

Financing Constraints and the Mode of Outward Foreign Direct Investment: Cross-Border Mergers and Acquisitions or Greenfield Investment

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In this paper, two investment modes, greenfield investment and cross-border mergers and acquisitions, are introduced on the basis of Manova (2008), and it is found that enterprises with less financing constraints tend to choose cross-border mergers and acquisitions. Therefore, this paper takes Chinese industrial enterprises that conducted cross-border mergers and acquisitions and greenfield investment in 2003–2010 as examples to test the above hypothesis. The result shows that enterprises with lower financing constraints are more likely to choose cross-border mergers and acquisitions, while those with stronger constraints choose greenfield investment. More specifically, a 1% reduction in financing constraints raises the probability of choosing cross-border mergers and acquisitions by 2.51%. The authors also find that the influence of financing constraints varies under different investment motivation. For business service and production-related investment, enterprises with lower financing constraints tend to choose cross-border mergers and acquisitions; while for R&D investment, financing constraints have no impact on the choice of investment mode.

Keywords: financing constraints, outward foreign direct investment, cross-border mergers and acquisitions, greenfield investment

1. Introduction

In recent years, the outward foreign direct investment (OFDI) of Chinese enterprises has attracted the attention of academia. Enterprises' OFDI can be categorized into two modes: cross-border mergers and acquisitions (M&A) and greenfield investment. In cross-border M&A, the enterprise purchases all or a part of the equities of an existing foreign enterprise; in greenfield investment, the enterprise makes investment to build a new factory. According to *Statistical Bulletin of China's Outward Foreign Direct Investment 2019*, China's OFDI has witnessed a dramatic increase. Compared with

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2002, the OFDI scale in 2018 experienced a 63-fold growth, with annual growth rate of 32.18%. In 2018, Chinese enterprises were engaged in 421 M&A deals, with a total value of USD 104.25 billion, accounting for 62.5% of the total flow of OFDI. On average, each deal registered a value of USD 248 million. In addition, in previous years, Chinese enterprises' cross-border M&A occupied a large share in total investment value—on average, 47%. For some years, this proportion was even higher than 50%. For example, in 2004 and 2008, this figure was 54%; in 2016 and 2017, cross-border M&A accounted for 68.99% and 75.77% respectively, outperforming other years' figures.

Survey on Current Conditions and Intention of Outbound Investment by Chinese Enterprises released by China Council for the Promotion of International Trade (CCPIT) in 2013 has shown that 14.2% of Chinese enterprises regarded “difficulties in financing” as a barrier to the international market; 22.7% of non-stated-owned enterprises considered difficulties in financing as a bottleneck in their internationalization. According to this survey, more than half of surveyed enterprises thought “accumulation of enterprises' own profits” as the most important financing mode of outbound investment; 21% regarded “bank loans” as the most important source of fund in their outbound investment; and 11% chose “capital market financing”. Only 7.1% regarded “equity participation of investment partners” as important financing mode. The result indicates that Chinese enterprises lack diverse financing channels in the process of “going global”. Internal capital accumulation and external bank loans are their main fund sources. Ownership of enterprises also has impact on their funding channels. Moreover, Chinese enterprises that invest in overseas projects lack awareness and ability to attract local funding in host countries, and have difficulties in get access to domestic credits, because of information asymmetry brought by high supervision cost of domestic agencies. As a result, fund providers always require a higher risk premium on OFDI projects, which makes external financing cost higher and the enterprises less possible to get financial credits. The influence of financing constraints on Chinese enterprises' OFDI becomes an extraordinarily important issue.

Existing literatures either focus on the influence of financing constraints on the decision-making of Chinese enterprises' OFDI, or focus on the mode choice of OFDI (cross-border M&A or greenfield investment). Only a few literatures have discussed the influence of financing constraints on the choice of OFDI modes. For instance, Liu *et al.* (2015) and Wang *et al.* (2015) have discussed the influence of financing constraints on Chinese enterprises' OFDI decision-making. Some scholars also have studied the choice of OFDI modes and related issues, that is, greenfield investment or cross-border M&A (Nocke and Yeaple, 2007; Jiang and Jiang, 2017). These literatures have enabled the academia to understand how financing constraints influence the OFDI decision-making of enterprises, and deepened the theories on how enterprises choose OFDI modes. However, they omitted the influence of financing constraints on OFDI

modes of enterprises, nor did they analyze how financing constraints have impacts on deciding OFDI modes from the perspective of financial heterogeneity. This paper aims to fill this gap, studying Chinese enterprises' choice of OFDI modes from the perspective of financing constraints.

Under the background of “going global” of Chinese enterprises, deep studies on this issue have significant practical and theoretical relevance. As China is in the process of transition, enterprises are faced with multiple financing constraints in an immature financial market, and the barriers by encountered non-state-owned enterprises are even higher (Poncet *et al.*, 2010). With financing constraints prevailing, studying how such constraints impact OFDI mode choice is relevant in many aspects. First, based on the features of Chinese enterprises in an emerging market, this paper discusses the role of financing constraints in OFDI mode choice; second, when studying the role of financing constraints, this paper takes full account of development level of host countries and the motivation of OFDI, and conducted empirical analysis to further sort out the features of investment modes; finally, this paper probes into the relationship between financing constraints and OFDI modes, which helps Chinese enterprises choose the optimal mode of market entry on the basis of “heterogeneous” advantages (productivity and financing capacity).

The structure of this paper is as follows: section 2 presents literature review; section 3 is theoretical analysis; section 4 elaborates data processing and measurement model; section 5 shows empirical results and robustness test; the final section concludes.

2. Literature Review

2.1. Financing Constraints and Enterprises' Entry into International Market

Under the framework of enterprise heterogeneity theory, some scholars have introduced liquidity constraints into heterogeneous enterprise model, and have found that enterprises with high liquidity faced less credit constraints, more likely to overcome the sunk cost of export, and thus more probable to enter export market (Chaney, 2016). Financing constraints not only influence enterprises' export, but also influence OFDI decision-making as well. For example, Buch *et al.* (2014) pointed out that the sunk cost of OFDI was higher than that of export, and thus financing constraints have a larger impact on OFDI. They analyzed financing constraints of OFDI in theory, and conducted an empirical study with German enterprises as examples. The result showed that enterprises with higher leverage ratio, higher fixed cost and smaller cash flow were less likely to choose OFDI, and that financing constraints had restrained OFDI more obviously in enterprises with larger scale and higher productivity.

As more and more Chinese enterprises are “going global”, Chinese scholars also

have started the studies on financing constraints' impact on OFDI decision-making. Based on heterogeneity trade theory, scholars have analyzed financing constraints and enterprises' international investment decisions, and have found that financing constraints were a significant factor influencing enterprises' decision on OFDI. Like productivity, enterprises with strongest financing capacity chose OFDI, those with weaker financing capacity chose export, and those with the weakest financing capacity chose only to serve domestic market (Lv and Sheng, 2015). In terms of empirical studies, scholars discussed relationship between financing constraints and Chinese enterprises' OFDI (Liu *et al.*, 2015; Wang *et al.*, 2015). They have found that financing constraints played an important role in Chinese enterprises' decision-making of OFDI.

2.2. Studies on FDI Mode Choice

First, in terms of traditional economy and management theory, scholars conduct their studies from multiple perspectives: trade cost, organizational learning and resources acquisition (Brouthers and Brouthers, 2000; Anand and Deilos, 2002). By adding trade cost theory into enterprise OFDI modes, scholars found that integration cost have very significant influence on investment modes (Erramilli and Rao, 1993). Analyzing OFDI from the perspective of organizational learning, scholars have considered that greenfield investment extended the knowledge and technologies of home country's enterprises to the newly established enterprises in host countries, and such extension would form knowledge dependence pathway; while M&A weakened such pathway, and widened the knowledge of enterprises (Vermeulen and Barkema, 2001).

Second, in terms of macro factors, studies have shown that with larger institutional barriers in host countries, M&A would be a better choice (Brouthers, 2013). From the perspective of the culture of host countries, studies have shown that more integrated culture would bring larger probability of choosing cross-border M&A (Brouthers and Brouthers, 2000). Studies also have shown that the growth rate of host countries' per capita income influenced the investment mode of enterprises, as the probability of choosing M&A grew larger when the per capita income of host countries increased (Zejan, 1990).

Third, in terms of industry-level factors, studies have shown that industrial diversity of home country and industrial development rate of host countries had influence on OFDI mode. Enterprises with more diverse product portfolio in home country were more likely to choose M&A (Zejan, 1990). Anand and Delios (2002) have found that enterprises with upstream capabilities in high technology-intensive industries in the home country are suitable for greenfield investment, otherwise it is better to choose M&A. In downstream-resource-intensive industries, enterprises were more likely to choose M&A in their OFDI.

Finally, in terms of influence of enterprise heterogeneity on OFDI modes, scholars have found that from the perspective of enterprise heterogeneity, decision-making of enterprises are based on transferable and non-transferable advantages. Enterprises featuring transferable advantages, such as high productivity and outstanding R&D competence, tend to choose M&A; while those with low productivity tend to choose greenfield investment. But when enterprises enjoy non-transferable advantages, such as market channel, sales network and brand loyalty, those with higher productivity choose greenfield investment, while those with lower productivity choose M&A (Nocke and Yeaple, 2007). Jiang and Jiang (2017) have discovered that “transferable advantages” was a critical factor in the decision-making of Chinese enterprises on OFDI modes. Chinese enterprises with high productivity, intensive capital, large scale, high R&D density and larger share of circulating capital are more likely to choose cross-border M&A.

2.3. Current Situation of Studies

From existing researches on financing constraints and OFDI decision-making, scholars have reached the same conclusion that financing constraints may obstruct enterprises' OFDI. In terms of choosing OFDI modes, traditional economic and management theories, industry-specific and nation-specific researches have provided some theoretical bases, but enterprise heterogeneity was omitted in all of these studies. Researches taking enterprise heterogeneity into account only focus on productivity, transferable or non-transferable advantages, but consideration on financing constraints is lacking. Therefore, so far, few researches study the influence of financing constraints on OFDI modes from the perspective of financial heterogeneity. Different from previous studies, this paper discusses the influence of financing constraints on OFDI modes from the perspective of financial heterogeneity, which contributes to enterprise heterogeneity theory.

3. Theoretical Analysis

3.1. Various Investment Modes and Sunk Cost

Sunk costs needed by cross-border M&A and greenfield investment vary largely (Nocke and Yeaple, 2017). Referring to Madhok (1997), this paper divides the cost of OFDI into three stages. First, decision-making cost in the early stage of investment, that is, costs of searching for information, such as investment target, target market capacity, product customization and laws and regulations. Second, implementation cost in the middle stage. Greenfield investment requires cost of building plants, purchasing machine and equipment, as well as other fixed assets; while cross-border M&A

requires cost of purchasing the equity of target enterprise and the premium. Third, integration cost in the later stage. Investors shall not only bear the cost of coordination, such as staff training, corporate culture development and strategic management, but also undertake the cost of establishing and maintaining overseas distribution network. Among all the costs, the largest share always goes to establishing new plants or paying for equity values in the middle stage. Therefore, this part, to some extent, directly determines the choice of OFDI mode by the enterprise (Madhok, 1997).

For Chinese enterprises, a larger sum of fund is involved in cross-border M&A than in greenfield investment, mainly due to the following three reasons. First, most of the M&A deals of Chinese enterprises are conducted with European and North American developed countries' counterparts. As the target enterprises are often mature and well-developed ones, which owns larger asset scale and enjoys higher value per unit of asset, Chinese enterprises need to pay a high cost of M&A in the early stage. Second, equity and asset transfer needs lump-sum payment, which requires sufficient financing capacity of the acquirer. According to BvD M&A statistics, 80% of the cross-border M&A deals of Chinese enterprises adopt lump-sum payment in cash, which means that strong financing capacity is needed from these enterprises. Finally, to raise success rate and reduce information asymmetry, enterprises need to hire professional consulting agencies, incurring extra cost. In comparison, greenfield investment demands smaller scale of fund. For example, in 2017, Chinese enterprises' average value spent in cross-border M&A reached USD 278 million.¹ As of 2017, average investment in each greenfield project was approximately USD 46 million, far lower than that in each cross-border M&A deal (USD 278 million) (same data source as above). Jiang and Jiang (2017) has found that enterprises with higher productivity choose cross-border M&A while those with lower productivity chose greenfield investment. This indicates that as cross-border M&A requires higher sunk cost, only those enterprises with higher productivity are able to offset extra cost and choose cross-border M&A.

3.2. Theoretical Framework and Research Hypothesis

3.2.1. Consumer Level

It is assumed that each country produces and consumes a series of products, and the consumer preference is CES utility function:

$$U_i = \left[\int_{w \in \Omega_i} q_i(w)^\rho d\omega \right]^{\frac{1}{\rho}}, \quad \sigma = \frac{1}{1-\rho}, \quad \sigma > 1 \quad (1)$$

¹ *Statistical Bulletin of China's Outward Foreign Direct Investment 2017.*

In Equation (1), $q_i(w)$ represents the consumption volume of product w , Ω_i represents the set of all consumer product w in country i . σ represents the elasticity of substitution among various types of goods. If Y_i represents the total income of each country, then the following constraint condition can be reached:

$$\int_w p(w)q(w) dw = Y_i \quad (2)$$

If price index is defined as the figure when consumption utility equals 1, then the following equation can be reached:

$$P_i = \left(\int_w p(w)^{1-\sigma} dw \right)^{\frac{1}{1-\sigma}} \quad (3)$$

If we combine Equation (1), (2) and (3) into simultaneous equations and find the maximum consumer utility, we have the following expression of the demand function $q(w)$:

$$q(w) = \frac{Y_i}{P_i} \left(\frac{p(w)}{P_i} \right)^{-\sigma} \quad (4)$$

3.2.2. Producer Level

It is assumed that the market of country i is a monopolistic competition market, and the output of per unit of labor input of enterprise is a , which means a represents the productivity of enterprise. It is also assumed that each enterprise has identical productivity cumulative distribution function (CDF), $a \in [a_L, a_H]$ and $a_H > a_L > 0$.

As the marginal earnings under maximized profit equals the marginal cost of producing per unit of product in a monopolistic competition environment, if w_i represents the wage level of country i , then the marginal cost of enterprise is $c_i = w_i / a$.

Meanwhile, because enterprise has the pricing power in a monopolistic competition market, the following equation can be reached based on profit maximization: $p = c_i / \rho = w_i / a\rho$. If f_i^h represents the fixed cost when the enterprise only operates within the border, then the total expenditure of producing $q(w)$ units of products is: $f_i^h + q(w)w_i / a$, and the total revenue is $p(w)q(w)$. Thus, the net profit is:

$$\pi_i^h(a) = w_i q(w) / a\rho - (f_i^h + q(w)w_i / a) \quad (5)$$

By plugging Equation (4) into (5), we have:

$$\pi_i^h(a) = (1 - \rho)(\rho P_i)^{\sigma-1} Y_i (1 / w_i)^{\sigma-1} a^{\sigma-1} - f_i^h \quad (6)$$

By making $A_i = (1 - \rho)(\rho P_i)^{\sigma-1} Y_i$, $B = a^{\sigma-1}$, we can simplify Equation (6) as:

$$\pi_i^h(a) = A_i B (1 / w_i)^{\sigma-1} - f_i^h \quad (7)$$

3.2.3 Cross-Border M&A and Greenfield Investment

It is assumed that the sunk costs involved in cross-border M&A and greenfield investment respectively are f_i^g and f_i^{ma} . Based on the former statements and other studies on Chinese enterprises' OFDI, we assume $f_i^{ma} > f_i^g > f_i^h$, that is, the sunk cost needed by cross-border M&A is higher than that by greenfield investment, and that by greenfield investment is higher than that by building domestic plants. Although enterprises may have retained earnings or operating costs, internal fund is still not enough to meet the demand of OFDI. Therefore, external fund is needed as supplementary resource. If the proportion of external fund to the total fund that the enterprise needs to raise is α ($0 < \alpha < 1$), then the proportion of internal fund is $(1 - \alpha)$. If F ($0 < F < 1$) represents the financing cost in the financial market, then the profits of greenfield investment and cross-border M&A respectively are:

$$\pi_i^g(a) = A_j B (1 / w_i)^{\sigma-1} - \alpha(1 + F)f_i^g - (1 - \alpha)f_i^g \quad (8)$$

$$\pi_i^{ma}(a) = A_j B (1 / w_i)^{\sigma-1} - \alpha(1 + F)f_i^{ma} - (1 - \alpha)f_i^{ma} \quad (9)$$

π_i^{ma} and π_i^g represent the profits of greenfield investment and cross-border M&A respectively, and the market size of country j is expressed by $A_j = (1 - \rho)(\rho P_j)Y_j$. From Equations (7), (8) and (9), we can have the critical value of productivity when the enterprise runs domestic business, makes greenfield investment and conduct cross-border M&A. Making (7) equal zero, we have the critical value of productivity when the enterprise runs domestic business: $B_i^h = (f_i^h / A_i)w_i^{\sigma-1}$. When the profit of greenfield investment equals zero in (8), we have the critical value of productivity when the enterprise makes greenfield investment:

$$B_i^g = \frac{(\alpha F + 1)f_i^g}{A_j} w_i^{\sigma-1} \quad (10)$$

Similarly, when the profit of cross-border M&A equals zero in (9), we have the critical value of productivity when the enterprise conducts cross-border M&A:

$$B_i^{ma} = \frac{(\alpha F + 1)f_i^{ma}}{A_j} w_i^{\sigma-1} \quad (11)$$

Because $f_i^{ma} > f_i^g > f_i^h$, we can compare Equation (10) and (11), and get $B_i^{ma} > B_i^g$. We assume that the market size of each country is similar, namely $A_i \approx A_j$, and because we have $\alpha F + 1 > 1$, therefore, the conclusion is $B_i^g > B_i^h$. To sum up, $B_i^{ma} > B_i^g > B_i^h$. From this we draw that in OFDI, the critical value of productivity of cross-border M&A is higher than that of greenfield investment, and that of greenfield investment is higher than that of only running domestic business. If we differentiate the financing cost F from Equations (10) and (11), then we have:

$$\partial B_i^g / \partial F = \frac{\alpha f_i^g}{A_j} w_i^{\sigma-1} \quad (12)$$

$$\partial B_i^{ma} / \partial F = \frac{\alpha f_i^{ma}}{A_j} w_i^{\sigma-1} \quad (13)$$

From the above analysis, we deduce $0 < \partial B_i^g / \partial F < \partial B_i^{ma} / \partial F$. We can conclude that as the financing cost increases, the productivity thresholds of both OFDI modes will rise, but the productivity threshold increment in cross-border M&A due to financing cost is larger than that in greenfield investment. It indicates that when the productivity is fixed, cross-border M&A requires lower financing cost, or stronger financing capacity than greenfield investment. Only with stronger financing capacity can the enterprise bear the sunk cost and surmount the productivity threshold of cross-border M&A.

From the above theoretical deduction, we can conclude that when productivity is fixed, rise in financing capacity makes enterprises more likely to choose cross-border M&A.

4. Data and Measurement Model

4.1. Data Description

Data is obtained from China Industrial Enterprise Database 2003–2010, China's OFDI Enterprises Catalog by the Ministry of Commerce of China (MOFCOM) and BVD (Zephyr). According to related state policies, all greenfield investment projects of Chinese enterprises shall be registered and put on file by MOFCOM, and deals

involving equity purchase, including cross-border M&A and share acquisition, shall be reviewed and approved by National Development and Reform Commission (NDRC). Therefore, samples of greenfield investment enterprises in this paper are obtained by connecting China's OFDI Enterprises Catalog of MOFCOM to China Industrial Enterprise Database. The Catalog includes the names of OFDI enterprises, their provinces, the names of overseas enterprises receiving the investment, their countries and business scope. By matching this information with the Database, we obtained 2,574 enterprises making greenfield investment in 2003–2010 as the samples in this paper.

Samples of cross-border M&A are obtained by connecting BVD (Zephyr) to China Industrial Enterprise Database. BVD (Zephyr), as an often-used database in international M&A studies, include the data of domestic and cross-border M&A of all countries. We translated the names of enterprises conducting cross-border M&A within each year, and matched these names with the entries in the Database, and then we obtained the financial data of these enterprises. By data combination, we acquired the data of 99 enterprises involved in cross-border M&A in 2003–2010. In regards to sampling, two points need to be explained: first, to prevent the influence of previous OFDI experience on current decision-making, this paper only selects samples that conduct greenfield investment or cross-border M&A for the first time; second, to avoid the cross impact of greenfield investment and cross-border M&A on each other, this paper omitted samples that conduct both greenfield investment and cross-border M&A.

4.2. Model Setup

This paper focuses on the influence of financing constraints on OFDI mode choice. As the explained variable is whether cross-border M&A or greenfield investment is chosen by the enterprise, we applied binary selection model of discrete explained variables in the empirical analysis. The model is set up as follows:

$$\text{probit}(d_{ijkt}^{ma} = 1) = year_i + reg_i + ind_j + \beta \times fc_{ijk(t-1)} + \sum \phi_n x_{ijk(t-1)}^n + \varepsilon_{ijkt} \quad (14)$$

In this model, i, j, k and t represent region, industry, enterprise and time respectively. d_{ijkt}^{ma} represents whether Enterprise k has conducted cross-border M&A. Greenfield investment is denoted as 0, and cross-border M&A is denoted as 1. $year_i$, reg_i , ind_j represent the fixed effect at the level of year, region and industry respectively, in order to control the influence of unobservable differences in time, region and industry on OFDI mode choice. $fc_{ijk(t-1)}$ represents financing constraints, and $x_{ijk(t-1)}^n$ is the controlled variable of the enterprise, such as productivity, management fee on per head, corporate tax rate, foreign shareholders, capital density, etc. ε_{ijkt} is the error term. As the OFDI mode choice in the current period may lead to changes in characteristic

variables, the explaining variables lagged by one period are chosen in the model to solve the endogeneity problem of this model.

4.3. Measurement of Core Indicators

Kaplan and Zingales (1997) adopted sequential Logit regression method, selected cash flow ratio, corporate debt ratio, cash stock ratio and other indicators in their measurement, and building KZ index assessing financing constraints with regression coefficient. Whited and Wu (2006) adopted a similar method, building WW financing constraints index with quarterly financial data. These two indices have common deficiencies. On one hand, they include a number of endogenous financial variables, such as leverage ratio, circulating fund and dividend payout. As these variables and financing constraints may have a relationship of mutual determination, there is endogenous interference. On the other hand, these two methods require detailed analysis on the annual reports and financial information of all samples, which means a high requirement on sample data. However, instead of listed companies, the samples in this paper are industrial enterprises, and thus the database in use has not include all of the aforementioned indicators. Therefore, there are difficulties in data availability.

Based on the studies mentioned above, Hadlock and Pierce (2010) expanded the KZ method. On the basis of financial situation, that paper first qualitatively classified enterprises into five hierarchical levels of financing constraints, and then adopted Ordered Probit model to estimate the *SA* index measuring the financing constraints of these enterprises. Some Chinese scholars also has adopted the same method to measure financing constraints. This paper refers to the *SA* index of Hadlock and Pierce (2010) in measuring financing constraints. The formula of *SA* index is: $-0.737 \times Size + 0.0043 \times Size^2 - 0.04 \times Age$. In this formula, *Size* represents the size of enterprises. In this paper, total asset is used to measure the size of enterprises, because the size of asset is regarded by banks as one of the critical indicators of credit. Enterprises with larger asset size always enjoy stronger financing capacity. *Age* represents number of years since the enterprise was established. The larger the *SA* index is, the weaker financing capacity the enterprise have, and the more serious financing constraints it faces.

Referring to Bellone *et al.* (2010), Yang (2012) and Wang *et al.* (2015), we also use a comprehensive scoring indicator to measure financing constraints. They have built a comprehensive scoring system, which includes internal financing, commercial credit, external financing and foreign capitals and other factors. In this paper, this comprehensive indicator is used for robustness test.

4.4. Statistical Interpretation

Table 1 shows the statistical description on major variables of enterprises

conducting cross-border M&A and greenfield investment. The average *SA* index of cross-border M&A enterprises is -9.654 , which is lower than that of greenfield investment enterprises (-7.999). This means that enterprises with stronger financing capacity tend to choose cross-border M&A, while those with weaker financing capacity tend to choose greenfield investment. The average productivity of cross-border M&A enterprises is also higher than that of greenfield investment enterprises, which means that enterprises with higher productivity tend to choose cross-border M&A. This conclusion is the same as Jiang and Jiang (2017). The capital density and management fee on per head of cross-border M&A enterprises are higher than those of greenfield investment enterprises, which also indicates that cross-border M&A put higher requirements on capital density and management fee on per head. From the descriptive analysis, it can be seen that enterprises conducting these two modes of OFDI have sharply different features, and such differences keep consistent with the theoretical analysis in the previous part.

Table 1. Descriptive Statistics of Major Variables

Variables	Description	Cross-border M&A		Greenfield investment	
		Average	Standard deviation	Average	Standard deviation
<i>ma</i>	cross-border M&A or not	0.031	0.173		
<i>SA</i>	financing constraints	-9.564	1.272	-7.999	1.202
<i>tfp</i>	productivity	7.594	1.376	7.031	1.072
<i>Management fee</i>	management fee on per head	3.438	1.068	2.687	1.056
<i>Tax ratio</i>	tax rate	0.030	0.036	0.027	0.029
<i>Capital ratio</i>	capital density	5.221	1.224	4.305	1.254
<i>fdi</i>	foreign equity involved or not	0.149	0.359	0.167	0.373
<i>State-owned</i>	state-owned enterprises or not	0.448	0.501	0.071	0.257

Source of data: calculated based on China Industrial Enterprises Database.

5. Empirical Test and Result Analysis

5.1. Benchmark Test

Results are elaborated in Table 2. After basic characteristic variables and fixed effects are controlled, the *SA* coefficient of the financing constraints index of column (1) is significantly negative. After adding other characteristic variables, the signs of *SA* coefficients in columns (2) and (3) are still significantly negative at the 1% level,

remaining robust. This indicates that the weaker the financing constraints are, the more likely enterprises choose cross-border M&A. We also calculated the model's marginal effect, as is shown in Table 2 (1a) — (3a). From column (3a), we can draw that for enterprises with a medium level of financing capacity, when other conditions remain identical, a 1% reduction in financing constraints will raise the probability of choosing cross-border M&A as the OFDI mode by 2.51%. This may be because enterprises with weak financing constraints enjoy internal fund on one hand, and on the other hand, their features in size and profits enable them to get access to smooth financing channels. In other words, enterprises with weaker financing constraints have stronger ability to afford the cost of purchasing equity and cost of management and coordination incurred by cross-border M&A.

Table 2 also indicates that productivity has insignificant impact on OFDI mode choice. This is different from the conclusion of some scholars. In Probit model (0), only *tfp* is explaining variable, and its coefficient is significantly positive. But after the financing constraints are controlled, the coefficient of *tfp* is no longer significant, indicating that the financing constraints may have heavier impact on OFDI mode choice. Jiang and Jiang (2017) has found that enterprises with higher productivity tend to choose cross-border M&A, but that study did not take financing constraints into account. This paper considers that if financing constraints are taken into account, the role of productivity in choosing OFDI mode may be weakened. Thus, this paper provides new perspective for current literatures.

The measurement results show that the coefficient of dummy variable for whether the enterprise is state-owned is significantly positive at the 5% level, indicating that state-owned enterprises (SOEs) have a higher probability of choosing cross-border M&A. The reason may lie in China's unique situation. In China, SOEs enjoy more convenient financing channels and lower financing cost, so they have stronger ability to afford the large sunk cost of cross-border M&A. This result is similar to other researches. For instance, Yang (2012) have argued that different ownership leads to different level of financing constraints, and that private enterprises are faced with stronger financing constraints than SOEs.

Finally, the coefficient of whether the enterprise is foreign-invested in column (3) is significantly positive at the 5% level, indicating that foreign-invested enterprises are more likely to choose cross-border M&A in OFDI. There are two possible reasons: first, foreign investment background broadens the enterprise's financing channel; second, with a multicultural atmosphere brought by foreign shareholders, the enterprise can gain more experience in operating in the international market. Other variables are not significant, and thus no definite conclusion can be reached, so they will not be elaborated here.

Table 2. Benchmark Model Test

	(0)	(1)	(2)	(3)	(1a)	(2a)	(3a)
	ma=1	ma=1	ma=1	ma=1	margin	margin	margin
<i>SA</i>		-0.4231*** (-5.96)	-0.5009*** (-5.54)	-0.4318*** (-3.86)	-0.0257*** (-5.79)	-0.0302*** (-5.40)	-0.0251*** (-3.82)
<i>tfp</i>	0.1594** (2.48)		-0.1307 (-1.63)	-0.0718 (-0.83)		-0.0079 (-1.62)	-0.0042 (-0.83)
<i>State-owned</i>				0.4514** (2.00)			0.0263** (1.97)
<i>fdi</i>				0.4900** (2.35)			0.0285** (2.29)
<i>Capital ratio</i>				0.0395 (0.46)			0.0032 (0.47)
<i>Tax ratio</i>				-4.4919* (-1.65)			-0.2615 (-1.64)
<i>Management fee</i>				-0.0267 (-0.26)			-0.0016 (-0.26)
Constant term	2.6233** (2.37)	0.0007 (0.00)	0.2091 (0.18)	0.5624 (0.47)			
Year	controlled	controlled	controlled	controlled	controlled	controlled	controlled
Industry	controlled	controlled	controlled	controlled	controlled	controlled	controlled
Reg	controlled	controlled	controlled	controlled	controlled	controlled	controlled
Number of samples	2160	2160	2160	2160	2160	2160	2160
Pseudo R ²	0.3030	0.3729	0.3776	0.4020	0.3729	0.3776	0.4021

Note: Model (1a) – (3a) is the marginal effect of Probit. The values in brackets under regression coefficients are Z values. *, ** and *** represent 10%, 5% and 1% of significance level. The same below.

5.2. Host Countries' Income Level Test

Nocke and Yeaple (2017) has pointed out that in cross-border M&A, enterprises need to undertake the sunk cost of equity purchase, corporate integration, management and coordination. The value of the sunk cost has direct correlation with the income level of host countries. In countries with different development levels, the degree of corporate management standardization and market information vary to some extent, which leads to different cost of market research and decision-making in the early stage of M&A. In high-income countries, as the market is more mature and the management is more standardized, the cost of searching for M&A targets and decision-making may be lower than that in low-income countries.

This section conducts an empirical analysis based on the income of host countries, as is shown in Table 3. After enterprise characteristic variables and fixed effects are added, the financing constraints index SA of column (4) is significantly negative at the

5% level, indicating that when the host country is a high-income country, enterprises with weaker financing constraints tend to choose cross-border M&A. This is mainly because M&A needs a higher financing threshold, or requires stronger financing capacity of enterprises. From column (4a), it can be seen that the marginal effect coefficient is -0.0235 , indicating that when other conditions are fixed, for an enterprise with average financing capacity, a 1% reduction in the financing constraints will raise the probability of choosing cross-border M&A by 2.35%.

Table 3. Host Countries' Income Level Model Test

	(4)	(4a)	(5)	(5a)
	High-income countries	High-income countries	Middle- and low-income countries	Middle- and low-income countries
	ma=1	margin	ma=1	margin
<i>SA</i>	-0.3219** (-2.37)	-0.0235** (-2.39)	-5.0484*** (-3.43)	-0.2349*** (-3.28)
<i>tfp</i>	0.0178 (0.17)	0.0013 (0.17)	-2.8904*** (-3.10)	-0.1350*** (-2.84)
Constant term	-1.3686 (-0.80)		-16.9347*** (-3.04)	
Characteristic variables	controlled	controlled	controlled	controlled
Year	controlled	controlled	NO	NO
Industry	controlled	controlled	controlled	controlled
Reg	controlled	controlled	controlled	controlled
Number of samples	1515	1515	645	645
Pseudo R ²	0.4147	0.4147	0.7330	0.7330

Note: If all dimensions of fixed effects including year and industry are controlled, serious collinearity problem will occur and a lot of samples will be deleted, and thus no measurement result can be obtained. Therefore, we eased some fixed effects in this model.

From column (5) in Table 3, it can be seen that after enterprises' characteristic variables and regional fixed effects are controlled, the coefficient of the *SA* index is significant at the 1% level, indicating that when making direct investment in low-income countries, enterprises with weaker financing constraints are more likely to choose cross-border M&A. The reason may be that the cost of equity purchasing and integration involved in cross-border M&A is higher than the cost of fixed asset investment involved in greenfield investment. From the perspective of marginal effect, the marginal effect coefficient of *SA* index is -0.2349 , indicating that for an enterprise with average financing capacity, a 1% reduction in the financing constraints will raise the probability of choosing cross-border M&A by 23.49%.

Measurement of the middle- and low-income countries group shows that productivity is significantly negative in the Probit model, and its marginal effect

coefficient is -0.1350 . This indicates that in OFDI in middle- and low-income countries, productivity has significant influence on the choice of mode. Enterprises with higher productivity are less likely to choose M&A, and for these enterprises, greenfield investment is more attractive. In addition, when other conditions are fixed, a 1% rise in productivity will reduce the probability of choosing cross-border M&A by 13.50%. This is mainly because Chinese enterprises are more competitive than most of the enterprises in middle- and low-income countries, and thus the purpose of Chinese enterprises' investment in these countries is to take advantage of overseas low-priced factors and expand overseas market. This conclusion is consistent with Nocke and Yeaple (2017), a study based on enterprise heterogeneity.

5.3. Test of Different Investment Motivation

Based on Jiang and Jiang (2017) and referring to the OFDI motivation classification method of MOFCOM, we classified enterprises' investment model into four categories: resource development, technological R&D, production and sales, and business service. From the concepts of different types of investment, it can be seen that different motivation has significantly different requirements on cost. First, requirements on fixed costs. As technological R&D investment involves R&D innovation and technological transformation in other countries, which puts higher requirements on equipment and other fixed assets, so the fixed costs that the enterprise need to bear are the highest. Production and sales investment also requires fixed assets such as plants and machine, for enterprises establish factories and sell products in other countries. Therefore, the fixed costs borne by enterprises are the second highest. In business service investment, enterprises do not need production in host countries, and the motivation is only to reduce export costs. Therefore, the fixed costs borne by enterprises are the lowest. Second, requirements on variable costs. In R&D investment, enterprises need to employ local high-tech talents in host countries, and thus they need to pay higher wages. Therefore, the variable costs borne by enterprises in R&D investment are the highest. In production and sales investment, enterprises employ local technicians, and thus the variable costs borne are the second highest. In business service investment, enterprises also employ ordinary labor, but there is no need of production. Therefore, the amount of labor required is less than that of production and sales investment, and the variable cost is the lowest. Generally speaking, in terms of the comprehensive costs of OFDI (fixed costs and variable costs), the cost of technological R&D is the highest, that of production and sales investment the second highest, and that of business service investment the lowest. Due to the significant difference in the capital required by different types of investment, financing capacity threshold varies for different types of investment, and thus enterprises' OFDI modes differ under different financing constraints.

Table 4 shows the measurement results of business service investment and production and sales investment. As is illustrated in Table 4, after characteristic variables and fixed effects are controlled, the *SA* coefficient in column (6) is significantly negative at the level of 1%, indicating that under this motivation, enterprises with weaker financing constraints choose cross-border M&A. In other words, enterprises enjoying stronger financing capacity choose cross-border M&A, because they are able to bear the high sunk costs. From the test results of production and sales investment, it can be seen that the coefficient of *SA* index is significantly negative at the level of 1%, indicating that under this motivation, enterprises with weaker financing constraints are more likely to choose cross-border M&A.

Table 4. Test of Business Service and Production and Sales Investment

	(6)	(6a)	(7)	(7a)
	Business service	Business service	Production and sales	Production and sales
	ma=1	margin	ma=1	margin
<i>SA</i>	-0.4981*** (-3.68)	-0.0335*** (-3.71)	-0.8808*** (-2.68)	-0.0474*** (-2.65)
<i>tfp</i>	-0.1210 (-1.08)	-0.0081 (-1.07)	-0.2165 (-0.82)	-0.0117 (-0.87)
Constant term	0.3154 (0.23)		-7.1419*** (5.29)	
Year	controlled	controlled	NO	NO
Industry	controlled	controlled	NO	NO
Reg	controlled	controlled	controlled	controlled
Number of samples	1445	1445	448	448
Pseudo R ²	0.4579	0.4579	0.3939	0.3939

Table 5 shows the test results of technological R&D investment. In columns (8), (9) and (10), when all fixed effects and enterprise controlled variables are controlled simultaneously, the coefficient of *SA* index is insignificant. In columns (11), (12) and (13), the control over fixed assets is gradually eased, but the coefficient of *SA* index is still insignificant. Therefore, it indicates that under this motivation, financing constraints have no influence of OFDI mode choice. The reason may be technological R&D investment aims to learn advanced knowledge and technology and raise the R&D ability of enterprises in the home country. Such investment requires strong capital support from the enterprises, and with strong financing capacity, the enterprises are able to surpass the financing threshold of both cross-border M&A and greenfield investment. Under such a circumstance, influencing factors of OFDI mode may be other characteristic factors of enterprises or countries, and thus financing constraints have no influence on OFDI mode choice.

Table 5. Test of Technological R&D Investment

	(8)	(9)	(10)	(11)	(12)	(13)
	OLS	OLS	OLS	OLS	OLS	OLS
<i>SA</i>	-0.0046 (-0.94)	0.0000 (-0.00)	0.0063 (0.78)	0.0042 (0.65)	0.0020 (0.50)	0.0025 (0.85)
<i>tfp</i>		0.0071 -0.92	0.0106 (0.97)	0.0099 (0.95)	0.0078 (0.99)	0.0050 (0.96)
Characteristic variables	NO	NO	controlled	controlled	controlled	controlled
Year	controlled	controlled	controlled	NO	NO	NO
Industry	controlled	controlled	controlled	controlled	NO	NO
Reg	controlled	controlled	controlled	controlled	controlled	NO
Number of samples	267	267	267	267	267	267
R ²	0.1393	0.1485	0.1918	0.1616	0.1297	0.0365

Note: Even if fixed effects are excluded from Probit model, serious collinearity problem still occurs, and no measurement results can be obtained. Therefore, OLS model is used for the tests in this section.

5.4. Robustness Test

To test the robustness of empirical results, we used comprehensive scoring method to build financing constraints indicator system, and then tested whether different financing indicators had influence on the empirical results in this paper. Referring to Yang *et al.* (2012) and other mainstream literatures measuring financing constraints, we built the system as follows:

First, we set up the comprehensive scoring indicators of financing constraints, including size of enterprise, debt service ratio, fix assets proportion, net profit, liquidity ratio and years of operation. Second, we calculated each indicator, and marked and ranked the value of all indicators. According to the ranking (0%–20%, 20%–40%, 40%–60%, 60%–80%, 80%–100%) of enterprises' variables in all the enterprises in the database in the current year, we marked them as 5, 4, 3, 2 and 1 respectively. Enterprises with larger scores face stronger financing constraints. Then, we counted how many indicators were marked as 1 for each enterprise, and thus built a comprehensive indicator. Last, we standardized this comprehensive indicator to [0,1], and obtained the final comprehensive indicator of financing constraints. From this process, we can draw that the more advantages enterprises have in all indicators, the stronger financing capacity enterprises enjoy and the smaller financing constraints they face. Detailed test results are demonstrated in Table 6.

As is shown in Table 6, the coefficients of comprehensive financing capacity indicators in columns (14), (15) and (16) are significantly positive at the level of 10%, indicating that enterprises with stronger financing capacity are more likely to choose cross-border M&A. In the marginal effect result of column (16a), the marginal

coefficient of financing capacity is 0.0382% at the significance level of 10%, indicating that when other conditions are fixed, a 1% rise in enterprises' financing capacity will raise their probability of choosing cross-border M&A by 3.82%. From column (16), we can also find that productivity is significantly positive at the level of 5%. This result is similar to that of Jiang and Jiang (2017). It indicates that for Chinese enterprises, higher productivity means larger probability of choosing cross-border M&A.

Table 6. Empirical Test of Measuring Financing Constraints with Comprehensive Financing Constraints Indicator

	(14)	(15)	(16)	(14a)	(15a)	(16a)
	ma=1	ma=1	ma=1	margin	margin	margin
<i>FC</i>	0.9761*** (3.13)	0.9828*** (2.91)	0.6362* (1.70)	0.0654*** (3.04)	0.0650*** (2.87)	0.0382* (1.72)
<i>tfp</i>		0.1576** (2.38)	0.1443** (2.23)		0.0104** (2.39)	0.0086** (2.21)
Constant term	3.2840*** (3.19)	2.2175** (1.96)	1.8519 (1.60)			
Characteristic variables	controlled	controlled	controlled	controlled	controlled	controlled
Year	controlled	controlled	controlled	controlled	controlled	controlled
Industry	controlled	controlled	controlled	controlled	controlled	controlled
Reg	controlled	controlled	controlled	controlled	controlled	controlled
Number of samples	2160	2160	2160	2160	2160	2160
Pseudo R ²	0.3019	0.3137	0.3799	0.3019	0.3137	0.3799

6. Conclusions and Policy Implications

This paper studies how financing constraints influence Chinese enterprises OFDI mode choice from the perspective of financing constraints. The conclusions are as follows:

First, in the OFDI of enterprises, whether the financing channels are smooth has significant influence. Compared with greenfield investment, cross-border M&A has a higher requirement on enterprises' financing capacity, as the cost of equity purchasing, integration and coordination in the latter mode is higher than the fixed cost of building new plants in the former mode.

Second, in all host countries of different income levels, financing constraints influence the choice of OFDI mode. In high-income countries, financing constraints have a negative effect on enterprises' choosing cross-border M&A. This is mainly because in high-income countries, equity purchasing cost, integration cost and other variable costs needed by cross-border M&A are higher in these countries than in others. In middle- and low-income host countries, financing constraints also hinder enterprises from choosing cross-border M&A. Only enterprises with stronger financing capacity will choose cross-border M&A, while those with weaker financing capacity

are more likely to choose greenfield investment. This is mainly because Chinese enterprises are generally more competitive than those in middle- and low-income countries; and investment in middle- and low-income countries mainly aims to take use of low-priced factors and to expand market. All these lead to the result that the sunk cost of cross-border M&A is higher than that of greenfield investment.

Third, under three different types of investment motivation—business service, production and sales, and technological R&D, financing constraints have different influences on the OFDI mode choice of enterprises. In business service investment and production and sales investment, the influence of financing constraints on OFDI mode choice manifests as weaker financing constraints make cross-border more attractive. This is mainly because the fixed asset investment in the early stage of greenfield investment is lower than the equity purchasing cost and integration and coordination cost of cross-border M&A. In addition, asset-based investment requires ability to establish a sound sales network, so as to partially offset the advantages in acquiring channel resources of M&A. Therefore, greenfield investment, with a lower financing threshold, is a better choice. For technological R&D investment, financing constraints have no influence on the OFDI mode choice of enterprises. This is mainly because this type of investment requires enterprises to be able to afford the high cost of overseas R&D and to enjoy smooth financing channels. Therefore, enterprises making technological R&D investment always have strong financing capacity, which is strong enough to cover the financing threshold of both greenfield investment and cross-border M&A.

References

- Anand, J., & Delios, A. (2002). Absolute and Relative Resources as Determinants of International Acquisitions. *Strategic Management Journal*, 23 (2), 16–29.
- Bellone, F., Musso, P., Nesta, L. & Schiavo, S. (2010). Financial Constrains and Firm Export Behaviour. *The World Economy*, 33 (3), 347–373.
- Brouthers, K. D., & Brouthers, L. E. (2000). Acquisition or Greenfield Start-Up? Institutional, Cultural and Transaction Cost Influences. *Strategic Management Journal*, 21 (1), 89–97.
- Brouthers, K. D. (2013). A Retrospective on: Institutional, Cultural and Transaction Cost Influences on Entry Mode Choice and Performance. *Journal of International Business Studies*, 44 (1), 14–22.
- Buch, C. M., Kesternich, I., & Lipponer, A. (2014). Financial Constraints and Foreign Direct Investment: Firm-Level Evidence. *Review of World Economics*, 150 (2), 393–420.
- Chaney, T. (2016). Liquidity Constrained Exporters. *Journal of Economic Dynamics & Control*, 35 (4), 141–154.

- Erramilli, M. K., & Rao, C. P. (1993). Service Firms' International Entry-Mode Choice: A Modified Transaction-Cost Analysis Approach. *Journal of Marketing*, 57 (3), 19–38.
- Hadlock, J., & Pierce, J. R. (2010). New Evidence on Measuring Financial Constraints: Moving Beyond the KZ Index. *Review of Financial Studies*, 23 (5), 1909–1940.
- Jiang, G., & Jiang, D. (2017). Greenfield Investment or Cross-Border M&A: Chinese Enterprises' Choice of Outward Foreign Direct Investment Mode. *The Journal of World Economy (Shijie Jingji)*, 7, 128–148.
- Kaplan, S. N., & Zingales, L. (1997). Do Investment-Cash Flow Sensitivities Provide Useful Measures of Financing Constraints? *The Quarterly Journal of Economics*, 112 (1), 169–215.
- Kogut, B., & Nath, R. (1988). The Effect of National Culture on the Choice of Entry Mode. *Journal of International Business Studies*, 19 (3), 411–432.
- Liu, L., He, Y., Wang, Z., & Cheng, T. (2015). Do Financing Constraints Influence Chinese Enterprises' OFDI: Theoretical and Empirical Analysis from a Microscopic Perspective. *Journal of Financial Research (Jinrong Yanjiu)*, 8, 124–140.
- Ly, Y., & Sheng, B. (2015). Are Financing Constraints the Reason of Export and OFDI of Manufacturing Enterprises: Empirical Evidence in China from a Microscopic Perspective. *World Economy Studies (Shijie Jingji Yanjiu)*, 9, 13–21.
- Madhok, A. (1997). Cost, Value and Foreign Market Entry Mode: The Transaction and The Firm. *Strategic Management Journal*, 18 (1), 39–61.
- Manova, K. (2008). Credit Constraints, Heterogeneous Firms, and International Trade. NBER Working Papers.
- Nocke, V., & Yeaple, S. (2007). Cross-Border Mergers and Acquisitions VS. Greenfield Foreign Direct Investment: The Role of Firm Heterogeneity. *Journal of International Economics*, 72 (2), 336–365.
- Poncet, S., Steingress, W., & Vandenbussche, H. (2010). Financial Constraints in China: Firm-Level Evidence. *China Economic Review*, 21 (3), 411–422.
- Vermeulen, F., & Barkema, H. (2001). Learning through Acquisitions. *Academy of Management Journal*, 44 (3), 457–476.
- Wang, B., Tan, Y., Yu, M., & Wang, Y. (2015). Have Financing Constraints Hindered the Outward Foreign Direct Investment of Chinese Private Enterprises. *The Journal of World Economy (Shijie Jingji)*, 12, 56–80.
- Whited, T., M & Wu, G. (2006). Financial Constraints Risk. *Review of Financial Studies*, 19 (2), 531–559.
- Yang, J. (2012). Financing Constraints and Enterprises' Export Behaviors: Empirical Studies Based on Industrial Enterprises' Data. *China Economic Quarterly (Jingjixue Jikan)*, 4, 337–358.
- Zejan, M, C. (1990). New Ventures or Acquisitions. The Choice of Swedish Multinational Enterprises. *Journal of Industrial Economics*, 38 (3), 349–355.