

# The Impact of Financing Constraints on Chinese Enterprises' OFDI

## -- A Comparison between SOEs and Non-SOEs

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**Abstract.** As Chinese government pushes forward "One Belt One Road" Initiative and further facilitates foreign investment, Chinese enterprises have the intensified incentives to go out. However, many enterprises face financial constraints. Do financial constraints affect enterprises' Outward Foreign Direct Investment (OFDI) behavior? The paper makes a comparative analysis of financial constraints between state-owned enterprises (SOEs) and non-state-owned enterprises (non-SOEs). The paper concludes that whether private or state-owned enterprises OFDI behavior are significantly affected by the inner financing constraints. The credit financing constraint have significant inhibitory effect on the non-SOE' OFDI behavior, while the state-owned enterprises affected by the level of commercial credit is more obvious.

### 1.Introduction

Overseas foreign direct investment (OFDI) becomes an important route for Chinese businesses to enter international markets in today's China. Currently, Chinese economy further integrates into the global economy; China attempts to develop a sound financial market; China's foreign trade growth slows. With "One Belt One Road" Initiative, the issue about how Chinese businesses can go international receives increasing attention. Considering policy incentives and business growth prospects, a large number of Chinese enterprises want to going international and grow into competitive multinationals. Expanding into an overseas market presents a wide array of challenges including higher productivity level and enormous input in capital and human resources.

China's overseas investment has been rising in recent years. But for Chinese enterprises, OFDI remains fresh attempts. With the implementation of "Go out" Strategy, Chinese enterprises invest overseas through increased channels rather than mere government-driven OFDI aiming to access resources and technology. An increasing number of private businesses invest overseas and involve themselves in international competition.

By 2014, China's OFDI stock for the financial sector was US\$745.02 billion, 53.6% of which came from SOEs and 46.4% from non-SOEs. Between 2006 and 2014, SOEs are major outbound investors for China's non-financial sector. However, the growth rate for SOEs slows down as more non-SOEs invest overseas.

Owing to uneven allocation of resources and imperfect market mechanism, SOEs have been advantageously positioned. Huang Mengfu (2010) finds that only 30% large private businesses have access to bank loans, and a mere 5% small and medium-sized private businesses use bank loans. Owing to the advantaged position SOEs have, private businesses, medium and small-sized businesses confront financing constraints.

China is regarded as a prospective partner for economic cooperation by many countries with the changing economic global picture, global industrial upgrading and resource optimization. Meanwhile, Chinese enterprises undergo the restructuring and upgrading process, and "Go Out" becomes a growth strategy for many enterprises and China embraces fresh opportunities for international cooperation. Optimizing allocation of resources between SOEs and non-SOEs and accelerating industrial restructuring and upgrading are important economic issues for China.

Under this background, the paper looks into how financing constraints would affect Chinese SOEs and non-SOEs in making outbound investments. Through the study, the paper attempts to provide some insights into how policymakers can formulate sound foreign investment and cooperation policies.

The rest of the paper is structured as follows: Section 2 reviews previous studies. Section 3 describes the theoretical framework for the study. Section 4 involves data collection, quantitative modelling and statistical analysis. Section 5 analyzes empirical results. Section 6 concludes this paper and makes policy recommendations.

## 2.Literature Review

With the development of New New Trade Theory (NNTT), researchers give more attention to the motives which encourage firms to go international. Firms enter international markets through exporting or through outbound investments. The theory of heterogeneous firms developed by Marc Melitz (2003) has sparked growing interest in looking at the outbound investment behavior of heterogeneous firms. Helpman et.al (2004) find that entry into an overseas market requires larger fixed cost, which means a firm needs higher productivity to enter an overseas market. Damijan et al (2007),Grossman(2006),Yeaple (2009) have empirically studied the effects of productivity on a firm's outbound investment using data from individual countries.

The existing studies into firms' outbound investment focus on productivity at the firm level. The studies are based on perfect financial market assumptions. But in reality the financial markets are imperfect. Information asymmetry and financing constraints present prevailing problems. Therefore, it is assumed that financing capabilities affect firms' internationalization decisions. A firm can rely on internal financing and external financing to cover fixed costs involved in an outbound investment. According to the pecking order theory developed by Donaldson in 1961 and modified by Stewart C. Myers and Nicolas Majluf in 1984, companies give priority to their internal financing resources over external financing resources. Internal financing includes retained earnings and free cash flow; External financing includes equity financing <sup>1</sup> and securities financing.

Chaney (2005) incorporates liquidity constraints into Melitz's heterogeneous trade model. Chaney's study reveals that firms which are constrained by liquidity cannot cover fixed costs required for exporting and that they fail to export. Manova (2008) points out that credit constraints have negative effects on a firm's production and also limit the extensive and intensive margins of trade. Manova (2013) concludes that financially developed countries are more likely to take part in exporting and that financially vulnerable sectors are more likely to be affected by financing constraints. Muùls (2008) has found from the data on Belgian manufacturing companies that less financially constrained companies are more likely to export and import their products. Alvarez (2013) concludes that companies with high productivity are positively affected by financial developments and that external financing constraints less affect foreign-invested manufacturing firms. Manova (2009) finds from firm-level Chinese Customs data that private businesses have more financing constraints. The study reveals that private businesses are evidently disadvantaged in terms of export sales, product variety and export destinations.

Based on the heterogeneous trade theory, studies in China also support that the less financing constraints companies have, the more likely they are to export. Their studies prove that financing constraints have negative impacts on export decisions (Yu Hongxia, Xi Liutang, Chen Yuyu, 2011; Sun Linyan, Li Ronglin, 2011; Yang Jiayu, 2012; Li Zhiyuan, Yu Miaojie, 2013; Xu Rong, Zhao Yong, 2015).

The above studies focus on the impact of financing constraints on firm-level exporting. But there is limited research on the impact of financing constraints on firm-level OFDI. C.M.Buch et al.(2010) use data on German firms and studies whether external financing support significantly affects a firm's exporting and OFDI behavior. C.M.Buch et al.(2014) further find that productivity is the motive

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<sup>1</sup> Owing to imperfect securities market conditions, China Securities Regulatory Commission sets tight refinancing requirements. Public companies have difficulty in refinancing through the securities market. So the paper just examines firms' equity financing capability.

behind OFDI and that a firm's financing capability decides whether a firm is able to cover larger fixed costs involved in international market access. In China, Research into firm-level OFDI behavior from the perspective of financial constraints is limited. Li Lei and Bao Qun (2015) use China's Industrial Enterprise Database and reveals that credit financing markedly promotes industrial enterprises to "Go Out". Li Liya and He Yanlin(2015) find that financing constraints severely affect firm-level OFDI behavior and that firms in industries that rely more on external financing are more likely to be affected.

The paper examines the impact of internal financing constraints and external financing on both SOEs and Non-SOEs in China. Considering the different types of business ownership, financing constraints may have varied impacts and hence may affect firms' OFDI decisions.

### 3.Theoretical Model

In this section, we base the study on the trade theory of heterogeneous firms and constructs the OFDI decision-making model when businesses face financing constraints. We assume that the market competition confronted by businesses is in line with monopolistic competition model developed by Dixit and Stiglitz (1977).

To make outbound investments, firms need to cover fixed cost  $F_{OFDI}$ . The marginal cost for the firms is written as  $c/\beta$ , among which  $c$  means production cost per unit and  $\beta$  means efficiency level. To finance outbound investments, firms need to cover certain financing cost incurred in either external financing or internal financing. And the cost involved in external financing is usually higher than that in internal financing. When firms make outbound investments, probability of their meeting the fixed cost through external financing is  $q$  and that through internal financing is  $1-q$ . When a firm does external financing, the total cost will increase by  $\lambda(\lambda>1)$ . The bigger  $\lambda$  is, the higher is the external financing cost, and the larger financing constraints are.

- the consumer utility function

$$U = \left\{ \int_{\omega \in \Omega} \left( s(\omega)^{\frac{\theta-1}{\theta}} \right) dx \right\}^{\frac{\theta}{\theta-1}} \quad (1)$$

$\Omega$  means the number of possible product variety.  $\theta>1$  means elasticity of substitution. When the maximum consumer utility is achieved, the demand function is

$$s(p, P) \equiv s = \frac{Ep^{-\theta}}{p^{1-\theta}} \quad (2)$$

$p$  means product prices;  $P$  is price index.

- profits

$$\pi_i = p \cdot s \cdot \frac{c}{\beta} - F_{OFDI} \quad (\text{internal financing}) \quad (3)$$

$$\pi_e = p \cdot s \cdot \lambda \left( \frac{c}{\beta} + F_{OFDI} \right) \quad (\text{external financing}) \quad (4)$$

When profits maximize,

$$\pi_i = \frac{E}{\theta} \left[ \frac{c}{\beta p} \frac{\theta}{1-\theta} \right]^{1-\theta} - F_{OFDI} \quad (5)$$

$$\pi_e = \frac{E}{\theta} \left[ \frac{\lambda c}{\beta p} \frac{\theta}{1-\theta} \right]^{1-\theta} - \lambda F_{OFDI} \quad (6)$$

Therefore, the expected utility function is written as

$$E(\pi) = (1-q) \left[ \frac{E}{\theta} \left[ \frac{c}{\beta p} \frac{\theta}{1-\theta} \right]^{1-\theta} - F_{OFDI} \right] + q \left[ \frac{E}{\theta} \left[ \frac{\lambda c}{\beta p} \frac{\theta}{1-\theta} \right]^{1-\theta} - \lambda F_{OFDI} \right] \quad (7)$$

Based on  $E(\pi) \geq 0$ , we derive the following:

$$\beta^* \geq \left\{ [\lambda q + (1-q)][\lambda^{1-\theta} q + (1-q)^{-1}] F_{OFDI} \left( \frac{E}{\theta} \right)^{-1} \left( \frac{c}{P} \frac{\theta}{\theta-1} \right)^{\theta-1} \right\}^{\frac{1}{\theta-1}} \quad (8)$$

Therefore, when a firm's productivity is over  $\beta^*$ , its outbound investment starts to yields profits.

According to Formula (8),  $\frac{\partial \beta^*}{\partial q} \geq 0, \frac{\partial \beta^*}{\partial \lambda} \geq 0$ , there is a positive correlation among productivity, external financing probability and financing constraints. This means that the thresholds for outbound investments are raised and that only firms with higher productivity can overcome financing constraints.

## 4. Data collection, Mathematical Modelling and Statistical Analysis

### 4.1 Data Collection

We take advantage of the data on Chinese public firms between 2007-2014 from CSMAR's Research Database on Chinese Public Companies and Directory of Chinese OFDI Enterprises (Organizations). We exclude firms from the financial sector and samples with missing key indicators. Similar to the methods used by Whited and Wu (2006), we exclude firms with negative growth rate in core business lines so that a firm's own financial problem would not affect the current research.

We gather valid data for 8384 businesses. We use the same method of categorizing business ownership as in CSMA Research Database on Shareholders of Chinese Public Companies. We divide firms into SOEs<sup>2</sup> and non-SOEs and we extract 3325 SOE samples and 4959 non-SOE samples. Previous studies about firm-level OFDI often use Chinese Industrial Enterprises Database compiled by China Statistical Bureau. However, previous studies most used data before 2009 owing to low update frequency. Before 2007, very few Chinese companies invested overseas and most entered international markets through exporting. Therefore, data for years before 2007 are not representative. The data we use are those between 2007 and 2014 for Chinese listed companies and are significant for research. However, the samples extracted are not random samples. Compared against Chinese listed companies, Chinese non-listed companies have smaller business sizes and narrower financing channels and tougher financing constraints. So when non-listed companies make outbound investment decisions, they should be more markedly impacted by financing constraints. The lack of non-listed samples would not underestimate the effect of financing constraints. Therefore, the sample selection would not affect the validity of the research (Li Liya, He Yanlin, 2015).

### 4.2 Modelling and Variables.

Based on the previous theoretical assumptions, we construct the following regression model to study the impact of external financing constraints and internal financing constraints on firms' OFDI decisions:

$$P(D_{OFDI_{it}} = 1) = \beta_0 + \beta_1 \text{ifin}_{i(t-1)} + \beta_2 \text{efin}_{i(t-1)} + \beta_3 \text{TFP}_{i(t-1)} + \beta_4 Z_{it} + \varepsilon_{it}$$

Explained variables represent dummy variables for outbound investment choices. Among them,  $i$  means Company No.  $i$ ;  $t$  means year No.  $t$ ;  $t-1$  means one-period lag;  $\text{ifin}_{i(t-1)}$  means internal financing capability;  $\text{efin}_{i(t-1)}$  means external financing capability;  $\text{TFP}_{i(t-1)}$  represents control variable for a firm's productivity;  $Z_{it}$  means other control variables including capital intensity( $\ln k1$ ), the natural log of firm age ( $\ln \text{age}$ ), industry dummy variable (industry) and region dummy variable( $\text{prov}$ ). To avoid endogeneity problem, one-period lagged variables are used for  $\text{ifin}$ ,  $\text{efin}$  and  $\text{TFP}$ . We use probit model to do the estimation and the selection of explanatory variables are as follows:

① Firm's financing constraints. We use the method in the research done by Yang Jiayu (2012) and regard cash stock as the internal financing capability indicator ( $\text{ifin}$ ). We consider external financing capability ( $\text{efin}$ ) from two aspects: First, we refer to the method used by Peterson's research (1994) and use the percentage of the account payable out of the business income to represent a firm's credit indicator. The account payable can reflect the credit a firm obtains from a supplier. The higher the

<sup>2</sup> Government organizations, local governments and governments agencies have similar ownership types. We categorize them into SOEs in the research.

payable account is, the higher the level of credit worthiness a firm has. Mortgage loans are the dominant loan type from Chinese commercial banks and inter-company lenders. Hence, we use the log value of the net fixed assets as the indicator of a firm's solvency (asset).

②Firm productivity(Intfp). Productivity is a decisive factor in a firm's outbound investment decisions. We use LP semi-parametric approach to estimate total factor productivity. We make the estimations using 2007 as a base year and adjusting with producer's price index for manufactured products. The stock of fixed assets is adjusted with price index of investment in fixed assets<sup>3</sup>

③Other control variables. The log value of the firm age is the log value of the difference between the sampling year and the establishment year. Capital intensity (lnkl) is the ratio between the net value of fixed assets and the number of employees in the sampling year. The industry dummy variable is based on the industry categorization method used for Chinese public companies.

#### 4.3 Descriptive Analysis.

As shown in Table1, a firm with outbound investment has a higher value in terms of internal financing capability than one without outbound investment. It can be initially assumed that the higher a firm's internal financing capability is, the easier it is for a firm to make outbound investment decisions.

Table 1: Statistical analysis of major continuous data (raw data<sup>4</sup>)

Ownership Type	Variable	(ofdi=0)				(ofdi=1)			
		mean	variance	min	max	mean	variance	min	max
Non-SOEs	ifin	0.43	0.20	0	0.99	0.44	0.16	0.06	0.86
	credit	0.21	1.39	0	66.70	0.17	0.13	0.01	1.73
	asset	19.16	1.38	8.96	24.12	19.71	1.25	14.95	23.60
	Intfp	12.85	0.94	5.25	17.35	13.10	0.92	10.62	17.07
	lnkl	12.13	1.06	6.57	18.19	12.15	0.96	9.05	17.13
	lnage	2.43	0.50	0	3.55	2.39	0.45	0.69	3.29
	ifin	0.33	0.18	0	0.99	0.40	0.20	0.01	0.94
	credit	0.18	0.32	0	9.82	0.40	0.15	0.02	0.80
	asset	20.42	1.80	7.94	27.27	21.47	1.88	16.41	27.22
	Intfp	13.32	1.12	7.26	17.99	14.32	1.10	11.99	18.08
SOEs	lnkl	12.65	1.25	5.64	18.79	12.71	1.17	9.56	15.73
	lnage	2.69	0.32	0.69	3.55	2.70	0.32	1.38	3.52

## 5. Empirical Results

### 5.1 Basic Results

We gradually add the control variables into the regression analysis. As illustrated in Table2, Column (1), Column (2) and Column (3) are based on the all sample size. The results indicate that internal financing capability and commercial credit worthiness have positive correlation with OFDI decisions. As more control variables are added, the commercial credit worthiness has a coefficient over 5% as shown in Column (3). Among control variables, the increase in productivity is positively correlated with OFDI decisions. The firm age is negatively correlated with OFDI in Column (2) and capital intensity is not markedly correlated with OFDI decisions.

Estimation results in Column (4) and Column (5) represent the effects of financing constraints on OFDI decisions for non-SOEs and SOEs respectively. The internal financing capability for both SOEs and non-SOEs are positively correlated with OFDI activities, which means the availability of sufficient financing is the first consideration when firms make OFDI decisions. However, the results

<sup>3</sup> Price indices are collected from CEInet Statistics Database.

<sup>4</sup> The chart uses raw data. The main explanatory data have outliers. Referring to previous literature, the empirical part will winsorize the 1% extreme values at the two ends of explanatory data.

for the effects of external financing capabilities are varied. Commercial credit worthiness for non-SOEs is not significantly correlated with their OFDI decisions and commercial credit indicators are markedly correlated. And the results for SOEs are just the opposite.

Table 2: Impact of financing constraints on OFDI

	Full sample size			Non-SOEs	SOEs
ofdi	(1)	(2)	(3)	(4)	(5)
L. ifin	1.231*** (8.01)	1.027** (6.57)	0.809*** (5.02)	0.615*** (3.41)	1.216*** (3.68)
L. credit	0.216 (0.99)	0.361 (1.64)	0.482** (2.02)	0.355 (1.24)	0.848** (1.98)
L.asset	0.155*** (7.89)	0.143*** (5.26)	0.112*** (3.87)	0.180*** (5.12)	0.0901 (1.61)
l.lntfp		0.108*** (3.19)	0.143*** (3.73)	0.0873** (1.96)	0.328*** (4.31)
lnage		-0.202*** (-2.98)	-0.0851 (-1.21)	-0.0834 * (-1.17)	0.172 (0.87)
lnkl		-0.0491 (-1.44)	-0.00222 (-0.06)	-0.0466 (-1.14)	0.0516 (0.71)
industry			yes	yes	yes
prov			yes	yes	yes
_cons	-5.303*** (-12.25)	-5.266*** (-9.51)	-5.616*** (-8.64)	-5.183*** (-6.35)	-9.661*** (-7.44)
lnsig2u	-0.938*** (-6.28)	-1.043*** (-6.58)	-1.218*** (-6.91)	-1.912*** (-5.68)	-1.031*** (-3.53)
_cons					
N	8284	8284	8284	4959	3325
adj. R-sq					

l. efin, l. credit, l.asset and l.lntfp are all lagged by one period. The bracketed figure is t value, and \*\*\*, \*\* and \* mean "marked" on the level of 1%, 5%, 10% respectively.

The results show that both internal and external financing constraints affect firm-level OFDI decisions. A firm's own capital like retained earnings have marked effects on its OFDI decisions. The comparative analysis reveals that OFDI decisions for non-SOEs are more affected by their solvency. Main outside capital sources for non-SOEs come from financial institutions like banks. And the better mortgage loan capability a non-SOE has, the smaller the financing constraints are, and the easier it is for a non-SOE to make outbound investment decisions. However, SOEs have the advantage of benefiting from preferential policies in that the collateral requirements over SOEs are not rigid. Instead, commercial credit worthiness constrains an SOE's external financing capability and hence its outbound investment decisions.

## 5.2 Interactions between productivity and financing constraints

According to the theoretical assumptions, the higher a firm's productivity is, the less the financing constraints on OFDI are. We divide the total factor productivity (lntfp) into two categories based on 1/2 quantile. Then, we compare regressions in the two data sets. Table3 shows that the higher a firm's productivity is, the more marked is the effect of financing capability on OFDI. This indicates that higher productivity may ease the negative impact of financing constraints on a firm's OFDI. Table4 shows that the higher productivity may more markedly ease the impact of financing constraints.

Table 3: full sample size

	High productivity	Low productivity
L. ifin	1.217*** (5.47)	0.351 (1.48)
L. credit	0.812** (2.48)	-0.0444 (-0.12)
L.asset	0.151*** (4.01)	0.0738 (1.58)
Other	control	control

Table4: ownership types

Ofdi	SOEs		Non-SOEs	
	High productivity	Low-productivity	High productivity	Low-productivity
L. ifin	1.520*** (4.09)	-0.383 (-0.44)	1.049*** (4.01)	0.273 (1.11)
L. credit	1.274** (2.46)	0.146 (0.13)	0.860** (2.03)	-0.120 (-0.31)
L.asset	0.0945 (1.55)	0.154 (0.82)	0.225*** (4.69)	0.125** (2.44)
Other	control	control	control	control

## 6. Conclusions and Recommendations

The research uses data on public companies between 2007 and 2014 and examines the impacts of financing constraints on Chinese firms' OFDI decisions. The research concludes that: First, Both internal financing constraints and external financing constraints inhibit the OFDI decisions made by both non-SOEs and SOEs. Second, OFDI decisions made by non-SOEs are mainly affected by commercial credit capability and those by SOEs are mainly affected by commercial credit worthiness. Third, financing constraints have minor impacts on highly productive firms in making OFDI decisions.

Since the "Go Out" Strategy was implemented, China's OFDI have been increasing. However, overall OFDI activities are at a less sophisticated level than those in the advanced economies. At the initial stage, SOEs were the major players in OFDI activities. The participation of non-SOEs adds to the diversity of China's OFDI and meanwhile non-SOEs can be less affected by political risks than SOEs.

From the perspective of financing constraints, the Chinese government may need to expand financing channels because loans cannot meet firms' financing requirements. Particularly, non-SOEs have higher thresholds to cross when they seek bank loans. In addition, SOEs need to speed up restructuring and enhance their competitiveness and make more effective OFDI decisions. Moreover, a rational financing support system may be required to optimize the allocation of funds.

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