

# Financing Methods, Financing Constraints and Outward Foreign Direct Investment

## -- Evidence from Chinese A-share Listed Companies

Xiao Yang<sup>1, a, \*</sup>

<sup>1</sup>College of Economics, JiNan University, Guangzhou 510632, China.

<sup>a</sup>Corresponding author e-mail: 634704942@qq.com

### Abstract

Since the strategy of "going out" was put forward, China's OFDI has entered the fast track, the financing constraints will restrain the Chinese enterprises' OFDI to some extent. In order to study how financing constraints affect ofdi, this paper conducts theoretical and empirical analysis from a microscopic perspective, and finds that: first, all types of financing constraints significantly inhibit the OFDI decision making of listed companies; Second, according to the signal transmission mechanism, debt financing constraint at a lower level will reduce the inhibition of equity financing constraint. Third, differences in internal and external factors such as productivity and industry among companies will lead to differences in the impact of financing constraints.

### Keywords

Financing method; Financing constraints; OFDI; A-share Listed company.

## 1. INTRODUCTION

China as a developing country, although in recent years, in particular, launched the "The Belt and Road" initiative, fast development of China's OFDI, both in breadth and depth of OFDI has significantly increased, but the start OFDI started late, the current total OFDI of international direct investment and the ratio of the domestic economy is still relatively low, are still at the stage of development of low level. Compared with other developed countries in the world, there is still a big gap.

Moreover, compared with developed countries, China's current financial market is not so perfect. The imperfect financial system and the unreasonable allocation of resources all lead to the dilemma of financing constraints for enterprises, especially small and medium-sized enterprises. Moreover, under the background of ownership credit discrimination, state-owned enterprises can get stable and continuous financial support from Banks, while private enterprises have a lower priority in obtaining financial support. By considering the financing constraints of different financing modes, this paper studies the influence of OFDI decision making on enterprises.

## 2. LITERATURE REVIEW AND RESEARCH HYPOTHESIS

### 2.1. The Impact of Financing Constraints on OFDI of Enterprises

Klein et al. (2002), who first started to study this aspect, believed that in the 1990s, Japan's direct investment in the United States declined significantly because of the banking crisis in Japan, which weakened the credit capacity of Banks and prevented enterprises from obtaining

financing support. Buch et al. (2010) used the micro-data of German enterprises to analyze the impact of corporate financing constraints on the decision of enterprises to enter the international market, and the results showed that the ability of enterprises to obtain external financing significantly affects the decision of whether enterprises enter the international market and choose export or ofdi. Todo (2011) made use of the data of Japanese enterprises and found that the relatively large financing constraints would have a significant negative impact on the ofdi decisions of Japanese enterprises. Buch, etc. (2014) established a relatively complete model to further to analyze the factors such as productivity, financing constraints, the impact on the enterprise foreign direct investment decision, the study found that using the German enterprise micro data due to foreign direct investment in enterprise need more fixed costs, so the enterprise financing ability has a significant role in the decision-making, financing constraints will reduce the probability of the foreign direct investment of enterprise, and the higher the possibility of foreign direct investment of enterprises, the greater the impact of financing constraints; And enterprise productivity is different, the influence degree is different, the influence on the enterprise with high productivity is bigger than that of the enterprise with low productivity.

Liu Liya (2015) in Chinese listed companies, such as data as sample, using the SA index as a proxy variable of financing constraints, the study found that the financing constraints to the Chinese enterprise of foreign direct investment ability has inhibitory effect, and the higher the dependence of exogenous financing enterprises industry, the inhibition ability is stronger, but for productive enterprises, financing constraints on enterprise's foreign direct investment will reduce the negative effect. Wang bijun et al. (2015) adopted the micro data of manufacturing industry in zhejiang province, and the research results showed that the improvement of financing constraints not only increased the possibility of enterprises' ofdi, but also had a positive impact on the expansion of enterprises' ofdi scale. Li lei and bao qun (2015) analyzed the micro-data of Chinese industrial enterprises, and the results showed that financing constraints would also significantly affect the ofdi of Chinese enterprises. The stronger the financing ability of enterprises, the greater the possibility of ofdi, and the greater the possibility of multiple investment or multi-country investment. Moreover, for enterprises of different ownership, the financing ability of state-owned enterprises does not affect the decision of ofdi, but the financing constraint will have a restraining effect on the ofdi of private enterprises. Lv yue and sheng bin (2015) found that the influence of financing ability on the internationalization choice behavior of enterprises was similar to the efficiency factor, that is, the enterprises with the strongest financing ability would make ofdi, the enterprises with the middle financing ability would export, and the enterprises with the weakest financing ability could only serve the domestic market. Qiu licheng and liu kuining (2016) found that the internal financing ability only affected private enterprises, while the external financing ability had a positive impact on the ofdi tendency of all types of enterprises. However, the external financing ability of state-owned enterprises and foreign-funded enterprises was significantly higher than that of private enterprises. In addition, enterprises engaged in export trade face less financing constraints than non-export enterprises when they make ofdi. Luo yong and zhang yue (2017) show that the debt-to-capital ratio is also an influencing factor for enterprises to make ofdi. Yu guansheng (2017) included the exchange rate risk of the host country into the analysis framework, and found that Chinese enterprises with strong financing constraints were more inclined to invest in countries with high exchange rate risks, while those with weak financing constraints would choose to invest in countries with low exchange rate risks. Wang zhongcheng et al. (2017) and gong xuhong et al. (2017) incorporated credit support into the analysis framework, and found that credit support can only affect the breadth of enterprises' ofdi, but not the depth. Lun xiaobo et al. (2018) found that in regions with less financial misallocation, there would be a mitigating effect on the impact of financing constraints.

## 2.2. Research Hypothesis

When the internal financing of enterprises is more abundant, the possibility of OFDI is higher, and the debt financing constraint and equity financing constraint are higher, the possibility of OFDI is lower. The financing constraint of the three financing channels is inversely proportional to the possibility of OFDI. Therefore, the first hypothesis is proposed in this paper.

H1: The higher the constraint of endogenous financing, debt financing and equity financing, the lower the possibility of OFDI.

For listed companies, the two main channels of external financing are debt financing and equity financing. However, due to information asymmetry in the capital market, the debt financing situation of enterprises will affect investors through the signal transmission mechanism, and then affect the equity financing of enterprises. When the debt financing constraints of enterprises are relatively small, enterprises can obtain a large amount of funds from the bond market and the banking system, which will send a signal of good corporate credit, solvency and profitability in the market, enhance the confidence of investors, and ease the equity financing constraints of enterprises, and vice versa.

H2: The good debt financing constraint of listed companies can mitigate the impact of equity financing constraint of companies to some extent

Due to the imperfect financial market in China, not only does financial friction inhibit enterprises from financing, but also there is ownership discrimination in external financing. Under the same conditions, state-owned enterprises are more likely to get external financing support than non-state-owned enterprises according to their own system advantages (Allen et al., 2005; Luo Changyuan and Chen Lin, 2012), non-state-owned enterprises may face more severe external financing constraints.

H3: debt financing constraints and equity financing constraints have a greater impact on non-state ownership enterprises.

## 3. MODEL SELECTION AND SAMPLE ANALYSIS

### 3.1. Econometric Model Construction

The interpreted variable studied in this article is a discrete binary variable with a value of only 0 or 1. The probability of its value being 1 is affected by other variables, so the binary choice Logit model is a good choice. . Therefore, based on the framework of the theoretical model of enterprise heterogeneity, this paper establishes an empirical model of the impact of heterogeneity of financing constraints and constraints on enterprises' foreign direct investment decisions under different financing methods. Among them, internal financing constraints, debt financing constraints, and equity financing constraints are explanatory variables, and total factor productivity of the enterprise, enterprise size, enterprise age, price-to-book ratio, export intensity, and enterprise ownership are control variables. Therefore, referring to the practice of Buch et al. (2014), the empirical model of this paper is set as follows:

$$Pr(OFDI_{it} = 1) = \beta_0 + \beta_1 IF_{i(t-1)} + \beta_2 DF_{i(t-1)} + \beta_3 EF_{i(t-1)} + \theta X_{i(t-1)} + dummies + \varepsilon_{it} \quad (1)$$

In model (1), the interpreted variable OFDI is a binary variable of whether the company made foreign direct investment in the year, with foreign direct investment as 1, and no foreign direct investment as 0;  $\beta_0$  is a constant term; IF indicates the enterprise's Internal financing constraints; DF represents the debt financing constraints of the enterprise; EF represents the equity financing constraints of the enterprise; X is the set of control variables, including the

productivity of the enterprise and the size of the enterprise. dummies is a set of dummy variables, including year, industry, and region. The year dummy variables are used to control the impact of macroeconomic fluctuations on the possibility of foreign direct investment of enterprises in different years. Industry dummy variables are used to control Factors affecting the possibility of foreign direct investment of enterprises in different industry characteristics; regional dummy variables, in order to control the impact of unobservable factors related to the locality of enterprises on foreign direct investment of enterprises  $\varepsilon$  is the error term. In the subscripts,  $i$  and  $t$  indicate the data of the  $i$ -th enterprise in the  $t$ -year, and  $t-1$  indicates that the data has been processed with a lag period.

### 3.2. Sample Data Preparation

The data used in this paper are the data of listed companies in the 11 years from 2008 to 2018, and the data are from guotai 'an database and Wind database. Due to the listed companies in the annual report disclosure of foreign direct investment situation, according to the definition of foreign direct investment enterprise refers to the foreign enterprise directly owned or controlled by more than 10% stake, voting rights, or other equivalent to the interests of domestic enterprise, so this article according to the listed company whether the overseas affiliates have the standard to judge whether the foreign direct investment. In this paper, the detailed information of listed companies of foreign affiliates in taian database, data from the countries on the basis of foreign direct investment enterprise definition, if a listed company in more than 10% when the new control rights, associated enterprises registered address on the outside mainland China and correlation for the listed company's subsidiary, joint venture or consortium of associated enterprises abroad, argues that the listed companies of foreign direct investment in that year.

According to the above criteria, this paper collects the data of outbound direct investment of all listed companies in China's a-share market from 2008 to 2018. The data were processed as follows: the delisted companies, ST companies and financial companies were eliminated; Remove companies whose affiliates are domiciled in tax havens such as the British virgin islands, the cayman islands and Bermuda, and the purpose of such investments is only for tax avoidance and has no reference value; Excluding companies with net fixed assets of 0 and those with less than 10 employees; Companies with missing data on some key variables were eliminated. After the above treatment, a total of 9,889 samples were obtained.

#### 3.2.1 Measurement of financing constraints

According to the theory of superior order financing, this paper divides the financing constraints faced by listed companies into internal financing constraints, debt financing constraints and equity financing constraints according to different financing methods, among which debt financing constraints and equity financing constraints data external financing constraints.

Internal financing constraint (IF) : the constraint faced by an enterprise in raising funds from within the enterprise. This paper selects the real value of cash flow based on 2008 and takes the natural logarithm form, namely  $\ln(\text{cash})$ , to measure the internal financing constraints of enterprises. The less the cash flow of enterprises, the greater the internal financing constraints of enterprises. Debt financing constraints (DF) : enterprise debt financing constraints is mainly manifested in the difficulty of issuing bonds and to get loans from the bank, enterprise tangible assets of all assets can also measure of corporate debt financing constraints, the enterprise the proportion of tangible assets, the greater the firm's ability to obtain mortgages the stronger, the less the debt financing constraints. Equity financing constraints (EF) : the stronger the ability of enterprises access to funds through the issue of shares, equity financing constraints is weak, this article selects the business net interest rates as a proxy index, as a mature listed companies, the net rate shows that the company's operating income is good, promising investors on the

company's development, the company issued shares to obtain funds difficulty become low, equity financing constraints become low.

### 3.2.2 Control Variable Selection and Measurement

Productivity (TFP) : according to the new trade theory, for enterprises with three levels of productivity, only enterprises with high productivity can make ofdi. In this paper, the natural logarithm of total factor productivity is used as the proxy variable, and total factor productivity is calculated by using the LP method proposed by Levisohn and Petrin (2003) to control the endogenous problem. Enterprise Size (Size) : the larger the company is, the higher the possibility of ofdi will be. Besides, large-scale companies have more advantages in external financing than small-scale companies, and the internal capital of large-scale companies will be higher than that of small-scale companies. Therefore, enterprise Size will also affect the decision of ofdi. In this paper, the logarithm of the real value of the total assets of a listed company is taken as a proxy variable to measure the size of the enterprise. Enterprise Age (Age) : the operation time, affect the enterprise internal management experience and ability to affect the enterprise production management efficiency, long time to develop the good relationship with the fact that it is easier to get bank borrowing money, so young enterprises will face more severe financing constraints, this article uses the public life of the natural logarithm of measure enterprise Age. Price-to-book (PB) : in the stock market, the price-to-book ratio can react to a certain extent investors invest risk degree, low price-to-book of company stock is higher than price-to-book company stock has investment value, therefore, affect the enterprise financing constraints, low stock price-to-book enterprises will be more easy to obtain equity financing, the lower the equity financing constraints, this article selects the end of the year's closing price and the ratio of the net assets per share as a price-to-book ratio index. Export intensity(Ex): managers have different understandings of the international market depending on whether a listed company has exported or to what extent. The more experienced the managers are in overseas operation, the higher the possibility of the listed company to make ofdi. Therefore, in order to measure the degree of export, the ratio of overseas business income and main business income of listed companies is selected as an indicator of export strength. Enterprise ownership (Pri) : according to the nature of the actual controller after the tracing of the equity chain of the listed company, if the enterprise is a Private enterprise, the value is 1; if it is a state-owned enterprise, the value is 0. Region (Province) : the preferential policies and different financial development levels faced by enterprises in different regions of China will have an impact on the ofdi of enterprises, so the dummy variables of the regions to which the enterprises belong are added. Industry: different industries have different dependence on finance and different development levels. Therefore, dummy variables are added to control the robustness of the model.

### 3.3. Descriptive Statistical Analysis

Table 1 shows the data comparison between the original data and the samples without foreign direct investment after Windsor processing. Looking at the average of the three financing constraint indicators, for listed companies that have undertaken foreign direct investment, the endogenous financing constraint indicator (6.8173) is higher than that of listed companies without foreign direct investment (5.7528); the debt financing constraint indicator (0.9266) requires Higher than listed companies without direct foreign investment (0.9367), the equity financing constraint index (0.0638) is greater than listed companies without foreign direct investment (0.0581), and for these three indicators, a larger value indicates that the listed company responds accordingly The stronger the financing capacity of the company, the smaller the financing constraints faced. Therefore, the listed companies subject to outward direct investment are subject to lower endogenous financing constraints and equity financing constraints than listed companies that have not made outward direct investment, and debt

financing constraints are slightly greater than those listed companies that have not made outward direct investment. In addition, listed companies that make direct foreign investment have relatively higher productivity and company size, a younger listing age, and a lower price-to-book ratio and lower export intensity.

**Table 1.** Comparative data description of foreign direct investment

Variable	OFDI=1				OFDI=0			
	Mean	Var	Min	Max	Mean	Var	Min	Max
IF	6.817	1.388	2.253	10.953	5.753	1.503	-4.127	10.984
DF	0.927	0.096	0.165	1	0.937	0.087	0.148	1
EF	0.064	0.084	-0.15	0.283	0.058	0.096	-0.15	0.283
TFP	10.508	0.869	6.81	13.887	9.958	0.895	4.878	14.4118
Size	9.05	1.354	5.044	14.13	8.045	1.3726	0.753	14.234
Age	2.579	0.47	0	3.332	2.617	0.385	0	3.332
PB	2.718	1.941	0.887	10.013	3.355	2.452	0.887	10.013
Export	0.201	0.611	0	3.32	0.369	0.86	0	3.32

Table 2 is the correlation coefficient matrix of the main explanatory variables and control variables in the model. It can be seen from the table that total factor productivity and scale have a slight positive correlation with the endogenous financing constraints of listed companies. The financing constraint index is the logarithm of cash flow. The higher the productivity of a listed company, the larger the scale, and the larger the cash flow owned by the listed company. In addition, the correlation coefficient between the productivity and scale of listed companies is 0.8731, and there is a high positive correlation, indicating that the larger the scale of listed companies, the higher the productivity, which is consistent with previous scholars' related research expectations. In addition, the correlation between the main variables does not exceed 0.3. According to past experience, it can be considered that the model does not have multicollinearity.

**Table 2.** Correlation Coefficient Matrix

	IF	DF	EF	TFP	SIZE	AGE	PB	EX
IF	1							
DF	0.0302	1						
EF	0.0402	0.0071	1					
TFP	0.336	0.0556	-0.0066	1				
SIZE	0.3521	-0.0123	-0.0297	0.8731	1			
AGE	-0.0681	-0.0255	0.007	0.0886	-0.0774	1		
PB	-0.1603	-0.0166	0.2843	-0.0627	-0.1585	0.039	1	
EX	-0.1135	0.0114	-0.0001	-0.11	-0.0845	0.0049	0.0176	1

## 4. RESULTS AND DISCUSSION

### 4.1. Benchmark Model Estimation Results

For the binary choice Logit model used in this article, there are two regression methods, mixed cross-section regression method and panel regression, but mixed cross-section regression may not be accurate enough because of missing variables, so this paper chooses to use panel data regression Make estimates. When panel data regression is used in empirical analysis, there are two methods of random effect model and fixed effect model. Therefore, in order to test H1, this article uses random effect and fixed effect to perform regression.

**Table 3.** The Impact of Financing Constraints on OFDI

Variable	Explained variable: OFDI (yes=1, no=0)			
	Random effect		Fixed effect	
IF	0.493*** (10.57)	0.142** (2.07)	0.449*** (5.89)	0.114* (1.21)
DF	3.586*** (6.78)	3.087*** (5.91)	4.304*** (5.70)	3.491*** (4.50)
EF	0.188* (1.60)	0.277** (1.89)	0.107** (1.01)	0.384* (1.90)
TFP	0.437*** (5.89)	0.362*** (4.88)	0.281*** (2.61)	0.153** (1.37)
PB	-0.012* (-1.14)	-0.006* (-0.72)	-0.011* (-0.98)	-0.002* (-0.81)
SIZE		0.526*** (6.83)		0.742*** (5.39)
AGE		-0.302* (-1.73)		-0.958*** (-2.65)
EX		-0.032* (-1.15)		-0.080** (-1.97)
PRI		0.906*** (7.50)		0.875*** (3.19)
_cons	-5.884*** (-5.70)	-7.139*** (-6.40)		
Year	yes	yes	yes	yes
Industry	yes	yes	yes	yes
Province	yes	yes	yes	yes
Num	9464	9459	5058	5055

Note: The numbers in parentheses represent the statistical value of Z. Among them, \*\*\*, \*\*, and \* indicate that the data are significant at the levels of 1%, 5%, and 10%, respectively. Subsequent forms apply.

Empirical results as shown in table 3, in contains a random effect and fixed effect, the empirical results in four endogenous financing constraint index of the coefficient is positive, and in a random effects model significantly, under the level of 1% and 5% respectively in a fixed effect model respectively, significant at 1% and 10% levels, although the company daily management, and other investment needs the support of cash flow, but there is no limit to the use cost and use of cash flow is still the preferred sources of funds for the company to invest, so when undertaking foreign direct investment in the company of endogenous financing is still important financing way. Debt financing constraint index of the coefficient in table 4-5 4 columns are significant under 1% level is positive, on the one hand, through debt financing of listed companies can usually get a lot of money to meet the needs of investment, obtain funds through debt financing, financing amount is bigger than the internal financing, access to funds time shorter than equity financing, procedure is more simple and convenient, on the other hand, although the need for debt financing companies servicing rising funding costs on a regular basis, but for the policy to encourage foreign direct investment projects, bank credit is usually will also have the corresponding preferential interest rate policy, so the company in the foreign direct investment decision, Debt financing is the most important source of financing among the

three types of financing. Equity financing constraint index of the coefficient is positive, and random effects of significant at 10% and 5% levels respectively, at 5% and 10% respectively in the fixed effects levels significantly, equity financing receive money no reimbursement pressure, and a relatively large amount of financing, but by the time needed for the public to raise money for a longer, more complicated formalities. The coefficients of the three explanatory variables in table 4-5 are all significantly positive, indicating that the smaller the constraints of endogenous financing, debt financing and equity financing of listed companies are, the higher the possibility of ofdi of listed companies is. In addition, the coefficient of total factor productivity is significantly positive in all regression results, which also confirms the conclusion that in the theory of enterprise heterogeneity, enterprises with higher productivity are more likely to make ofdi.

**Table 4.** Robustness Test Result

Variable	Explained variable: OFDI (yes=1, no=0)		
	(1)	(2)	(3)
IF		0.075** (2.04)	0.070** (1.79)
IF1	0.073* (1.86)		
DF	1.619*** (5.63)		1.697*** (5.78)
DF1		2.154*** (4.99)	
EF	0.148** (1.90)	0.150** (1.98)	
EF1			0.034* (0.91)
TFP	0.209*** (5.30)	0.191*** (4.79)	0.231*** (5.41)
PB	-0.002* (-0.54)	-0.002* (-0.40)	-0.002* (-0.35)
SIZE	0.348*** (12.52)	2.440*** (5.65)	0.296*** (6.83)
AGE	-0.180* (-1.89)	-0.163* (-1.72)	-0.162* (-1.65)
EX	-0.015* (-1.05)	-0.015* (-1.06)	-0.003* (-0.20)
PRI	0.493*** (7.57)	0.503*** (7.76)	0.481*** (7.19)
_cons	-4.168*** (-7.10)	-5.537*** (-10.34)	-4.234*** (-6.76)
Year	yes	yes	yes
Industry	yes	yes	yes
Province	yes	yes	yes
Num	9464	9459	8338



## 4.2. Robustness Test

For the measurement of explanatory variables in this paper, many scholars have proposed different measurement indexes. Therefore, it is necessary to perform corresponding robustness tests on the proxy variables of the explanatory variables used in this paper. For endogenous financing constraints, proxy variables are usually measured by the company's cash flow and (retained income + depreciation) / total assets. Commonly used measures to measure debt financing constraints include interest expenditure, interest protection multiples, and tangible asset share. The proportion of all assets, asset-liability ratio, etc; the indicators for measuring equity financing constraints also mainly include two types: operating net interest rate and dividend payment rate. The explanatory variables in the benchmark model of this article are measured by the company's cash flow, tangible assets proportion and net operating margin. Therefore, this article will use (retained income + depreciation) / total assets, interest expenses and dividend payment rates as the internal financing constraints, The debt financing constraint and the equity financing constraint proxy variables are tested for robustness.

The results estimated by using different proxy variables are shown in table 4, where IF1 represents (retained earnings + depreciation)/assets, DF1 represents interest expense, and EF1 represents dividend payout ratio. In the first column, the use of retained earnings and depreciation of assets than instead of company cash flow as a measure of endogenous financing constraints proxy variables, the empirical results show that the coefficient of significant under 10% level is positive, the company's retained earnings and depreciation can reflect the available funds of the company, the higher the ratio, the more internal funds available, the less the endogenous financing constraints, the company for the higher the possibility of foreign direct investment. In the columns 2, use the interest payments instead of tangible assets as a measure of corporate debt financing constraints proxy variables, the results show that the coefficient of interest payments at 1% level of significant is positive, the company on debt financing, whether by issuing bonds or through the commercial bank credit financing, all need to pay the interest, therefore the interest payments can response to the company's debt financing ability, the higher interest payments showed that the smaller the company debt financing constraints, the company for the higher the possibility of foreign direct investment. In column 3, the use of the net interest rate of the dividend payment rate instead of the business as a proxy variable to measure equity financing constraints, the results show that the dividend payment rate coefficient under the 10% level significantly positive, high rate of dividend payment instructions listed company business is good, especially in China's capital market situation now, the problem of high rate of dividend payment easier favored by the investors of listed companies, listed companies face lower equity financing constraints, the higher the likelihood of outward foreign direct investment. In this paper, three explanatory variables are tested for robustness respectively. In the empirical results, the debt financing constraint index is significant at the 1% level, and the endogenous financing constraint index and equity financing constraint index are significant at the 10% level at least. Therefore, it can be concluded that the explanatory variable used in this paper is effective.

## 4.3. Further Analysis

### 4.2.1 Interaction between DF constraints and EF constraints

In the incomplete capital market, there is information asymmetry problem, but the signal transmission mechanism can to a certain extent, reduce the negative effects of information asymmetry, when the enterprise credit is good, the bank is willing to provide financial support, the credit rating is high on the bond market, investors will also enhance confidence in the future management of listed companies, the company for equity financing, improve the capacity of the influence of the equity financing constraints will be weakened.

**Table 5.** The result of Interaction between DF constraints and EF constraints

Variable	Explained variable: OFDI (yes=1, no=0)	
	Logit estimate	Probit estimate
IF	0.142** (2.07)	0.077** (2.09)
DF	3.077*** (5.64)	1.669*** (5.62)
topDF*EF	-0.028* (-0.06)	-0.026* (-0.11)
EF	0.279* (1.83)	0.149* (1.87)
TFP	0.362*** (4.87)	0.194*** (4.85)
PB	-0.006* (-0.71)	-0.002* (-0.62)
SIZE	0.526*** (6.83)	0.284*** (6.88)
AGE	-0.302* (-1.73)	-0.173* (-1.82)
EX	-0.032* (-1.15)	-0.015* (-1.05)
PRI	0.906*** (7.49)	0.493*** (7.59)
_cons	-7.146*** (-6.36)	-3.910*** (-6.51)
Year	yes	yes
Industry	yes	yes
Province	yes	yes
Num	9459	9459

Debt financing constraint index according to the size of this article divided into four groups, and take the group according to the order of the highest as debt financing constraints on the panel, and then to verify whether low debt financing constraints will mitigate the effects of equity financing constraints, on this basis, this paper builds a virtual variable (topDF) : debt financing constraints in the group's value is 1, other values to 0. In the above benchmark model with the lowest debt financing constraints (topDF) and equity financing constraints (EF) the interaction of topDF \* EF and regression analysis, the empirical results as shown in table 5, column 1 is to use a Logit model regression results, interaction of significant negative abnormal coefficient under the level of 10%, equity financing constraints comprehensive coefficient is 0.251 (0.028 + 0.279), less than equity financing restraint coefficient of 0.277 in the benchmark model. The second column is the result obtained by using the Probit model regression. The coefficient of the interaction term is -0.026, which is significant at the 10% level. The comprehensive coefficient of equity financing constraint is 0.123 (-0.026+0.149), which is also smaller than the coefficient of -0.151 in the benchmark model. The empirical results show that no matter what kind of estimate method, the existence of the interaction term makes the comprehensive coefficient of equity financing constraints is reduced, which means less debt financing of listed companies will make the company faced by equity financing constraints

become low, ease the company's equity financing constraints, thus increasing the possibility of foreign direct investment.

#### 4.2.2 Ownership Difference Analysis

Due to the imperfection of China's financial market, financial friction not only inhibits enterprises from financing, but also makes it more difficult for non-state-owned enterprises to obtain financing support than state-owned enterprises under the same conditions. In addition, among the 27,100 domestic investors in China, the proportion of state-owned enterprises is only 4.9%, and non-state-owned enterprises become the main force of outbound direct investment. Therefore, it is necessary to study the difference in the relationship between financing constraints and ofdi of listed companies under different ownership. This paper divides all data into two sub-samples of state-owned listed companies and non-state-owned listed companies according to ownership, and makes regression estimation and comparison of the two sub-samples respectively. From the regression results in table 6 as you can see, although the listed companies to foreign direct investment decision-making as a whole will be affected by different financing constraints, but look from different ownership, state-owned enterprise debt financing constraint coefficient (2.227) and equity financing constraint coefficient (0.4) significantly less than the non-state-owned companies (3.696) (0.769), showed the debt financing and equity financing constraints to the influence of state-owned enterprises is much lower than non-state-owned enterprises. Therefore, it can be concluded that H3 is valid. External financing constraints have a greater impact on non-state-owned enterprises.

**Table 6.** The result of Ownership Factors Affect

Variable	Explained variable: OFDI (yes=1, no=0)		
	State-owned	Non-state-owned	Original sample
IF	0.302*** (3.08)	0.099* (0.91)	0.142** (2.07)
DF	2.227*** (2.93)	3.696*** (4.32)	3.087*** (5.91)
EF	0.400* (1.48)	0.769*** (3.09)	0.277** (1.89)
TFP	0.580*** (5.66)	0.135* (1.26)	0.362*** (4.88)
PB	-0.006* (-0.72)	-0.006* (-0.7)	-0.006* (-0.72)
SIZE	0.262*** (2.6)	0.770*** (5.75)	0.526*** (6.83)
AGE	-0.093* (-0.43)	-0.483 (-1.49)	-0.302* (-1.73)
EX	0.004 (0.16)	-0.140*** (-2.67)	-0.032* (-1.15)
_cons	-9.652*** (-7.34)	-4.769*** (-3.08)	-7.139*** (-6.40)
Year	yes	yes	yes
Industry	yes	yes	yes
Province	yes	yes	yes
Num	5982	3477	9459

## 5. CONCLUSION

Based on the theory of enterprise heterogeneity, the theory of superior financing and the theory of ofdi, this paper qualitatively analyzes the inhibitory effect of financing constraints on ofdi decisions of listed companies under different financing modes and puts forward relevant research hypotheses. Based on the hypothesis, this paper USES the data of a-share listed companies from 2008 to 2018 to investigate the impact of financing constraints on ofdi of listed companies from three aspects: endogenous financing constraints, debt financing constraints and equity financing constraints, and draws the following conclusions:

(1) the financing constraints under the three financing methods all play a inhibiting role in the ofdi decision of listed companies. Because ofdi requires higher entry costs, listed companies with weak financing ability cannot rely on their own internal cash flow or external financing to meet the financing needs, so the possibility of ofdi of listed companies will be reduced. This paper studies the influence of internal financing constraints, debt financing constraints and equity financing constraints on ofdi of listed companies. The empirical results show that all types of financing constraints have a significant inhibitory effect on ofdi decision making of listed companies.

(2) when listed companies have lower debt financing constraints, it is easier to obtain equity financing funds. This phenomenon is because the good credit level of listed companies will make investors more optimistic about the operation of listed companies through the signal transmission mechanism of the market, and the degree of equity financing constraints faced by listed companies will be alleviated to some extent. This paper studies the interaction between debt financing constraints and equity financing constraints on the ofdi of listed companies. It is not difficult to find from the measurement results that when a listed company's debt financing constraints are relatively light, equity financing constraints will be reduced.

(3) From the perspective of ownership differences of listed companies, it is found that external financing constraints have less impact on the ofdi decision of state-owned listed companies. State-owned listed companies, with its ownership advantages, from a commercial bank debt financing and the ability to obtain equity financing from capital market is relatively strong, the influence of external financing constraints on its smaller, while the non-state-owned listed companies in China's financial market is relatively difficult to obtain debt financing and equity financing, financing constraints on the inhibitory effect of non-state-owned listed companies is more prominent.

## REFERENCES

- [1] Klein M W, Peek J, Rosengren E S(2002). Troubled banks, impaired foreign direct investment: the role of relative access to credit[J]. *American Economic Review*, vol.92 no.3, p.664-682.
- [2] Buch C M, Kesternich I, Lipponer A, et al(2010). Exports Versus FDI Revisited: Does Finance Matter? [J]. *Discussion Paper*.
- [3] Todo Y(2011). Quantitative Evaluation of the Determinants of Export and FDI: Firm-level Evidence from Japan[J]. *The World Economy*, vol.34 no.3, p.355-381.
- [4] Buch C M, Kesternich I, Lipponer A, et al(2014). Financial Constraints and Foreign Direct Investment: Firm-Level Evidence[J]. *Review of World Economics*, vol.150 no.2, p.393-420.
- [5] Liu Liya, He Yanlin, Wang Zhaofei, et al. Will Financing Constraints Affect Chinese Enterprises' Outward Direct Investment? —— Theoretical and Empirical Analysis Based on Micro Perspective [J]. *Financial Research*, vol.3, p.124-140.
- [6] Wang Bihuan, Tan Yuyan, Yu Miaojie, et al(2015). Whether Financing Constraints Suppress Foreign Direct Investment by Chinese Private Enterprises [J]. *World Economy*, vol.12, p.54-78.

- [7] Li Lei, Bao Qun(2015). Do Financing Constraints Restrict Foreign Direct Investment by Chinese Industrial Enterprises? [J]. Finance and Economics Research, vol.41 no.6, p.120-131.
- [8] Lu Yue, Sheng Bin(2015). Are Financing Constraints the Causes of Manufacturing Enterprises' Exports and Foreign Direct Investment? —— Empirical Evidence from China's Micro-level [J]. World Economic Research, vol.9, p.13-21.
- [9] Qiu Licheng, Liu Kuining(2016). The Effect of Financing Heterogeneity on the Tendency of Foreign Direct Investment of Enterprises——A Test Based on Data of Chinese Industrial Enterprises [J]. Finance and Trade Research, vol.3, p.47-54.
- [10] Luo Yong, Zhang Yue(2017). The Impact of Financing Constraints on the Internationalization of Enterprises——Analysis of the New and New Trade Theoretical Model Based on Extension [J]. International Business: Journal of University of International Business and Economics, vol.1, p.99-109.
- [11] Yu Guansheng(2017). Financing Constraints, Host Country Exchange Rate Risk and Location Selection of Foreign Direct Investment of Enterprises——An Empirical Study Based on Zhejiang Province Micro-enterprise Data [J]. Journal of Zhejiang Gongshang University, vol.31 no.6, p.87-96.
- [12] Wang Zhongcheng, Xue Xinhong, Zhang Jianmin(2017). Financing Constraints, Financing Channels and Foreign Direct Investment of Enterprises [J]. Financial Economics Research, vol.32 no.1, p.60-72.
- [13] [Gong Xuhong, Ren Ye(2017). Financing Constraints, Credit Support and Foreign Direct Investment of Private Enterprises [J]. Industrial Economy Research, vol.5, p.25-37.
- [14] Lun Xiaobo, Yang Zhudi, Li Xin(2018). Ownership, Foreign Direct Investment and Financing Constraints: An Empirical Analysis Based on the Perspective of Financial Resource Mismatch [J]. World Economic Research, vol.6, p.009.