Master Program in corporate and financial management

The Relationship between Domestic and Outward Foreign Direct Investment in China

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BUSM36
Master's thesis (15 credits ECTS)
Spring 2010

Supervisor: **Lars Oxelheim**

TITLE	The Relationship between Domestic and Outward Foreign Direct Investment in China
SEMINAR DATE	June 7th, 2010
COURSE	BUSM36 Master Thesis in Corporate & Financial Management, 10 Swedish credits (15 ECTS)
AUTHORS	Fang, Shuai Wang, Zhao
ADVISOR	Lars Oxelheim
KEY WORDS	domestic investment, outward foreign directly investment, China
PURPOSE	The aim of this paper is to examine the relationship between domestic and outward foreign directly investment in China, on a national level, to determine if the increasing overseas investments crowed out any domestic investment with unique Chinese situation.
METHODOLOGY	In this study, we employed econometrics method to analysis the relationship with time-series data and panel data at regional level. The literature review is used to discuss the relationship as well.
THEORECTICAL PERSPECTIVES	We emphasize on the theories about the motivation of OFDI, and the development path of OFDI. We also discuss the effects from OFDI on the domestic market.
EMPIRICAL FOUNDATION	All the data, which include domestic gross fixed capital formation, GDP, average annual wage, and China's OFDI are collected from authority record. We employed the data from 1985 to 2008 to investigate the relationship with time series analysis, and top 10 overseas investment regions during 2003 to 2008 to do panel data analysis. All the regression process worked with Eviews.
CONCLUSIONS	Both time-series data and panel data analysis results indicate that there is a significant positive relationship between China's OFDI and domestic investment. The increasing OFDI motivate higher domestic investment with the unique Chinese situation nowadays. With the limitation on the available data, we cannot analyze the industry-special effect in this study. With the previous study, different industries have different effect on domestic investment. Most of China's OFDI works on the non-knowledge intensity industries, today. In the future, with the development of industry structure more analysis is necessary to study the relationship with industry-special effect.

Acknowledgement

We would like to express our gratitude to our supervisor, Professor Lars Oxelheim, for his careful guidance and stimulating suggestions have helped us finalize this thesis. He uses his unparalleled expertise indicate the direction of our study. We are so grateful to him to not only give us knowledge, but also teach us the methods of scholarship.

Besides, it is our pleasure to thank all the teachers and tutors in our program. They gave us valued lectures on our study here in the past year, thank for their selfless guidance. We would like to acknowledge the master program of Corporate and Financial Management at Lund University that offers us such an amazing experience in Sweden. We are very grateful to all the helps which contributed to this study.

We dedicate this humble effort to our beloved parents who made it possible for us to reach this far.

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Abstract

The Relationship between Domestic and Outward Foreign Direct Investment in China

The relationship between domestic investment and overseas investment has heavily analyzed before. With different situation, they get various results. Most of the analyses study the effect in the case of investments in developed countries, from high-production-cost home countries to low-cost host countries. In this study, we analyze this relationship in China, a low-cost host country. We use regression analyses with both time series data between 1985 and 2008 and panel data on the regions level. The results from both time series data and panel data analysis in our study imply that there is a significant positive relationship between OFDI and domestic investment in China.

Keywords: domestic investment, outward foreign directly investment, China

1. Introduction

1.1. Background information

In the past two decades, there has been a rapid increase in China's outward foreign direct investment (OFDI) across industries and regions. China was a poor country twenty years ago. Due to the effects of domestic economic policy and globalization, China has become one of the central nodes in the world economic order. The cheap labor, low sovereign risk, and huge market size has in the past decades attracted abundance of FDI interest from other countries into China. Today, China stands on the global stage, not only attracting investment and offering a huge untapped market, but also plays a more important role in providing capital resources to the overseas markets. China's investments are already one of the most significant sources of capital to the developing countries[1]. There have been done lots of research analysis on the effects from inward FDI on the Chinese economy. In this study, we will focus on the relationship between OFDI and domestic investment in China.

In the past several years, China has acquired IBM PC business, purchased Volvo cars, invested in Blackstone etc. Chinese investments are found spread all across the global markets. From the oil in Russia[2], to the copper in Afghanistan[3], to the coal in Australia[4], Chinese investors are trying to gain on increasing opportunities for investing abroad. Without a doubt, China is one of the most important investors in the global market. But, what is the consequence of the increasing OFDI on China's domestic economy, today? With the help from OFDI, China can easily capture other markets outside its borders. The local demand in China has already been satisfied in the past years, with the rapid development. The competition in domestic market became intense due to more inward

[1] . Alon, T.M. (2010) *Institutional Analysis and the Determinants of Chinese OFDI.* Available from: http://ssrn.com/abstract=1562087 [Accessed 29th, March 2010].
[2] . China Investment Corporation. *New*. Available from: http://www.china-inv.cn/resources/news_20091116_339873.html [Accessed 29th April, 2010].
[3] . Sun, Y. P. *Suggestion from Chinese Ambassador.* Available from: http://gb.cri.cn/27824/2010/02/02/110s2748735.htm [Accessed 29th April, 2010].
[4] . Embassy of the China.P.R. in Australia. *Australia admit Chinese investments.* Available from: http://au.china-embassy.org/chn/zagx/zajmhz/t623926.htm [Accessed 29th April, 2010].

FDI and growth of domestic firms. In the long term it is necessary for Chinese firms to find other potential market in order to attain sustainable development. Considering the tariff and non-tariff barrier against Chinese exporters, capture foreign market with OFDI is highly demanded for Chinese firms. Seeking natural resources is another motivation for Chinese OFDI. With rapid economic growth in China, the higher demand on commodity resources needs to be satisfied as well. The capital invested abroad in natural resources and service industries increased much quicker than those in the manufacturing industry.

The studies conducted on Chinese outward FDI are limited. Most of the previous researches on OFDI focus on developed host countries, from high-cost regions to low-cost regions. Considering the special situation in China, the effect from China's OFDI on the domestic economy is not so clear. Most of the Chinese firms do not have advantages on technology, management, and monopoly power compared to their competitors from developed countries. Lots of FDI wants to benefit from cheap labor costs in developing countries in order to reduce the production cost. It is very difficult for Chinese investors to find significant cheaper labor cost than in China. Today, when Chinese enterprises invest abroad, most of them even bring along their own human resources from China to continue benefiting from the cheap costs. In 2008, about half of employees who work in China's OFDI projects are Chinese people[5]. Most of the Chinese OFDI is not being invested in knowledge intensive industries today, since the technology development in China is still much worse than the western world. Most of the knowledge intensive industries in China do not have the ability to compete in the global market. So far, most of the investments are focusing on capital intensive project in developing regions. However, Chinese investors have more disadvantages on using foreign financial resources, compared with the other investors from developed countries. Different systems, limited knowledge and less experience limit Chinese investors to enjoy the financial support from foreign resources. It means China's OFDI have to take capital resources from the domestic market.

[5] . National Bureau of Statistics of PRC and State Administration of Foreign Exchange, Ministry of Commerce of PRC. *2008 Statistical Bulletin of China's Outward Foreign Direct Investment*. 2009

OFDI can increase domestic investment through attracting FDI, extending available market, satisfying natural resources demands, developing relative industries, such as legal service, upward and downward industries, etc. On the other hand, these OFDI occupy resources also, and transfers the product activities to other places. Whether these OFDI can bring positive effects or crow out domestic investment is very difficult to say under the current Chinese situation. In this article, we will do the study on the relationship between China's OFDI and domestic investment considering the unique Chinese situation.

1.2. Research problem

We doubt if the rapid growth of OFDI will crow out domestic investment in China. The study of this thesis will help us to find out what the relationship is between the strong performance in OFDI and China's domestic investment.

Outward Foreign Direct Investment (OFDI) in China kept increasing during the recent years with the trend of globalization and the economy development in China. In this study, we try to use regression analysis with time series data and panel data to understand the relationship between China's Outward Foreign Direct Investment and Domestic Investment with the special Chinese macroeconomic environment.

For developed countries OFDI can bring monopoly profit, help investors enjoy cheap labor, and transfer more domestic resources to other high value-added activities. Previous research in this field has shown that OFDI can bring more opportunities for home-countries to develop high value-added work, such as legal services, innovation work etc. However, as a developing country, the technology advantage in China is not as strong as developed countries, and difficult to enjoy profit on cheaper labor in other places. Whether these OFDI can make some contributions to China's domestic investment is not very clear. In this thesis, we will investigate the question of what the relationship is between increasing OFDI and domestic investment in China.

Based on the result of the regression, we will discuss the probable reasons behind the relationship. For instance, the effect of OFDI on accessing to natural resources, potential markets, relative industries, such as relative services, downward or upward industries, and so on will be analyzed. Further, we will give some recommendations on the development of China's policy on OFDI in the future. In this study, we have a limitation on the available data. The OFDI data on Schumpeter industry and Heckscher-Ohlin industry which can be employed to analyze the different effects within different industries cannot be available now. But we will do some general analysis with Chinese situation and the results presented by Oxelheim L. etc. (2005)'s research. So far, majority of China's OFDI is being invested in the non-knowledge intensive industry. With Dunning's investment development path theory, we can say China has moved to the 3rd phase. In the future, China's OFDI will keep increasing. With the development of technology, China's OFDI will be invested more in the knowledge intensive industry. We will study more with Oxelheim L. etc. (2005)'s findings on how to balance the domestic investment and outward FDI in the future with this trend. In addition to this limitation, the regional OFDI data only include private enterprises' overseas investments. In the future, the analysis can be improved with better data, if the detail data can be available.

1.3. Aim and scope

The principle aim of this study is to understand the relationship between Outward Foreign Direct Investment (OFDI) and Domestic Investment in China. As one of the developing countries, China does not have strong technology advantages, efficient management, and strong competitive position compare with developed countries. In the past several years, the China's overseas investment has experienced sharp increases. Chinese investors try to learn to be more innovative in both technology and management, capture more market on the global level and get more natural resources through OFDI. In this study, we will analyze the effect of OFDI on domestic investment from a macroeconomic point of view in China.

We will use research methodologies such as regression analysis and co-integration test to identify if any there is a relationship between China's OFDI and domestic investment, whether the relationship is a positive one or a negative one?

The results of this research would be beneficial for us to understand the relationship between their OFDI and domestic investment in China, and also help us to consider how to improve the OFDI policies within Chinese special situation if possible.

1.4. Previous research

The effects of OFDI on home-country have aroused a lot of arguments already. There is no doubt OFDI can help us to catch more market share, and get more natural resources. However, with the limited resources, we also need to consider whether more OFDI would harm the domestic investment.

If we look at the previous researches on this field, we can easily observe that the early research found there is a positive relationship between domestic investment and OFDI. With time series data in US firms, Herring and Willett found a positive relationship between overseas and domestic investment[6]. Noorzoy estimated the impacts of the flows of direct investment in the U.S. The result shows that the U.S. direct investment abroad is complementary to and stimulates business gross fixed investment[7]. These researches indicate that OFDI can increase the development speed of technology through enjoying the technology spillover from abroad, and bring larger market, natural resources to develop the relative industries, therefore increase the domestic investment.

However, Belderbos argue that OFDI has a negative relationship with domestic investment[8]. Stevens and Lipsey also argue that OFDI will crowd out domestic

[6] . Herring, R., Willett, T. (1973). The relationship between US direct investment at home and abroad. *Revista Internazionale dio Scienze Economiche e Commerciale.* 20(1), 72–82.

[7] . Noorzoy, S. (1980). Flows of direct investment and their effects on US domestic investment. *Economics Letters.* 5(4), 311–317.

[8] . Belderbos, R. (1992). Large multinational enterprises based in a small economy: Effects on domestic investment. *Weltwirtschaftliches Archiv.* 128(3), 543–557.

investment.[9] They focus on interactions between domestic and foreign investment and propose that more favorable investment opportunities in one area tend to reduce investment in the other areas. Feldstein conclude with quantity analysis that one dollar in overseas investment will reduce the domestic capital stock by between 20 and 40 cents[10]. These studies in 90s, found that OFDI would crowd out the domestic investment, reduce the job opportunities, and restrict the development of technology in home-country.

Braunerhjelm, Oxelheim, & Thulin improve the former researches and analyze the relationship with different industries. They suggest that the different situations across industries tend leading to different results in previous studies. Different industrial structure across countries leads to different effects of OFDI. They consider the industry specific effects to analyze the relationship between OFDI and domestic investment in Sweden. The results show that the relationship depends on the intensity-specific effects, the more knowledge intensity there is, the more negative the relationship will turn out to be.[11]

So far, most researches about foreign investment in China are focusing on the effects from inward FDI. These studies examined the impact of FDI on domestic market, innovation, economic growth, employment etc. Limited study about the effects from Chinese OFDI on domestic market. Only several academics focus on OFDI's impact on domestic employment and innovation. Dong and Huang proved that OFDI does not reduce employment in home-country, but provides more employment by developing related industry[12]. Feng and Cai studied the situation in China and found that OFDI helped China improve its human resources management and the employment structure[13].

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[9] . Stevens, G. V. G., Lipsey, R. E. (1992). Interactions between domestic and foreign investment. *Journal of International Money and Finance.* 11(1), 40–62.

[10] . Feldstein, M. S. (1995). The effects of outbound foreign direct investment on the domestic capital stock. In M. S. Feldstein, J. R. Hines, & R. G. Hubbard (Eds.), *The effects of taxation on multinational corporations*. Chicago, IL: University of Chicago Press.

[11] . Braunerhjelm, P., Oxelheim, L., & Thulin, P. (2005). The relationship between domestic and outward foreign direct investment: The role of industry-specific effects. International Business Review. 14. 677–694

[12] . Dong, H., L., & Huang, S., D., (2001). Analysis of the impact of FDI on employment. Comprehensive Discussion of Economic. Dec.2001. 199-201

[13] . Feng, Z., J., Cai, X. (2007). Expand foreign investment and promote employment. International Technical and Economic Research. 10(4), 44-47

Alon researched the relationship in China with quantity analysis. He concluded that institutional discrimination creates relative advantages for state-owned firms at a cost to private enterprise[14].

In this study, we will analysis the relationship with Chinese situation. The OFDI in developed countries happened more within knowledge intensive industry. So far, however, most of OFDI in China work in non-knowledge intensive industry. In addition to this, most of the Chinese OFDI happened in the developing region, Asia, Latin America and Africa, instead of developed regions, EU or USA. OFDI has both sides on domestic investment. On one hand, OFDI will transfer the production to other places, and occupy resources. OFDI need home country to invest capital and human resources to operate and manage business. On the other hand, OFDI also develop the relative industries in the home country with accessing more markets, and getting more natural resources. The financial support from foreign resources, also help OFDI diminish occupying resources in home country.

We want to check whether or not China's OFDI bring any positive or negative effects to the domestic investment. In this article, we will study the relationship between domestic investment and outward foreign direct investment in China. We want to check whether or not the increasing OFDI in the past decades led to a decrease in the domestic investment in China.

2. The Theoretical background about OFDI

After Second World War, multinational enterprises' activities experienced a rapid development with the growth of economic and globalization. FDI, as one of the most important parts in these activities, gained lots of interests in the academic field in the past decades. There are extensive researches about FDI behaviors, such as strategic decisions, ownership advantages, capital movement, investment motivation etc.

[14]. Alon, T.M. (2010) *Institutional Analysis and the Determinants of Chinese OFDI.* Available from: http://ssrn.com/abstract=1562087 [Accessed 29th March 2010].

In early empirical studies, Hymer analyzed FDI activities with market imperfections theory. The firms constantly seek market opportunities and invest overseas as a strategy to capitalize on certain capabilities not shared to capitalize on certain capabilities not shared by competitors in foreign countries[15]. In the real world, the imperfect competition can be found on the products and factors of production. Firms have different competitive advantages with their technology, unique marketing, brand strategy, tariff and non-tariff protection from the government, different access to capital market etc. These imperfect competitions facilitate firms to get more profit with investment overseas with monopolistic advantages. However, this theory cannot explain the outward FDI happened in developing countries without significant monopolistic advantages.

Vernon [16] related the FDI activities with product life cycle hypothesis. Product experienced a life cycle which can divided into three stages, new, mature, and standardized products. A firm would take different strategy on export and investment during the different stages. FDI is one step done with standardized products. The fear of losing competitiveness, the competition in the domestic market, other high value-added products force the firm to invest abroad in order to get profit and balance the operation process.

Buckley and Casson[17] argued FDI activities happened with internalizing transactions. Since the market is imperfect, it would be better the firm have internalizing transactions with different regions to avoid the high risk, uncertainty, and high transaction costs such as information, enforcement, tax and tariff costs. In the internalizing theory, Buckley and Casson concluded firms trend to have their intern market with investing abroad, instead of exporting their products or licensing, when transaction cost can be lower within the firm. The motivation of FDI has been explained in this theory with consideration on industry factors, region factors, nation factors and firm factors.

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[15] . Hymer, S.H. (1960) The international operations of national firms: A study of direct foreign investment. Ph.D. Thesis, M.I.T. Boston: M.I.T. Press, 1976.

[16] . Vernon, R. (1966) International investment and international trade in the product cycle. *Quarterly Journal of Economics* 80: 190–207.

[17] . Buckley, P.J. and Casson, M. (1976) *The Future of the Multinational Enterprise*. London: Macmillan.

The investment development path (IDP) theory[18] hypothesizes that there is a relationship between net foreign direct investment (FDI) and the level of economic development in the home country. There are five stages of a country's FDI development. In stage one, the country limited induces FDI with weak local demand and inadequate infrastructure. During stage two, the development of economy, growing local demand and better infrastructure will bring a significant increase in the inflow of FDI and its growth rate surpasses that of the GDP. When a country moves to stage three, the rate of inward investment flows growth will start decreasing. Growing competitiveness of local firms reduce the attractiveness for foreign companies. At the same time, domestic investors have more incentive to invest abroad. The rate of outward FDI surpasses the rate of inward FDI. When the outward FDI stock exceeds inward FDI stock and the rate of outward foreign investment increases faster than the rate of inward investment, the country stand in stage four. Stage five, the net investment position will tend to oscillate around zero.

The Ownership, Location and Internalization Advantages (OLI) Theory, which was developed by Dunning[19], combine internalization theory and traditional trade economics. In this theory, Dunning explained the reasons for internationally operating and the entry model (FDI, export and licensing). When a firm has three types of special advantages on ownership, location and internalization respectively, FDI is more attractive than other type of international business, compare with licensing and exporting. Ownership advantages include production process, management skills, technology, and special brand reputation. Location advantages referred to accessing market, tax protection, tariff barriers, lower sovereign risk and better competition situation etc. Internalization advantages are lower internal transaction cost, more efficient with management and quality control. With more consideration on countries', firms' industries' special

[18] . Dunning, J.H. (1981) Explaining the international position of countries towards a dynamic or developmental approach, *Weltwirtshaftliches Archiv*, 117, pp. 30–64

[19]. Dunning, J. H. (1993). Multinational enterprises and the global economy. Wokingham, UK: Addison Wesley.

characters, OLI framework have related FDI with market size, factor cost, property right, and regime type etc.

3. The China's OFDI

3.1. The current situation of China's OFDI and domestic investment

Since 1979, when the first Chinese overseas investment happened in Japan, China's OFDI has developed rapidly in the past 30 years. With the development of the economy, China has changed from a country with limited capital and knowledge to one of the most important investors in developing countries. By the end of 2008, nearly 8,500 Chinese investing entities had established about 12,000 overseas enterprises, spreading in 174 countries (regions) globally.[20] In the past five years, China's OFDI annually net flows increased 18 times. In 2008 the number reached to US $ 52 billion[21], which has an increase by 132% compared with the previous year.

According to data from *China statistical yearbook*, China's nominal GDP growth rate has been stable above 8% since 2000. In 2008, China's nominal GDP had reached 30 Trillion Chinese Yuan that lead China to be the third largest economy in the world. China's economic growth depends much on its high domestic investment. In the past five years, the total domestic gross fixed capital formation investment in China, kept the annual growth rate around 25 percent[22]. In 2008, the total fixed assets investment was RMB 17 283 Billion. Beside the investment from Chinese investors, foreign investment also played an important role on the domestic investment. National policy of opening Chinese market attracts huge flow of foreign direct investment to China. However, during the global financial crisis, many countries reduced their foreign direct investments. According to the *world investment report*, the global FDI capital flow reduced 14% in

[20] . National Bureau of Statistics of PRC and State Administration of Foreign Exchange, Ministry of Commerce of PRC. *2008 Statistical Bulletin of China's Outward Foreign Direct Investment*. 2009

[21]. United Nation Conference on Trade and Development, (2009). *World Investment Report*,2009. New York/Geneva: United Nations

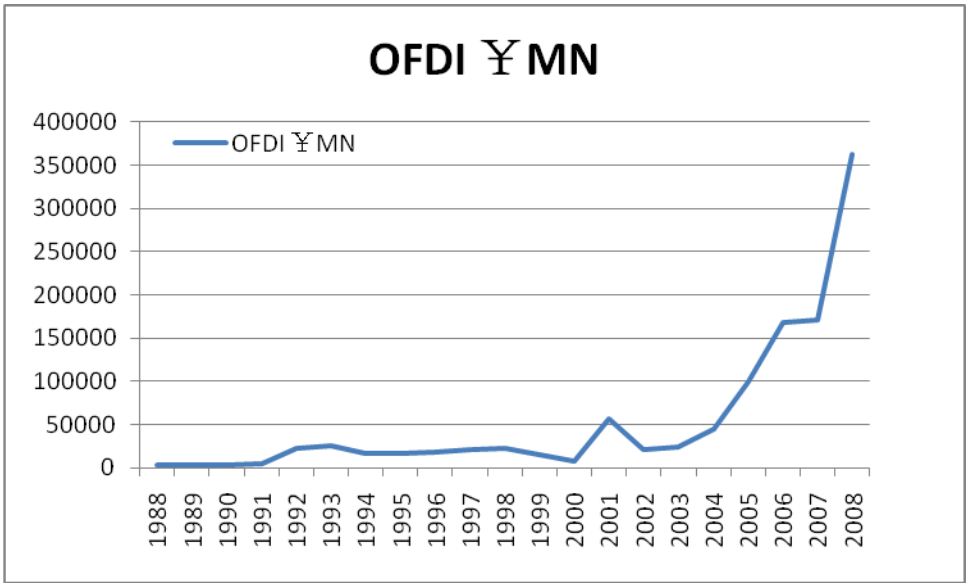
[22] . National Bureau of Statistics of China, (2009). *China's Statistical Yearbook*, Beijing: China Statistics Press.

2008 compared with the previous year. In the first half year of 2009, this figure reached 40%. The number of FDI capital flow to China increased 30% in 2008, but decreased 18% at the beginning of 2009. Obviously China needs to keep a huge domestic investment to develop its high growth economy.

3.2. The Development of China's OFDI

Besides enjoying the benefits from inward FDI, China is sharing a growing role in the OFDI fields at the same time. As Graph 3-1 shows, in the past two decades, Chinese OFDI has had a rapid increase. In the year of 2008, China's OFDI increased 132% to 52 billion US dollars. China had become the 11th largest outward investor in 2008 in the world.

Graph 3-1: The Flow of Chinese OFDI in Each Year (1988-2008)



Source: calculation based on: 1. China's Statistical Yearbook, Various years;
2. World Investment Report, various years.

All of these OFDI achievements began in the year of 1979 at the same time with China proposed national policy of "Reform and Opening up"[23]. The development of Chinese OFDI can be divided into four periods until now.

Almost blank period (1979-1983)

Since some historical reasons (World War Ⅱ, native war and Chinese Cultural Revolution), Chinese economy was almost at a standstill before 1979. Although Chinese economy was opened to the world after that, China's OFDI in this period was just from "no" to "little". Planned economic system was in control of all areas of Chinese economy. There was no corresponding national policy or law for OFDI field. Very few state-owned enterprises developed some pilot overseas investments under the country's external economic policy while in line with other national policies. As China's window, these companies also had some government's economic functions and tasks such as foreign aid construction. OFDI enterprises engaged in foreign trade, foreign labor cooperation and international engineering contracting as their main foreign operations. These companies accumulated experiences for the other companies that helped the latter a lot in their future overseas investments. The goal of OFDI in China was not economic profits, but helping Chinese enterprises establish their images in the world. All of OFDI situated in very small-scale while being intervened very much by the country.

Exploring period (1984-1990)

In May 1984, the government of Chinese P.R. for the first time in the history promulgated an official regulation for OFDI, *Circular Concerning Approval Authorities and Administrative Principles for Opening up Non-Trade Joint Venture Overseas*, which provided a legal basis for Chinese enterprises moving forward to abroad. However, OFDI was still heavily influenced by government's decisions. The goal of OFDI at this time was not economic profits, neither, but increasing China's foreign exchange reserve to protect national economic environment. Enterprises could only operate in OFDI after

[23] "Reform and Opening up" Policy: In 1979, China officially proposed a national policy in purpose to partly apply market economy instead of the "planned economy system." In the same year, government set up several special economic zones in the southeast coast of China, studying and practicing western technology and managing methods.

getting special permits, the application procedure of which was long and complex. Chinese government subsidized these permitted enterprises a lot that lead significant differences existing between domestic and foreign prices. Dual pricing system was widespread in Chinese OFDI enterprises. Subsidies policies helped the developing of Chinese OFDI a lot while had negative impacts on Chinese economy. Many countries refuse to admit China is a market economy country even today. On the other hand, the country still strictly controlled the transfer of foreign currency that limited the growth of Chinese OFDI.

As China improved their OFDI regulations and laws, the OFDI behaviors of Chinese enterprises have been gradually standardized. Chinese enterprises began the real OFDI. However, since there were no powerful multinational corporations in China, enterprises were lack of hard power, Chinese OFDI still situated in small-scale at this time.

Slowly growing period (1990-2000)

One of the most important things happened during this period in China is Deng Xiaoping's Tour Speech in South China. In the speech, he expressed that China would emphasis on deepening economic reform and opening up policy as the main tasks of Chinese economic work in next step. After that, Chinese companies had a mighty wave of restructuring. Many state-own companies were privatized to enhance their competitiveness. Chinese economy began to show its activity. During this process, a number of internationally competitive enterprises emerged in China.

At the same time, China loosened its control on OFDI and foreign exchange, and clearly put forward the policy of encouraging enterprises to invest overseas. Enterprises were encouraged to go abroad to learn and buy western advanced technology, purchase foreign natural resources, in order to accelerate Chinese economy's development. Many Chinese electrical and mechanical companies started to go to the world, such as Haier, Changhong, TCL etc.

Chinese OFDI had taken shape, but most of them came from state-owned enterprises which operated in foreign trade. It was much easier for state-owned companies to enjoy the support from tax, financial, information etc from the government.

Dramatic developing period (2001-now)

As China joined WTO (World Trade Organization), Chinese economy formally integrated into the world. In the year of 2000, an important document of *Regulations on Examination and Approval of OFDI Project Proposals and Feasibility Reports* was issued that showed China's determination of further encouraging OFDI. Private, joint venture and small companies were encouraged to go abroad under the supporting of this document. The government changes its role from controller to server and regular. It mainly serves as information, insurance and even financial supplier. The targets of Chinese OFDI are located in technology, natural resources, economic profits and competitiveness.

Many private enterprises start their road to cross-border mergers and acquisitions, among which Lenovo acquired IBM's PC business in 2004, Geely bought 100% of Volvo's car stake in 2010 might be the most famous ones. In natural resources, Chinese state-owned companies also quietly engaged their foreign investment. In 2008, China Steel Group successfully acquired Australian Midwest Corporation. In 2010, China National Offshore Oil Corporation acquired 50% shares of Argentina Bulidasi Corporation[24]. China's OFDI has been broadened in both industries and regions.

The growth rate of China's OFDI has been kept around 100% at the present stage. China's OFDI is now facing a rapid development period.

3.3. The Characteristics of OFDI in China

Although its history is not very long, China's OFDI developed very quickly. In 2008, countries covered by China's direct foreign investment increased to 174. Asia is the

[24] . Mergers and acquisitions in Australia as the largest destination for Chinese enterprises. *Chinahourly.* Available from: http://www.chinahourly.com/bizchina/1440/ [Accessed *May 05, 2010*].

largest concentration of China's foreign investment while Africa is the region with highest growth rate. The foreign industries China invested in have been gradually broaden from the fields of trade-based industries to producing and processing industries, natural resources developing industries, agriculture industries, cooperative research and development industries and other fields. The level of investments has been constantly improved from opening branches and setting up overseas offices to transnational mergers and acquisitions, equity swap, overseas listing, setting up offshore development center, establishing international marketing network and strategic partnerships and other forms. Acquisition and merger occupied half the total amount of China's outward foreign direct investment. Some companies such as Huawei, ZTE, Lenovo, are now actively establishing wholly owned or joint-venture technology center and research institutions in U.S.A and European developed countries. However, basically speaking, China's OFDI is still situating in an initial developing stage, concentrating in small-scale primary products processing industries. Here, we concluded the characteristics of China's OFDI as below.

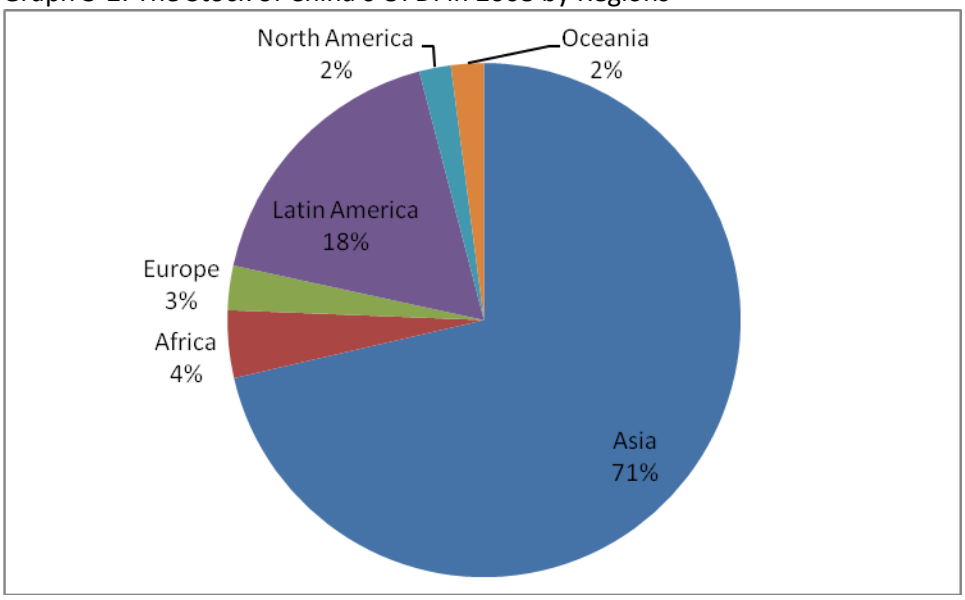
1. Rapid development with high potential

China's OFDI had been situated in a state of slow growth during a long period ever since 1979. According to *world investment report*, China's foreign direct investment flows had been lower than 5 billion US dollars before 2000. In 21st century China's OFDI has a rapid growth. During the past five years, OFDI has increased 18 times. During 2003 to 2008, the annual growth rates of OFDI in China are 93%, 124%, 72%, 6% and 132% respectively. The geographical distribution of China's OFDI is also becoming more widely. In 2005, China's OFDI mainly concentrated in Asian and Pacific area. 60.8% of China's overseas directly investment flowed to East and Southeast Asian countries.[25] As we can find in Graph 3-1, most of China's OFDI still invest in Asia in 2008, but distributed to other part of the global market also. In 2008, proportion of other investment destination increased a lot. Especially, information and technical industry has been

[25] . National Bureau of Statistics of PRC, State Administration of Foreign Exchange, and Ministry of Commerce of PRC. *2008 Statistical Bulletin of China's Outward Foreign Direct Investment, 2009*

widely distributed. China's IT investment in North America, Western Europe, Eastern Europe and Africa accounted more than 20% in total IT investment.[26]

Graph 3-2: The Stock of China's OFDI in 2008 by Regions



Source: 2008 Statistical Bulletin of China's Outward Foreign Direct Investment

With 30 years' development since China's opening up national policy, China's economy has had a huge improvement. To some degrees, China has become one of the major economic powers in the world. The total number of many economic indicators in China has reached world leading level. For example, in 2009, China's GDP reached 4327 US billions, situating in the third around the world, occupying 7.1% of world's total GDP.[27] Till December 2009, China's foreign exchange reserve has reached 2399 billion US dollars, taking 30.7% of world's total FER, which is around twice as much as G7 countries' total FER (1.24 trillion US dollars).[28] According to *world investment report*, in 2007, China's OFDI only took 1.1% of the world, one third of Japan, one seventh of German, one tenth of France, one twelfth of Britain and one fourteenth of U.S.A. Except

[26] . China International Trade Promotion Committee, the Economic Information Department, *Status of Chinese Enterprises and Foreign Investment Intentions Survey Report,2009,*April 2009

[27] . World Bank, *World Development Indicators database*. Available from http://siteresources.worldbank.org/DATASTATISTICS/Resources/GDP.pdf, [Accessed 19th April. 2010].

[28] . World Trade Organization, *China's foreign exchange reserves, 1977-2010.* Available from http://www.chinability.com/Reserves.htm, [Accessed 19th March 2010].

Hongkong which accounting for more than 60% of China's OFDI, China's OFDI was even much more smaller than other main powerful economies. China is now becoming more and more important to the world economy. But China's OFDI is not consistent with its economic role. Though the absolute number is not so high compare with China's GDP and foreign exchange reserve, there is a sharply increasing on growth rate. In the future, there could be larger potential for Chinese OFDI to develop.

2. Concentrated in primary products and services

Developed countries often restrict high technology diffusion to developing countries through all kinds of direct and indirect trade barriers in purpose to keep their technical advantages. It's very difficult for Chinese companies to get new advanced technologies through trading or introducing inward foreign capitals from western World. In order to get advanced technologies and managing skills, which can promote their competitiveness and capabilities, many Chinese companies go oversea to set up joint-venture or even merger local enterprise. However, without the technology advantages, most China's OFDI still happen in the primary production and services industry today.

In 2008, the number manufacturing investors took 42.7% of total. Business services, finance, wholesale and retail trade, mining, transportation / warehousing and postal industries, manufacturing took nine tenth of China's OFDI. In the future 3 to 5 years, manufacturing industry and wholesale and retail trade industry will continue being the top favorite industries for Chinese OFDI companies.[29] China's foreign investment is still mainly concentrated in labor-intensive industries. IT enterprises have the most willingness to invest oversea across all industries in China. According to *Status of Chinese enterprises and foreign investment intentions survey report*[30] , more than 50% respondents from IT industry invested outside of China. Although the companies investing in high technical industries increased in the past years, high-tech enterprises just occupy a small portion in overseas invested enterprise from China. Labor-intensive

[29] . National Bureau of Statistics of PRC and State Administration of Foreign Exchange, Ministry of Commerce of PRC. *2008 Statistical Bulletin of China's Outward Foreign Direct Investment*. 2009

[30] . China International Trade Promotion Committee, the Economic Information Department, *Status of Chinese Enterprises and Foreign Investment Intentions Survey Report,2009,*April 2009

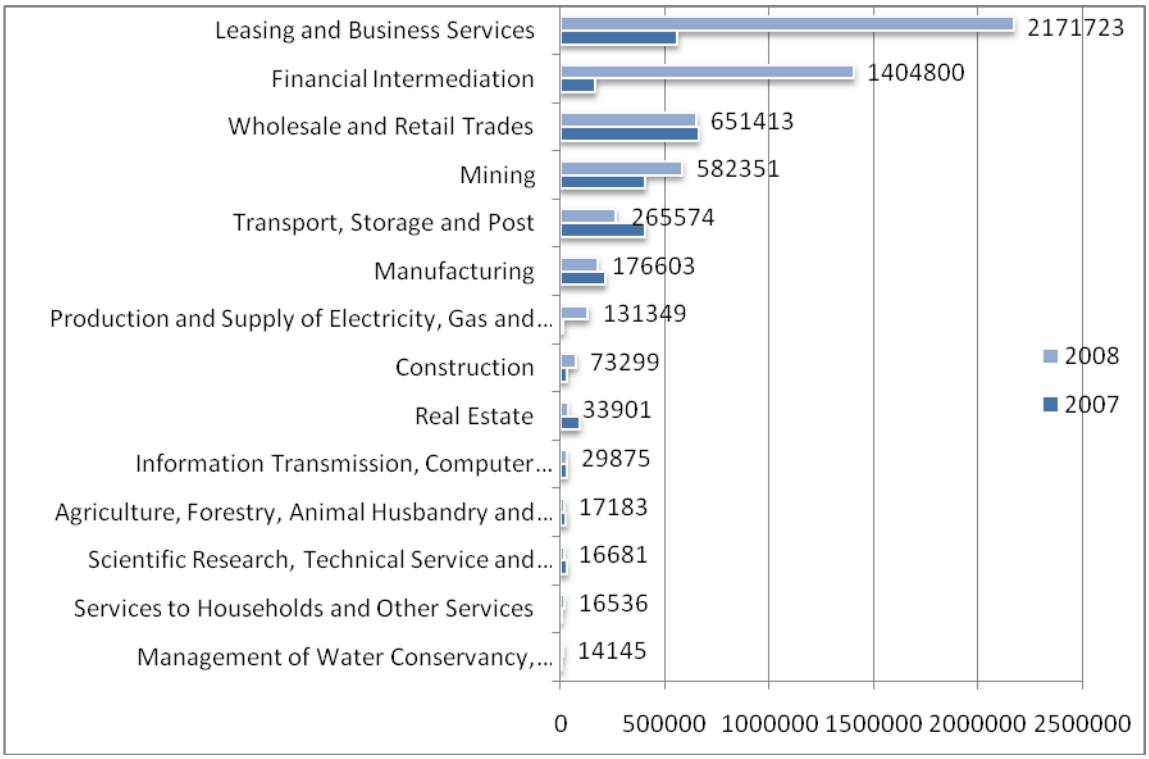
companies contribute most part of China's OFDI. Around 40% of respondents from construction, natural resources developing industry and agriculture invested in overseas market. Little enterprises from chemical and manufacturing industries engaged in OFDI in China but occupied a big proportion in China's total foreign investment.

Feng and Cai's research also shows that industries China's OFDI distributing in mainly concentrated in primary products and services.[31] Ten percent of China's OFDI flow to mining industry in 2008, to ease the supply shortage of natural resources in China. These capitals are mainly invested in Australia and South Africa. As we can see from Graph3-2, industries such as financial intermediation, retail trades, transport and manufacturing take 55% of total OFDI. They are mostly invested in Asia and Latin American to avoid market barriers and capture more market share. Most of the rest capitals are invested in service industries. The capitals invested in natural resources and service industries increased much quicker than those in manufacturing industry. China International Trade Promotion Committee forecasted that there probably will not be large-scale OFDI from most of China's industries in the following 3 to 5 years[32]. IT industry has the highest probability to invest largely abroad. Natural resources developing industry and construction have the second and the third highest probability for OFDI.

[31] . Feng, Z., J., Cai, X. (2007) Expand foreign investment and promote employment. International Technical and Economic Research. 10(4), 44-47

[32] . China International Trade Promotion Committee, the Economic Information Department. (2009). Status of Chinese Enterprises and Foreign Investment Intentions Survey Report, 2009

Graph 3-3: The Flow of China's OFDI by Sector in 2007 and 2008



Source: 2008 Statistical Bulletin of China's Outward Foreign Direct Investment

3. Diversification of investors

Joint ventures are the main force of China's outward foreign direct investors. Investors of China's OFDI are made up of state-owned companies, state-owned holding company, private enterprise, cooperative companies, joint ventures and other companies and individuals. State-owned enterprises and limited liability company is a major force in China's foreign direct investment. In 2008, China's foreign direct investors remain diversified. The proportion of limited liability company investor numbers increased to 50.2%, situating in the first place among China's OFDI investors. The number of state-owned enterprises accounted for 16.1%, decrease 3.6 percentage points over the previous year, situating in the second place. The number private companies accounted for 9.4%, situating in the third.[33]

[33] . National Bureau of Statistics of PRC, State Administration of Foreign Exchange, and Ministry of Commerce of PRC. *2008 Statistical Bulletin of China's Outward Foreign Direct Investment, 2009*

4. Single mode of operation

China's OFDI investors have common operation mode. (1) More export, less triangular trade. (2) More merchandise, less permits trade. (3) More branches or offices (small scale), less overseas enterprises (large scale). Subsidiaries and affiliates accounted for 96% of the number of foreign enterprises, joint venture companies accounted for only 4%.[34] (4) More overseas marketing, less overseas investment. Above four characteristics limit the quality of China's OFDI and overseas cooperation on an international level.[35]

5. Small and inefficiency

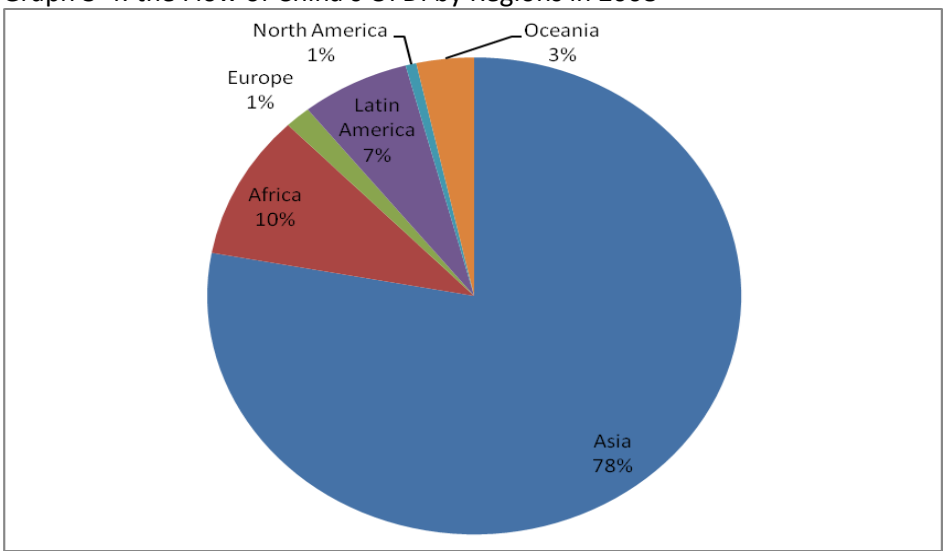
On one hand, many Chinese companies have willingness to go oversea for investing. Chinese government also encourage more Chinese enterprise, especially more Chinese private enterprise to go oversea. On the other hand, Chinese companies lack of information such as overseas investment environment and market situation. There is not enough of investment insurance, credit management policies, the investment management process supported by Chinese government, neither. Graph 3-4 show that around three quarters of Chinese OFDI flow to Asian and Oceania regions which are very closed to China in 2008. Detailed to the states, only 5 of top destinations of China's OFDI belong to developed countries. (Except Hongkong and Macau) Most of China's OFDI situates in a small scale and inefficiency state.[36]

[34] . National Bureau of Statistics of PRC, State Administration of Foreign Exchange, and Ministry of Commerce of PRC. *2008 Statistical Bulletin of China's Outward Foreign Direct Investment, 2009*

[35] . China consultant and legal portal, *character of China foreign investment*, Available from http://news.9ask.cn/touzirongzi/dwtz/200907/169533.html, [Accessed 10th March 2010].

[36]. China International Trade Promotion Committee, International Trade Promotion Committee, the Economic Information Department, (April 2009) *Status of Chinese Enterprises and Foreign Investment Intentions Survey Report,2009*, .

Graph 3-4: the Flow of China's OFDI by Regions in 2008



Source: 2008 Statistical Bulletin of China's Outward Foreign Direct Investment

4. Methods and Data

4.1. Methods

In this study, the domestic gross fixed capital formation (DFC) in China is used as domestic investment indicator. Beside the effects from OFDI, we also take the country-specific factors which could be influence domestic investment into consideration. First, the changes on labor cost are included as an influence factors. We assume that higher labor cost will reduce the attractiveness on domestic investment. In addition to this, the economic situation is another indicator to influence the investment attentions. Higher growth on GDP could provide larger market size and more available capital. We expect higher growth on GDP will have positive effect on domestic investment. Economic situation (GDP), labor cost (average wage per year), are considered as other main factors which influence domestic investment.

In order to assess the relationship between OFDI and domestic investment (DFC) in China, the correlation study will be developed based on regression technique with the time series data from 1985 to 2008 at first. Then the panel data in 10 different regions in China are used in this study, to analyze the effect from sharply OFDI growth on domestic investment from 2003 to 2008. From 2001, after China joined WTO, China's OFDI

experienced a sharp increase. Studying the relationship within this sharply growth period could help us to understand more about the effect from OFDI on domestic investment. In this study, we use top 10 regions with outward FDI to study the relationship.

Time series analysis with China's data from 1985 to 2008

We use cointegration theory to analyze the relationship with time series data. If this economic time series variables are dominated by smooth and long term trends, then the variables individual behavior will be non-stationary random walks. In this case, we will get a spurious regression with high R^2 and low Durbin-Watson statistic. In order to avoid the spurious regression, the model will be estimated with a correction of the non-stationary of the series, and use cointegration theory to analyze the correlation. Cointegration is the link between integrated processes and steady state equilibrium.

The study is based on secondary data from *Chinese Year Book* and *World Investment Report* to conduct the analysis. We assume there is no relationship between OFDI and domestic investment, and use econometric method to test this hypothesis.

To detect cointegration relationship we use the following procedure：

1. At first, we need to determine whether or not all series contain unit roots. The *Augmented Dicky Fuller* (ADF) test in Eviews 5.1 will be used to check the stationarity of the time series and detect the existence of unit roots. If all the series are stationary at the same difference (~I(d)), then we can reject the hypothesis of no cointegration relationship between them. This is equivalent to say there will be a relationship between them in the long run, i.e. they can be cointegrated.

2. With cointegration relationship, we can estimate the parameters of the cointegrating relation with *Vector Autoregression* (VAR) model and *Johansen* Technique.

   The model to estimate is:

   $$\ln \mathrm{DFC}_t = \alpha + \beta_1 \ln \mathrm{GDP}_t + \beta_2 \ln \mathrm{OFDI}_t + \beta_3 \ln \mathrm{Wage}_t + \varepsilon_t$$

   where t denote time, and ε_t is the basic error component.

3. With the result from Johansen Test, we can identify the relationship, but the causality. At the last step, we will use *Granger causality* test, to find out whether the changes of OFDI is the reason for the changes of DFC.

Panel data analysis with 10 different regions in China from 2003 to 2008

The panel regression technique is employed to study the effect from China's OFDI to domestic investment within the boom period during 2003 to 2008. We used data from the top 10 regions[37] in China on OFDI to do the regression. All the regression are estimated with natural logarithms in the flow of OFDI each year (OFDI)[38], the average wage every year (wage), the annually GDP (GDP), and the domestic gross fixed capital formation (DFC).

The model to estimate is:

$$\ln \mathrm{DFC}_{i,t} = \alpha + \beta_1 \ln \mathrm{GDP}_{i,t} + \beta_2 \ln \mathrm{OFDI}_{i,t} + \beta_3 \ln \mathrm{Wage}_{i,t} + \varepsilon_{i,t}$$

where i and t denote region and time respectively and $\varepsilon_{i,t}$ is the basic error component.

Considering that the panel data contains both time series and cross-section data, we employ Pooled Least Squares, (PLS) to avoid the mistake from OLS with heteroscedasticity and Serial correlation.

Then the Hausman test and F statistic will be employed to test the hypotheses on the models. Hausman test is employed in this study for fixed- versus random-effects specification model. F statistic can help us to decide which model is better for this analysis between pooled estimation and fixed-effects specification. With the result test, we can get the best model to do the regression analysis and get result on the relationship.

[37] . Beijing, Tianjing, Liaoning, Heilongjiang, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, and Guangdong.
[38] . With the statistic method now, we can only get the OFDI from private enterprise in different regions. All the OFDI from state-owned enterprises in different regions are not available so far.

4.2 Source material

In this study, the data used for time series analysis are based on secondary data between 1985 and 2008. All the raw data[39] on GDP, Labor Cost and Domestic investment come from the authority records in China's Statistical Yearbook published by the China's Statistical Bureau. But the OFDI data are taken from World Investment Report published by UNCTAD, since China does not have authority records about OFDI until 2003.

In the time series model, the real price of DFC based on 1984 prices will be used. The independent variables have all been transferred to 1984 prices as well. In this model, the natural logarithms will be used instead of real numbers to avoid the effect from different weights on different indicators.

Table 4-1: Data for Each Indicator at 1984 Price, 1985-2008

	Price Index	Real DFC (￥billion)	Real OFDI (￥billion)	Real wage (￥/year)
1985	113.47	2241.372	16.27905	1011.755
1986	123.50	2526.723	12.58066	1076.08
1987	137.81	2686.097	17.42081	1058.707
1988	153.36	3099.859	20.63042	1139.184
1989	159.59	2763.643	18.40242	1212.509
1990	165.71	2725.796	23.95741	1291.389
1991	180.92	3092.187	26.8631	1293.363
1992	206.69	3336.905	106.7229	1799.809
1993	235.55	4255.296	107.6318	1678.616
1994	266.36	6398.376	64.71397	1703.691
1995	295.46	6775.569	56.52823	1810.04
1996	325.03	7049.56	54.07494	1839.805
1997	355.25	7020.657	59.79549	1813.918
1998	383.08	7415.189	56.92148	1943.713
1999	412.27	7241.516	35.62773	2017.845
2000	447.03	7363.625	16.95893	2087.774
2001	484.14	7686.577	117.7157	2237.8
2002	528.11	8236.968	39.47099	2342.902
2003	581.05	9563.13	40.66418	2404.095
2004	639.65	13878.48	71.14171	2488.863
2005	706.38	15572.04	142.189	2576.507
2006	788.66	17412.43	213.8873	2644.502

[39] . see Appendix

2007	882.77	19577.84	193.5414	2824.28
2008	962.22	17961.32	376.4064	3037.653

Source: price index calculated based on the price in 1984 (1984 price = 100), which came from China's Statistical Yearbook, 2009

The GDP was calculated by the current price, the GDP growth rate was calculated by the comparable price, the real GDP is calculated with the GDP growth rate and the GDP data in 1984 (GDP: 720.81 Billian Yuan).

Table 4-2: GDP in Each Year in China, 1985-2008

year	GDP(￥ 0.1 Billian)	GDP growth rate	Real GDP(￥ 0.1 Billian)
1985	9016	13.50%	8181.194
1986	10275.2	8.90%	8909.32
1987	12058.6	11.60%	9942.801
1988	15042.8	11.30%	11066.34
1989	16992.3	4.10%	11520.06
1990	18667.8	3.80%	11957.82
1991	21781.5	9.20%	13057.94
1992	26923.5	14.20%	14912.17
1993	35333.9	14.00%	16999.87
1994	48197.9	13.10%	19226.85
1995	60793.7	10.90%	21322.58
1996	71176.6	10.00%	23454.84
1997	78973	9.30%	25636.14
1998	84402.3	7.80%	27635.76
1999	89677.1	7.60%	29736.07
2000	99214.6	8.40%	32233.9
2001	109655.2	8.30%	34909.32
2002	120332.7	9.10%	38086.06
2003	135822.8	10.00%	41894.67
2004	159878.3	10.10%	46126.03
2005	183084.8	10.20%	50830.89
2006	211923.8	11.60%	56727.27
2007	249530.6	11.90%	63477.81
2008	300670	9.00%	69190.82

Source: Real GDP calculated based on the GDP in 1984 (720.81 Billian Yuan) and GDP growth rate which came from China's Statistical Yearbook, Various years, National Bureau of Statistics, China Statistics Press.

The panel data analysis is estimated with OFDI, GDP, Labor Cost and Domestic investment in the 10 regions. Beside OFDI, all the raw data[40] come from the authority records in China's Statistical Yearbook published by the China's Statistical Bureau. The OFDI data are taken from Statistical Bulletin of China's Outward Foreign Direct Investment published by Ministry of Commerce of PRC, China's Statistical Bureau and State Administration of Foreign Exchange. We use the price index in different regions to get the real price data. All the data in the panel data analysis used at 2003 price, as table 4-3 show. Since, the raw OFDI data are available only in USD, we use the average exchange rate in each year to calculate RMB price. Considering that absolute numbers largely reflect the maintenance of an existing capital stock, we employ the natural logarithms in this model to avoid the effect from different weights on different indicators.

[40] . see Appendix

Table 4-3: Data for all Indicators for Panel Regression Analysis at 2003 Price in 10 Regions, 2003-2008

		Beijing	Tianjing	Liaoning	Heilongjiang	Shanghai	Jiangsu	Zhejiang	Fujian	Shandong	Guangdong
GDP	2003	5023.77	2578.03	6002.54	4057.40	6694.23	12442.87	9705.02	4983.67	12078.15	15844.64
	2004	5732.12	2985.36	6770.87	4532.12	7644.81	14284.41	11112.25	5571.74	13938.19	18189.65
	2005	6408.51	3424.21	7603.68	5057.84	8493.38	16355.65	12534.62	6218.07	16056.79	20699.82
	2006	7228.80	3920.72	8652.99	5669.84	9512.59	18792.65	14276.93	7138.34	18433.19	23721.99
	2007	8190.23	4516.67	9907.67	6350.22	10872.89	21592.75	16375.64	8223.37	21069.14	27209.12
	2008	8927.35	5261.92	11205.58	7099.55	11927.56	24248.66	18029.57	9292.40	23618.51	29957.25
Wage	2003	25312.00	18648.00	13008.00	11038.00	27304.00	15712.00	21367.00	14310.00	12567.00	19986.00
	2004	28067.18	20875.64	15142.10	11979.49	28489.90	17329.50	22423.49	15084.27	13298.11	21324.69
	2005	31818.70	23402.38	16453.89	13267.94	31865.80	18724.56	24155.38	16230.18	14406.73	22173.61
	2006	36890.52	25885.59	18428.74	15090.13	37795.74	20647.96	25230.04	18181.95	16054.16	23746.00
	2007	40723.84	31245.69	20853.45	17424.68	43986.29	22962.45	27105.49	19811.73	18535.97	25772.36
	2008	47946.08	34570.55	23081.96	19689.07	49253.55	25332.11	28651.75	22066.98	20070.22	27786.63
DFC	2003	2169.26	1039.39	2076.36	1166.18	2499.14	5233.00	4740.27	1496.37	5315.14	4813.20
	2004	2391.31	1195.36	3023.74	1365.02	2888.54	6242.74	5515.10	1829.99	6467.77	5659.99
	2005	2631.07	1384.59	3987.87	1594.28	3256.31	7295.56	6081.82	2192.98	8070.77	6457.94
	2006	3031.26	1643.02	5343.09	2044.32	3578.83	8742.28	6883.59	2806.47	9277.33	7230.42
	2007	3421.34	2104.46	6682.62	2546.83	3943.13	10290.96	7342.21	3812.22	10173.28	8135.55
	2008	3247.08	2807.01	8340.00	3123.43	4199.72	12239.72	7822.89	4471.16	11733.16	9121.23
OFDI	2003	2487.57	45.03	70.11	61.58	432.39	206.10	303.35	510.03	735.25	790.87
	2004	1232.18	139.32	347.83	445.75	1611.84	451.77	570.47	127.31	577.76	1108.78
	2005	870.87	144.64	237.24	1264.15	5120.71	800.76	1221.18	333.22	1141.49	1586.28
	2006	427.15	209.76	754.05	1649.41	3407.48	891.31	1615.99	746.62	875.32	4728.40
	2007	1108.54	591.66	954.67	1328.04	3859.00	3603.40	2911.83	2711.59	1271.22	8266.74
	2008	3332.37	562.03	730.33	1612.06	2429.81	3269.82	2692.51	1149.03	2987.09	8630.77

Source: China's Statistical Yearbook, various years; Statistical Bulletin of China's Outward Foreign Direct Investment, various years.

5. Empirical analysis

5.1 Results

Result from time series analysis

From the data for the period during 1985 to 2008 for China, the following results were obtained with the traditional ordinary least square regression method.

$$\ln DFC_t = 1.83 + 1.48 \ln GDP_t + 0.13 \ln OFDI_t - 1.13 \ln Wage_t$$

t =（1.44） （2.91） (7.46) (-2.67)

R^2=0.97 *D.W.*= 1.17

The coefficient of all *independent variables* are highly statistical significant. And the R-square in this model is also very high, 97 percent of DFC change can be explained by the model. However, the Durbin–Watson *stat* value, which suggests the autocorrelation between variables, is low. This result suggests that there is an autocorrelation between the explanation and dependent variables in the preceding regression. Therefore, the equilibrium above is a spurious regression result. In order to avoid this spurious regression, the model will be estimated with cointegration theory.

In order to find out whether there is a cointegration relationship between these variables, we use the Augmented Dicky Fuller (ADF) test to do the unit root test and determine the cointegration relationship. Based on the result of the test, indicated in the Table 5-1, we can easily find that the dependent variable, $\ln DFC_t$, is nonstationary, but its first difference ($D\ln DFC_t$) is stationary. Regarding the independent variable, the ADF test indicates that they all integrated at the same order as $\ln DFC_t$, the first difference is stationary while the original data is nonstationary.

Table 5-1, Result of the Unit Root Test of GDP and IPR Index

	(C,T,K)	t-Statistic	Test critical values (5% level)	stationary
$\ln DFC_t$	(C,0,0)	0.525208	-2.998064	Nonstationary
$D\ln DFC_t$	(C,0,0)	-3.249681	-3.004861	stationary

$\ln OFDI_t$	(C,T,0)	-2.548866	-3.622033	Nonstationary
$D\ln OFDI_t$	(C,0,0)	-6.172500	-3.004861	stationary
$\ln GDP_t$	(C,0,2)	0.487202	-3.012363	Nonstationary
$D\ln GDP_t$	(C,T,1)	-4.401272	-3.644963	stationary
$\ln Wage_t$	(C,T,1)	-2.952180	-3.622033	Nonstationary
$D\ln Wage_t$	(C,T,0)	-6.726726	-3.632896	stationary

Note: Augmented Dicky Fuller (ADF) test, C as intercept; T as trend; K as Lag Length, which is automatically selected based on SIC.

Four indicators in the time series analysis are all nonstationary, but stationary at first difference, *I* (1). Therefore we can say they have cointegration relationship.

Then we can use the *Johansen* Technique for testing cointegration with VAR model. The lag length is considered within the model to diminish the autocorrelation. AIC statistic result show VAR (3) model is the optimal model here. With Eviews 5.1, we get the result from Johansen test as Table 5-2 shows:

Table 5-2: Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.847859	80.06102	63.87610	0.0012
At most 1	0.680136	38.63614	42.91525	0.1256
At most 2	0.353204	13.55925	25.87211	0.6937
At most 3	0.165235	3.973318	12.51798	0.7460

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

At 5% level, there is one cointegration relationship between DFC, OFDI GDP and Wage in China. The equilibrium is indicated as below:

$$\varepsilon_t = \ln DFC_t - 9.48 \ln GDP_t - 0.17 \ln OFDI_t + 1.26 \ln Wage_t + 0.74$$
$$(0.67) \qquad (0.05) \qquad (0.42)$$

With the result of t-statistics, we know that all the time series factors have a significant relationship. *OFDI* has a significant positive effect on DFC in the long run. They will change in the same direction. Since we take natural logarithms here, the coefficient is the elasticity for variables. Based on the result from this equilibrium, each 1 percent change on OFDI will bring 0.17% increase on DFC.

Now we know these variables are cointegrated and each of them is individually stationary on the first difference. However, we have no idea either DFC must Granger-cause OFDI or OFDI must Granger-cause DFC, or they influence each other until now. We use Granger causality test to check the causality relationship between OFDI and DFC. With Eviews 5.1, we got the result of Granger causality test which is shown in Table 5-3.

Table 5-3, the Result of Granger Causality Test

Null Hypothesis:	Obs	F-Statistic	Probability
OFDI does not Granger Cause DFC	23	3.20140	0.08873
DFC does not Granger Cause OFDI		4.50147	0.04655

From these results, we can refuse the hypothesis that OFDI does not cause DFC and DFC does not cause OFDI at 10 percent level. Higher Outward Foreign Direct Investment could contribute on the Domestic investment growth. Under the unique situation in China, invest abroad can encourage more investment in the domestic market.

Result from panel data regression

Based on the result from the random model, we employ the Hausman Test to identify the hypothesis between fixed-effect model and random model. As Table 5-4 show, the result from Hausman Test refuses the hypothesis that random model is better in this regression analysis at 1 percent level. Fixed-effect model is more proper than random model to do the panel regression.

Table 5-4: Correlated Random Effects - Hausman Test
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	22.623637	3	0.0000

Table 5-5: Result from Pooled Estimation and Fix-effect Model

Variable	pooled estimation	fixed-effect model
Constant		-3.725296***
		(-3.520546)
GDP	1.032595***	0.945111***
	(23.84586)	(3.526827)
OFDI	0.016269	0.042646*
	(0.6286590)	(1.638337)
WAGE	-0.126948***	0.308077
	(-3.61274)	(1.068932)
R^2	0.924069	0.979556
Adjust R^2	0.921405	0.974336
Mean dependent var	8.295747	8.295747
SSE	2.025557	0.545367
No. of obs	60	60

Dependent variable: Domestic gross fixed capital formation. *, ** and *** denote statistical significant at the 10, 5 and 1 percentage level, respectively.

Compare with $F_{0.05}(9, 49) = 2.077$, F statistic result[41] in this panel regression refuses the hypothesis on pooled estimation is more proper than fixed-effect model. With F statistic, we will take the fixed-effect model to analyze the effect from OFDI on domestic investment.

The result from the fixed-effect model tells us there is a significant positive relationship between OFDI and domestic investment at 10% level. The higher outward investments in recent years encourage more domestic investment.

Both the time series analysis and panel data analysis show us that there is a positive relationship between OFDI and domestic investment in China.

[41] . F = 14.78

5.2 Discussion

China's OFDI has had a rapid increase in the past decades based on the development of domestic economy and globalization in the whole world. After joining WTO, China's enterprises have more opportunities to operate oversea. With the quantity analysis above, we know there is a significant positive relationship between China's OFDI and China's domestic investment. As Dunning explained in the investment development path (IDP) theory that one country will investment abroad more with the development of economy. With the development of China's economy, the flow of OFDI has had rapid growth during the recent years. Now the increasing rate of the OFDI is higher than the FDI in China [42]. These overseas investments also bring more opportunities to domestic investment.

With the high growth rate of domestic investment, we can easily observe the benefit on Chinese economy. High growth rate and better industry structure both shows that China has the ability to invest in the global market. The performance of OFDI not only improves the enterprises' individual competitiveness in the global market, but also improves the whole domestic investment. China's OFDI has a strong ability to resist the international pressure. During the world financial crisis, most developed countries, especially European countries, reduced their OFDI. In contrast, China' OFDI continued its strong growth that mainly due to China's rapid economic growth. Although the status of China's OFDI is far lower than its status in the international economy, China's outward investment is rising in the beginning of the upswing stage. With the deepening of China's economic internationalization and the support of government, China has a great potential in OFDI development. OFDI stimulates Chinese economic development, domestic economy, in turn, supports the overseas investment. The increasing OFDI provides opportunities for China's economic virtuous circle.

Market access is an important determinant for China's enterprises invest abroad. The tariffs and non-tariffs barriers, such as Dumping, Green Trade Barrier, Technical Barriers,

[42]. Wang D., Chi H.J., Liu X.M., An Empirical Study of China's Investment Development Path, http://www.gmrjournal.com/FichierPDF/v5n1art3.pdf [Accessed 10th May, 2010].

are important factors which limit China's enterprises to get benefit on economic of scale from the global market. For some service companies, they have to locate nearby the customers to do their services more convenience. Investing in the overseas market can make them access more market and bring economy scale to the Chinese firms. Beside this, the higher production can develop more of the upward and downward industries in the domestic market. So far, several merger and acquisition investments have happened with Chinese bidder. For instance, Lenovo acquired IBM PC business in 2005, TCL acquired THOMSON in 2004, and the acquisition between Geely and Volvo. These OFDI invest a lot in domestic market also after the acquisition. With these OFDI, they can enjoy the benefit from the famous brand to catch bigger market. In addition to this, these investments can bring more opportunities to develop the downward and upward industries. OFDI reduce the trade friction, and optimize the export structure at the same time.

Accessing natural resources is another one of the most important motivations for China's OFDI. The rapid development of Chinese economy demand huge resources to support the production and the whole market chain. Nowadays, China has became the top 1 consumer on copper, iron ore, aluminum and nickel etc. and the top two consumer on petroleum.[43] The shortage is one of the bottlenecks for production. There were more than 800 enterprises invested in 49 countries in Africa in 2006. Investing in the natural resources abroad can help Chinese market obtain lower-cost and stabile supply of critical resources and eliminate resources. As we mentioned in chapter 2, about 10% OFDI happened in mining industry. Invest abroad can help full fill the domestic requirement on natural resources demand. OFDI encourage domestic investment activities development in this way.

In addition to this, technology spillover from OFDI is also one of the most important factors to encourage domestic investment. Learning advanced technology is the top 2

[43] . China consultant and legal portal, *character of China foreign investment*, Available from http://www.gemag.com.cn/gemag/new/Article_content.asp?D_ID=10048, [Accessed 10th March 2010].

motivation for Chinese enterprises to invest abroad.[44] With investment in the developed regions, they can enjoy the advantages on the research resources, such as human capital, technology spillover etc. and then develop their own technology advantages. These improvements also give the parent company in the home country more competitiveness. The positive impact from these improvements would encourage more domestic investment to fulfill the requirement on the bigger market share. Relative industry could also benefit with these OFDI development. Training, legal and consulting services would be developed more to satisfy the growth of the parent company in the home-country.

OFDI can reduce the risk with divergence geography location, and make the management process more efficient by learning advanced skills from other places. All these advantages from OFDI encourage China's domestic investment with increasing China's OFDI.

With the result from our study, the economic policy should rather promote domestic firms entry to the global market with direct investments. These investments can not only improve the individuals' performance with technology spillover, management learning, and strategy asset access, but also bring positive impact on the domestic investment. As the previous study implies that in the knowledge intensive industry, the OFDI would show negative effect on domestic investment, but other manufacturing industries would not.[45] Today, most part of China's OFDI work in the non-knowledge intensive industries. With the current situation, China's economic policy should encourage the development of OFDI. China's outward FDI benefits both microeconomic and macroeconomic development in China.

5.3 Recommendation

With our analysis result, we found that there is a mutually reinforcing relationship between Chinese OFDI and domestic investment. This relationship can promote Chinese economic development by increasing China's overseas investment. Chinese government

[44] . Ministry of commerce of the PRC (2006), Strategic Way-Out for Chinese FDI, [J], *Intertrade.* 7, 50-56

[45] . Braunerhjelm, P., Oxelheim, L,.&Thulin, p.(2005) The relationship between domestic and outward foreign direct investment: The role of industry-specific effects. *International Business Review.* 14. 677–694

should continue to deepen opening up policy and strengthen the OFDI strategy in the future.

Firstly Chinese government should transfer their economic policies with the development of OFDI. Generally speaking, Chinese OFDI development lagged behind its economic development that mainly due to the supporting system in China. The government should strengthen its services functions through supplying information, financial support, tax preferential and providing insurance to improve the environment of China's OFDI. Today, most China's OFDI can get help from the government on overseas market information, and tax preferential. Based on the result from the survey on China's OFDI[46] however, Chinese enterprises need more support on corporate loan and foreign exchange from the government. Transformation of government functions and policy adjustment should focus on the status of the OFDI.

In addition to this, government should provide policy to support OFDI in the overseas market. Some more measures should be made to urge the world to admit China as a free market economy by which Chinese OFDI companies can really get national treatment overseas. Chinese government should also strengthen its international economic strategy to protect the interests of OFDI companies overseas. Huawei successfully bidding a communication network project with Ericsson in India but was refused by Indian government is a typical case of the failure of China's economic foreign policy. China's government should provide more information and services about the overseas market, policy, and project as well. The government can access this kind information easier through diplomatic method, than the individual enterprises.

The policy adjustment towards OFDI in China should be developed with the time changes. As the study in this thesis shows, nowadays China's OFDI focus more on natural resources and accessing to bigger market. With the development, China's OFDI will not work more on the technology intensity industry, such as IT, automobile etc, in

[46] . China International Trade Promotion Committee, the Economic Information Department.(2009) *Status of Chinese Enterprises and Foreign Investment Intentions Survey Report, 2009.*

the future. Related regulations need to be adjusted with the change on OFDI to encourage the China's OFDI and benefit the domestic economy development.

6. Conclusion

From a poor country to one of the economic centers, China plays a more important role on the global stage. China is the largest emerging economy in the world and becoming more and more important in the world economy. With stable sovereign situation, big market size, cheap labor cost, China attracts lots of inward FDI to invest in the domestic market. At the same time, China has invested more and more on the abroad market with the development of the domestic economy and globalization. Facing an unprecedented rate of development at the present stage, we wondered if there is a relationship between Chinese domestic investment and overseas investment. With the result from our study, we found the rapid increase on overseas investment in the past years brought positive impact on the domestic market is. Although China is a low-cost home country, and no technology advantages, efficient management in Chinese firms, investing abroad still bring positive impacts on the domestic investment.

Methodologies such as literature reviews, time series analysis and panel data analysis technique were used in the thesis. The results of the time series analysis and panel data analysis showed that there was positive relationship between OFDI and domestic investment in China. The overseas investments would bring more domestic investment opportunities in China at the present stage. We assumed that larger market, natural resources access, technology spillover, relative industries development from OFDI might be the motivation lead to a more active domestic investment. The results of our study show that nowadays there is no ground to fear the crown out domestic investment when firms in China invest more in other countries. China's OFDI create more opportunities to encourage domestic investment.

Considering the limitation on the available data, we cannot analyze the relationship with industry-special effects in this study with Chinese situation. Most of China's OFDI work

in the non-knowledge intensive industries today, and bring positive effects on domestic investment. Thus, we should encourage Chinese firms to invest more on the overseas market. But with the development of the industry structure, the economy policy on OFDI should change with time.

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Appendix

Table 1: Raw datas for indicators in the model, 1985-2008

	OFDI $MN	DFC ￥0.1BN	Wage ￥/year	GDP ￥0.1BN
1985	629	2543.2	1148	9016
1986	450	3120.6	1329	10275.2
1987	645	3701.7	1459	12058.6
1988	850	4753.8	1747	15042.8
1989	780	4410.4	1935	16992.3
1990	830	4517	2140	18667.8
1991	913	5594.5	2340	21781.5
1992	4000	6897	3720	26923.5
1993	4400	10023.4	3954	35333.9
1994	2000	17042.9	4538	48197.9
1995	2000	20019.3	5348	60793.7
1996	2114	22913.5	5980	71176.6
1997	2562.49	24941.1	6444	78973
1998	2633.807	28406.2	7446	84402.3
1999	1774.313	29854.7	8319	89677.1
2000	915.777	32917.7	9333	99214.6
2001	6885.398	37213.5	10834	109655.2
2002	2518.407	43499.9	12373	120332.7
2003	2854.65	55566.6	13969	135822.8
2004	5497.99	70477.4	15920	159878.3
2005	12261.17	88773.6	18200	183084.8
2006	21160	109998.2	20856	211923.8
2007	22468.86	137324	24932	249530.6
2008	52150	172828	29229	300670

Source: 1. China's Statistical Yearbook, Various years;
2. World Investment Report, various years.

Table 2: OFDI data, 1985-2008

	OFDI ($ Millions)	Exchange Rate ($ 1.00)	OFDI (￥Millions)
1985	629	2.9366	1148
1986	450	3.4528	1329
1987	645	3.7221	1459
1988	850	3.7221	1747
1989	780	3.7651	1935
1990	830	4.7832	2140
1991	913	5.3233	2340
1992	4000	5.5146	3720
1993	4400	5.762	3954
1994	2000	8.6187	4538
1995	2000	8.351	5348
1996	2114	8.3142	5980
1997	2562.49	8.2898	6444
1998	2633.807	8.2791	7446
1999	1774.313	8.2783	8319
2000	915.777	8.2784	9333
2001	6885.398	8.277	10834
2002	2518.407	8.277	12373
2003	2854.65	8.277	13969
2004	5497.99	8.2768	15920
2005	12261.17	8.1917	18200
2006	21160	7.9718	20856
2007	22468.86	7.604	24932
2008	52150	6.9451	29229

Source: 1. China's Statistical Yearbook, Various years;
2. World Investment Report, various years.

Table 3: GDP in 10 regions from 2003 to 2008

Region	GDP (￥0.1 Billion)					
	2003	2004	2005	2006	2007	2008
Beijing	5023.77	6060.28	6886.31	7861.04	9353.32	10488.03
Tianjing	2578.03	3110.97	3697.62	4344.27	5050.40	6354.38
Liaoning	6002.54	6672.00	8009.01	9214.21	11023.49	13461.57
Heilongjiang	4057.40	4750.60	5511.50	6201.45	7065.00	8310.00
Shanghai	6694.23	8072.83	9154.18	10366.37	12188.85	13698.15
Jiangsu	12442.87	15003.60	18305.66	21645.08	25741.15	30312.61
Zhejiang	9705.02	11648.70	13437.85	15742.51	18780.44	21486.92
Fujian	4983.67	5763.35	6568.93	7584.36	9249.13	10823.11
Shandong	12078.15	15021.84	18516.87	22077.36	25965.91	31072.06
Guangdong	15844.64	18864.62	22366.54	26159.52	31084.40	35696.46

Table 4: GDP index in 10 regions from 2003 to 2008

Region	GDP Index (Previous Year =100)					
	2003	2004	2005	2006	2007	2008
Beijing	100.00	114.1	111.8	112.8	113.3	109.0
Tianjing	100.00	115.8	114.7	114.5	115.2	116.5
Liaoning	100.00	112.8	112.3	113.8	114.5	113.1
Heilongjiang	100.00	111.7	111.6	112.1	112.0	111.8
Shanghai	100.00	114.2	111.1	112.0	114.3	109.7
Jiangsu	100.00	114.8	114.5	114.9	114.9	112.3
Zhejiang	100.00	114.5	112.8	113.9	114.7	110.1
Fujian	100.00	111.8	111.6	114.8	115.2	113.0
Shandong	100.00	115.4	115.2	114.8	114.3	112.1
Guangdong	100.00	114.8	113.8	114.6	114.7	110.1

Table 5: Average Wage in 10 regions from 2003 to 2008

Region	Average Wage (￥/Year)					
	2003	2004	2005	2006	2007	2008
Beijing	25312	29674	34191	40117	46507	56328
Tianjing	18648	21754	25271	28682	34938	41748
Liaoning	13008	14921	17331	19624	23202	27729
Heilongjiang	11038	12557	14458	16505	19386	23046
Shanghai	27304	30085	34345	41188	49310	56565
Jiangsu	15712	18202	20957	23782	27374	31667
Zhejiang	21367	23506	25896	27820	31086	34146
Fujian	14310	15603	17146	19318	22283	25702
Shandong	12567	14332	16614	19228	22844	26404
Guangdong	19986	22116	23959	26186	29443	33110

Table 6: The domestic gross fixed capital formation in 10 regions from 2003 to 2008

Region	The Domestic Gross Fixed Capital Formation (￥ 0.1 Billion)					
	2003	2004	2005	2006	2007	2008
Beijing	2169.26	2528.2	2827.2	3296.4	3907.2	3814.7
Tianjing	1039.39	1245.7	1495.1	1820.5	2353.1	3389.8
Liaoning	2076.36	2979.6	4200.4	5689.6	7435.2	10019.1
Heilongjiang	1166.18	1430.8	1737.3	2236.0	2833.5	3656.0
Shanghai	2499.14	3050.3	3509.7	3900.0	4420.4	4823.1
Jiangsu	5233.00	6557.1	8165.4	10069.2	12268.1	15300.6
Zhejiang	4740.27	5781.4	6520.1	7590.2	8420.4	9323.0
Fujian	1496.37	1892.9	2316.7	2981.8	4287.8	5207.7
Shandong	5315.14	6970.6	9307.3	11111.4	12537.7	15435.9
Guangdong	4813.20	5870.0	6977.9	7973.4	9294.3	10868.7

Table 7: OFDI in 10 regions from 2003 to 2008

Region	OFDI (￥ 0.01 Million)					
	2003	2004	2005	2006	2007	2008
Beijing	30054	15739	11306	5612	15295	47299
Tianjing	544	1754	1887	2808	7993	8200
Liaoning	847	4141	3019	9701	12833	10600
Heilongjiang	744	5645	16643	21796	17851	22797
Shanghai	5224	20564	66680	44863	52266	33714
Jiangsu	2490	5733	10828	12403	51899	49384
Zhejiang	3665	7225	15817	21528	40346	38768
Fujian	6162	1591	4253	9584	36847	16169
Shandong	8883	7523	15904	12666	18928	47478
Guangdong	9555	13893	20708	62997	114101	124251

Table 8: Price Index at 2003 price in 10 regions from 2003 to 2008

Region	Price Index at 2003 price					
	2003	2004	2005	2006	2007	2008
Beijing	1	1.057249	1.074557	1.087461	1.142009	1.17482
Tianjing	1	1.042076	1.079847	1.10803	1.11817	1.207617
Liaoning	1	0.985398	1.053307	1.064859	1.112621	1.201328
Heilongjiang	1	1.048208	1.089694	1.093761	1.11256	1.170497
Shanghai	1	1.055988	1.077801	1.089753	1.121031	1.148445
Jiangsu	1	1.050348	1.119225	1.151784	1.19212	1.250074
Zhejiang	1	1.048276	1.072059	1.102654	1.146853	1.19176
Fujian	1	1.034389	1.056427	1.062482	1.124738	1.164727
Shandong	1	1.077747	1.153211	1.197696	1.232414	1.315581
Guangdong	1	1.037108	1.080519	1.102754	1.142426	1.19158

Table 9: The Natural Logarithms Data for all indicators at 2003 price in different regions, 2003-2008

		Beijing	Tianjing	Liaoning	Heilongjiang	Shanghai	Jiangsu	Zhejiang	Fujian	Shandong	Guangdong
GDP	2003	8.5219	7.8548	8.6999	8.3083	8.8090	9.4289	9.1804	8.5139	9.3992	9.6706
	2004	8.6538	8.0015	8.8204	8.4189	8.9418	9.5669	9.3158	8.6255	9.5424	9.8086
	2005	8.7654	8.1386	8.9364	8.5287	9.0470	9.7023	9.4362	8.7352	9.6839	9.9379
	2006	8.8858	8.2740	9.0657	8.6429	9.1604	9.8412	9.5664	8.8732	9.8219	10.0742
	2007	9.0107	8.4155	9.2011	8.7562	9.2940	9.9801	9.7035	9.0147	9.9556	10.2113
	2008	9.0969	8.5683	9.3242	8.8678	9.3866	10.0961	9.7998	9.1370	10.0698	10.3075
Wage	2003	10.1390	9.8335	9.4733	9.3091	10.2148	9.6622	9.9696	9.5687	9.4388	9.9028
	2004	10.2424	9.9463	9.6252	9.3910	10.2573	9.7602	10.0179	9.6214	9.4954	9.9676
	2005	10.3678	10.0606	9.7083	9.4931	10.3693	9.8376	10.0923	9.6946	9.5755	10.0067
	2006	10.5157	10.1614	9.8217	9.6218	10.5400	9.9354	10.1358	9.8082	9.6837	10.0752
	2007	10.6146	10.3496	9.9453	9.7656	10.6916	10.0416	10.2075	9.8940	9.8275	10.1571
	2008	10.7778	10.4508	10.0468	9.8878	10.8047	10.1398	10.2630	10.0018	9.9070	10.2323
DFC	2003	7.6821	6.9464	7.6384	7.0615	7.8237	8.5627	8.4638	7.3108	8.5783	8.4791
	2004	7.7796	7.0862	8.0143	7.2189	7.9685	8.7392	8.6152	7.5121	8.7746	8.6412
	2005	7.8751	7.2332	8.2910	7.3742	8.0884	8.8950	8.7131	7.6930	8.9960	8.7731
	2006	8.0167	7.4043	8.5836	7.6228	8.1828	9.0759	8.8369	7.9397	9.1353	8.8861
	2007	8.1378	7.6518	8.8073	7.8426	8.2797	9.2390	8.9014	8.2460	9.2275	9.0040
	2008	8.0855	7.9399	9.0288	8.0467	8.3428	9.4124	8.9648	8.4054	9.3702	9.1184
OFDI	2003	7.8191	3.8073	4.2500	4.1204	6.0693	5.3283	5.7149	6.2345	6.6002	6.6731
	2004	7.1165	4.9367	5.8517	6.0998	7.3851	6.1132	6.3465	4.8466	6.3592	7.0110
	2005	6.7695	4.9742	5.4691	7.1422	8.5410	6.6856	7.1076	5.8088	7.0401	7.3691
	2006	6.0571	5.3460	6.6255	7.4082	8.1337	6.7927	7.3877	6.6156	6.7746	8.4613
	2007	7.0108	6.3829	6.8614	7.1915	8.2582	8.1896	7.9765	7.9053	7.1477	9.0200
	2008	8.1114	6.3316	6.5935	7.3853	7.7956	8.0925	7.8982	7.0467	8.0021	9.0631

Table 10: Result from Pooled Estimated Model

Dependent Variable: DFC?
Method: Pooled Least Squares
Sample: 2003 2008
Total pool (balanced) observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP?	1.032595	0.043303	23.84586	0.0000
OFDI?	0.016269	0.025880	0.628659	0.5321
WAGE?	-0.126948	0.035139	-3.612740	0.0006

R-squared	0.924069	Mean dependent var	8.295747
Adjusted R-squared	0.921405	S.D. dependent var	0.672413
S.E. of regression	0.188510	Akaike info criterion	-0.450623
Sum squared resid	2.025557	Schwarz criterion	-0.345906
Log likelihood	16.51868	Hannan-Quinn criter.	-0.409662
Durbin-Watson stat	0.196415		

Table 11: Result from Fixed-effect model

Dependent Variable: DFC?
Method: Pooled Least Squares
Sample: 2003 2008
Total pool (balanced) observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.725296	1.058159	-3.520546	0.0010
GDP?	0.945111	0.267978	3.526827	0.0010
OFDI?	0.042646	0.026030	1.638337	0.1040
WAGE?	0.308077	0.288211	1.068932	0.2906
Fixed Effects (Cross)				
BJ--C	-0.205426			
SH--C	-0.323796			
ZJ--C	0.078018			
JS--C	0.138011			
GD--C	-0.150383			
SD--C	0.256036			
FJ--C	-0.037841			
LN--C	0.342338			
HLJ--C	-0.093170			
TJ--C	-0.003787			

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.979556	Mean dependent var	8.295747
Adjusted R-squared	0.974336	S.D. dependent var	0.672413
S.E. of regression	0.107720	Akaike info criterion	-1.429431
Sum squared resid	0.545367	Schwarz criterion	-0.975657
Log likelihood	55.88294	Hannan-Quinn criter.	-1.251935
F-statistic	187.6645	Durbin-Watson stat	0.585835
Prob(F-statistic)	0.000000		