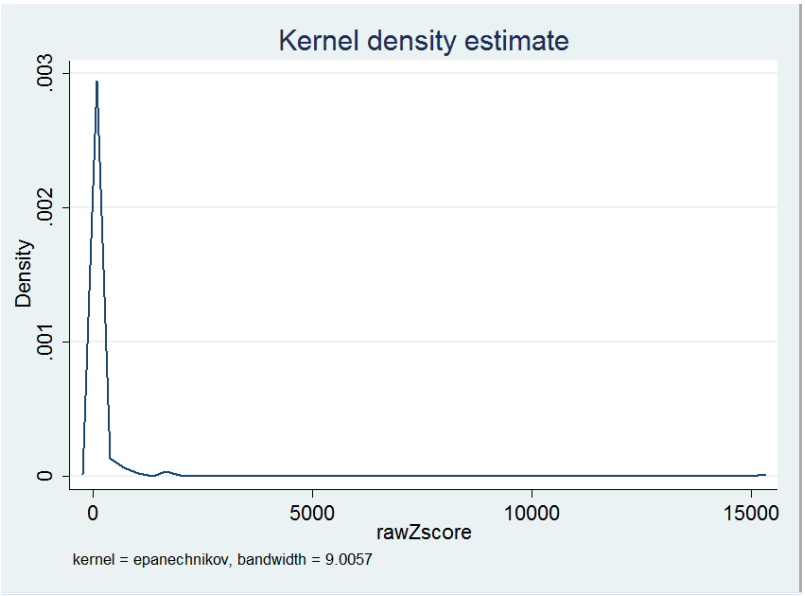

Figure 1b:

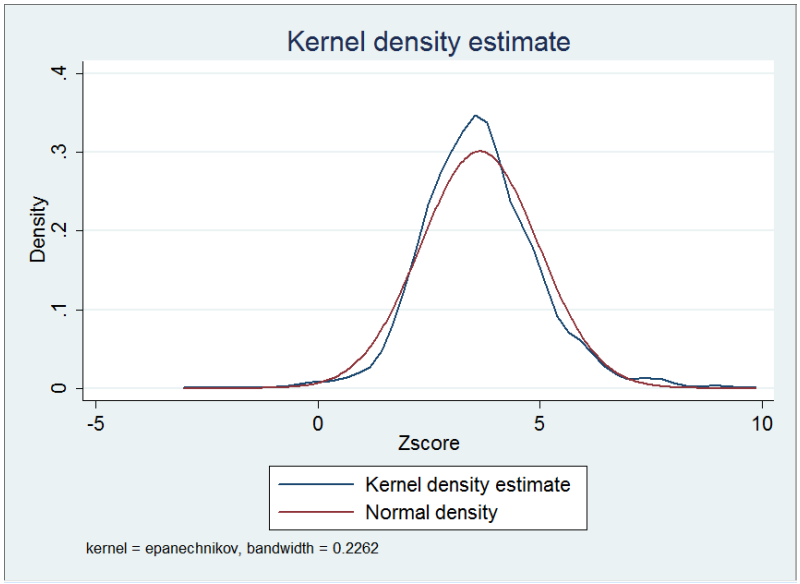

Table A: Definitions of variables

Variable	Definition	Original sources
Bank-level data		
Z-score	Equals log of (ROA+CAR)/σ(ROA), where ROA=π/A is return on assets and CAR=E/A is capital-asset ratio, both averaged over 2004-2006.	BankScope
Volatility of net interest margin	Standard deviation of ROA of a bank, computed over the period 2004-2006.	BankScope
Bank size	Natural logarithm of total assets, averaged over2004-2006.	BankScope
Too-big-to-fail	A dummy variable that takes a value of one if the bank's share in the country's total deposits exceeds 10%.	BankScope
Non-performing loans (%)	Non-performing loans divided by gross loans, in percentage, averaged over 2004-2006.	BankScope
Loan loss reserves (%)	Loan loss reserves divided by gross loans,averaged over 2004-2006.	BankScope
Country-level data		
Trust	"Trust" is the average score of responses in each nation replying "how much do you trust the people you meet for the first time" (after deleting no responses. For each response, "trust completely" equals to 1, “somewhat” equals to 0.67, “not very much” equals to 0.33, and “not trust at all” equals to 0.	World Value Survey (WVS)
Civic	"Civic" is the average score of responses in each country replying 3 questions about civic norms. For each question, respondents chose a number from 1 to 10. I reversed these scales, and summed values over the three items in each country to create a scale (Civic) ranging from 3 to 30.	World Value Survey (WVS)
HHI	Herfindahl-Hirschman Index, defined as the sum of the squared shares of bank deposits to gross deposits within each country, averaged over 2004-2006.	BankScope

Table A *(continued)*

CR4	CR4 is equal to the sum of the deposits of the four largest banks to total deposits within a given country.	BankScope
Log GDP per capita	Log real GDP per capita, in US dollars.	WDI
Inflation (%)	Percentage inflation rate, GDP deflator.	WDI
Diversification index	Whether there are explicit, verifiable, quantifiable guidelines for asset diversification and banks are allowed to make loans abroad.	Barth, Caprio,and Levine (2006)
Capital Regulatory Index	Capital regulatory index is an index of regulatory oversight of bank capital.	Barth, Caprio,and Levine (2006)
Official supervisory power	Whether the supervisory authorities have the authority to take specific actions to prevent and correct problems.	Barth, Caprio,and Levine (2006)
Provisioning stringency	Provisioning stringency measures the minimum requirement about provisioning percentages.	Barth, Caprio,and Levine (2006)
Deposit insurance coverage	Deposit insurance coverage to deposit per capita.	Demirguc-Kunt, Kane, and Laeven (2008)
Political stability	The indicator measures the perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including political violence and terrorism. The value of year 2005 is used.	Kaufmann, kraay, and Mastuzzi (2009)
Quality of regulation	The indicator measures the ability of the government to formulate and implement sound policies and regulations that permit and promote market competition and private – sector development. The value of year 2005 is used.	Kaufmann, kraay, and Mastuzzi (2009)
Control of corruption	The indicator measures the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as “capture” of the state by elites and private interests. The value of year 2005 is used.	Kaufmann, kraay, and Mastuzzi (2009)

Table B: List of Trust and Civic by country

country	Trust	Civic	country	Trust	Civic
Andorra	0.3003	24.9405	Mali	0.4103	23.2757
Argentina	0.3559	25.3563	Mexico	0.2276	21.9738
Australia	0.4648	26.8798	Moldova	0.2349	22.9342
Brazil	0.2129	22.6683	Morocco	0.2952	27.2625
Britain	0.4496	26.1996	Netherlands	0.3431	27.2852
Bulgaria	0.3265	26.1282	New Zealand		26.9909
Burkina Faso	0.3358	25.5018	Norway	0.5585	26.3665
Canada	0.4669	27.1228	Peru	0.1630	
Chile	0.2214	23.0208	Poland	0.3506	25.7076
China	0.3012	25.8996	Romania	0.2509	26.5964
Colombia	0.2357		Russia	0.2504	23.4051
Cyprus	0.2199	26.1080	Rwanda	0.3964	26.0441
Egypt	0.3616	27.5469	Serbia	0.3369	19.0377
Ethiopia	0.3595	27.4191	Slovenia	0.2347	24.3958
Finland	0.4896	26.5040	South Africa	0.3455	25.2326
France	0.4389	24.1913	South Korea	0.2879	25.9122
Georgia	0.3307	27.6790	Spain	0.3699	26.0158
Germany	0.3431	26.5437	Sweden	0.5644	26.1284
Ghana	0.2939	26.9647	Switzerland	0.4691	27.5280
Guatemala		23.2349	Taiwan	0.3533	26.3725
Hong Kong		26.1950	Thailand	0.2995	22.8030
India	0.3420	23.7596	Trinidad	0.2806	25.1282
Indonesia	0.3306	27.7448	Turkey	0.2550	28.1922
Iran		24.7129	Ukraine	0.3018	22.6730
Iraq			Uruguay	0.3729	25.9017
Italy	0.3102	27.1118	USA	0.4346	26.4236
Japan		27.8927	Vietnam	0.3668	26.9087
Jordan	0.3151	26.8428	Zambia	0.2491	22.6141
Malaysia	0.2600	21.6958			

Table 1: Summary statistics

Variable	No. of Obs.	Mean	Std. Dev.	Min	p25	p50	p75	Max
Bank-level data								
Z-score	2093	3.647466	1.323589	-2.8062	2.80841	3.60044	4.37297	9.63605
Non-performing loans (%)	1730	5.398932	11.86247	0	0.591667	1.914	5.04533	100
Bank size	2657	12.317	2.349	4.098	10.692	12.1752	13.834	20.291
Too-big-to-fail	2642	0.145	0.352	0.000	0.000	0	0.000	1.000
Loan loss reserves	2240	5.823	10.327	-0.050	1.355	2.79	6.275	100.000
Industry-level data								
HHI	13155	0.124	0.161	0.023789	0.060	0.06029	0.070	1.000
Country-level data								
Trust	51	0.394	0.064	0.16028	0.421	0.420701	0.421	0.567
Civic	53	24.070	1.219	14.503	24.392	24.3923	24.392	26.938
Inflation (%)	172	5.118	5.120	-1.430	3.120	3.12	3.120	36.690
Log GDP per capita	172	10.026	1.191	4.87	10.17	10.66	10.66	11.72
Diversification index	136	1.778	0.432	0	2	2	2.000	2.000
Capital regulatory index	126	6.144	0.877	3	6	6	6	10
Official supervisory power	134	12.158	1.788	4	12	13	13	14
Provisioning stringency	92	168.515	23.996	87	165	165	165	300
Deposit insurance coverage	76	3.359	23.544	0.095	2.272	2.27213	2.272	453.900

Table 1b: correlation matrix of main regression variables - Trust

Table 1b and table 1c report the correlations between the main regression variables. In table 1b, the indicator of social capital is Trust. And in table 1c, the indicator of social capital is Civic. *, **, and *** indicate significance at the 10%, 5%, and 1%.

	Z-score	Trust	Bank size	Too big to fail	LLR	HHI	Inflation	Log GDP / capita	Diversification index	Capital regulatory index	Official supervisory power	Provisioning stringency
Trust	0.0776**											
Bank size	-0.00871	0.627***										
Too big to fail	-0.0548*	-0.0219	0.239***									
LLR	-0.105***	-0.200***	-0.186***	0.0545*								
HHI	-0.136***	0.201***	0.304***	0.421***	0.0428							
Inflation	-0.0870***	-0.876***	-0.692***	-0.168***	0.195***	-0.383***						
Log GDP per capita	0.206***	0.726***	0.480***	-0.131***	-0.263***	-0.0873***	-0.680***					
Diversification index	0.103***	0.837***	0.539***	0.0870***	-0.214***	0.108***	-0.818***	0.582***				
Capital regulatory index	-0.164***	-0.509***	-0.465***	-0.0359	0.206***	-0.178***	0.555***	-0.658***	-0.292***			
Official Supervisory power	0.127***	0.589***	0.291***	-0.0155	-0.223***	-0.0306	-0.453***	0.422***	0.796***	-0.115***		
Provisioning stringency	0.177***	-0.0748**	0.199***	0.0193	-0.0691**	-0.0658**	-0.230***	0.132***	-0.0514	-0.331***	-0.250***	

Deposit insurance coverage	-0.0337	0.362***	0.258***	0.108***	-0.0454	0.247***	-0.492***	0.274***	0.376***	-0.192***	0.0597*	-0.186***

Table 1c: correlation matrix of main regression variables - Civic

	Z-score	Civic	Bank size	Too big to fail	LLR	HHI	Inflation	Log GDP / capita	Diversification index	Capital regulatory index	Official supervisory power	Provisioning stringency
Civic	0.129***											
Bank size	-0.00871	0.533***										
Too big to fail	-0.0416	0.0353	0.239***									
LLR	-0.108***	-0.215***	-0.187***	0.0529*								
HHI	-0.127***	0.278***	0.303***	0.398***	0.0418							
Inflation	-0.0925***	-0.778***	-0.687***	-0.154***	0.198***	-0.382***						
Log GDP per capita	0.197***	0.682***	0.473***	-0.120***	-0.254***	-0.0884***	-0.645***					
Diversification index	0.111***	0.524***	0.529***	0.0569*	-0.216***	0.103***	-0.820***	0.533***				
Captial regulatory index	-0.163***	-0.589***	-0.442***	0.00158	0.191***	-0.142***	0.490***	-0.683***	-0.209***			

Official supervisory power	0.113***	0.405***	0.237***	-0.0677***	-0.179***	-0.0817**	-0.311***	0.464***	0.558***	-0.210***		
Provisioning stringency	0.174***	0.223***	0.200***	0.0345	-0.0690**	-0.0592*	-0.231***	0.128***	-0.0469	-0.329***	-0.211***	
Deposit insurance coverage	-0.0148	0.632***	0.261***	-0.000246	-0.0438	0.199***	-0.480***	0.331***	0.328***	-0.181***	0.0468	-0.179***

Table 2: Main OLS regression

These two tables present the effects of trust and civic norms on the bank risk-taking. The sample contains about 2000 banks across almost 20 countries. Key variables: trust and civic are from 2005 surveys of WVS. Dependent variable – Z-score and other control variables are averaged over 2004-2006. Column 1 presents OLS results on the effects of trust on bank risk-taking without control variables. Column 2 presents OLS results with bank-level control variables. Column 3 presents OLS results with both bank-level and industry-level control variables. In Column 4, country-level control variables are added in the model based on Column 3. The *, ** and *** indicate the statistical significance at 10%, 5%, 1% levels.

Table 2a: OLS regression – Trust

	(1)	(2)	(3)	(4)
	Z-score	*Z*-score	*Z*-score	*Z*-score
Trust	2.212***	2.839***	3.060***	3.527*
	(5.58)	(5.93)	(5.79)	(1.66)
Bank size		-0.0431**	-0.0436**	-0.0821***
		(-2.49)	(-2.51)	(-3.93)
Too big to fail		-0.107	-0.0574	0.405*
		(-0.71)	(-0.36)	(1.70)
LLR		-0.0163***	-0.0160***	-0.00496
		(-3.80)	(-3.71)	(-1.13)
HHI			-0.257	0.381
			(-0.99)	(0.49)
Inflation				0.0765**
				(2.33)
Log GDP per capita				0.252***
				(3.49)
Diversification index				0.164
				(0.51)
Capital regulatory index				-0.0812
				(-1.04)
Official supervisory power				0.128***
				(2.60)
Provisioning stringency				0.0127***
				(4.79)
Deposit insurance coverage				0.379*
				(1.92)
Adjusted R^2	0.0200	0.0401	0.0401	0.1064
N	1479	1323	1323	975

Table 2b: OLS regression – Civic

	(1) Z-score	(2) Z-score	(3) Z-score	(4) Z-score
Civic	0.0883***	0.115***	0.125***	0.105*
	(5.03)	(5.56)	(5.53)	(1.72)
Bank size		-0.0426**	-0.0420**	-0.0820***
		(-2.54)	(-2.51)	(-4.00)
Too big to fail		-0.115	-0.0667	0.322
		(-0.76)	(-0.42)	(1.44)
LLR		-0.0172***	-0.0168***	-0.00576
		(-3.99)	(-3.89)	(-1.31)
HHI			-0.288	0.280
			(-1.13)	(0.40)
Inflation				0.0798***
				(3.20)
Log GDP per capita				0.220***
				(3.02)
Diversification Index				1.119***
				(3.98)
Capital Regulatory Index				-0.139*
				(-1.81)
Official Supervisory Power				-0.0361
				(-1.02)
Provisioning Stringency				0.00844***
				(4.81)
Deposit Insurance Coverage				-0.0724
				(-0.33)
Adjusted R^2	0.0157	0.0357	0.0359	0.1004
N	1526	1366	1366	987

Table 3: robustness checks: excluding US and weighted by total assets
Table 3a examines the results of the impact of trust on Z-score excluding US values. Table 3b examines the results of the impact of civic norms on Z-score excluding US values. Table 3c examines the results of both Trust and Civic on Z-score based on weighted OLS regressions, and for column 3 and 4 the indicators of Trust and Civic aren't weighted by WVS as another robustness check. *, ** and *** indicate the statistical significance at 10%, 5%, 1% levels, respectively.

Table 3a: excluding US – Trust

	(1)	(2)	(3)	(4)
	Z-score	Z-score	Z-score	Z-score
Trust	1.914***	2.637***	2.866***	10.37*
	(4.15)	(4.82)	(4.20)	(1.86)
Bank size		-0.0443**	-0.0435**	-0.0975***
		(-2.28)	(-2.24)	(-3.93)
Too big to fail		-0.105	-0.0795	0.439*
		(-0.65)	(-0.48)	(1.74)
LLR		-0.0156***	-0.0156***	-0.00447
		(-3.50)	(-3.49)	(-1.00)
HHI			-0.177	0.951
			(-0.56)	(1.08)
Inflation				0.143**
				(2.32)
Log GDP per capita				0.593**
				(2.21)
Diversification index				1.006
				(1.42)
Capital regulatory index				-0.112
				(-1.37)
Official supervisory power				0.204***
				(2.66)
Provisioning stringency				0.0146***
				(4.79)
Deposit insurance coverage				0.552**
				(2.27)
Adjusted R^2	0.0127	0.0299	0.0293	0.1026
N	1264	1114	1114	766

Table 3b: excluding US – Civic

	(1) Z-score	(2) Z-score	(3) Z-score	(4) Z-score
Civic	0.0757***	0.107***	0.108***	0.132*
	(4.04)	(4.91)	(4.38)	(1.74)
Bank size		-0.0535***	-0.0531***	-0.0936***
		(-2.82)	(-2.77)	(-3.89)
Too big to fail		-0.0552	-0.0510	0.345
		(-0.34)	(-0.31)	(1.41)
LLR		-0.0156***	-0.0156***	-0.00554
		(-3.49)	(-3.48)	(-1.24)
HHI			-0.0347	0.409
			(-0.12)	(0.57)
Inflation				0.0821***
				(3.09)
Log GDP per capita				0.128
				(0.82)
Diversification index				0.899**
				(2.09)
Capital regulatory index				-0.100
				(-0.99)
Official supervisory power				-0.0673
				(-1.11)
Provisioning stringency				0.00939***
				(4.16)
Deposit insurance coverage				-0.133
				(-0.56)
Adjusted R^2	0.0115	0.0300	0.0292	0.0949
N	1311	1157	1157	778

Table 3c: weighted OLS

	(1)	(2)	(3)	(4)
			Are not weighted by WVS	
Trust	12.82***		11.98***	
	(2.75)		(2.72)	
Civic		0.297*		0.477*
		(1.80)		(1.90)
Bank size	-0.143	-0.129	-0.142	-0.131
	(-1.26)	(-1.18)	(-1.26)	(-1.20)
Too big to fail	2.569***	2.529***	2.567***	2.535***
	(3.02)	(3.03)	(3.02)	(3.03)
LLR	-0.0441	-0.0408	-0.0440	-0.0404
	(-1.21)	(-1.12)	(-1.21)	(-1.12)
HHI	1.463	-0.231	1.326	-0.179
	(1.28)	(-0.24)	(1.17)	(-0.17)
Inflation	0.195**	0.123*	0.183**	0.150**
	(2.55)	(1.82)	(2.47)	(2.02)
Log GDP per capita	0.715***	0.478**	0.675***	0.464**
	(2.86)	(2.18)	(2.80)	(2.16)
Diversification index	0.445	1.230*	0.351	1.228*
	(0.72)	(1.72)	(0.57)	(1.72)
Capital regulatory index	0.0976	-0.00267	0.0949	0.0000767
	(0.70)	(-0.02)	(0.68)	(0.00)
Official supervisory power	-0.0545	-0.0629	-0.0539	-0.0985
	(-0.58)	(-0.76)	(-0.57)	(-1.03)
Provisioning stringency	0.0252***	0.0157***	0.0249***	0.0150***
	(3.37)	(2.90)	(3.36)	(2.81)
Deposit insurance coverage	0.749**	0.150	0.697**	0.00184
	(2.16)	(0.30)	(2.06)	(0.00)
Adjusted R^2	0.5508	0.5496	0.5508	0.5496
N	975	987	975	987

Table 4: subsample analysis – when education is low

This table compares the coefficient from the cross country OLS regressions when the country level education is low than median with the coefficient of main OLS regression. Key variables: trust is from 2005 surveys of WVS. Dependent variable – Z-score and other control variables are averaged over 2004-2006. Column 1 and 3 are the same regression in table 2. Column 2 and 4 presents OLS results when the country level education is low than median. Column 4 is a robustness test for Column 2, and it didn't use the weight from WVS. *, ** and *** indicate the statistical significance at 10%, 5%, 1% levels, respectively.

	(1)	(2)	(3)	(4)
	all obs.	Low edu.	all obs.	Low edu.
	weighted (provided by WVS)		without weight	
Trust	3.527*	4.948**	3.423*	4.761**
	(1.66)	(1.98)	(1.68)	(1.98)
Bank size	-0.0821***	-0.0203	-0.0822***	-0.0202
	(-3.93)	(-0.56)	(-3.94)	(-0.56)
Too big to fail	0.405*	0.36	0.405*	0.36
	(1.7)	(1.25)	(1.7)	(1.25)
LLR	-0.00496	-0.00611	-0.00494	-0.00612
	(-1.13)	(-0.62)	(-1.12)	(-0.62)
HHI	0.381	1.805	0.361	1.808
	(0.49)	(1.56)	(0.47)	(1.56)
Inflation	0.0765**	-0.0321	0.0744**	-0.0347
	(2.33)	(-0.53)	(2.34)	(-0.57)
Log GDP per capita	0.252***	0.176	0.237***	0.166
	(3.49)	(1.41)	(3.3)	(1.32)
Diversification index	0.164	0.573	0.14	0.552
	(0.51)	(1.41)	(0.44)	(1.36)
Capital regulatory index	-0.0812	-0.0791	-0.0822	-0.077
	(-1.04)	(-0.77)	(-1.06)	(-0.75)
Official supervisory power	0.128***	-0.0124	0.128***	-0.0155
	(2.6)	(-0.14)	(2.6)	(-0.17)
Provisioning stringency	0.0127***	0.00886***	0.0128***	0.00888***
	(4.79)	(2.68)	(4.81)	(2.69)
Deposit insurance coverage	0.379*	0.470*	0.369*	0.463*
	(1.92)	(1.73)	(1.91)	(1.71)
Adjusted R^2	0.1064	0.2163	0.1065	0.2163
N	975	351	975	351

Table 5: OLS regression about Non-performing loan

This table presents the relationship between social capital and non-performing loan. Dependent variable is the percentage of non-performing loan divided by gross loan averaged over 2004-2006. *, ** and *** indicate the statistical significance at 10%, 5%, 1% levels, respectively.

	(1)	(2)	(3)	(4)
	NPL	NPL	NPL	NPL
Trust	22.06***		30.33**	
	(2.66)		(2.56)	
Civic		0.427		0.412
		(1.55)		(1.49)
Bank size	-0.399***	-0.361***	-0.405***	-0.366***
	(-5.10)	(-4.43)	(-5.16)	(-4.48)
Too big to fail	-0.540	-2.354**	-0.546	-2.130**
	(-0.57)	(-2.51)	(-0.58)	(-2.19)
LLR	0.649***	0.772***	0.649***	0.772***
	(35.89)	(48.81)	(35.84)	(48.81)
HHI	-2.725	-2.392		
	(-0.77)	(-0.70)		
CR4			2.653	-4.334
			(0.57)	(-1.11)
Inflation	-0.800***	-0.818***	-0.527*	-0.978***
	(-4.82)	(-5.86)	(-1.68)	(-4.25)
Log GDP per capita	-2.707***	-2.653***	-2.244***	-3.062***
	(-9.26)	(-8.59)	(-3.61)	(-5.64)
Diversification index	-9.148***	-4.629***	-7.777***	-5.653***
	(-5.63)	(-2.98)	(-4.96)	(-2.88)
Capital regulatory index	0.435	-0.0799	0.536	-0.122
	(1.38)	(-0.21)	(1.47)	(-0.33)
Official supervisory power	0.729***	0.104	0.712***	0.0985
	(3.31)	(0.71)	(3.26)	(0.69)
Provisioning stringency	-0.00143	-0.0232***	0.0140	-0.0287***
	(-0.12)	(-2.74)	(0.74)	(-2.70)
Deposit insurance coverage	0.344	-1.763*	1.131	-2.045*
	(0.39)	(-1.75)	(0.96)	(-1.93)
Adjusted R^2	0.637	0.7531	0.6369	0.7533
N	1002	1009	1002	1009

Table 6: social capital of shareholder country vs registration country

This table presents the relationship between social capital of the country of the biggest shareholder. Dependent variable is log Z-score averaged over 2004-2006. *, ** and *** indicate the statistical significance at 10%, 5%, 1% levels, respectively.

	(1) Z-score	(2) Z-score
Trust	0.789	
	(0.60)	
Civic		-0.0592
		(-0.86)
Bank size	-0.102***	-0.0997***
	(-3.10)	(-3.05)
Too big to fail	0.297	0.278
	(0.88)	(0.85)
LLR	-0.00178	-0.00246
	(-0.26)	(-0.36)
HHI	-1.186	-1.155
	(-1.30)	(-1.28)
Inflation	0.000282	-0.0154
	(0.01)	(-0.46)
Log GDP per capita	0.232*	0.187
	(1.92)	(1.60)
Diversification index	-0.0521	0.0764
	(-0.12)	(0.17)
Capital regulatory index	-0.101	-0.133
	(-0.97)	(-1.27)
Official supervisory power	0.156**	0.143**
	(2.35)	(2.34)
Provisioning stringency	0.00259	0.00220
	(0.92)	(0.82)
Deposit insurance coverage	-0.194	-0.168
	(-1.55)	(-1.33)
Adjusted R^2	0.071	0.0688
N	398	397

Table 7:additional robustness check

The dependent variable is log Z-score in column 1 to 6, and is non-perform loan (%) in column 7 to 10. For column 3 and 4, regressions are OLS for all countries excluding US. For column 5 and 6, regressions are OLS for the countries with low country-level education (less than median). *, ** and *** indicate the statistical significance at 10%, 5%, 1% levels, respectively.

	(1) Z-score	(2) Z-score	(3) Z-score (excluding banks in US)	(4) Z-score (excluding banks in US)	(5) (with low country-level edu.)	(6) (without weight)	(7) NPL	(8) NPL	(9) NPL	(10) NPL
Trust	3.602*		10.97*		4.991**	4.803**	21.87***		29.61**	
	(1.69)		(1.93)		(2.00)	(2.00)	(2.61)		(2.49)	
Civic		0.106*		0.133*				0.440		0.424
		(1.73)		(1.75)				(1.59)		(1.54)
Bank size squared	-0.00314***	-0.00314***	-0.00403***	-0.00378***	-0.000789	-0.000787	-0.0134***	-0.0120***	-0.0136***	-0.0122***
	(-3.63)	(-3.71)	(-3.60)	(-3.54)	(-0.63)	(-0.63)	(-4.19)	(-3.61)	(-4.25)	(-3.68)
Too big to fail	0.422*	0.338	0.476*	0.370	0.367	0.367	-0.564	-2.373**	-0.570	-2.142**
	(1.75)	(1.50)	(1.85)	(1.50)	(1.27)	(1.27)	(-0.59)	(-2.51)	(-0.59)	(-2.18)
LLR	-0.00470	-0.00549	-0.00423	-0.00530	-0.00607	-0.00609	0.652***	0.775***	0.652***	0.775***
	(-1.07)	(-1.25)	(-0.94)	(-1.19)	(-0.62)	(-0.62)	(35.97)	(48.93)	(35.92)	(48.93)

Table 7 *(continued)*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
HHI	0.384	0.276	1.006	0.411	1.815	1.818	-2.787	-2.314		
	(0.50)	(0.40)	(1.14)	(0.57)	(1.57)	(1.57)	(-0.78)	(-0.68)		
CR4									2.348	-4.313
									(0.50)	(-1.10)
Inflation	0.0795**	0.0825***	0.150**	0.0840***	-0.0319	-0.0345	-0.782***	-0.791***	-0.526*	-0.952***
	(2.42)	(3.32)	(2.42)	(3.15)	(-0.53)	(-0.57)	(-4.69)	(-5.65)	(-1.67)	(-4.12)
Log GDP per capita	0.259***	0.226***	0.622**	0.133	0.178	0.167	-2.675***	-2.625***	-2.246***	-3.035***
	(3.59)	(3.11)	(2.30)	(0.85)	(1.42)	(1.33)	(-9.10)	(-8.47)	(-3.60)	(-5.58)
Diversification index	0.165	1.129***	1.058	0.899**	0.575	0.554	-9.133***	-4.496***	-7.808***	-5.537***
	(0.52)	(4.01)	(1.48)	(2.08)	(1.41)	(1.37)	(-5.59)	(-2.88)	(-4.96)	(-2.81)
Capital regulatory index	-0.0766	-0.136*	-0.109	-0.0974	-0.0782	-0.0760	0.464	-0.0609	0.552	-0.102
	(-0.98)	(-1.77)	(-1.33)	(-0.96)	(-0.76)	(-0.74)	(1.47)	(-0.16)	(1.51)	(-0.27)
Official supervisory power	0.128***	-0.0363	0.209***	-0.0680	-0.0129	-0.0161	0.735***	0.0950	0.712***	0.0903
	(2.61)	(-1.03)	(2.71)	(-1.12)	(-0.14)	(-0.18)	(3.33)	(0.64)	(3.24)	(0.63)

Table 7 *(continued)*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Provisioning stringency	0.0130***	0.00864***	0.0152***	0.00966***	0.00891***	0.00894***	-0.000694	-0.0224***	0.0138	-0.0279***
	(4.86)	(4.92)	(4.88)	(4.25)	(2.70)	(2.70)	(-0.06)	(-2.63)	(0.72)	(-2.62)
Deposit insurance coverage	0.398**	-0.0571	0.586**	-0.117	0.474*	0.468*	0.426	-1.688*	1.164	-1.974*
	(2.01)	(-0.26)	(2.39)	(-0.49)	(1.74)	(1.73)	(0.48)	(-1.67)	(0.99)	(-1.86)
Adjusted R^2	0.1044	0.0983	0.0997	0.0918	0.2165	0.2165	0.6340	0.7515	0.6338	0.7517
N	975	987	766	778	351	351	1002	1009	1002	1009

Table 8: Z-score, social capital and additional controls
*, ** and *** indicate the statistical significance at 10%, 5%, 1% levels.

	(1)	(2)	(3)	(4)	(5)	(6)
Trust	4.249*	4.860*	4.597*			
	(1.71)	(1.92)	(1.81)			
Civic				0.117	0.109	0.0839
				(1.55)	(1.43)	(1.03)
Bank size	-0.0825***	-0.0788***	-0.0801***	-0.0824***	-0.0773***	-0.0781***
	(-3.95)	(-3.74)	(-3.80)	(-4.01)	(-3.70)	(-3.73)
Too big to fail	0.416*	0.368	0.382	0.331	0.251	0.230
	(1.74)	(1.52)	(1.57)	(1.46)	(1.07)	(0.97)
LLR	-0.00509	-0.00495	-0.00440	-0.00567	-0.00522	-0.00503
	(-1.15)	(-1.12)	(-0.99)	(-1.29)	(-1.18)	(-1.14)
HHI	0.623	0.918	0.777	0.216	0.274	0.275
	(0.70)	(1.00)	(0.84)	(0.29)	(0.37)	(0.37)
Inflation	0.0703**	0.0739**	0.129**	0.0896**	0.0864**	0.117**
	(2.03)	(2.12)	(2.53)	(2.07)	(2.00)	(2.09)
Log GDP per capita	0.352*	0.281	0.201	0.169	0.0553	0.0217
	(1.81)	(1.38)	(0.96)	(0.86)	(0.26)	(0.10)
Diversification index	0.262	0.340	0.694	1.111***	0.987***	1.220***
	(0.72)	(0.92)	(1.57)	(3.93)	(3.30)	(3.03)
Capital regulatory index	-0.0771	-0.0585	-0.0391	-0.135*	-0.115	-0.0943
	(-0.98)	(-0.73)	(-0.48)	(-1.71)	(-1.44)	(-1.13)
Official supervisory power	0.138***	0.0898	0.0803	-0.0493	-0.0781	-0.0825
	(2.62)	(1.37)	(1.22)	(-0.83)	(-1.23)	(-1.29)
Provisioning stringency	0.0125***	0.0102***	0.0122***	0.00877***	0.00636**	0.00718**
	(4.65)	(3.11)	(3.44)	(4.15)	(2.24)	(2.40)
Deposit insurance coverage	0.319	0.221	0.458	-0.0599	-0.126	0.0385
	(1.41)	(0.92)	(1.59)	(-0.27)	(-0.55)	(0.13)
Control of corruption	-0.234	-0.621	-0.577	0.117	-0.161	-0.288
	(-0.55)	(-1.17)	(-1.09)	(0.28)	(-0.34)	(-0.57)
Regulatory quality		0.595	0.684		0.594	0.787
		(1.22)	(1.39)		(1.27)	(1.52)
Political stability no violence			0.377			0.276
			(1.48)			(0.87)
Adjusted R^2	0.1058	0.1062	0.1074	0.0996	0.1001	0.0999
N	975	975	975	987	987	987

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