Study on the location choice of Chinese outward foreign direct investment

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Abstract

With the steady implementation of the "Go Out" strategy, China has been developing rapidly in the outward foreign direct investment. This paper, based on the 2003-2012 panel data of Chinese outward foreign direct investment, applies systematic GMM model and variable intercept model to study the location choice of Chinese outward foreign direct investment. Research findings show that, the resource endowment and bilateral trade of the host country have significantly positive impacts on Chinese outward foreign direct investment, whereas the market size and technical merit of the host country bring about significant negative impacts. Therefore, domestic corporate outward foreign direct investment should still focus mainly on resource acquisition and trade complementarity rather than acquiring technologies.

Keywords: outward foreign direct investment, location choice, technical merit, GMM model

1 Introduction

Chinese outward foreign direct investment has been developing rapidly in this century. The *2012 Statistical Bulletin of China's Outward Foreign Direct Investment* issued by the Ministry of Commerce shows that, in 2012, Chinese outward foreign direct investment spread over 179 countries (regions) all over the world, and the coverage reached 76.8%. With an investment flow incremental change of 87.8 billion dollars in ten consecutive years and a year-on-year growth of 17.6%, China became one of the world's three biggest outward foreign investor countries. By the end of 2012, Chinese outward foreign direct investment had covered all industrial categories of the national economy and the stock of investment reached 531.94 billion dollars. The cumulative investment stock of the seven industries as rental service, commercial service, finance, mining, wholesale and retail trade and manufacturing accounted for 92.4% of the overall amount Chinese outward foreign direct investment. The sudden rise of China in the outward foreign direct investment with its various characteristics and unique dualistic economy has attracted more and more attention from scholars. With the acceleration of global economic integration, outward foreign direct investment begins to play a more and more significant role in enhancing the national economic development and the international competitiveness of enterprises, and to accelerate the development of a country's outward foreign direct investment has become a focus of the academic world. Location choice is the key to solve the issue. The United Nations Conference on

Trade and Development (UNCTAD) suggested that, for the host country, there are three major influential location factors on the outward foreign direct investment launched by transnational corporations: economic factors (e.g., material availability and cost, labour cost, agglomeration effect, etc.), operation framework of foreign investment and trade (entry and operation conditions, rule stability and transparency, etc.) and corporate operation convenience (preferential policy, operational risks, etc.). Therefore, this paper mainly focuses on these aspects during the discussion.

Scholars at home and abroad apply different methods to study location choice during outward foreign investment and have come to important conclusions. Abroad: Blonigen looked into the U.S. investment in 20 OECD countries and believed that, the market size, market potential, trade costs, population and technology of the host country have a remarkable impact on the inflow of foreign investments [1]. Cheung and Qian analysed the data of Chinese enterprises' investment in 31 countries and came to the conclusion that, the market size, per capita GDP and wage level of the host country have a significant impact on Chinese outward foreign direct investment [2]. Ramasamy et al. used the Poisson regression model and found that, state-owned enterprises tend to invest in countries with abundant resources and close in politics, whereas private enterprises pay greater attention to the development of overseas market [3]. Kolstad and Wiig pointed out that, the institutional quality and resource endowment of the host country have a significant impact on Chinese outward foreign direct investment and enterprises prefer to invest in countries

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with lower institutional quality but abundant resources [4]. Martínez-Martín used the spatial panel data model to study Spanish transnational corporations' direct investment and concluded that, the market size, trade costs, population, distance off the home country and the technical merit of the host country have a significant impact on foreign capital inflow [5]. In addition, Buckle et al. and Peimin et al. also researched into a country's corporate outward foreign direct investment [6, 7].

In China: He Benfang and Zhang Xiang applied gravity models to conduct empirical study and reached the conclusion that, the trade and labor costs, distance off and other factors of the host country have a significant impact on Chinese outward foreign direct investment [8]. Li Meng and Yu Jinping found that, the market size, resource endowment and trade links of the host country are critically influential on Chinese outward foreign direct investment [9]. Qi Chunling and Zou Chao believed that, Chinese outward foreign direct investment tends to avoid "weak-effect systems" and seek "strong-effect systems". The higher the institutional quality is, the more attractive it is to the Chinese investment [10]. Wang Juan and Fang Liangjing found that, the market size, resource endowment and opening degree of the host country have a significantly positive influence on Chinese outward foreign direct investment, while the impact of political risks and cultural links is not obvious [11]. Song Weijia and Xu Hongwei pointed out that, the resource and technical endowment, infrastructure construction, foreign capital opening degree and bilateral trade of the host country are all very important to the location choice of Chinese outward foreign direct investment [12]. Zong Fangyu et al. looked into the impact of bilateral investment treaty and institutional environment on Chinese outward foreign direct investment, and found that bilateral investment treaty can effectively promote the development of domestic enterprises' outward foreign direct investment [13]. Jiang Guanhong and Jiang Dianchun reported that, Chinese outward foreign direct investment seeks market and resources in developing countries and strategic assets in developed ones [14].

Most of the current researches on the location choice of Chinese outward foreign direct investment are based on the gravity model and the eclectic theory of international production. Conclusions reached upon different variables and models vary and sometimes even poles apart. In fact, Chinese outward foreign direct investments have its own characteristics: on the one hand, it began to develop rapidly only after 2002, and the investment flow before that was small and could hardly bring about any significant economic effect; on the other hand, outward foreign direct investment is a continuous dynamic course; thus, it's more meaningful to use the panel data after 2002 and employ dynamic models to study the location choice of Chinese outward foreign direct investment. This paper uses the 2002-2012 panel data and employs the systematic GMM to conduct empirical study on it.

2 Theoretical analysis

2.1 MARKET SIZE

Location advantage is a critical influential factor on the inflow of foreign capital and market size is an important variable to measure a country's location advantage. Enterprises are mainly driven by the constantly expanding of overseas market in developing their outward foreign direct investment. Dunning's eclectic theory of international production also stresses the effect of market size of the host country in foreign capital inflow as an important influential factor. Generally, the greater the market size and the stronger the economic strength of the host country is, the easier it is for enterprises to use the advantages of the economy of scale and scope to cut down production costs and increase profits, and thus foreign capital inflow is more likely to be attracted; on the contrary, it's harder for host countries with smaller market sizes to attract foreign capital inflows. With the constant incoming of external capitals, the market size of the host country grows and becomes more attractive to external capitals. Therefore, it is hypothesized here that, the market size of the host country is in positive correlation with Chinese outward foreign direct investment. Because GDP (gross domestic product) indicates the overall national output, this paper uses the GDP of the host country as the proxy variable for the market size.

2.2 BILATERAL TRADE

Chinese outward foreign direct investment has been developing rapidly these years and its foreign trade also increases continuously. As a result, it is hypothesized here that, bilateral trade is in positive correlation with Chinese outward foreign direct investment. Since the connection between export and outward foreign direct investment is getting closer, China's export (EXP) to the host country is used here as the proxy variable for the bilateral trade.

2.3 RESOURCE ENDOWMENT

With the further economic development, the imbalance between supply and demand gets more and more severe; the demand of oil, gas and other mineral resources rises increasingly and is strongly dependent on exports. However, in imports from foreign countries, tariffs, transport costs, trade friction and price volatility are inevitable; thus, it's rational to conduct direct investment and production in the host country through outward foreign direct investment, so that the abundant resources of the host country can be used to effectively cut down production costs and improve profits. Recent years, domestic enterprises have accelerated investments mainly targeted at resource exploitation; merger and acquisition, in particular, is developing unexpected speedy. Thus, it is

hypothesized here that, the more abundant the resources of the host country are, Chinese corporate investment is more likely to be attracted. The proportion of the sum of the mineral, metal and fuel exports in its total exports (ORE) of the host country is used here as the proxy variable for the resource endowment of the host country.

2.4 INSTITUTIONAL QUALITY

In general, higher institutional quality of a country (region) contributes to the building of a stable social environment and fairly competitive market environment, reduces information asymmetry and cuts down trade costs and controls investment risks. Conversely, a country (region) with a lower institutional quality may suffer more uncertainty due to its defective rules and inefficient administration. As a matter of fact, the impact of institutional factors on investment is not only derived from the institution of the host country but also from the institution gap between the host country and the investor's home country. With the continuous progress made by China in its legal regulations and government efficiency, the gap between it and the developed countries has been narrowed. Thus, it is hypothesized here that, Chinese outward foreign direct investment is in positive correlation with the institution quality of the host country.

World Governance Index (WGI) is recommended by the World Bank to measure the institutional environment of the host country. WGI includes six aspects, including government efficiency, political stability, rules of law and so on. Here, the index of law of the host country (INST) is used here as the proxy variable for the institutional quality of the host country.

2.5 EXCHANGE RATE

Exchange rate and its fluctuations cause significant impacts on a country's trade balance, capital flows, price level and national income. In general, the continuous appreciation of the home country's currency can reduce the commodity price of the host country, lower the foreign investment costs but also pull down the profit level of the future; on the contrary, the continuous depreciation of home country's currency can improve the profit level of the future while increasing the foreign investment costs. The impact of the appreciation (depreciation) of the home country's currency on enterprises' overseas investment has always been controversial in the academic world. These years, China Yuan (CNY) has been appreciating against major currencies as USA Dollar (USD), and the outward foreign direct investment flow has been increasing rapidly. Therefore, it is hypothesized here that, the appreciation of CNY can significantly promote the development of Chinese outward foreign direct investment. The bilateral exchange rate of China and the host country (EXCH) is here expressed with indirect quotation.

2.6 TECHNICAL MERIT

The international competition is becoming increasingly fierce with the further development of the economy. Investments targeted at technology acquirement have been developing fast. The United States and the European Union have become important investment areas for enterprises from developing countries. According to the *2012 Statistical Bulletin of China's Outward Foreign Direct Investment,* China invested 4.048 billion dollars in U.S. in 2012, and the U.S. had become the second biggest destination of Chinese outward foreign direct investment second only to Hong Kong. With the strengthening of Chinese enterprises' investment in developed countries (regions) these years, China has been more and more obviously motivated by "technology seeking" in its outward foreign direct investment. Thus, it is hypothesized here that host country with higher technical merit is more attractive to Chinese enterprise investment. The export of high and new techniques of the host country (TEC) is here used as the proxy variable for the technical merit of the host country.

2.7 INFRASTRUCTURE CONSTUCTION

Infrastructure refers to the material facilities that serve the social production and the lives of residents. Since infrastructure construction has the "multiplier effect", that is, it can bring about a total social demand and national income a few times greater than the investment volume. The perfection of a country's (region's) infrastructure construction is critically important to the national economy. Developed transportation, complete information & communication and power system of the host country can effectively cut down the costs of operation and information collection and reduce the information asymmetry. With the further development of economy, infrastructure construction becomes more and more attractive to the foreign capital inflow of a country. Thus, it is hypothesized here that, a host country with better improved infrastructure construction is more attractive to foreign capital inflows. The sum of number of fixed broadband Internet users and telephone circuits owned by every one hundred people of the host country (INT) is here used as the proxy variable for the infrastructure construction of the host country.

2.8 WAGE LEVEL

Labour cost is an important element of enterprise's production cost, and the reduction of production cost is the key for achieving profits and a critical driving force of enterprise's outward foreign investment. The external scale economy believes that, large industrial scale can improve the production efficiency and reduce the production cost if it occurs in an area where a large number of enterprises gather. Enterprises of the home country transfer the manufacturing into other countries

with lower wage levels, and thus to greatly reduce the costs. Meanwhile, since more and more enterprises choose the same destinations for direct investment, they can effectively use the characteristics of external scale economy to have their costs further reduced and achieve higher profits, which is a significant reason why Chinese outward foreign direct investments appear to be in aggregation. Similarly, the eclectic theory of international production believes that, host countries with lower wage levels enable enterprises to achieve higher profits. Therefore, it is hypothesized here that, the wage level of the host country is in positive correlation with Chinese outward foreign direct investments in the country. Since GNI per capita reflects the wage level of the host country as a direct measurer of consumer's average income in that country, it (RGNI) is here used as the proxy variable for the wage level.

In fact, countries with higher technical merits usually have higher wage levels while the ones with low wage levels usually have low technical merit. With the continuous development of Chinese economy and the increasingly improvement of the capital strength and technical power of domestic enterprises, the destination choice of outward foreign investment and the investment flow are changing constantly. This paper provides empirical research findings about the most possible characteristics presented by Chinese enterprises' overseas investments at present.

3 Empirical test

3.1 MODEL SELECTION

This paper studies the influential factors of the host country on Chinese outward foreign direct investment from both dynamic and static angles.

First: Dynamic analysis. Since outward foreign direct investment is a continuous dynamic course, the investment flow of variables lagged by one period is taken as one of the explaining variables during model construction. The model is constructed as below:

$$LnFDI_{it} = \alpha LnFDI_{it-1} + \beta_1 LnGDP_{it} + \beta_2 LnEXP_{it} +$$
$$\beta_3 LnTEC_{it} + \beta_4 INT_{it} + \beta_5 ORE_{it} + \beta_6 RGNI_{it} + \qquad , \quad (1)$$
$$\beta_7 INST_{it} + \beta_8 EXCH_{it} + u_i + v_{it}$$

where i and t, representing the country and the year respectively, refer to the impact of the host country induced by individual difference; $v_{it} \sim IID(0, \sigma_v^2)$ represents the general error item.

Since the explaining variables of this model are inclusive of lagged terms of explained variables, there is a correlation between the explaining variable and random disturbance term. Big errors will be produced in fixed effect estimation if OLS is employed directly. As a result, this paper applies the systematic GMM method proposed by Arellano and Bover (1995) and Blundell and Bond (1998) to estimate the model. The systematic GMM of

panel data can be further divided into the one-step method and two-step method. The weight matrix used by the two-step method, compared with the one-step estimation, deals with the impact caused by sample heterogeneity more effectively, yet despite that advantage, it can lead to considerably under-evaluated standard error of the estimated parameter. This, the significance judgment of the estimated parameter made by this paper with the two-step method is based on the robustness standard error proposed by Weidmeijer (2005). During the estimation with the systematic GMM method, the serial correlation between the instrumental variable effectiveness and the residual term needs to be tested. In this paper, the instrumental variable effectiveness is examined with the Sargen test, which is based on the number of moment condition divisors, whereas the serial correlation of the residual term is examined with the serial correlation model.

Second: Static analysis. Considering the short time span and large number of variables of data selection, this paper adopts the variable intercept model that contains N individual members. The model is as below:

$$LnFDI_{it} = \alpha LnFDI_{it-1} + \beta_1 LnGDP_{it} + \beta_2 LnEXP_{it} +$$
$$\beta_3 LnTEC_{it} + \beta_4 INT_{it} + \beta_5 ORE_{it} + \beta_6 RGNI_{it} + \qquad , \quad (2)$$
$$\beta_7 INST_{it} + \beta_8 EXCH_{it} + u_i + v_{it}$$

where i and t represent the country and the year respectively; α_i represents the intercept term; and $v_{it} \sim IID(0, \sigma_v^2)$ represents the general error item. Since different locations have varied advantages, they attract foreign capitals in different ways. Therefore, GLS (cross-section weights) is used to do the estimation.

3.2 DATA DECLARATION

During the selection of the host country, on the one hand, data continuity and availability are taken into consideration; on the other hand, despite the fact that countries as BVI (British Virgin Islands) and the Cayman Islands have great investment flows, they are usually the transfer station of capitals can hardly reflect the ultimate object and motivation of the investment. Therefore, such regions should be removed off the samples. This paper looks into the investment data of 40 countries (regions) where China had invested during 2003-2012. Since data on stocks mainly reflects an accumulative process of the outward foreign direct investment while data on flows can better reflect the development characteristics of a country presented in different periods, this paper takes the foreign direct investment flow (FDI) as the explaining variable. The data is from the annual *Statistical Bulletin of China's Outward Foreign Direct Investment.* Besides, the data of China's outward export comes from the annual *China Statistical Yearbook.* The index of the rule of law of the host country is from the WGI indicators published by the World Bank. The rest data comes from

the World Bank's WDI data base. Since there is considerable data missing in the 2012 hi-tech product exports of the host country, the 2002-2011 data is used to replace the original considering the data availability.

3.3 EMPIRICAL TEST AND RESULT ANALYSIS

It can be seen from Table 1 that, neither the Sargan test nor AR test is significant, indicating that instrumental variable selection is effective and residual terms are serially uncorrelated. In Model 2, the degree of fitting is also high, and specific to each variable:

First, the operation results of the two models both indicate that, there is a positive correlation between exports, resource endowment of the host country and Chinese outward foreign direct investment. In exports, since product production is divided into several procedures and each of them is usually carried out in separated location. Expansion of any of these production procedures can effectively promote the enlarging of the production scale and the improvement of production efficiency in other procedures. Therefore, the development of foreign trade can effectively promote the outward foreign investment. Meanwhile, with the further development of the foreign trade, information about the more and more extensive and detailed, which enables the market of the host country to be better understood. Thus, enterprises from the home country can make the best of the location advantages of the host country to further scale up their outward foreign investment.

Second, there is a significant negative correlation between the GDP of the host country, technical merit and China's outward foreign investment. In Model 1, the

infrastructure construction of the host country doesn't have a significant impact on it; while in Model 2, the negative impact is significant. Thus it can be seen that, in investment destination selection, domestic enterprises are still avoiding the developed countries with strong technical force and perfect infrastructure and paying more attention to the developing countries.

Third, investment lagged by one period has a significant impact on the current period. After the earlier period of outward foreign investment, enterprises from the home country have obtained a better understanding toward the rules of law, customs, product distribution channels, market saturation level, market potential and other information of the host country. Some enterprises even have developed their own regular customer base and sales networks. With the deepening of the understanding toward the market of the host country, domestic enterprises can get more and more detailed information and can make the best of the location advantages of the host country to further scale up the investment. Therefore, wider earlier investment scope and richer gained experience can better promote the development of the direct investment.

Fourth, according to the static analysis, the wage level of the host country has a significant negative impact on a country's investment, which is consistent with the hypothesis analysis above. However, such impact is not significant according to the dynamic analysis, that is, the influence of the wage level of the host country has no continuity. Besides, the impact of bilateral exchange rate and institutional quality on Chinese outward foreign direct investment is also not significant.

TABLE 1 Operation result of the panel data models

Explaining variable	Model 1		Model 2	
	Coefficient	T-Statistic	Coefficient	T-Statistic
LnFDI(−1)	0.374***	4.315	–	–
LnGDP	−0.274***	−2.629	−0.617***	−9.966
LnEXP	1.002**	5.131	1.697***	23.827
LnTEC	−0.125*	−1.773	−0.135***	−3.200
INT	−0.005	−0.643	−0.011***	−3.245
ORE	0.017***	2.616	0.025***	5.323
INST	0.253	0.736	0.139	0.699
EXCH	0.001	0.510	−0.001	−0.901
LnRGNI	0.188	0.734	−1.929**	−2.186
R^2	–		0.90	
AR(2)_P	0.326		–	
Sargen_P	0.421		–	

4 Conclusion

This paper applies macroeconomic data to study the location choice of Chinese outward foreign direct investment. It turns out that domestic enterprises tend to invest in the countries with abundant resources and in close trading relationship with China and avoid the developed countries with vast market size and advanced technology. However, this characteristic is changing. With the rapid development of domestic economy and

the increasingly improvement of enterprises' technical merit, especially the constantly deepening impact enforced by the global economic integration, enterprises from the home country have to face more and more fierce international competition wherever their investments locate. The importance of the role played by technology in competition has been proved repeatedly. The competition of the future is the contest of core technologies, and enterprises that master the leading technology would win in the global competition; on the

contrary, enterprises without core technology would be gradually cleaned out even if they have good brand effects, high market shares and other advantages. As a result, the mastery of technology is become more and more important to enterprises.

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