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INSTITUTIONAL TRANSITION AND THE FINANCING OF HIGH-TECH SMES IN CHINA: A LONGITUDINAL PERSPECTIVE

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Abstract

This paper examines changes in Chinese high-tech SMEs' access to both bank and informal finance in response to the institutional changes relating to the private sector and financial transactions. Using a theoretical framework based on institutional theory, the paper distinguishes between changes at different institutional levels and between formal and informal institutional arrangements as they relate to the availability of business finance during the institutional transition over a period from 1998 to 2009. The findings were based on a set of longitudinal datasets including two rounds of face to face interviews with the owners of high-tech SMEs and finance providers in the Chinese provinces of Guangdong and Guangxi. It shows that the responses of high-tech SMEs and informal investors to the institutional changes have been more positive compared with those of banks. Consequently, access to informal sources of finance has grown, including to longer term equity finance, whereas that to bank finance has not significantly improved. The paper contributes to institutional theory by providing that the effects of the overall institutional framework on the optimal selection of formal and informal institutional arrangements to secure funding differ between types of finance provider and are not necessarily positively associated with the phases of the institutional transitions.

Introduction

Investment in R&D and innovation for developing new technologies or new products has been widely recognised to be a key determinant in the long-term success of high-tech small and medium-sized enterprises (SMEs) (Acs and Audretsch, 1988, North and Smallbone, 2000). Yet emerging economies such as China often lack sufficient long-term investments necessary for developing such ventures because of the lack of institutional support (Xiao, 2011). The availability of relatively long-term loan and equity finance to SMEs requires fully developed legal structures and regulatory institutions. A lack of legal protection for the private sector leads to market uncertainty and high regulatory variability (Peng and Luo, 2000, Wright et al., 2005), resulting in the preferences of both high-tech SMEs and informal investors for short-term investments. Informal investors are referred to in this study as those who provide financial support to SMEs and who typically are neither part of the regular management team of the SME nor related to any members of the management team. They are generally business people themselves who are looking to reinvest their profits in other SMEs.

Traditionally, the financial regulations for the banking sector in China that focused on state-owned companies resulted in local branches being reluctant to provide funding to SMEs. More recently, the institutional environment for high-tech SMEs and financial suppliers (e.g. the protection of private property rights and incentives to the banking sector) has developed dramatically in China. However, little is known about the impact of these institutional changes on high tech SMEs' access to both formal and informal finance sources as the regulatory institutions improve. This paper therefore presents the findings of a longitudinal study of the financing of high-tech SMEs in China and investigates changes in the nature of the relationship between such SMEs and both banks, as formal finance sources, and informal investors in response to restructuring of the institutional environment for entrepreneurial activities.

In the studies of SME finance in developed countries there is a long-standing theoretical debate about the nature and existence of potential market failure relating to SMEs' access to bank finance. This debate concentrates on two aspects of lending to SMEs: first, whether credit availability to SMEs is affected by the existence of information asymmetries which arise because finance providers do not have perfect knowledge about the business, especially where assets are knowledge-based and intangible as in many high-tech SMEs; and second, whether this is affected by the reputation that business owners have with different types of investors (Moore, 1994). Information asymmetries have been widely applied to explain why there will be insufficient credit available for all sound or lendable propositions in western economies where legal and financial institutions are more developed than in emerging economies. Lending decisions in western countries are primarily determined by the personal guarantees and collateral provided by the borrower together with the lender's assessment of the ability of the borrower to pay back the loan at a given interest rate. Insofar as insufficient credit is available for all sound or 'bankable' propositions (e.g. projects with an expected positive return), this has been argued to be due to informational asymmetries arising from conditions of imperfect information (Stiglitz and Weiss, 1981).

However, in sharp contrast to most developed countries, Chinese SMEs' access to bank finance may be entirely due to the legal and regulatory institutions relating to finance suppliers and the private sector, which influence formal and informal arrangements to make loan decisions rather than secure finance (Shen et al., 2009, Tan et al., 2009). Rules for the banking sector in China had primarily focused on supporting state-owned companies, political factors (i.e. social security, etc.) and reducing non-performing loans rather than seeking efficiency and the profit motive (Allen et al., 2003). Traditionally, the banking sector did not have any interest in supporting SMEs because these firms had a private ownership structure. Contracts between SMEs and banks have been difficult to enforce was another reason for this market deficiency. Therefore, the nature and existence of potential financial market deficiency has been strongly influenced by the less-developed banking sector.

The availability of loan and equity finance from individual investors may be again exclusively determined by the legal and regulatory institutions relevant to the private sector. The absence of legal protection of private property has made relatively long-term equity finance largely unpredictable, leading to preferences of both high-tech SMEs and finance suppliers for short-term investments. The preferences may be shifted from short-term loan investments to relatively long-term equity finance as the regulatory institutions improve. Furthermore, the causes for limited demand for relatively long-term finance may be again influenced by the less protection for SMEs and informal investors.

To overcome the problem associated with the unsuitability of previous theoretical frameworks to the Chinese context, a fresh perspective adopted by this study focuses on macro and micro levels of institutions drawing upon ideas from institutional theory. It examines how finance availability is influenced by the interaction between macro level regulatory institutions and micro level institutional arrangements adopted by banks and informal investors to secure finance. Moreover, attempts to identify the institutional changes needed in order to finance investment in relatively long-term projects are crucial to the further growth and development of high-tech SMEs in the Chinese context. In this article, institutional theory has been used to extend the body of literature on how institutional changes have impacted on the ability of high-tech SMEs to access different sources of finance during improvements in fundamental institutions for SMEs and suppliers of finance. The use of institutional theory as a foundation also helps to explain effects of regulatory changes on the selection of formal and informal institutional arrangements to secure finance, and the role of institutional arrangements employed by financial suppliers in responding to the financial needs of high-tech SMEs.

This study contributes to the existing literature as follows: first it concentrates on changes to SMEs' access to formal and informal finance during China's institutional transition by using a longitudinal study; and second, it contributes to the application of institutional theory by explaining how macro level regulations shape a set of formal and informal institutional arrangements adopted by financial suppliers to guide transactions. The paper aims to provide insights into the process of institutional change and how this has impacted on the availability of various sources of finance to high-tech SMEs. The rest of the paper is organized as follows. It initially outlines a theoretical framework about the access to finance for high-tech SMEs[1] in the emerging economy of China before describing the research design and methods. The empirical results are then presented and analysed contrasting the two time periods over which the study was conducted prior to discussing the findings and their implications.

Theoretical Development and Proposion

Institutional levels and formal and informal institutions

Williamson (1985) differentiated institutions, defined as "any form of constraints that human beings devise to shape human interaction" (North 1990, p.4), into three levels of social analysis namely the socially-embedded (e.g. norms, customs, traditions and religions), the macro (e.g. regulatory institutions), and the micro (e.g. institutional arrangements). The selection of institutional arrangements to secure finance is typically influenced by culture, regulatory institutions, and the tangible and intangible assets available, all of which shape the relationships between SMEs and their financial suppliers. A supportive relationship requires fully developed regulatory institutions. It has been argued that regulatory institution changes affect culture slowly (Brint and Karabel, 1991, DiMaggio, 1988), but may bring about the selection and utilisation of institutional arrangements more quickly. This suggests that the institutional effect of culture on change in SMEs' access to finance is likely to be considerable in the long-term, it is only likely to have changed gradually over the last ten years when the numbers of high-tech SMEs in China grew rapidly.

At the macro level, the regulatory institutions that most influence access to finance include legal protection for private property, financial regulations for the banking sector, accounting system practices, contractual enforcement mechanisms, and the cost of producing financial disclosure documents. A set of institutional arrangements between firms or individuals that govern exchanges between them is influenced by regulatory institutions in subtle but pervasive ways (Ang et al., 2000, Peng, 2003, Scott, 1995 and 2002). Regulatory institutions serve as foundations and the level of institutional development leads individuals and firms to select a set of formal and informal institutional arrangements to manage economic transactions (North, 1990, Scott, 2001).

Formal institutional arrangements are defined as written contractual arrangements governing exchanges between firms and/or individuals which are supposed to be legally enforceable by a third-party judicial body. In this study, formal institutional arrangements are typically formal financial documents representing the value of real estate property, other fixed assets, contracts signed by customers etc. required by finance suppliers such as banks to act as collateral to secure funding. Informal institutional arrangements are typically unwritten codes of conduct (North, 1990, Hodgson, 2003), in this paper, incorporating personal knowledge of either owners or their family, knowledge of investee businesses, personal reputations of owners, and interpersonal trust used to judge the risk of loan and equity application.

It has been found that informal institutional arrangements are widely used to guide entrepreneurial activities in emerging economies when the legal and regulatory institutions are dysfunctional (Ahlstrom and Bruton, 2006). We argue there are various influences on the extent to which formal and informal institutional arrangements are employed in financial transactions. First, the utilisation of formal institutional arrangements to secure finance is associated with enforcement mechanisms since a weak legal system makes formal arrangements powerless and problematic when firms cannot pay back loans. The perceived difficulty in enforcing contracts means either less use of formal institutional arrangements or only accepting those (e.g. estate property) that are easier to enforce. Second, the costs of producing formal financial documents based on fixed assets owned by firms adds to the total cost of investment capital, leading to cheaper informal arrangements being employed. Third, the level of complexity of accounting system practices (e.g. asset evaluation) determines the ability of SMEs to amortise fixed assets and produce accurate formal financial documents. And finally, the tangible and intangible assets owned by SMEs reveal the ability of SMEs to provide collateral required by finance suppliers. As a result, the heavy dependence on formal institutional arrangements to govern finance made funding less available to firms particularly in emerging economies where regulatory institutions are yet to be fully developed. It is the interplay of these factors which influence the combination of formal and informal institutional arrangements used to shape investment finance.

The formal and informal institutional arrangements used, as "the types of collateral", direct various sources of finance towards entrepreneurial activities. The availability of various sources of finance is driven by the optimal selection of formal and informal institutional arrangements adopted by finance suppliers to secure loan and equity capital. A supportive relationship between SMEs and finance suppliers is built through a selection of formal and informal institutional arrangements. Access to finance can be increased when the types of collateral required by finance suppliers can be reasonably met by high-tech SMEs that intend to apply for external funding and conversely, the availability of various sources of finance to SMEs decreases when the types of securities required cannot be met by them. The following section discusses how high-tech SMEs' access to bank and informal finance in particular is influenced by a set of formal and informal institutional arrangements which respond to changes in regulatory institutions.

Institutional changes and previous research evidence

In the Chinese context, regulatory institutions have experienced fundamental and comprehensive changes throughout the country's economic reforms since 1978 (Peng, 2000, Newman, 2000). More specifically, the protections of private property, contract enforcement, and financial policies and regulations relating to the availability of financial resources to SMEs in general and high-tech SMEs in particular have been developing fundamentally over the last decade. The effects of a significantly improved institutional environment for the banking system and the private sector could be increasing the number of investments secured by a wide range of formal institutional arrangements or an optimal combination of formal and informal ones, thereby enhancing both the demand for and supply of relatively long-term finance in particular.

Access to bank finance

Having considered theoretically the influence of institutional levels on the availability of finance to SMEs, we now consider the Chinese banking culture in support of the private sector by examining the history of firms' access to bank finance through the phases of reform within the banking sector. In the 1980s, the availability of bank finance was primarily determined by the ownership structure of the business, such that the financial policies and regulations for the banking system were aimed at supporting state-owned companies (through the provision of either grants or loans), and emerging private businesses did not receive any support from the banks. The financial regulations during the 1990s focused on the reduction of non-performing loans with the intention of establishing banks as commercially viable operations. Then, from the late 1990s to 2004, banks began to attach less importance to the ownership structure of the enterprise and more importance to the role of real estate property as security for loans (Xiao, 2011). Employing real estate property (which had significantly increased in value) to secure bank finance was to reduce the level of risk involved in the exchanges and protect local bank branches against the possibility of fraud. The history shows that the issue of SMEs' access to bank finance has been largely disregarded because of the targeted aims of the banks set by the financial ministry central bank. Thus the key considerations influencing a local bank's selection of a combination of formal and informal arrangements to govern bank finance has been changing to reflect adjustments in the stated goals and business strategies of the banking sector defined by the Chinese authorities over time (Haveman, 1992). The recent bank goals set by the State have changed to encourage local branches to make more funding available to SMEs, which may be slow by the banks' tradition of being reluctant to serve SMEs (Lu and Tao, 2010). This can be expected to have affected the perception and attitudes of Chinese small business owners toward raising bank finance, even to the extent of discouraging them from applying altogether (Kon and Storey, 2003).

A recent study focusing on bank size and SME lending in China found that the factors that determined banks' lending to SMEs were institutional arrangements and the reward system for bank managers (Lin, 2007 and Shen et al., 2009). Well-intentioned changes in the financial policies and regulations for the banking system to shift from the reduction of non-performing loans to supporting the private sector have been made to enable greater access to bank finance for high-tech SMEs since 2004. Governments at the provincial level introduced a reward system in 2006 by which local branches will receive rewards if they lend a significant amount of capital to SMEs. The State Council has given appropriate subsidies since 2007 to financial institutions to support those branches extending loans to small companies, as shown in Table 1. The newly introduced macro level financial policies and regulations are expected to guide bank managers to select a reasonable set of formal and informal institutional arrangements to secure loans, enhancing the ability of SMEs to obtain bank loans. This paper considers:

> ***Proposition 1a**: SMEs' access to bank finance should be greater during the period between 2004 and 2009 as a result of increasing regulatory or governmental support for the banking sector and the private sector;*
>
> ***Proposition 1b:** a wider range of formal institutional arrangements and a combination of formal and informal ones (e.g. contracts signed by customers, reputation, trust, real estate*

property, and other fixed assets) are more likely to have been employed by local bank branches after 2004 to make loan decisions in response to more supportive regulatory institutions.

Access to informal sources of finance

In contrast to the banks, informal investors can be expected to rely on informal institutional arrangements such as relationship-based, personalised ones, helping build a closer relationship between SMEs and individual investors than that between SMEs and the banking sector (Peng, 2003, Tsai, 2002, Xiao 2011). Informal investors in China have had an advanced relationship with SMEs in general and high-tech SMEs in particular and have been largely substituting for the banking sector, a substitution made possible by employing the informal institutional arrangements preferred by informal investors (Tsai, 2002). Informal sources tended to be small amounts and for a short-term, a pattern which differed substantially from that in developed market-oriented countries (Hitt et al., 2004, Ahlstrom and Bruton, 2006, Scheela and Isidro, 2009). The distinctiveness of informal finance available to SMEs likely relates to the lack of a fully-developed institutional environment for the private sector that increased the risk of long-term investment in business activities. Previous empirical evidence demonstrates that economic institutions (e.g. protection of private property and contract enforcement) strongly influence entrepreneurial activities in the emerging economy of China (Lu and Tao, 2010). Both SMEs and informal investors look for environments with a stable rule of law and an effective enforcement regime to facilitate and safeguard their investments and pursue long-term success in business (Cardis et al., 2001). However, the institutional environment for the private sector has lagged behind both SME development and the contribution of informal investors to entrepreneurial activities. Private businesses began to be legally recognised for the first time in 1988. Formal protection of private property was not offered until 2004, and the legal status of private lending institutions was not granted until 2007, as shown in Table 1. Taken together this indicates that a lack of legal structure and regulatory institutions for the private sector made SMEs and individual investors less confident in investing larger amounts of capital in relatively long-term projects.

The less developed and effective legal structure and regulatory institutions for the private sector leads to individual investors adopting informal institutional arrangements entirely (e.g. investor's knowledge of investee businesses, trust between investee firms and investors, and the entrepreneur's reputation) to analyse loan suitability and to secure finance (Peng, 2003, Ramamurti, 2000), as discussed earlier. This indicates that prior knowledge of the business and the entrepreneurs is likely to be very important, leading to informal investors investing in local businesses that they already know about. The willingness of informal investors to employ informal institutional arrangements links to two difficulties perceived by SMEs: to produce reliable formal financial documents representing properly-valued assets in the firm that will or can be used as collateral, and to enforce agreements/contracts signed by SMEs and their finance suppliers (Meyer, 2001). Informal institutional arrangements therefore become important collateral which overcome the absence of institutional structures (Peng, 2000, Tan et al., 2009) and play an important role in helping informal investors navigate the challenging environment with poor protection of private property and less enforcement of contracts (Butler et al, 2003, Peng, 2003, Hoang and Antoncic, 2003). More recently, progress has been made to improve regulatory institutions for SMEs and informal investors and as a result, it is expected that informal investors will be encouraged to provide more support for the private sector. The improved legal environment enables SMEs and informal investors to reduce the risk of their relatively long-term investments, more investment capital from informal sources will thus be made available. We propose:

Proposition 2a: *informal sources of finance for short-term loan capital continued to be the dominant funding for high-tech SMEs during the period from 1998 to 2009.*

Proposition 2b: *the informal finance providers who had primarily offered debt finance over the period from 1998 to 2004 became the basis of an embryonic business angels and/or venture capital sector after 2004 and were more likely to provide longer-term equity capital to high-tech SMEs as a result of macro level institutional advancements.*

Research Design and Methods

This research addresses concerns the changes in the nature of finance available to high-tech SMEs and the formal and informal institutional arrangements relating to it during China's institutional transition. A longitudinal study comprising two business surveys covering sequential time periods from 1998 to 2009 was employed to investigate this research issue. The surveys were conducted in 2004 and again in 2009. The first survey covered the period from 1998 to 2004 and the second focused on the period between 2004 and 2009. The choice of 2004 as the dividing line between the two surveys is that fundamental changes in the regulations for encouraging entrepreneurial activities and lending to SMEs have been introduced since 2004. Face to face interviews with the senior manager/owner of high-tech SMEs were undertaken to investigate in-depth how high-tech SMEs met their financial needs during the two time periods. Information on experiences of raising finance, types and amounts of funding being sought, types of collateral provided to secure finance, purposes of raising finance, and reasons for the difficulties encountered was collected through the interviews. This provided an important empirical basis for identifying the availability of various sources of finance to high-tech SMEs and for detecting changes in finance supply during the two time periods.

The 2004 survey

The sample for the 2004 survey was stratified into three criteria: industrial sectors (electronic information technology (EIT) and bio-technology (Bio-tech)), business employment size (fewer than 250 employees), and location (two Chinese provinces of Guangdong and Guangxi). A sample of 129 high-tech SMEs that met the criteria, drawn from the sampling frames provided by government agencies at the national level from four high-tech parks within the two selected provinces, was approached and invited to participate in a face to face interview in 2004. Interviews were successfully conducted with 74 of these owner/senior managers in 2004, representing a response rate of 57 per cent. The interviews with the respondents lasted on average one hour and a follow-up telephone interview was conducted as well when additional information was required. The main reason for non-participation in the survey given by potential respondents was that they were too busy to afford time for an interview during the year 2004 of the survey. Table 2 provides a cross tabulation of the 2004 sample according to three development stages of the firm (See Xiao (2011) for details on the definitions of three stages) and geographical province. All 74 firms at the time of the 2004 survey were either at or previously experienced the start-up stage, whilst 65 firms were either at or previously experienced the early stage, with only 39 firms experiencing the later stage, and the average age of all 74 firms was four years old.

The 2009 survey

For the 2009 survey, a sub-sample of the firms participating in the 2004 survey was chosen comprising those firms that had survived and were willing to participate in a second face to face interview in 2009. In addition, 31 businesses from the 2004 sampling frames that met the original selection criteria but were unable to participate in the 2004 survey were approached and invited to take part in the 2009 survey. In the 2009 survey, there was no problem to collect information about the two time periods from the additional 11 firms contacted in the 2004 survey, although it was not really a 'pure' longitudinal study.

The 2009 survey started with an investigation of survival status of firms from the 2004 survey. For those respondents who changed contact details after the 2004 survey, information about either the survival status or updated contact details were again provided by the research assistants from government agencies. Table 2 shows that 77 per cent of the 2004 sample (i.e. 57 firms) were still operating in the market in 2009 and that the remaining 23 per cent had closed down. The failure rate was much higher for those that were at the start-up stage in 2004 than for those that were at the subsequent stages of development. About four firms had changed their ownership structure and eight had moved or were moving their premises. An interview with non-survivors was focused on the main reason for business failure; the most frequently identified reasons were 'conflicts between founder team members', 'failed to continually launch a new product', 'making a loss', and 'a shortage of investment capital'. Of the 57 survivors from the 2004 survey interview, face to face interviews were successfully conducted with 50 of them, giving a response rate of 88 per cent. The reason given by the seven survivors who did not participate in the 2009 survey was that they thought that their businesses had just survived and not made fast-growth. About 11out of the 31 additional high tech SMEs were interviewed in the 2009 survey, giving a response rate of 36 per cent. Table 3 provides a cross-tabulation of the samples according to survey year, geographical province, and structure of the 2009 sample. In total, 50 firms were successfully interviewed on two occasions in 2004 and 2009, and 35 firms were interviewed only once either in 2004 or in 2009.

Agency information

In addition to the longitudinal study of high-tech SMEs, in total 15 face to face interviews were conducted with finance suppliers, comprising four bank managers interviewed in 2004, two of them interviewed again in 2009, and nine informal finance suppliers interviewed in 2009. These interviews enabled this study to examine why a set of formal and informal institutional arrangements to secure finance differed according to finance suppliers, as well as the views of finance suppliers on the provision of finance to SMEs in general.

Data analysis

The quantitative data relating to what sources of external finance that SMEs sought and used in the two time periods were analysed, focusing on the subsequent stages of business development. The institutional arrangements required by the banks to secure a loan were also examined. More specifically, financial information about the 61 firms (including the 50 survivors from the first survey and the 11 "top-up" firms from the second survey) was analysed for comparability over the two study periods. The Wilcox test was then employed to examine for any significant differences in the high-tech SMEs access to both bank and informal finance before and after 2004. The detailed evidence on the micro-conditions around financing was used to corroborate the research findings. The qualitative data on the reasons why the sampled firms did not seek and accept bank finance and the motives why they were likely to cooperate with informal investors were coded for categories by the researcher who speaks both Chinese and English. The information collected was categorised into three aspects namely: availability and cost of formal institutional arrangements; types of informal institutional arrangements; and financial strategies adopted by firms. The institutional arrangements required by finance suppliers to secure finance were first grouped into formal and informal ones. The results from the two time periods were compared to explain how the availability of bank and informal finance to SMEs was influenced by institutional arrangement changes, reflecting the improvement of the regulatory institutions.

The Findings and the Longitudinal Study

This section compares bank and informal sources of finance available to high-tech SMEs, and examines institutional arrangement effects on the availability of financial sources. Changes in institutional arrangements employed to govern finance were observed between the two time periods as macro level institutional conditions improved.

Access to bank loans

The results does not support proposition 1a (the p-values of the Wilcox test were not at a statistically significant level) shown in Table 4. There is no evidence from the two interview surveys to indicate that SMEs' access to bank loans was greater after 2004 than previously and this applies to enterprises at the subsequent development stages. Therefore bank finance has yet to become a major source of funding for high tech SMEs in China. Just 12 per cent of the firms founded before 2004 approached banks for finance at the start up stage, which was secured against state-ownership structure. During the subsequent stages of business development, about 40 per cent of the firms in each study period actually approached banks for finance. However, the fact that the remaining 60 per cent did not intend to seek bank finance, even though many of them had real estate property, indicates that there has not been the greater use of bank finance that might have been expected. The findings also do indicate that whilst there was a slightly lower application rate after 2004 compared to that before 2004, there was a higher success rate in the second period. This higher success rate experienced in the post 2004 period probably reflects the greater ability of firms to obtain funding sources from somewhere else rather than the banks.

The sampled firms that applied for a bank loan were asked what institutional arrangements bank managers required from them to secure finance in the 2004 survey and again in the 2009 survey. The evidence shown in Table 5 demonstrates that Proposition 1b is not supported significantly. At a detailed level, real estate property (82 per cent) has been the dominant formal arrangement to secure bank loans, and other formal arrangements secured on fixed assets and contracts signed by customers were not widely employed. An interesting finding is that bank managers have begun using informal institutional arrangements (i.e. the reputation of firms) to judge loan applications in recent years, which was not the case prior to 2004. About four well performing firms in the second sample that invested ten million Yuan of the retained earnings and profits in purchasing the use right of land and building up their plants obtained bank loans of several million Yuan for a one year term, which was secured primarily on their reputation. There was a subtle shift in emphasis from real estate property as collateral to a wide range of both formal and informal institutional arrangements in response to the macro-institutional changes that had occurred, although the change was not substantial. This may suggest that Chinese banks' culture of being reluctant to support the private sector slowed the implementation of well-intentioned changes to improve high-tech SMEs' access to bank finance.

The firms that did not intend to approach banks for finance were asked what key factors stopped them from applying. The most frequent reason for not applying for bank finance given by the respondents in the first period was the inability to provide estate property as collateral, but in the later period the most common reason was the difficulty perceived by firms of producing formal financial documents accurately representing the value of property. The reasons for deciding not to apply for bank finance shifted from an inability to provide collateral to the difficulty that SMEs perceived in producing the formal documents that banks required. Firms that needed short-term working capital preferred individual investors over banks, differing from firms in western countries where SMEs would invariably fund working capital through overdraft facilities with their banks. The most recent version of the Chinese property evaluation certificate was required by bank managers to obtain a loan, but this led to the actual cost of short-term finance becoming disproportionately expensive when only small amounts of funding were sought. All these suggest that the use of formal institutional arrangements secured on estate property did not make bank finance any more attractive to SMEs.

Access to informal sources of finance

Propositions 2a and 2b are supported by the longitudinal evidence shown in Tables 6 and 7. There are indications from the survey evidence that informal investors are becoming the basis of an embryonic venture capital sector capable of providing the equity capital to high-tech SMEs that make longer-term investments. This is underpinned by the development of a more advanced relationship between high-tech SMEs and informal suppliers in recent years (p-values of Wilcox test shown in Column 6 of Tables 6 and 7). At a more detailed level, SMEs' access to informal sources of finance has significantly increased over time (the proportion of the sample firms obtaining short-term loans from informal sources increased from 31 per cent before 2004 to 51 per cent after 2004, p-value of 0.019 at a statistically significant level).

The evidence from both time periods shows that loans from informal investors have continually met short-term financial difficulties facing SMEs from several days up to a maximum of several months. Institutional arrangements employed by informal investors have predominately been the informal ones (e.g. knowing owners and their families, knowing investee businesses, reputations of owners, and trust) rather than formal financial documents. Short-term credit thus became available for all sound and lendable propositions from informal sources of finance and frequently substituted for bank finance in both periods. The findings demonstrate that greater access to loan capital from informal sources continued to be entirely based on the acceptance of informal institutional arrangements acting as security to shape transactions. Evidence from both interviewed SMEs and informal investors themselves demonstrates the high cost of informal finance (typically at an interest of .5 to 3.0 per cent per month) as a result of mainly employing informal arrangements to secure funding. Furthermore, the time taken to receive funding from informal investors was generally shorter than was the case with obtaining loans from the banks.

More recently, obtaining equity finance from senior employees has become a means of keeping highly skilled personnel motivated and invigorated as well as meeting long-term financial needs. As shown in Table 6, 27 per cent of the sampled firms accepted equity finance from their employees over the period 2004 to 2009 compared to 5 per cent of the firms in the earlier period. It also appears that equity finance from other sources became more prevalent after 2004. As shown in Table 7, demand for equity finance from informal sources increased from 12 per cent to 35 per cent (p-value of 0.004 at a statistically significant level). The proportion of firms seeking and using equity finance from informal investors over the second period was much greater than that during the time 1998 to 2004. SMEs' demand for external finance has shifted from a sole focus on short-term loan investments for covering working capital to a greater emphasis on equity investments for acquiring expensive fixed assets. It suggests that both high-tech SMEs and informal suppliers were more confident of investing in long-term projects (up to five years) for business expansion because of the increased security provided by the State for their investments since 2004. Moreover, personal trust developed further through successful previous short-term investments in SMEs. In effect, therefore it would appear that these informal suppliers of finance to high-tech SMEs represent the beginnings of a nascent form of business angel (i.e. private investor) venture capital in China, although as yet not able to provide the long-term equity investments to support R&D and the knowledge and expertise that venture capitalists typically provide in western countries.

Equity finance from informal investors was either tailored to the funding of specific projects or directed at buying a share of the business as a whole, as evident from the statements made by a number of respondents. An owner of an EIT firm in Shenzhen from the 2009 survey claimed: *"I accepted four million Yuan of equity finance provided by a friend of mine through offering him 20 per cent of company's shares in 2007."* The owner of a Guilin firm specialising in information system solutions from the 2009 survey stated: *"we raised equity finance from informal investors whom we knew for years since 2005, were basing on a project or new division rather than company' shares."* These examples show that informal institutional arrangements (e.g. trust and personal connections) play a critical role in providing equity investment capital to high-tech SMEs.

Discussions and Implications

The findings from the survey evidence spanning the two time periods have shown that the institutional effects on high-tech SMEs' access to finance vary according to the suppliers of finance as the regulatory institutions improve. The development of the overall institutional framework contributes positively to the availability of long-term loan and equity finance from informal sources to SMEs. In contrast, the nature of the relationship between high-tech SMEs and banks continued to be unsupportive and uncertain across the time periods, whereas informal suppliers of finance were able to establish a much closer personal relationship with high-tech SMEs. Informal investors have generally acted as a substitute for formal financial providers and have started to play the role of small venture capitalists (or business angels) in supporting the development of high-tech SMEs. These differences between banks and informal investors appear to be consistent over time and if anything seem to be widening. Moreover, there appears to have been little change in the preference of the banks for serving state-owned companies rather than privately owned SMEs. This is evident from the statements made by two bank managers in Nanning and Guilin respectively from the 2009 survey, claiming that "*the rewards from the provincial government have been much less than the profits made from providing sufficient amounts of bank finance to large companies*." The traditional attitudes of bank managers towards the private sector change very slowly and have held up the implementation of well-intentioned state policies to construct a more supportive relationship between SMEs and banks over the research study period.

In those instances where high-tech SMEs did seek bank finance, the institutional arrangements employed by local bank branches to secure loans to SMEs have primarily been based on real estate properties. This was consistent over the two time periods. However, the difficulties in producing reliable formal financial documents based on fixed assets proved to be a significant constraint on the ability of firms to obtain bank loans after 2004: these difficulties included the cost of producing the documents, the time taken to produce them, and the lack of knowhow or advice on how to complete them. Bank managers have continually thought that bank finance secured on formal arrangements (e.g. fixed equipments and contracts signed by customers) would be much more difficult to enforce when firms default without such documentation. Moreover, the actual costs to firms of producing formal financial documents (e.g. the most up-to-date certificate of property valuation) continued to be much higher than in more developed institutional environments. This indicates that progress made on Chinese financial policies and regulations for the banking system have so far failed to overcome these problems, such as better accounting system practices, contract enforcement required to make the banking system more accessible, and the construction of a supportive relationship between SMEs and the banking system.

Our evidence highlights the continual importance of informal sources of finance and informal investors to high-tech SMEs as the institutional environment improves. It suggests that informal suppliers of finance have been providing a substitute financial infrastructure and have successfully moved from the provision of short-term loans before 2004 to meeting the financial needs for both short-term working capital and long-term equity investment after 2004. The institutional arrangements employed by informal suppliers of finance have made informal loan finance easier to access than bank finance. Informal institutional arrangements have continually substituted for formal ones to evaluate the suitability of loan applications. The evolving trust between high-tech SMEs and informal investors that were based on personal knowledge and relationships reduced information asymmetries, leading to the willingness of informal investors to provide investment capital as the business develops. Improvements in private-sector protections have generated greater confidence between high-tech SMEs and informal investors, increasing demands for and supply of long-term equity investments. These findings tend to reinforce previous studies in showing informal arrangements to be crucial and effective strategies in emerging economies lacking fully developed institutions (Scheela and Isidro, 2009, Ahlstrom and Bruton, 2006, Peng and Heath, 1996).

From a more theoretical perspective, the findings from this study provide new insights into the process of institutional change and its influence on the availability of various sources of finance to high-tech SMEs in emerging economies, showing that the institutional perspective appears to be very relevant in explaining SMEs' access to finance under the absence of a well-developed institutional framework. This research has paid particular attention on the role institutional arrangements play in governing transactions and access to external finance and how these arrangements relate to other institutional changes. A particularly useful notion here has been that of institutional levels first put forward by Williamson (1985).

This article extends Peng's (2003) work by showing the contrary findings that the importance of informal institutional arrangements to secure informal finance stayed broadly unchanged as regulatory institutions improve. It demonstrates that improvements of regulatory institutions did not make a move from a relationship-based, personalised transaction structure to a rule-based impersonal exchange regime. Our article argues the importance of informal institutional arrangements to govern short-term finance would likely remain the same when the rise of more supporting regulatory institutions like overdraft facilities banks offer in developed counties. The effects of the overall institutional framework on the optimal selection of formal and informal arrangements to secure funding are thus not necessarily positively associated with the phases of the institutional transitions. This study also extends earlier work (Ahlstrom and Bruton, 2006, Welter and Smallbone, 2008), demonstrating the regulatory institution effects of selecting arrangements to shape financial transactions differ, depending on the finance supplier. The link between the micro and macro levels could also be influenced by the institutional culture regarding the privately owned small enterprise sector. Thus the way informal investors have been responding to changes in regulatory institutions has differed from, and been much more positive compared to that of the banking sector. Informal investors have already adopted to a private sector culture, whereas the decision-making of banks is still heavily influenced by the culture associated with centralised control. Relying on informal institutional arrangements to shape short-term loans rather than relatively long-term ones continues to be beneficial as the regulatory institutions improve. Relying on informal institutional arrangements makes equity investment capital more accessible when the regulatory institutions established. Our results thus suggest a necessity for scholars to conceptually differentiate term loan features and types of finance, particularly when conducting research over a period where there are fundamental institutional changes.

This study has identified the interaction between the level of the legal structure and regulatory institutions as well as the use of formal institutional arrangements. The lack of a fully-developed legal structure and regulatory institutions (e.g. accounting system practices and legal resources) makes it very challenging for financial suppliers to employ a wide range of formal institutional arrangements to secure their investments in SMEs. The lack of fully-developed institutions also makes it very challenging for SMEs to produce reliable formal financial documents representing properly-valued assets in the firm that can be used as collateral. The efforts made by the Chinese State to improve regulatory institutions have so far failed to enhance the use of formal institutional arrangements to govern exchanges. The use of informal arrangements to secure funding is more appropriate for short-term loan and equity investment from informal resources even after the level of institutional support improves. This study found that the banking sector has failed to differentiate short-term and relatively long-term finance and secure them on a varying range of formal and informal institutional arrangements. This research has also discovered that improvements in private-sector protections appear to be leading to increased levels of long-term equity investments. Overall, a closer relationship between SMEs and informal investors benefited from both a tradition of SMEs seeking external finance from informal sources and better securities for investment offered to the private sector.

Conclusions

This paper demonstrates how institutional changes matter in the crucial context of the availability of various sources of finance to high-tech SMEs in emerging economies such as China, depending on the finance suppliers. It was found that the responses of informal suppliers to the institutional changes (e.g. formal protection of private property and the legal status of private lending institutions) differed from those of the banks. Informal investors responded to the institutional changes more positively through shifting from a focus on short-term loan investments for covering working capital to an emphasis on equity capital for making longer-term investments. The reliance of informal investors on informal institutional arrangements with SMEs with which they had already fostered a close relationship remained largely unchanged throughout the two time periods. In contrast, the banks were slow to offer solutions to SMEs to meet their financial needs. The effects of the overall institutional framework on the availability of sources of finance to high-tech SMEs vary according to the cultural factors within finance provider. Informal investors' confidence has grown with regard to long-term investments amongst Chinese high-tech SMEs, responding to better investment protection offered to the private sector. Offering the protection of private property in particular lowered the risk and uncertainty of long-term investment in businesses across the private sector. From both the demand and supply sides, the investment preferences have shifted from meeting financial needs for short-term working capital to satisfying longer-term capital needs directed at investing in fixed assets. However, whilst access to informal sources of finance has grown, that to bank finance has not significantly improved in recent years. The establishment of regulatory institutions is clearly important, but there needs to be deeper seated and fundamental cultural changes within the banking sector itself before Chinese banks are likely to become more supportive of the formation and development of high-tech SMEs.

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Notes

1. High-tech SMEs in this study are from "high-tech industrial sectors", following the definition of the China National Bureau.
2. Only 52 out of the 61 firms in the first sample experienced subsequent stage of business development and the remaining were at the start-up stage during the period from the 1980s to 2004.

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Table 1: Description of key events during transition

Year	Key events
1995	The Central Bank introduced law to commercialize the operations of the four state-owned banks
1999	The asset management companies (AMC) were established to transfer the non-performing assets from the banks and sell them to the investors
2004	The Chinese constitution was further amended to ensure that the state protected the legal rights and interests of individual businesses and private enterprise and encouraged their development
2006	Government at provincial level began to offer rewards to local branches that lent a significant amount of capital to SMEs
2007	The decision was made by the State to allow the establishment of private lending companies
2008	The State Council will give appropriate subsidies to financial institutions to support them extending loans to small companies

Table 2: The 2004 sample and survival status in 2009

	2004			Survival status in 2009			
	Guangdong	Guangxi	Total	Closed down		Trading	
	No.	No.	No.	No.	%	No.	%
Start-up	4	5	9	6	67	3	33
Early stage	7	19	26	8	30	18	70
Later stage	21	18	39	4	10	35	91
Total	32	42	74	17	23	57	77

Table 3: The sample stratification for 2004 and 2009

Regions	2004	2009		Total interviews
		Longitudinal	New participant	
Guangdong	32	20	6	58
Guangxi	42	30	5	77
Total	74	50	11	135

Table 4: Bank loans approached and obtained by period

	From 1998 to 2004		Between 2004 and 2009		p-value
	No.	%	No.	%	
Start-up					
Total	74				
Approached	9	12.2	-	-	-
Obtained	6	8.1	-	-	-
Success rate	-	66.7	-	-	-
Subsequent stage					
Total	52[3]		61		
Approached	22	42.3	24	38.8	0.7029
Obtained	17	32.6	23	35.8	0.9892
Success rate	-	77.3	-	92.3	0.8892

Notes: statistically significant differences between two periods of time based on Wilcox test

Table 5: Institutional arrangements required by stage and period

	From 1998 to 2004		Between 2004 and 2009	
Start-up	No.	%	No.	%
Supervisory agency Guarantee	6	100	-	-
Subsequent stage				
Real estate property	14	82	18	75
Contract signed by customer	1	6	1	4.5
Guarantee company	2	12	1	4.5
Reputation of firms	0	0	4	17

Table 6: Informal sources of finance obtained by type and sample period (at the subsequent stages)

	From 1998 to 2004		Between 2004 and 2009		p-value
	No.	%	No.	%	
Total	52		61		
Loan from individuals	16	31	31	51	0.019
Loan from employees	12	23	2	3	0.000
Equity from employees	3	5	17	27	0.000

Notes: statistically significant differences between two periods of time based on Wilcox test

Table 7: Equity from informal investors by sample period

	From 1998 to 2004		Between 2004 and 2009		p-value
	No.	%	No.	%	
Total	52		61		
Approached	6	12	23	38	0.004
Obtained	4	8	16	26	0.039
Success rate	-	67	-	69	

Notes: statistically significant differences between two periods of time based on Wilcox test