Credit Financing, Financing Constraints and Enterprise Investment Efficiency: A Comparative Study of Manufacturing Enterprises in China and India

Deng Xiangrong
Nankai University

Zhang Jiaming
Nankai University

December 2016

Abstract

At present, there is no consensus in the literature concerning the influence of different credit financing on investment efficiency of enterprises, especially the lack of empirical evidence in developing countries. In this paper, based on the World Bank enterprise survey data, using the Heckman sample selection model, we study the effects of bank credit and trade credit on investment efficiency of manufacturing enterprises in China and India. The results show that in China, trade credit has a significant positive effect on investment efficiency of manufacturing enterprises. In contrast, bank credit has a significant negative effect. In India, trade credit can also improve the investment efficiency of manufacturing enterprises, but bank credit had no significant effect. From the point of view of the degree of financing constraints, the effects of bank credit and trade credit also have significant differences. In China, regardless of the financing constraint condition faced by the enterprises, trade credit improves the investment efficiency significantly. Bank credit, however, reduces the investment efficiency of weak financing constraint enterprises on the one hand, while on the other improves the investment efficiency of strong financing constraint enterprises. In India, both bank credit and trade credit have no significant effect on investment efficiency of weak financing constraint enterprises, but trade credit has a significant positive effect on the investment efficiency of strong financing constraint enterprises. In conclusion, this paper shows that trade credit can play a greater role in promoting the investment efficiency of manufacturing enterprises in developing countries.

Key words: investment efficiency; credit financing; financing constraint; bank credit; trade credit

JEL Codes: G30

1.Introduction

Currently, the low investment efficiency of enterprises in developing countries has become a problem that cannot be ignored. Take China as an example, according to Gugler et al. (2004), the investment efficiency of listed companies in China ranked in the bottom fifth. Xin et al. (2007) estimated the rate of return on the listed companies' investment and showed that cumulative return rate on investment in new 5-year was only 2.6%, far lower than the cost of capital. Among the many factors that affect the efficiency of investment, the financing mode is undoubtedly the most direct and most important. At present, investment by enterprises in developing countries is still highly dependent on credit financing. The main source of credit finance includes private credit lending, bank credit, and a wide range of various forms of trade credit. The former is mainly used to fund for enterprises' short-term liquidity shortage, while the latter two are mainly long-term financing for enterprises' fixed assets investment. In recent years, domestic and foreign scholars have begun to concern about the impact of financing modes on investment efficiency, but studies have largely ignored the characteristics behind different financing modes, and the focus of attention are concentrated on the capital markets and bank credit, so other credit financing mode such as trade credit has been ignored.

Based on the World Bank's *Investment Climate Survey* data of China and India, this paper studied the relationship between the two financing modes-bank credit and trade credit- and enterprises' investment efficiency using Heckman sample selection model. This paper contributes to the current literature from four aspects: First, from the reality of enterprises' financing mode in developing countries, this paper focused on two kind of credit financing mode that have the greatest impact on enterprises' long-term fixed assets investment. Secondly, the paper compared the different effects of bank credit and trade credit on enterprises' investment efficiency, and noted that trade credit played a more important role to promote investment efficiency. Thirdly, this paper considered the heterogeneity of enterprises' financing constraints, and studied how bank credit and trade credit affect investment efficiency of enterprises facing different degree of financing constraints.

The remainder of the paper is organized as follows. Section 2 discusses the related theory and literature review. Section 3 discusses data and constructs econometric model. Section 4 presents the main results of the effects of bank credit and trade credit on enterprise's investment efficiency. Section 5 concludes by providing a summary of the results and policy implications.

2.Literature Review

According to the theory of Modigliani and Mille(1958), on the complete capital markets, enterprises' financing decisions and investment decisions are separated from each other. But in reality, there are varies of frictions such as asymmetric information, incomplete contract and agency problems on financial markets, resulting in the direct effect of financing modes of enterprises on their investment behavior and investment efficiency. In terms of the impact of financing modes on enterprise's investment efficiency, there are two kind of research ideas: Early studies are more concerned

about the impact of internal financing on investment efficiency, especially the relationship between the cash flow and investment efficiency (Fazzari et al. , 1988; Kaplan and Zingales, 1997; Vogt, 1994; Lian and Cheng, 2007); in recent years, research and literature on how external financing modes affect enterprises' investment efficiency began to emerge (Sufi, 2009; Luo et al, 2012) .

Based on the theory of information asymmetry and the pecking order theory, using data for the US manufacturing enterprises, Fazzari, Hubbard and Petersen (1988) (hereinafter FHP) confirmed the positive correlation between financial constraints and investment - cash flow sensitivity, making pioneering contribution to the research concerning investment-cash flow sensitivity and investment efficiency. On this basis, a lot of empirical research supported FHP's conclusions from other perspectives such as enterprise size, dividend payout ratio, and enterprise-group relationship. However, Kaplan and Zingales (1997) (hereinafter KZ) reached the opposite conclusion using the same sample but a different methodology. They suggested that there is no monotonic causal relationship between financing constraints and investment-cash flow sensitivity. This conclusion is also supported by other research results (Cleary, 1999; Qu et al., 2011). Since then the subsequent research focused on agency problems and studied the different effect on enterprise's investment efficiency of agency problems and financial constraints (Vogt, 1994; Lian and Cheng, 2007; Huang and Shen, 2009).

As to the external financing, the existing literature mostly focused on the impact of debt financing on enterprise's investment efficiency. One view is that when a enterprise finances itself through debt financing, its owner are more inclined to invest in the projects that can increase the value of the equity but reduce that of debt, which results in over-investment or under-investment. Jensen and Meckling (1976) showed that high debt capital structure will enhance the opportunism tendency of shareholders, increasing the risk of failure greatly. So once the project fails, the loss is borne by the majority of creditors, therefor the high level of leverage may result in over-investment. Myers (1977) believed that when investment income is mainly attributable to creditors, even if the investment can increase the enterprise value, managers will tend to refuse investment, which will result in underinvestment. In contrast, there is still no consensus among research based on developing countries. The empirical analysis of Chinese listed companies by Tong and Lu (2005) showed that the scale of investment and debt proportion are significantly negative correlated. The more debt a enterprise bears, the less it invests, and the negative effect is affected by the risk of the investment project. Peng and Liu (2007) pointed out that debt financing can lower the effective tax rate, and the latter will inhibit enterprise's investment activity, and therefore, debt financing can indirectly improve the efficiency of investment. Xu and Zhou (2009) showed that the increase of an enterprise's leverage will significantly lower the investment efficiency of local SOEs and non-SOEs, but the impact on the central SOEs is not significant. In addition, there are also literatures focusing on more specific financing modes. Guo and Ma (2011) studied the impact of debt financing and trade credit on investment efficiency of unlisted manufacturing enterprises in China. They found that enterprises' investment spending is constrained by debt

financing, but trade credit can ease the constraints. Song and Yao (2014) believed that both bank credits and trade credit can limit enterprises' over-investment, and the relative importance of these two financing modes will change with the degree of financing constraints.

From the current literature, the majority of research provides analysis concerning the relationship between enterprise cash flow or debt financing and investment efficiency. These studies provide important inspiration for further reflection and exploration. However, there are still some deficiencies among the existing research. First, the existing literature ignores the characteristics of different financing modes, which remains to be further studied. Secondly, bank credit and capital market receive the most attention both in theory and in practice, while the role of trade credit has been ignored. Thirdly, the heterogeneity of enterprises' financial constraints has not been taken into consideration. In fact, compared with bank credit, trade credit may play more effective role on financing enterprises and improve their investment efficiency. In addition, problems about data and methodology also exist in the current literature, one of which lies in that most of the existing empirical research focus on listed companies, which will result in biased sample selection. In fact the majority of enterprises facing financial constraints in developing countries are SMEs and non-listed companies. Therefore, only a sample of listed companies does not reflect the overall situation of enterprise's investment activities in developing countries. In this paper, we use the World Bank *Investment Climate Survey* data, combined with Heckman sample selection model, focusing on the relationship between the two kinds of credit financing modes and enterprises' investment efficiency. We hope this study can be a supplement and amendment to existing literature to some extent.

3.Data and Methodology

3.1 Data

This paper uses the World Bank *Investment Climate Survey* data. The survey was conducted by random sampling, enterprises from 19 industries in China and India received the survey. The questionnaire contains 13 parts, covering basic information, supply and marketing, infrastructure and services, the competitive environment, the security environment, technology and innovation, financing conditions, labor conditions, and other various aspects, designed to conduct a comprehensive assessment of the investment climate. The survey provides detailed and valuable information on enterprise investment and financing behavior. According to the survey results, both in China and in India, not all enterprises in last fiscal year have carried out investment activities. The number of enterprises that carried out fixed asset investment in China is 1442, accounting for about 50.6%. In manufacturing enterprises' samples, the figure is slightly higher, reaching 56.1%. Among Indian manufacturing enterprises, the proportion accounted for only 28.6%.

Since this paper focuses on financing modes and investment efficiency of manufacturing enterprises, we drop the service industry enterprises, leaving only the sample of manufacturing enterprises. We also drop the missing observations, and finally get a sample of 801 Chinese observations and a sample of 526 Indian

observations. To reduce the effect of outliers, we winsorize the continuous variables at 1% and 99% level.

3.2 Econometrics Model and Variables

In both samples, over half of the enterprises have no fixed asset investment spending. Therefore, if using OLS method to estimate the investment efficiency equation, we may face a sample selection bias. In this paper, we use Heckman sample selection model to deal with this problem. The estimation process of Heckman sample selection model consists of two steps: first, estimating the probability of enterprise's investment in fixed assets by Probit model, getting an inverse Mills ratio estimates.in the second step, adding the inverse Mills ratio as a control variable to the investment efficiency equation, then estimating the equation by OLS. According to Heckman (1979), we specify the model as follows:

$$investdummy_i = \alpha Z_i + \varepsilon_{1i} \quad (1)$$

$$invest_i = \beta X_i + \varepsilon_{2i} \quad (2)$$

Equation (1) is investment-determined equation, and equation (2) is the investment efficiency equation. In equation (1), $investdummy_i$ is a binary dummy variable, and a value of 1 indicates enterprise i's investment expenditure is positive while a value of 0 indicates no investment expenditure of enterprise i. $invest_i$ represents enterprise i's investment expenditure in fixed assets, in logarithm form. Vector Z_i and X_i consist of variables that affect enterprise i's investment decisions and the investment level respectively. ε_{1i} and ε_{2i} follow joint normal distribution and the variance is $\rho\sigma_\varepsilon$. If$\rho \neq 0$, then the equation (1) and equation (2) are relevant, so they must be estimated simultaneously. Otherwise, the estimated coefficients will be biased.

As for the measurement of enterprise's investment efficiency, there are various of methods(Vogt,1994; Stein, 2003; Lian and Cheng, 2007; Richardson,2006; Biddle et al., 2009), and the most widely used are investment expectation model(Richardson,2006) and investment-investment opportunities sensitivity model(Biddle et al., 2009). The former is used to measure a enterprise's underinvestment or overinvestment. Richardson (2006) designed a regression equation to estimate the expected level of a enterprise's investment, and determined whether there is underinvestment or overinvestment by the estimated residual of the model. This method needs only financial indicators that are relatively easy to obtain (especially for listed company data), so it has been widely used in literature. However, an enterprise's expected investment can be influenced by many factors in addition to financial indicators used by Richardson (2006).So it may generate inevitable bias, which will lead to the estimates bias of the whole model. Investment- investment opportunities sensitivity model measures a enterprise's to investment efficiency through the sensitivity of investment to investment opportunities (Stein, 2003; Bushman et al, 2007; Chen et al, 2011; Jin et al., 2012; Ying and. Luo, 2012), and the investment opportunities are generally measured by the growth of a enterprise, whose proxy can be Tobin Q or sales growth. Tobin's Q has been widely used due to its simplicity of calculation, but it also has more serious flaws. At present, the

speculation on China's stock market is still common, thus the market value of the enterprises has been overestimated or underestimated to different extent, resulting in Tobin Q's failure in accurately reflecting the growth of enterprises. By contrast, the growth rate of sales is more robust. So we choose investment-investment opportunities sensitivity model, using the sensitivity of investment to growth rate of sales as the measurement of an enterprise's investment efficiency.

This paper focuses on two kinds of credit financing, namely bank credit and trade credit. therefore, we introduce two interaction terms- *bank * growth* and *credit * growth* –in equation (2) as the key independent variables, where *growth* represents the enterprise's growth rate of sales, *bank* and *credit* represent bank credit and trade credit respectively. Consistent with the literature, we use a binary dummy variable to represent the bank credit, *bank* = {0, 1}, where a value of 1 indicates the enterprise obtained loans or lines of credit from banks or other financial institutions, and a value of 0 means the opposite; we use *credit* - the proportion of the value of total annual purchases of material inputs or services paid for after delivery- to measure trade credit.

In addition to the two interaction terms, we also retain *growth*, *bank* and *credit* as independent variables.

According to Heckman (1979), vector Z_i must contain at least one variable that is not contained in vectorX_i. Obviously, the success of research and development of new products is one of the motives for an enterprise to invest, so whether to invest will be largely determined by new product development. On the other hand, according to the theory of industrial organization, the competitive position of enterprises will also affect the investment decisions. Therefore, we set the variable *newproduct* and *competitor* included only in vector Z_i but not in the vector X_i. *newproduct* is a binary dummy variable ,with the value of 1 indicating that enterprise *i* has introduced new products or services in the last three years. *competitor* is specified to measure the number of competitors that enterprise *i* faces, ranging from 1 to 5. The greater the number, the more competitors it faces.

Apart from *competitor* and *newproduct*, the equation (1) and (2) contain the same control variables. Based on the current empirical research, we specify the following four sets of control variables.

First, we control for the basic characteristics of enterprises. Enterprise size dummies *small* and *medium*, *small* = {0,1}, where the value of 1 indicates enterprise *i* is a small business (less than 20 people, according to the Survey), while the value 0 indicates enterprise *i* is not a small business; *medium* = {0,1}, where the value of 1 indicates enterprise *i* is a medium business (more than 20 but less than 100 people, according to the Survey), while the value 0 indicates enterprise *i* is not medium-sized; if both *small* and *medium* takes a value of 0 , it indicates that enterprise *i* is a large business (100 people or more in size). Enterprise age variable, *age*, logarithm of enterprise age. Enterprise ownership dummy *soe*(only applicable to China, but not for India), *soe* = {0,1}, where the value of 1 indicates enterprise *i* is a state-owned enterprise, with 0 representing private enterprise. Enterprise profit variable, *profit*, logarithm of enterprise *i*'s net profit. Group dummy variable, *part*, *part* = {0,1},

where the value of 1 indicates enterprise *i* is part of a larger group, value of 0 indicates enterprise *i* is an enterprise on its own. Export dummy, *export*, export = {0,1}, where the value of 1 indicates export enterprise, with 0 representing non-exporters.

Secondly, we control for corporate governance factors. The impact of corporate governance on enterprises' investment activity has been demonstrated by literature (Gao et al., 2012; Liu et al., 2014). This paper introduces *largestowner* to measure the proportion of shares hold by the largest shareholder, *experience* to measure the manager's working experience, *femaleowner* to measure whether there are any females among the owners of the enterprise, *femalemanager* to measure whether the top manager is female.

Thirdly, we control for government-enterprise relationship. Political relations make enterprises gain more external financing facilities that easing their financing constraints and reduce the cost of coordination with the government, thus improving investment efficiency (Chen and Zhu, 2009). Therefore, we introduce *time* and *govcontract* to control for the relationship between government and enterprises. *time* is the measurement of total senior management's time spent on dealing with requirements imposed by government regulations, and *govcontract* is a binary dummy variable, govcontract = {0,1}, the value of 1 indicates that enterprise i has secured a government contract, while value of 0 indicates no access to government contract.

At last, we control for regional fixed effects. Enterprises located in different cities have been surveyed, so we introduce binary area dummy variables to control for the impact of local factors on enterprises investment behavior.

In summary, the econometric model in this paper can be further written as follows:

$$investdummy_i = \alpha X_i + \theta_1 competitor_i + \theta_2 newproduct_i + \varepsilon_{1i} \quad (3)$$

$$invest_i = \beta_1 growth_i * bank_i + \beta_2 growth_i * credit_i + \beta_3 growth_i + \beta_4 bank_i + \beta_5 credit_i + \gamma X_i + \varepsilon_{2i} \quad (4)$$

3.3 Statistical Description

Table 1 shows mean, variance and extreme value of the variables. In the sample of China, more than half of the enterprises have investment in fix assets, and the average value of investment expenditure is about 4.346. In the sample of India, the proportion of enterprises that have fix asset investment is smaller than that of China. The average of investment expenditure is 4.917, a bit higher than China, but the variance is larger.

Table1

As for the sales growth, on average, the sales growth of the enterprises in China is higher than that of counterparts in India. As for the financing, both the proportion of enterprises to obtain bank credit and the amount of trade credit access to enterprises are larger in China.

4.Main Results

4.1 Benchmark Regression

We estimate equation (3) and (4) with the method of Heckman(1979). Table 2 shows the estimation results. The estimated results of the Chinese sample are displayed in the first two columns, and the results of Indian sample are displayed in the last two columns.

Table2

From table 2, both the two estimated inverse Mills ratio λ are significant, thus the null hypothesis that "equation (3) and (4) are independent of each other," should be refused. That means Heckman two-stage estimation method is necessary here to correct the sample selection bias.

The results show that the impact of different financing modes on enterprise's investment efficiency is different, and there are also obvious differences between in China and in India. As to the estimated results based on Chinese sample, the coefficient of *growth*bank* is significantly negative, indicating that bank credit may reduce enterprise's investment efficiency. While the coefficient of *growth*credit* is significantly positive, indicating that the trade credit can improve enterprise's investment efficiency. As to the estimated results based on Indian sample, the coefficient of *growth*bank* is positive, indicating that bank credit may improve enterprise's investment efficiency, but not significantly. The coefficient of *growth*credit* is also significantly positive, indicating that the trade credit can improve enterprise's investment efficiency both in China and in India.

Overall, in developing countries, the relationship between enterprise investment efficiency and bank credit is not clear, while a positive correlation between the investment efficiency and the trade credit is significant. This suggests that enterprises may not use the bank credit effectively after they obtained them. In the current bank-dominated financial system of China, the primary role played by bank credit is funding for businesses as "large lenders" (Hu et al, 2008; Shen et al, 2013; Zhang, et al, 2015), while its supervision function has been weakened. Information asymmetry between banks and enterprises also increases the difficulty of supervision on the use of funds. In contrast, trade credit is based primarily on the "relationship" accumulated in long-term economic dealings between borrowers and lenders, which can reduce the information asymmetry, making it easier for the lender to monitor the behavior of borrowers effectively. Petersen and Rajan (1997) pointed out that this information advantage of relationship lenders is difficult to obtain for banks. Therefore, if inefficient investment behavior exists after obtaining funds, it will easily be known by the lender, thus affecting subsequent financing and the subsequent cooperation, so the borrower in this case will urge itself to improve investment efficiency.

4.2 The Heterogeneity of Financing Constraints

The results above show that access to bank credit does not necessarily improve the investment efficiency of enterprises, which contradicts the conclusions in the literature (Ying and Luo, 2012; Song and Yao, 2014). Ying and Luo(2012) has shown that the effect of bank credit on enterprise investment efficiency depends on the degree of financing constraints facing enterprises. In order to further clarify the

different effect of different financing modes on enterprise investment efficiency, we divide each sample into two subsamples based on the heterogeneity of financing constraints: the subsample of enterprises facing strong financing constraints and subsample of enterprises facing weak financing constraints. If an enterprise has applied for bank credit but not been approved, or it has not applied for a loan due to the high interest rate, etc, then it will be classified as an enterprise facing strong financing constraints. If an enterprise has applied for bank credit and been approved, or it has not applied for a loan due to “no need”, then it will be classified as an enterprise facing weak financing constraints. Here, the Heckman two-step method is used to estimate the model, and when the sample selection effect is not significant, we also use the OLS method. Table 3 and table 4 shows the estimation results of Chinese sample and Indian sample respectively.

Table3

From Table 3 we can see that, in China, for enterprises facing strong financing constraints, access to bank credit can significantly improve the investment efficiency. Similarly, the more trade credit an enterprise obtained, the higher is its investment efficiency. This suggests that, when enterprises are facing strong financing constraints, obtaining credit financing(either bank credit or trade credit) can significantly improve the efficiency of investment, which is consistent with the conclusions of the existing research (Ying and Luo, 2012; Song and Yao, 2014). For enterprises facing weak financing constraints, the results here are the similar with the benchmark regression, namely: access to bank credit has a negative effect on investment efficiency, while more trade credit has a positive relationship with enterprise investment efficiency. This suggests that when facing weak financing constraints, enterprises could rely more on trade credit to improve their investment efficiency.

Table4

From Table 4 we can see that, in India, for enterprises facing strong financing constraints, access to bank credit can improve their investment efficiency, but this effect is not significant. At the same time, trade credit has a significantly positive effect on enterprise investment efficiency. This suggests that when enterprises are facing strong financing constraints, the improvement of investment efficiency can rely more on trade credit. For enterprises facing weak financing constraints, neither of the credit financing modes has a significant effect, suggesting in India, financing modes have no significant effect on enterprise investment efficiency when the financing constraints are not severe.

5. Conclusion

In this paper, we investigate the effects of bank credit and trade credit on enterprise investment efficiency using Heckman sample selection model, based on the World Bank *Investment Climate Survey* data for China and India. We have come to the following conclusions from the empirical results. First, on the whole, different financing modes have different effects on enterprise’s investment efficiency. In China, trade credit can improve enterprise’s investment efficiency, while bank credit may reduce it. In India, both bank credit and trade credit have a positive impact on

enterprise investment efficiency, but the former effect is not significant, so trade credit can play more important a role in the promotion of enterprise investment efficiency. Secondly, it should be emphasized that the impact of different financing modes on investment efficiency is related to the degree to which enterprises face financing constraints. Specifically, in China, both bank credit and trade credit can improve the investment efficiency of who face strong financing constraints, and bank credit has a negative but trade credit has a positive effect on enterprise's investment efficiency facing weak financing constraints, which is consistent with the baseline regression results. The reason may be that when an enterprise faces strong financing constraints, both bank credit and trade credit can alleviate it, thereby improving the efficiency of investment. And when facing weak financing constraints, banks may not be able to supervise the using of funds so that reduce enterprise's investment efficiency. While as for trade credit, information asymmetry between borrowers and lenders is not as serious as that in the situation of bank credit, and the "relationship" urges the enterprise promote investment efficiency of itself. In India, for enterprises facing strong financing constraints, trade credit has a significantly positive effect on enterprise investment efficiency, rather than bank credit. For enterprises facing weak financing constraints, neither of the credit financing modes has a significant effect. So both in China and in India, the promotion of enterprise investment efficiency depends more on trade credit.

Conclusions of this paper have important policy implications. At present, the financing of enterprises in developing countries rest on credit financing modes heavily, of which the most important are bank credit and trade credit. The results of this paper show that the effects of the two credit financing modes on enterprise investment efficiency are different, but in any case, trade credit can play a greater and more significant role than bank credit, which indicates that the trade credit should be emphasized and used more extensively. On the one hand, small and medium-sized enterprises usually face the most serious financing constraints, and it is difficult to obtain bank credit for them. So trade credit can not only be used as an important supplement to support the financing of small and medium-sized enterprises, but also plays a positive role in promoting the enterprise investment efficiency. On the other hand, in the period of economic downturn, the credit rationing results in the common difficulty of financing, thus some high quality investment projects are likely to be stranded due to financing difficulties. At this time, the trade credit can play a stronger role in alleviating the financing constraints and improving the efficiency of the enterprise investment. Therefore, the government should guide enterprises to take advantage of trade credit financing, and provide a guarantee for the effective use of trade credit for enterprises facing narrow financing channels.

References

Biddle G. C., Hilary G., Verdi R. S. How does financial reporting quality relate to investment efficiency?[J]. Journal of Accounting and Economics, 2009, 48(2): 112-131.

Bushman R. M., Smith A., Zhang F. Investment-cash flow sensitivities are really investment-investment sensitivities[R]. Working paper, University of North Carolina, 2007.

Chen J. Y., Wang D. J., Zhang J. Q. Debt Maturity Structure of Companies and Investment Efficienc [J]. The Journal of Quantitative & Technical Economics, 2009, (4):80-92.

Chen S., Sun Z., Tang S., et al. Government intervention and investment efficiency: Evidence from China[J]. Journal of Corporate Finance, 2011, 17(2): 259-271.

Chen Y.S., Zhu C. Political Connection , Institutional Environment and Capital Investment of Listed Companies [J]. Journal of Finance and Economics, 2009 (12): 27-39.

Cleary S. The relationship between firm investment and financial status[J]. The Journal of Finance, 1999, 54(2): 673-692.

Fazzari S.M., Hubbard R. G., Petersen B. C., et al. Financing constraints and corporate investment[J].Brookings papers on economic activity, 1988, 1(1):141-206.

Gugler K., Mueller D., Yurtoglu B. Corporate Governance and the Returns on Investment[J]. Journal of Law and Economics, 2004, 47(2): 589-633.

GUO L, MA W. Debt Financing, Trade Credit and SMEs' Investment: Evidence from Unlisted Manufacturing SMEs in China [J]. Journal of Finance and Economics, 2011, 3: 014.

Heckman J.J..Sample bias as a specification error[J].Econometrica, 1979, (47):153-162.

Hu Yiming , Thomas W .Lin., Li Siqi , Xie Shilei. The Role of the Great Creditors:Do the Banks in China Have the Monitoring Effect on the Borrowers? [J].Economic Research Juornal, 2008, (10):52-64.

Jensen M.C., Meckling W. H.Theory of the firm: Managerial behavior, agency costs and ownership structure[J].Journal of financial economics, 1976, 3(4):305-360.

Kaplan S.N., Zingales L. Do investment-cash flow sensitivities provide useful measures of financing constraints?[J].The Quarterly Journal of Economics, 1997, 112(1):169-215.

Lian Yuojun, Cheng Jian. InvestmentOCash Flow Sensitivity:Financial Constraints or Agency Costs? [J]. Journal of Finance and Economics, 2007, 33(2):37-46.

Modigliani F., Miller M. H. The cost of capital, corporation finance and the theory of investment[J].The American economic review, 1958, 43(3):261-297.

Myers S.C. Determinants of corporate borrowing[J].Journal of financial economics, 1977, 5(2):147-175.

Pan T, Zhengfei L. Debt Financing, the Sources of Debt, and the Enterprises' Investment Behavior: Evidence from Listed Companies in China [J][J]. Economic Research Journal, 2005, 5: 75-84.

Petersen M.A., Rajan R. G. Trade credit: theories and evidence[J].Review of financial studies, 1997, 10(3):661-691.

Qinglu J, Xiang K, Qingchuan H. Monetary Policy, Investment Efficiency and Equity Value [J][J]. Economic Research Journal, 2012, 5: 009.

Richardson S. Over-investment of free cash flow[J].Review of accounting studies, 2006, 11(2):159-189.

Song Shuqin Yao Kaili. Financing Constraints, Heterogeneous Debt and Over-investment Differentiation:the Samples of Private Listed Corporation in 2007 ~ 2011 [J].Reform, 2014, (1):138-147.

Stein J. C. Agency, information and corporate investment[J]. Handbook of the Economics of Finance, 2003, 1: 111-165.
Sufi A. Bank lines of credit in corporate finance: An empirical analysis[J]. Review of Financial Studies, 2009, 22(3): 1057-1088.
Vogt S.C. The cash flow/investment relationship: evidence from US manufacturing firms[J].Financial management, 1994, 23(2):3-20.
Wenzhou Q., Yalu X, Yumei Y. Information Asymmetry and Investment-Cash Flow Sensitivity: An Empirical Research Based on Market Microstructure Theory[J]. Economic Research Journal, 2011, 6: 011.
Xin Qingquan, Bin Lin Deming Yang. Return to Capital Investment and Its Determinants in China :Evidence from Listed Companies [J]. China Economic Quarterly, 2007, 6(4):1143-1164.
Xinsheng C, Youchao T, Jianmei L. The Non-financial Information, the External Financing, and the Investment Efficiency: a Study Based on the Constraint of External Systems [J]. Management World, 2012, 7: 013.
Xu Yude, Zhou Wei. Measurement of Investment Efficiency under Different Capital Structures and ownership Arrangements—An Empirical Evidence from Chinese Listed Companies[J]. China Industrial Economics, 2009, (11):131-140.
Ying Qianwei, Luo Danglun. Lines of Credit and Investment Efficiency[J]. Journal of Financial Research, 2012, (5): 151-163.

Table1-Summary Statistics

	China				India			
Variable	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
investdummy	0.538	0.499	0	1	0.146	0.353	0	1
invest	4.346	1.742	-5.298	11.608	4.917	2.162	-4.605	7.696
growth	0.435	1.374	-0.400	11.500	0.249	0.462	-0.473	3.25
bank	0.415	0.493	0	1	0.394	0.489	0	1
credit	61.323	29.943	0	100	51.061	32.629	0	100
small	0.285	0.452	0	1	0.396	0.49	0	1
medium	0.408	0.492	0	1	0.464	0.499	0	1
age	2.681	0.390	1.099	4.466	2.932	0.739	0	4.431
soe	0.015	0.122	0	1	——	——	——	——
profit	15.484	1.950	8.882	22.946	15.594	2.024	11.653	20.338
part	0.111	0.315	0	1	0.217	0.412	0	1
export	0.351	0.478	0	1	0.108	0.31	0	1
largestowner	0.839	0.223	0.2	1	72.875	27.135	15	100
experience	2.792	0.455	0.693	3.850	2.561	0.701	0.693	4.159
femaleowner	0.545	0.498	0	1	0.131	0.338	0	1
femalemanager	0.077	0.267	0	1	0.056	0.229	0	1
time	1.080	2.103	0	30	8.029	19.114	0	100
govcontract	0.112	0.316	0	1	0.299	0.458	0	1
newproduct	0.463	0.499	0	1	0.511	0.5	0	1
competitor	4.632	0.924	1	5	3.703	1.173	2	5

Table2-Main Results

	China		India	
	First stage	Second stage	First stage	Second stage
growth*bank		-0.233*		1.346
		(0.136)		(1.615)
growth*credit		0.003**		0.064**
		(0.002)		(0.032)
constant	-0.227	0.251	-9.974	2.563
	(1.191)	(1.361)	(0.000)	(3.797)
growth	0.040	-0.111	0.239	-3.305
	(0.038)	(0.171)	(0.194)	(2.252)
bank	0.449***	0.244	0.692***	-1.351**
	(0.119)	(0.181)	(0.216)	(0.682)
credit	-0.005***	0.000	0.006	-0.017
	(0.002)	(0.003)	(0.003)	-1.351**
soe	-0.364	1.136*		
	(0.406)	(0.643)		
small	-0.287*	-0.464**	0.187	-2.028*
	(0.157)	(0.218)	(0.352)	(1.057)
medium	0.095	-0.329**	-0.022	-0.910
	(0.132)	(0.159)	(0.286)	(0.797)
age	-0.075	-0.226	-0.117	-0.036
	(0.146)	(0.187)	(0.141)	(0.433)
profit	0.058	0.332***	0.098	0.113
	(0.037)	(0.047)	(0.064)	(0.179)
part	-0.155	0.148	0.558**	-2.382***
	(0.168)	(0.198)	(0.246)	(0.647)
export	0.362***	0.170	0.117	-1.063
	(0.117)	(0.152)	(0.333)	(0.818)
largestowner	-0.396	0.038	-0.011***	0.015
	(0.251)	(0.322)	(0.004)	(0.012)
experience	0.158	-0.216	0.331**	0.561
	(0.132)	(0.175)	(0.167)	(0.478)
femaleowner	-0.010	0.060	0.047	1.621**
	(0.114)	(0.152)	(0.265)	(0.760)
femalemanager	0.270	-0.625**	-0.245	1.463
	(0.206)	(0.254)	(0.375)	(1.172)
time	0.132	0.031	0.005	-0.012
	(0.025)	(0.032)	(0.005)	(0.019)
govcontract	0.022	-0.037	0.266	1.905***
	(0.177)	(0.195)	(0.242)	(0.694)
newproduct	0.686***		0.471**	
	(0.114)		(0.211)	
competitor	-0.174***		-0.159*	

	(0.062)		(0.089)	
λ		-0.918***		-1.209*
		(0.342)		(0.679)
N	801		526	

Standard errors are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Fixed effects are not listed for brevity.

Table3- Financing Constraints: China

	SFC			WFC		
	Heckman		OLS	Heckman		OLS
	First stage	Second stage		First stage	Second stage	
growth*bank		1.087*	1.080*		-0.326*	-0.366**
		(0.591)	(0.625)		(0.173)	(0.197)
growth*credit		0.019*	0.019*		0.010***	0.009
		(0.010)	(0.011)		(0.002)	(0.004)
constant	-6.110	0.422	1.969	5.434	1.353	1.108
	(1.959)	(1.552)	(1.712)	(1.402)	(1.604)	(1.592)
growth	0.134	0.128	0.109	0.029	-0.565**	-0.491
	(0.320)	(0.505)	(0.636)	(0.042)	(0.226)	(0.356)
bank	0.521*	0.258	0.213	0.411***	0.339	0.518
	(0.279)	(0.241)	(0.233)	(0.155)	(0.257)	(0.222)
credit	-0.007*	-0.004	-0.003	-0.005**	-0.005	-0.007
	(0.004)	(0.004)	(0.005)	(0.002)	(0.004)	(0.004)
small	-0.346	-0.859***	-0.826**	-0.336*	-0.502	-0.648
	(0.306)	(0.268)	(0.337)	(0.204)	(0.307)	(0.315)
medium	0.196	-0.384*	-0.390*	-0.025	-0.331	-0.365
	(0.272)	(0.200)	(0.227)	(0.167)	(0.214)	(0.214)
age	0.033	-0.151	-0.162	-0.220	-0.271	-0.354
	(0.342)	(0.278)	(0.393)	(0.176)	(0.237)	(0.219)
soe				0.219	1.082	1.134
				(0.543)	(0.747)	(0.609)
profit	0.034	0.207***	0.202**	0.061	0.274***	0.295
	(0.081)	(0.073)	(0.091)	(0.045)	(0.061)	(0.067)
part	0.249	0.108	0.086	-0.098	-0.005	-0.029
	(0.402)	(0.257)	(0.341)	(0.205)	(0.260)	(0.369)
export	0.864***	0.322	0.260	0.132	0.270	0.294
	(0.233)	(0.237)	(0.217)	(0.149)	(0.201)	(0.201)
largestowner	-0.032	-0.488	-0.482	-0.713**	-0.036	-0.261
	(0.479)	(0.366)	(0.470)	(0.334)	(0.447)	(0.448)
experience	0.085	0.183	0.180	0.268	-0.188	-0.091
	(0.284)	(0.231)	(0.267)	(0.167)	(0.245)	(0.198)
femaleowner	0.050	0.089	0.076	-0.015	0.162	0.169

	(0.210)	(0.173)	(0.219)	(0.142)	(0.220)	(0.217)
femalemanager	0.379	-0.012	-0.028	0.135	-0.417	-0.350
	(0.531)	(0.375)	(0.427)	(0.241)	(0.330)	(0.320)
time	0.006	-0.007	-0.008	0.038	0.026	0.043
	(0.095)	(0.087)	(0.119)	(0.028)	(0.039)	(0.042)
govcontract	-0.344	0.002	0.011	0.280	-0.171	-0.084
	(0.382)	(0.261)	(0.343)	(0.233)	(0.264)	(0.358)
newproduct	0.644***			0.706***		
	(0.231)			(0.149)		
competitor	-0.281**			-0.159**		
	(0.126)			(0.078)		
λ		0.151			-0.808	
		(0.392)			(0.500)	
N		286	116		495	295

Standard errors are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. Fixed effects are not listed for brevity.

Table4- Financing Constraints: India

	SFC		WFC		
	Heckman		Heckman		OLS
	First stage	Second stage	First stage	Second stage	
growth*bank		1.026		3.698	0.234
		(2.928)		(9.940)	(0.626)
growth*credit		0.126**		-0.009	0.008
		(0.052)		(0.064)	(0.010)
constant	-6.110	1.298	-5.146**	-16.267	-4.959**
	(1.959)	(6.130)	(2.278)	(14.610)	(2.200)
growth	0.171	-5.765*	0.029	-0.692	-0.274
	(0.390)	(3.458)	(0.215)	(10.506)	(0.335)
bank	1.201***	-2.181*	0.848**	1.141	0.813*
	(0.351)	(1.211)	(0.336)	(2.379)	(0.481)
credit	0.007	-0.035**	0.010**	-0.030	0.004
	(0.006)	(0.017)	(0.005)	(0.031)	(0.006)
small	0.302	-4.714**	-0.404	2.894	-0.157
	(0.539)	(1.988)	(0.552)	(2.044)	(0.626)
medium	0.484	-4.449***	-0.517	2.611*	-0.346
	(0.453)	(1.663)	(0.445)	(1.586)	(0.551)
age	-0.336	0.226	0.213	2.247	0.268
	(0.205)	(0.600)	(0.285)	(1.936)	(0.236)

profit	0.054	0.297	0.105	0.966**	0.143
	(0.094)	(0.285)	(0.092)	(0.416)	(0.103)
part	0.623	-3.373***	0.466	-2.022	0.583
	(0.389)	(1.141)	(0.375)	(1.285)	(0.453)
export	0.672	-5.371***	-0.160	-2.635*	-0.188
	(0.513)	(1.750)	(0.479)	(1.523)	(0.560)
largestowner	-0.014**	0.041	-0.003	-0.017	-0.007
	(0.006)	(0.027)	(0.006)	(0.024)	(0.006)
experience	0.431*	1.340	0.434*	-0.802	0.408*
	(0.260)	(0.953)	(0.240)	(1.289)	(0.245)
femaleowner	0.151	1.485	0.056	1.615	0.657
	(0.429)	(1.786)	(0.393)	(1.312)	(0.455)
femalemanager	-0.311	2.745	-0.509	2.347	-0.135
	(0.772)	(2.820)	(0.508)	(1.833)	(0.593)
time	0.014	0.078	-0.007	-0.061**	0.001
	(0.012)	(0.091)	(0.006)	(0.031)	(0.007)
govcontract	-0.005	1.706	0.178	2.246	0.061
	(0.383)	(1.151)	(0.357)	(1.658)	(0.387)
newproduct	0.691**		0.966***		
	(0.296)		(0.324)		
competitor	-0.165		-0.087		
	(0.144)		0.466		
λ		-2.463***		-0.163	
		(0.855)		(2.110)	
N	355		206		206

Standard errors are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. Fixed effects are not listed for brevity.