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The Relationship between Domestic Investment and Outward Foreign Direct Investment: Evidences from China

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KEY WORDS	OFDI, Gross domestic investment, Cointegration test, Hausman test, China
PURPOSE	The aim of this thesis is to provide a systematic analysis about China's OFDI during the period of 1986-2010, and analyze the macroeconomic relationship between OFDI and the domestic investment.
METHODOLOGY	We use econometrics method with time series on a national level of China and in different time periods to identify the relationship between OFDI and GDI; and we also test this effect using panel data analysis for different regions and different destinations of OFDI.
DATA SOURCE	In this thesis, all data of OFDI, FDI, GDI, GDS and GDP in the model are mainly from the *China statistical yearbook on science and technology*, *China statistical yearbook* and *United Nations Conference on Trade and Development* (UNCTAD).
EMPIRICAL ANALYSIS	We use ADF method to test unit root for the stationary and undertake Johansen cointegration test in our model in the time series analysis, then we apply Granger causality test to indicate whether there is a causal relationship between OFDI and domestic investment. In the panel data part, we use Hausman test to find out that the random effect model is better and compare the regression results to explore the further relationship.
CONCLUSIONS	Both results from time series data and panel data analysis show that there is a significant positive relationship between China's OFDI and domestic investment. Investing abroad would bring more domestic investment opportunities in China in both short and long terms during the whole period. But the promoting effect of OFDI only behaves significantly in the different regions, but not in the separated periods. By analyzing results from different regions, we find that the situation is in line with the country level. And the destinations of OFDI make no difference to the effect of OFDI on GDI.

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Table of Contents

List of tables and graphs

LIST OF GRAPHS:

LIST OF TABLES:

Abstract

Since the strategy of “Going Global” to be implemented, the Chinese OFDI has been increased rapidly. For a long time, governments in developed countries as well as some scholars hold the different attitudes that OFDI will crowd out Chinese domestic investment. In this study, we empirically analyze this relationship between OFDI and domestic investment in China based on the data from 1986 to 2010, we use unit root test, Johansen cointegration test and structure the cointegration model in the time series nanalysis. What’s more, we apply Hausman test and use random and fixed effect model in the panel data research. Both results from time series data and panel data analysis show that OFDI has a significant promoting effect on the domestic investment. Investing abroad would bring more domestic investment opportunities in China in both short and long terms during the whole period in the case of overall and divided periods. By analyzing results from different regions, we find that the situation is in line with the country level. And the destinations of OFDI make no difference to the effect of OFDI on GDI.

Keywords: OFDI, gross domestic investment, unit root test, cointegration test, Hausman test, China

1. Introduction

1.1. Background information

Foreign direct investment (FDI) is that investment, which is made to serve the business interests of the investor in a company, which is in a different nation distinct from the investor's country of origin. Correspondingly, outward foreign direct investment (OFDI) is referred to as the “direct investment abroad”. OFDI is an important feature of globalization in recent years. OFDI Since the “Open Door” policies in 1978, China has undergone three decades of steady economic reforms. With several policy changes such as the “Going Global” slogan in 1999, WTO entrance in 2001, and the liberalization of OFDI to private firms in 2003, China has experienced a process of progressive liberalization of the OFDI institution, in line with its economic improvement in general. Until up to the end of 2010, the cumulative OFDI of Chinese enterprises reached to $ 590 billion.[1]

These reforms aimed at raising the incorporation of China’s economy, increasing the amount of businesses into the global economy and changing the domestic economic and industrial structure. Therefore, China has changed its position from a marginal relevance of the outward foreign direct investment to an important country of origin among developing countries.

China’s development has enriched the theory of outward foreign direct investment. In recent years, because of the higher level of economic development and the "Going Global" strategy, China’s outward foreign direct investment has become an increasingly important issue.

Specifically, China has become to the second largest FDI inflows country in the world since 1993, just after the United States. Meanwhile, China also become to an increasingly important FDI outflows country. According to the United Nations Conference on Trade and Development (UNCTAD)’s report, China acts as one of the largest outward investors among developing economies during 90s. By the end of 1996,

[1] The Central People's Government of the China

the cumulative stock of China's OFDI had reached over $ 18 billion. As China's economic grows rapidly as a new economic power, its deepening participation in the regional and global economy through both inward and OFDI will inevitably bring the significant implications in the international political economy.

1.2. Literature review

Outward foreign direct investment can make a change to the size of capital stocks and the total amount of available savings for investment in home countries. From the indirect impact, foreign investment can generate revenue and some of the incomes can be used as reinvestment. Meanwhile, outward foreign direct investment may have a positive or negative multiplier effect to the home country.

Whether the outward foreign direct investment would replace domestic investment and the size of substitution effect are the important scopes for the studying of the foreign direct investment. The early researchers in this field, such as Stevens (1992) found that there was a significant relationship between OFDI and domestic investment. However, this studies were not representative due to the limited observations and the short time series.

In the early researches, Herring and Willett (1973) studied US firms with time series data in 1973, which indicated that direct investment abroad has a positive effect on the domestic investment. And later on, Noorzoy (1980) based on the ex-post pattern of direct investment and focused on the effects from the outflow and inflow of direct investment on U.S. domestic investment, which concludes that OFDI will stimulate domestic investment while IFDI will displace this investment. Those literatures indicate that OFDI can develop the relative industries and economies in home countries through occupying more markets and obtaining more natural resources. In this case, OFDI can lead to a positive effect on the domestic investment.

However, there are some other researchers who hold opposing views toward the aspect of limited resources in the domestic country. Feldstein (1995) studies the empirical analysis between foreign investment and domestic investment in the OECD countries.

The result shows that there exists a substitution effect between them, which implies that such investment does reduce domestic investment, but each dollar of assets in foreign affiliates reduces the domestic capital stock by 0.2-0.38 dollar.

Belderbos (1992) also provided evidences for the study of substitution effect in several industries of Holland, which argue that OFDI will crowd out domestic investment. The result accounts that profitable investment opportunities in one area may result in reducing the investment in the other areas.

Stevens and Lipsey (1992) study both the domestic and foreign fixed investment expenditures in multinational firms. They also had use the operational data from seven of the U.S. manufacturing companies in a time span of 16-20 years to do regression analysis for each company. The results showed that the competitive relationship between the samples of overseas investment in fixed assets and the domestic investment.

Herzer and Schrooten (2008) use cointegration techniques, find in the US the OFDI has positive long-run effects on domestic investment. This complementary relationship exists only in the short run in the German, while in the long run, OFDI will substitute domestic investment.

To be more specific in analyzing the relationship, for instance in industry area, Braunerhjelm, Oxelheim and Thulin (2004) analyzed the relationship according to the different industries. They argued that the different industrial structure will leads to different effects on OFDI, as well as the relationship between OFDI and domestic investment. The results concluded that the relationship depends on the intensity-specific effects, and the more knowledge intensity in industries, the more negative relationship turn out to be. This gives us an indication that we could analyze the impact of OFDI on domestic investment more specifically.

Herzer (2008) studies the effect of OFDI on domestic investment by applying cointegration techniques to macroeconomic time series data in the evidence from Italy. They identify that OFDI has negative short-term and positive long-term impacts on domestic investment. In addition, their empirical result shows the long-term causality is duo directional, which suggest that increased OFDI is both a cause and a consequence

of increased domestic investment. While in another study, Pietrobelli et al. (2009) investigates the motivations driving Chinese OFDI to Italy, based on the secondary sources and interviews of key informers and senior managers of Chinese affiliates in Italy.

China's OFDI started late and slowly than developed countries and a lot of researches focused on studying the effect of attracting foreign investment on China's domestic economic. Wang (2011) goes into details to study on the effect of OFDI on domestic investment in China, by using the provincial panel data analysis during time period of 2004-2007, and draws the conclusion that OFDI will increase 1 percentage when the amount of domestic investment increases by 0.042 percentages, even the significance is on the 1% confidence level. However, we should see the promoting effect is still low (only 0.042%) in spite of the result showing statistically significant. It may be due to the fact that China is still in the development stage and the core competitiveness of multinational companies is not strong enough to make much more profits.

So far as we know, China is not capital intensive, so most of China's foreign investments abroad expend to the developing countries, such as Asia, Latin America and Africa, rather than the developed countries.

If we look at the previous literatures, we could find that there exists a relationship between OFDI and domestic investment. We can make a definitive conclusion that OFDI will bring more market share, catch more natural resources and get more profit. However, we cannot make sure that whether this kind of effect can lead to a positive impact on the domestic investment or not.

However, the research of China's OFDI on domestic investment is still not comprehensive enough, only few literatures provide the relationship between OFDI and domestic investment and its development in China. What's more, there is no research to study this relationship according to different regions in China. Based on this, we try to use the latest data, adopt the cointegration model to do the relative test, then make the political recommendations with certain theoretical and practical significances.

1.3. Aim and scope

There are two main purposes in this paper: Firstly, to provide a systematic analysis of the size and also the composition of China's OFDI during the period of 1986-2010, the data over this period are available from China's Ministry of Commerce. And the second intention is to describe the determinants of the direction and amount of the domestic investment in China, and analyze the macroeconomic relationship between OFDI and the domestic investment using econometrics methodology.

We have summarized the previous researches in the last section; there are many different verdicts in different points of view from those researchers based on the diverse methodologies.

As one of the developing countries, China does not have so much strong competitive advantages than the developed countries, such as technology advantages, financial support, and superior management. In the meanwhile, the level of FDI inflows is far exceeds the level of FDI outflows in China. China has achieved significant success in attracting foreign direct investment since the earlier 1990s. It has became the largest recipient of FDI among developing economies in 1993 for the first time and then became one of the top three recipients of FDI in the world. Since China was experiencing such a big reflection of success during that time, there were many papers writing focused on the various aspects of China's inward FDI. In contrast, China's OFDI up to now is still small, according to this there is not as much systematic research has been done on this area.

Although China's outward foreign direct investment has maintained a high growth rate in recent years, the proportion of OFDI in China's foreign economic activities is still quite low. However, there always has an interaction between FDI and OFDI, so the analysis must take this into account when studying the relationship between OFDI and domestic investment.

The two most important motivations for China's OFDI are to occupy more market share, and find more natural resources. The total distributional proportion of Chinese OFDI in

services industry, resource development and manufacturing is over 90%, which can help the domestic surplus capital to find a way out of difficult situations.

2. The Theoretical Background about OFDI

The overseas researches find that FDI outflows both contain positive and negative effects. In the previous studies review, the positive effect includes several aspects. For instance, increase in product outputs, bring monopoly profit, ensure the investors to take advantage of cheap labor, and also transfer more cheap domestic resources to another area where has high value-added transactions.

2.1. The relationship between OFDI and domestic investment

Under the background of economic globalization, the world outward foreign direct investment has been growing rapidly, the extended scope and the impact on the world economy are more significant than before. United Nations Centre on Transnational Corporation (UNCTC) said that the OFDI can be regarded as the “engine” of the world economic growth. Today, OFDI flows have become one of the most important motives for the economical operations.

From the empirical analysis of the developed country’s OFDI, we could indicate that OFDI is a new economic growth engine at a certain stage of economic development. The development scale, flow direction and structure of OFDI have acted a significant impact on the economic growth, domestic investment, balance of payments, international competitiveness of enterprises and even a country’s sustainable and stable development. FDI has been proved a tremendous role in the promotion on China’s economic development, but what kind of impacts of OFDI on China’s domestic economy, domestic investment, employment, import and export trade need a further research and feasibility study to test whether this economic effect is positive or not. In this thesis we would like to empirically analyze the economic effect of OFDI

in China on gross domestic investment (GDI), which means that the total amount of investment that invested into one's own country.

The effect of OFDI on GDI mainly concludes two aspects: one aspect is that outflows of foreign direct investment will substitute or crowd out the domestic investment to some extent, thereby leading to an adverse effect or crowding-out effect for the domestic investment; another aspect is that OFDI will promote or facilitate domestic investment to improve domestic economic growth, which shows up a positive effect or a boosting effect on domestic investment in China.

2.2. The historical situation of China's OFDI

Since the reform and opening-up policy in 1979, China's foreign direct investment has gone through four stages and finally taken shape.

The first stage: initial development (1979-1985)

During the early phase of China's reform and opening up, foreign investment activities developed from scratch, which are mainly foreign investment and cooperation from state-owned enterprises. Most of them are taking place in Hong Kong and Macao and the Middle East Area.

The second stage: rapid development (1986-1992)

Foreign direct investment went into an accelerated phase of development, particularly after Deng Xiaoping's "southern tour" in 1992 which is a new promotion point of foreign direct investment and foreign trade activities. The types of foreign investment enterprises, the fields of the investments and the number of overseas enterprises have been increased to some extent.

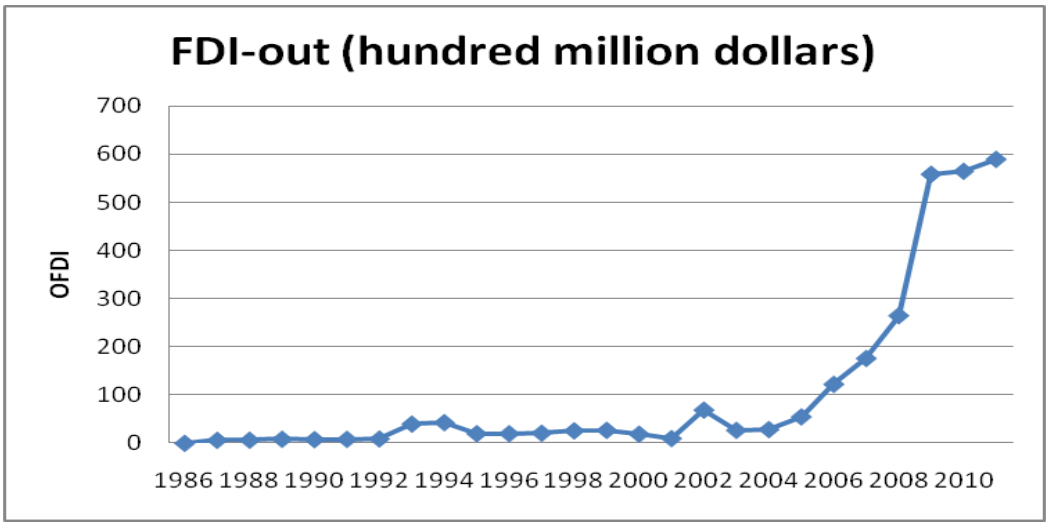
The third stage: adjustment and development (1993-1998)

From 1993, China's overseas investment slowed down due to the adjustment of domestic economic policies. The tightening monetary policy is to change the phenomenon of the economy overheating and the irrational investment structure. As a result, foreign direct investment made some consolidations.

The fourth stage: the "Going Global" strategy (1999-now)

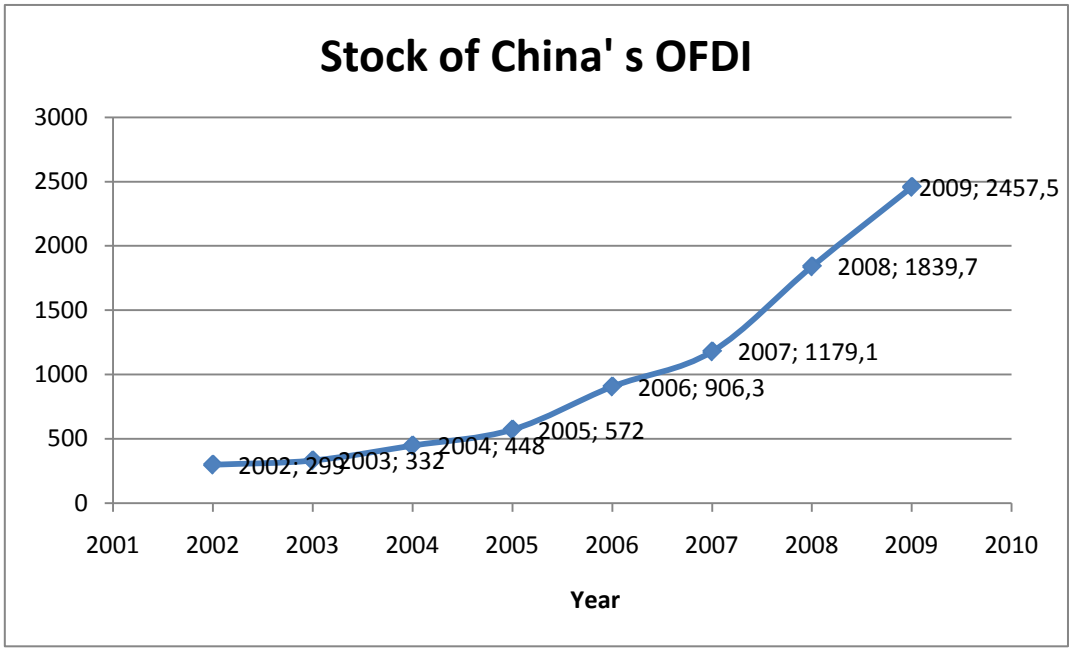
In order to adapt to economic globalization, China launched the "Going Global" strategy and the foreign direct investment began to grow steadily. In short, foreign direct investment and foreign trade are the important part of open and export-oriented economy in China at this time period.

Graph 2-1: China's Outward Foreign Direct Investment flows, 1986-2010



Source: 2009 Statistical Bulletin of China's Outward Foreign Direct Investment

Graph 2-2: China's OFDI stocks, 2002-2009 ($ 0.1 billion)

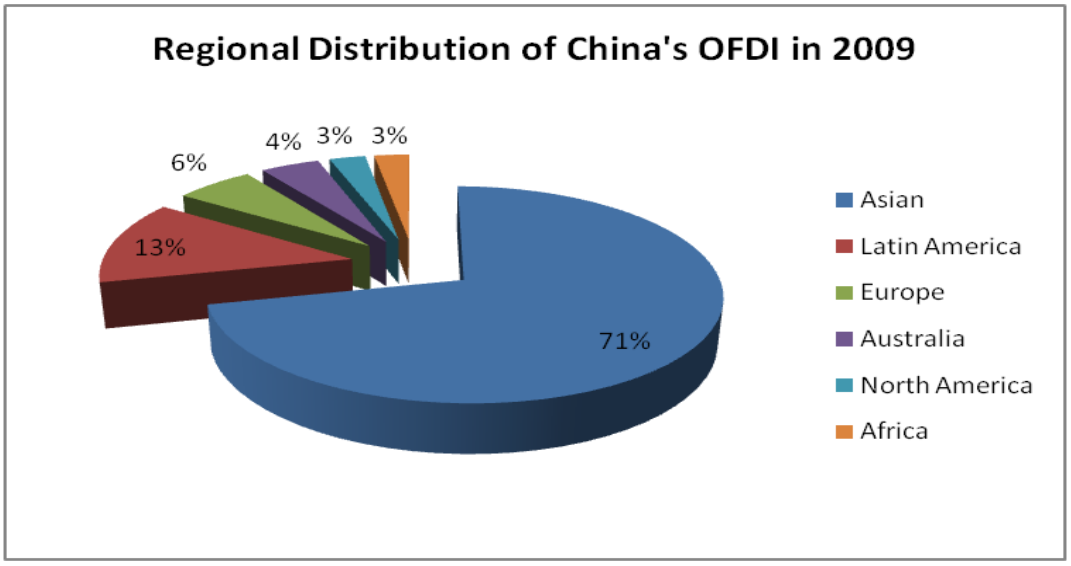


Source: United Nations Conference on Trade and Development (UNCTAD) OFDI Statistics and China Statistical Yearbook (2011)

2.3. The current situation of China's OFDI

Since the reform and opening up, China's economy has maintained sustained and rapid development with China's foreign direct investment showing a trend of steady growth. Foreign direct investment grows for nine consecutive years. From National Bureau of Statistics of PRC, China's net foreign direct investment in 2009 is $ 56.53 billion with an increase of 1.1% compared to 2008. Among this, 47.8 billion is from non-financial part with a percentage of 84.5 and an increase of 14.2% while financial part is $ 8.73 billion with a percentage of 15.5 and a decrease of 37.9%. The flow of global foreign direct investment in 2009 is $ 1.1 trillion and the stock at the end of 2009 is $ 18.98 trillion[2]. Based on this data, China's foreign direct investment in 2009 is 5.1% of the global flow, ranking the first place among the developing countries and fifth largest in the world.

Graph 2-3: The distribution of China's OFDI flows by regions, 2009



Source: Statistical Bulletin of China's Outward Foreign Direct Investment (2009)

The investment coverage of Asia and Africa reached 90% and 81.4%. From the regional distribution of the abroad companies, Asia is the most concentrated and Africa is the third followed by Europe. The major industries are wholesale and retail, leasing

[2] National Bureau of Statistics of PRC

and business services, construction and agriculture, forestry, animal husbandry, fisheries, of which, manufacturing, wholesale and retail trade are accounted for 30.2% and 21.9%, respectively[3].

Graph 2-4: The distribution of China's OFDI stocks by industry, 2009

Source: 2009 Statistical Bulletin of China's Outward Foreign Direct Investment

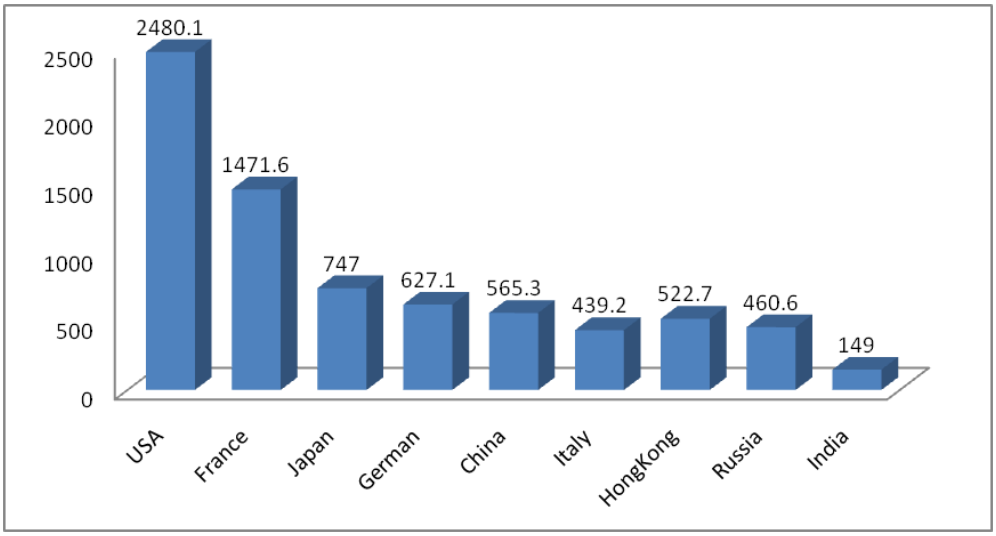
The stock of foreign direct investment increased substantially over the previous years and the regions distributed more widely. In 2009 the scale of China's foreign direct investment stock is over $ 200 billion and Asia and Latin America are the highly concentrated areas. The stock on the developed countries and regions is accounted for 7.4% of all the stock investments. At the end of 2009, 12 thousand domestic investors in China have invested directly among 13,000 foreign direct investment enterprises and foreign enterprises have a total asset of over $ 1 trillion[4].

The investment in the U.S. and Europe doubled over the previous years. In contrast to the past rapid growth in Asia and Africa, China's investments in Europe, North America, Latin America have a vigorous growth in 2009, of which $ 3.35 billion is

[3] UNCTAD (World Investment Report 2010)
[4] National Bureau of Statistics of China (2010)

European investment with an increase of 282.8 percent, $ 1.52 billion invested in North America with an growth of 3.2 times and the investment in Latin America is $ 7.33 billion, doubled compared to the previous years[5].

Graph 2-5: The comparison of OFDI for China and other countries, 2009 ($0.1BN)



Source: Statistical Bulletin of China's Outward Foreign Direct Investment (2009)

2.4. The characteristics of China's OFDI

From the beginning until now, China's foreign investment is always a "non-capital surplus overseas investment". By taking an overview of its development process, the history of Chinese multinational's experience of reform and its opening up process are almost synchronous, which need to experience beginning, development, expansion, and adjustment periods from small to large. According to the Ministry of Commerce statistics, up to the end of 2010, 3125 China's foreign investment enterprises directly invested 590 billion dollars to 129 countries and regions all over the world[6]. As China has different backgrounds with the early expansion of overseas investments, it shows the following characteristics:

China's foreign direct investment lacks of systematicness, continuity and stability. Foreign-invested enterprises lack of advantages and business initiatives in the

[5] UNCTAD (2010)
[6] The Central People's Government of the PRC

traditional theory to promote foreign direct investment mechanisms, and thus lack the motivation of foreign direct investment while mostly rely on the “Going Global” preferential policy to promote a passive investment.

The foreign investment has an irrational industrial structure. Although foreign direct investments involve in all areas, they still mainly concentrate in low value-added resource development industry and primary processing and manufacturing industry.

Making a general survey of the United States, Japan and other developed countries or the newly industrialized countries in Asia, they are all focused their foreign direct investment on the service industry. Though it is unrealistic to China at this stage, it may represent the direction of the foreign direct investment development in future.

China’s foreign direct investment policy system is only a preliminary built and still lacks of macro-management. The short of effective management institutions abroad and the complicated approval procedures of foreign investment projects affect the enthusiasm of overseas investment. The legislation is lagging behind because of a lack of systematic, comprehensive and complete system of laws and regulations as well as an empty of risk assessment and regulatory specialized agencies.

3. Data and Methodology

3.1. Methods

The existing studies about how the OFDI affects the domestic capitals are based on the theoretical models from Feldstein (1994) and Horioka (1980). Their theories mainly analysis the effects of the savings on the domestic capital formation under the situation of different capital flows. Based on this, Feldstein (1994) introduced the inward and outward foreign direct investment as two explanatory variables to analysis the relationship between OFDI and domestic investment.

$$\mathbf{[GDI/GDP]_t=\alpha+\beta_1\,[FDI\text{-}out/GDP]_t+\beta_2[FDI\text{-}in/GDP]_t+\beta_3[GDS/GDP]_t+\mu} \quad (3.1.1)$$

Where t represents the year, GDI is the gross domestic investment, GDP is the gross domestic product, GDS is gross domestic savings, outflow and inflow FDI is represent as FDI-out and FDI-in respectively and μ is the white noise error term.

Since our study is to test the impact of China's outward foreign direct investment on total domestic investment, then the dependent variable is the gross domestic investment (GDI), the independent variable is the outward foreign direct investment (FDI-out). However, the factors which affect domestic investment should also include the gross domestic savings (GDS) and foreign direct investment (FDI-in), as well as other factors. Therefore, we introduce these variables into the model as:

$$\mathbf{GDI = f\ (FDI\text{-}out,\ FDI\text{-}in,\ GDS)}$$

In order to study the impact of OFDI on the domestic investment during those 25 years, we would like to follow Feldstein (1994)'s idea and structure the following econometric model:

$$\mathbf{GDI_t=\alpha\ +\beta_1 OFDI_t+\beta_2 FDI_t+\beta_3 GDS_t+\mu} \qquad (3.1.2)$$

Where GDI is gross domestic investment rate measured by the ratio of GDI to GDP, OFDI is the outward foreign direct investment rate measured by the ratio of OFDI to GDP, FDI is the inward foreign direct investment rate measured by the ratio of FDI to GDP and GDS is the gross domestic saving rate measured by the ratio of GDS to GDP and μ is the white noise error term.

We take the natural logarithm of model (3.1.2) to reduce the heteroscedasticity and the effects on stationarity from abnormal items.

$$\mathbf{\ln GDI_t=\alpha+\beta_1 \ln OFDI_t+\beta_2 \ln FDI_t+\beta_3 \ln GDS_t+\mu}$$

Another innovation in this study is the divided periods we choose to investigate the macroeconomic relationship. As the second part of the article said, 1986-1992 is the rapid development stage; 1993-1998 is the adjustment and development period and from 1999 to now is the "Going Global" phase. Hence we divide our data into two periods and compare the regression results of those two periods with the overall period. The first period is the developing stage when is from 1986 to 1998 and the second

period is the developed stage when is from 1999 to now. The separate regressions by different stages didn't show in the previous researches.

In China, there are too many differences between the economically developed areas and economically underdeveloped areas. Therefore, it is necessary to do the analysis region by region. In order to investigate whether the outward foreign direct investment affects domestic investment differently using the data from distinct areas, we divided China into three parts: the east, the middle and the west.

According the National Development and Reform Commission (NDRC), China's east, middle and west regions are the divisions of different policies, not based on the administrative or geographical concept. Therefore, the east region is the coast areas where firstly carried out the "open door" policy and also include the higher economic development provinces; the middle region is the less developed economies while the west is underdeveloped western region. In this paper, the data will be divided into three sub-sample panel data using the following model to do regression.

$$\ln GDI_{i,t} = \alpha + \beta_1 \ln OFDI_{i,t} + \beta_2 \ln FDI_{i,t} + \beta_3 \ln GDS_{i,t} + \mu_{i,t} \quad (3.1.3)$$

where i and t measure region and time respectively, β_1 represents OFDI on domestic investment elasticity and, $\mu_{i,t}$ is the white noise error term. We need to notice that GDI as well as other independent variables are both measured by the ratio of GDI to GDP, OFDI to GDP and so on.

During those years, the China's OFDI flows have been growing rapidly to invest into different countries and regions. For instance, the investment in Europe is $ 3.35 billion with an increase of 2.82 times in 2009, which is a significant characteristic of China's OFDI. As a result, we separate the abroad investment into six parts (excluding Antarctica) according to the division of the seven continents and independently uncover the relationship between OFDI and domestic investment using data from different destinations in China.

According to the modern econometric point of view, most of the time series of economic data is not stationary. It might lead to the false results if we use non-stationary time series regression analysis. Since this model is a time series econometric model, in the first step we need to use ADF unit root test to test stationary

and Johansen cointegration test to avoid the pseudo-regression, then apply Granger causality test to indicate whether there is a causal relationship between OFDI and domestic investment. For the panel data, we use Hausman test to find the proper model and compare the results between the sub-panel regressions. We use the statistical software Eviews 7 to do get all the empirical results.

3.2. Source material

In this thesis, the data sources of the econometric model are mainly from the *China statistical yearbook on science and technology*, *China statistical yearbook* and *United Nations Conference on Trade and Development* (UNCTAD).

We choose all the data of OFDI, FDI, GDI, GDS and GDP from 1986 to 2010 for the time series analysis, among which the raw data of GDP, GDS, FDI and GDI comes from the authority records in *China Statistical Yearbook* which were published by the China's Statistical Bureau. But we can't get the data of OFDI before 2003 in the above publications so that we refer to the *World Investment Report* to obtain the OFDI data from 1986 to 2002.The raw data of FDI and OFDI are measured by US dollar.

The data we showed in the below table is the processed data which comes from the raw data. We transferred OFDI and FDI into Chinese monetary unit by using the average annual exchange rate, which is collected from *China Statistical Yearbook* as well.

The data of OFDI for each province in China is arranged from 2003 to 2009 and some of the data is not available in the early time since several regions have not invested in the foreign market early than this period.

The panel data for three different regions are listed here, the east region contains 11 provincial administrative regions, namely, Beijing, Tianjin, Hebei, Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong and Hainan. The middle region contains 8 provincial administrative regions, namely Heilongjiang, Jilin, Shanxi, Anhui, Jiangxi, Henan, Hubei and Hunan. The west region contains 12 provincial administrative regions, namely, Sichuan, Chongqing, Guizhou, Yunnan, Tibet, Shanxi, Gansu, Qinghai, Ningxia, Xinjiang, Guangxi and Inner Mongolia. Since the data of

OFDI for Tibet is zero during the whole period of 2003-2009, so we decide not to run the regression with the data from this area.

The data for GDI, FDI, GDP and GDS are directly sorted out into Chinese Yuan (CNY) for price of 1 million, but the OFDI which is measured by US dollar should be transferred into Chinese monetary unit using the average exchange rate for each year.

Since we are aiming to identify the relationship between China's OFDI into different regions of the world and domestic investment in China, then we decide to use the data invested into the six continents from 2003 to 2009, all the data below is processed by using average annual exchange rate to transfer U.S. dollar into CNY. This data is collected from *2009 Statistical Bulletin of China's Outward Foreign Direct Investment*.

4. Empirical analysis

4.1. Empirical results

4.1.1. Result from time series analysis in China

Use the data from 1986 to 2010 of China, the following results were obtained with the traditional ordinary least square (OLS) method. Where GDI is gross domestic investment rate measured by the ratio of GDI to GDP and so as other variables,

$$\ln GDI = -0.005 + 0.198 \ln OFDI - 0.115 \ln FDI + 0.476 \ln GDS \quad (4.1.1)$$

(0.01) (4.0) (-1.9) (4.0)

$R^2 = 0.727$, $\bar{R}^2 = 0.688$, DW=0.945, F=18.64

The values in brackets are the t-values. Given the confidence level of 5%, the coefficients of all independent variables in the regression are statistically significant except for the ln FDI. But since it is significant under the 10% confidence level, the ln FDI is not so bad. According to the F-statistic distribution table, the regression equation is highly significant. And considering the data are from the real economic world, R^2 in this model is also good, 72.7% of ln GDI change can be explained by the model.

The Durbin-Watson stat value, which suggests the autocorrelation between variables, is in the rejection area. This result suggests that there is an autocorrelation between the explanation and explaining variables in the preceding regression. Therefore, the equation (4.1.1) is a spurious regression result and the model will be estimated with cointegration theory. Here we follow Herzer and Schrooten (2008), who use cointegration techniques to test the effect of OFDI on domestic investment both in the US and German.

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 following result, we can see that the dependent variable ln GDI is nonstationary but its first difference (Dln GDI) is stationary under the confidence level of 5%. The original independent variables are stationary except ln OFDI which is stationary after first difference and is in line with the ln GDI. Therefore, the variables have a cointegration relationship thus the cointegration method can be applied in this case.

Table 4-1: Results of the unit root test

Variables	K	t-Statistic	Test critical values (5% level)	Stationary
ln GDI	2	0.623645	-3.004861	Nonstationary
Dln GDI	1	-3.603039	-3.004861	Stationary
ln OFDI	0	-1.960121	-2.991878	Nonstationary
Dln OFDI	0	-6.151230	-2.998064	Stationary
ln FDI	4	-3.108632	-3.020686	Stationary
ln GDS	0	-3.315774	-2.991878	Stationary
residual	0	-2.691889	-1.955681	Stationary

Note: Augmented Dicky Fuller (ADF) test. K is Lag Length, which is automatically selected based on SIC. All values are with intercept and trend.

From the unit root test we found that ln GDI and ln OFDI are both stationary after first difference, which means there is cointegration relationship between them and then we get the result after revising this model with first difference

$$\Delta \ln GDI = 0.084 + 0.029\,\Delta \ln OFDI - 0.0015 \ln FDI + 0.093 \ln GDS \quad (4.1.2)$$

(0.8) (0.4) (1.0) (0.2)

$R^2 = 0.186171$, $\bar{R}^2 = 0.064096$, DW=1.470124, F=1.525058

The low R^2 indicates that this model cannot make sense in the circumstance of first difference, so we could neither make conclusions from this nor do further analysis.

By testing the cointegration relation, the equation reflects the long term stable equilibrium between OFDI and GDI. While in a short time, the variables may deviate from the long term equilibrium but will adjust to the long term situation. To analysis the short-term deviation from the correction mechanism, we use the Johansen (1991) approach to estimate the regression with cointegrated variables. With Eviews 7, we get the result from Johansen test as Table 4-2 shows:

Table 4-2: Unrestricted Cointegration Rank Test (Trace)

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.837858	71.35708	47.85613	0.0001
At most 1	0.567276	27.69432	29.79707	0.0858
At most 2	0.270834	7.590609	15.49471	0.5102
At most 3	0.000421	0.010112	3.841466	0.9196

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 GDI, OFDI, FDI and GDS in China. The equilibrium is showed as below:

$$\varepsilon_t = \ln GDI - 0.306 \ln OFDI - 0.026 \ln FDI + 0.158 \ln GDS \quad (4.1.3)$$

(0.03) (0.04) (0.08)

The values in parentheses are standard errors. Looking at the regression result of standard errors, we know that all the time series factors have a significant relationship. OFDI has a significant positive effect on GDI in the long run, so that they will change

in the same direction. The coefficient is the elasticity for variables because we take natural logarithms here. Based on the result from the former equation (4.1.1), the change on OFDI will have a positive effect on GDI with a proportion of 0.198. The above equation (4.1.3) shows the long relationship between the variables. In the long run, the OFDI increase 1% will lead to a 0.306% increase on GDI.

According to the cointegration model, we can get important information that OFDI has the same direction impact both in short-term and long-term; that is to say, foreign direct investments promote the gross domestic investment in China all the time.

The cointegration test used before reflects that OFDI and GDI have long term equilibrium, but whether it is a causation relation requires further test. Therefore, we have undertaken the Pairwise Granger (1988) Causality Test to discuss the actually relationship between OFDI and GDI.

Table 4-3: Granger causality tests for OFDI and GDI

Pairwise Granger Causality Tests
Date: 05/24/11 Time: 15:23
Sample: 1986 2010
Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
DLN_OFDI does not Granger Cause DLN_GDI	23	2.14956	0.1582
DLN_GDI does not Granger Cause DLN_OFDI		0.00941	0.9237

Since OFDI and GDI are not stationary, we take the first difference of OFDI and GDI to explore the causality relationship between them. We can conclude that under the 5% significance level, OFDI doesn't granger cause GDI and GDI doesn't granger cause OFDI either. This conclusion isn't in line with our basic assumption that the outward foreign direct investment will affect the gross domestic investment in China.

4.1.2. Empirical analysis of two different periods

In this section we analyze the effect relationship on two different time periods since it has different economic development level and financial support policies in different stages. The first period is from 1986 to 1998 which is combined the second stage (1986-1992) and the third stage (1993-1998) we analyzed in section 2.1, since the economy in those thirteen years are underdevelopment than the later period; the second period is from 1999 to 2010, which is the fourth stage for the implement of "Going Global" stratagem and in which time the economy is developing unprecedented fast. In order to investigate whether the OFDI have different effect on the domestic investment by different time periods, we use the model we analyzed above to run the OLS regression. GDI here is also measured by the ratio of GDI to GDP and it's the same method treating with other variables. Following table is the result we got from the estimation in two different stages:

Table 4-4: Regression result of two different periods

Time Period	First Period (1986-1998)	Second Period (1999-2010)
C	-0.628627 (0.0235)	-3.370422 (0.0000)
$LnOFDI_t$	0.013815 (0.7688)	0.005126 (0.8346)
$LnFDI_t$	0.220602 (0.0006)	-0.808286 (0.0000)
$LnGDS_t$	-0.421374 (0.0033)	0.926445 (0.0006)
R^2	0.810023	0.986286
DW	1.274359	2.380023
Sample Number	13	12

In the underdevelopment stage, the first period, we can find that the coefficient of domestic savings is negative and others are both positive. So increase 1 unit of OFDI will lead to the increase of GDI by 0.013815 percentages, which means that the influence of OFDI to domestic investment is relatively small. In addition, the coefficient of OFDI in this model is not significant, while the coefficients of FDI and

GDS are both significant under the confidence level of 1%. R^2 in this period is high enough; almost 81% of ln GDI change can be explained by the model.

The insignificant coefficients in this time period show that GDI cannot be explained by OFDI very well in this model; this is mainly due to the limited observations and immature market economies, which are quite easily to cause an unstable series in the regression model.

In the "Going Global" strategy, the second period, only the coefficient of FDI is non-positive. GDI will decline relatively 0.005126 when the OFDI increases 1 percentage, so the impact of OFDI on GDI is so faint in this strategy. Since the coefficient of FDI and GDS is significant with a P-value equals to 0.0000 and 0.0006 respectively, we can conclude that FDI and GDS have a significant effect on domestic investment, while OFDI does not influence GDI so much as we assumed initially.

We wonder whether there is an empirical causation relation between OFDI and domestic investment. Therefore, we have undertaken the Pairwise Granger Causality Test to further discuss the causality relationship between OFDI and GDI by different periods.

Table 4-5: Granger causality tests for OFDI and GDI in first time period

Pairwise Granger Causality Tests
Date: 05/24/11 Time: 13:04
Sample: 1986 1998
Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
L_OFDI does not Granger Cause L_GDI	12	6.69298	0.0294
L_GDI does not Granger Cause L_OFDI		4.54468	0.0618

Under the 5% significance level, the OFDI granger causes GDI while GDI does not granger causes OFDI. This conclusion is in line with our basic assumption that the outward foreign direct investment will affect the gross domestic investment in China.

For the second period, we undertake the same test:

Table 4-6: Granger causality tests for OFDI and GDI in second time period

Pairwise Granger Causality Tests
Date: 05/24/11 Time: 13:12
Sample: 1999 2010
Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
L_OFDI does not Granger Cause L_GDI	11	0.38468	0.5524
L_GDI does not Granger Cause L_OFDI		7.55739	0.0251

Under the 5% significance level, the OFDI does not granger causes GDI while GDI granger causes OFDI. This is on the contrary with the conclusion of first time period, thus the OFDI does not have an effect on the domestic investment in China in this circumstances.

4.1.3. Empirical analysis of three different regions

This study is mainly about the emphasis of the OFDI react on the domestic investment. In order to analyze the effects on different regions, we try to use panel data analysis with different provinces of China from 2003 to 2009. We use the same model as we showed before:

$$\ln GDI_{i,t} = \alpha + \beta_1 \ln OFDI_{i,t} + \beta_2 \ln FDI_{i,t} + \beta_3 \ln GDS_{i,t} + \mu_{i,t} \quad (4.1.4)$$

where GDI is gross domestic investment rate measured by the ratio of GDI to GDP and the same as other variable. The subscripts i and t measure region and time respectively, β_1 represents OFDI on domestic investment elasticity and, $\mu_{i,t}$ is the white noise error term.

After the regression, we get the pooled estimation result without intercept and the equation with random effects using pooled EGLS method, which will be analyzed further later. So based on the result from the random model, we apply the Hausman (1978) test to identify the hypothesis between fixed-effect model and random model.

Table 4-7: Hausman test for three different regions

Correlated Random Effects - Hausman Test
Pool: EAST
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	1.762483	3	0.6231

Correlated Random Effects - Hausman Test
Pool: MIDDLE
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	4.024778	3	0.2588

Correlated Random Effects - Hausman Test
Pool: WEST
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.511728	3	0.9163

As table showed above, the result from Hausman test accepts the hypothesis that random model is better in this regression analysis. Random effect model is more suitable than fixed-effect model to do the panel regression.

Since random effect model is much better than fixed one, we will compare the pooled estimation without intercept model and the random effects model. We show the regression results for both two effect models and three different regions. The data in the bracket is the P-value.

Table 4-8: Results of pooled estimation and random effect model

Variable	Pooled estimation			Random effect model		
	East	Middle	West	East	Middle	West
Constant				2.48E-05	0.089038	0.064115
				(0.9997)	(0.3015)	(0.6263)
OFDI	29.96859	-15.59468	57.87021	29.87163	21.74526	59.67352
	(0.0358)	(0.4813)	(0.0668)	(0.0048)	(0.1824)	(0.0320)
FDI	0.314297	-0.063276	-2.094997	0.196736	0.781231	-1.856709
	(0.0737)	(0.8205)	(0.0000)	(0.1250)	(0.0254)	(0.0000)
GDS	0.446259	0.571719	0.640321	0.503060	0.322711	0.612481
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0006)	(0.0000)
R^2	0.636221	0.885950	0.885984	0.756321	0.857297	0.877217
Adjust R^2	0.626389	0.881646	0.882903	0.746307	0.849064	0.872171

From the table above, according to the pooled estimation model and random effect model, most of the coefficients from those three regions are positive and R^2 are relatively high in both of two effect models.

OFDI in the east and west part are both positive and significant under the confidence level of 5%, which indicate that the aggregate level of domestic investment will grow when the OFDI increases in both east and west part.

The negative coefficient of OFDI in the middle part illustrates that there may exist a crowding-out effect between the productions and the investments in this area, while the coefficients of OFDI in the middle part are both insignificant in two models. And we can see that the coefficients of the GDS variable are always positive in all of three regions and two effect models, which implies that the domestic savings increases will lead to the growth of domestic investment in each region.

4.1.4. Empirical analysis for OFDI into different continents

In the previous article, Feldstein (1994) uses the additional variables to solve the simultaneity problem. He includes four variables in addition to the saving rate and FDI variables, and one of the variables is a dummy variable indicating whether the country is in Europe or not. In order to identify which continent is much better or much profitable for China to invest in, and also point out which receiving continent has

more influence on the domestic investment in China, we will follow Feldstein's idea and run the regression with OFDI into six continents instead of the overall OFDI using panel data.

The six continents conclude Asia, Africa, Europe, Latin America, North America and Oceania. Our data is from 2003 to 2009 and we run the same model as before.

$$\ln GDI_{i,t} = \alpha + \beta_1 \ln OFDI_{i,t} + \beta_2 \ln FDI_{i,t} + \beta_3 \ln GDS_{i,t} + \mu$$

where GDI, OFDI, FDI and GDS are the data which have already divided by GDP, i represents different continents.

Based on the regression result from the random model, we undertake the Hausman Test to test the hypothesis between fixed and random effect model.

Table 4-9: The result of Hausman test

Correlated Random Effects - Hausman Test

Pool: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000000	3	1.0000

* Cross-section test variance is invalid. Hausman statistic set to zero.

** WARNING: estimated cross-section random effects variance is zero.

The above table shows us that the random model is better than the fixed effect model for the regression analysis. Then we choose the random model to do the panel regression.

Table 4-10: Results of pooled estimation and fix-effect model

Variable	Pooled estimation	Random effect model
Constant		-3.194781 (-34.38980)
OFDI	0,063837 (4.891756)	0.001493 (0.504978)
FDI	4.891756 (0.047288)	-0.730297 (-31.85027)
GDS	0.533921 (1.267430)	0.618001 (8.191136)
R^2	0.034942	0.972668
Adjust R^2	-0.014548	0.970511

Comparing the R squares in two models, the random effect model is more proper than the pooled model, so that we take random effect model to analyze the effect from OFDI on domestic investment.

The result from the random model shows that the FDI affect oppositely on the GDI, while GDS has a positive effect on GDI. OFDI plays a positive role on the GDI but its t-statistic isn't significant under a 5% confidence level.

4.2. Results discussion

4.2.1. The results discussion for time series analysis in China

From the outcome of the cointegration analysis, there is a cointegration relationship between OFDI and GDI, which shows that there exists a dynamic and stable balance in the long run so that the overseas investments from Chinese enterprises will promote the economic growth in China on a long view.

In a long time span, Chinese firms actively participate in the competitions in international markets through OFDI to use the foreign resources, capitals, technologies and management experience, so that they can gain the international competitiveness and get the access to the overall economic efficiency with the international divisions.

First, OFDI as a high form of the international economic integration is an important aspect of the development about multinational companies and the economic

globalization. Meanwhile, the OFDI promotes the growth of exports along with the related equipments and services output.

Secondly, using OFDI as a form of multinational operations, the firms will bypass trade barriers and take advantage of the foreign tariffs, credit, exchange markets and preferential policies to improve their economic efficiency. Furthermore, OFDI can also be directly involved in the development of foreign resources to compensate for the lack of domestic resources.

Finally, OFDI can introduce some foreign advanced equipment, technologies and management experience, which will improve the technological level of domestic enterprises.

4.2.2. The results discussion for two different time periods

In the first period, we know that the coefficient of domestic savings is negative and others are both positive. Thereby, we can conclude that domestic savings had a crowing-out effect on the domestic investment if people use their money for saving instead of invested into the market, because there are huge requirements of the investment capital in this time period. Additionally, investment abroad and product development in this period could improve domestic investment development, due to the reason that the increase in products development and the rapid development in investment growth aiming at expanding outward markets. The insignificant coefficient of OFDI is so faint due to the possible reason of the adjustment domestic economic policies, which were carried out and implemented during those years. The tightening monetary policy which advocates increasing of China's domestic savings is another reason, so that the domestic investment will decline.

In the second period, the coefficient of OFDI is positive, which illustrates that there is a positive relationship between OFDI and domestic investment. However, the coefficient is too small to explain the effect on the domestic investment, so the promoting effect from OFDI on the domestic investment could not be considered in this time period. On the other hand, the coefficients of FDI and GDS are significant under the confidence

level of 1%, so we indicate that reducing savings or attracting more foreign investments will change the domestic investment significantly.

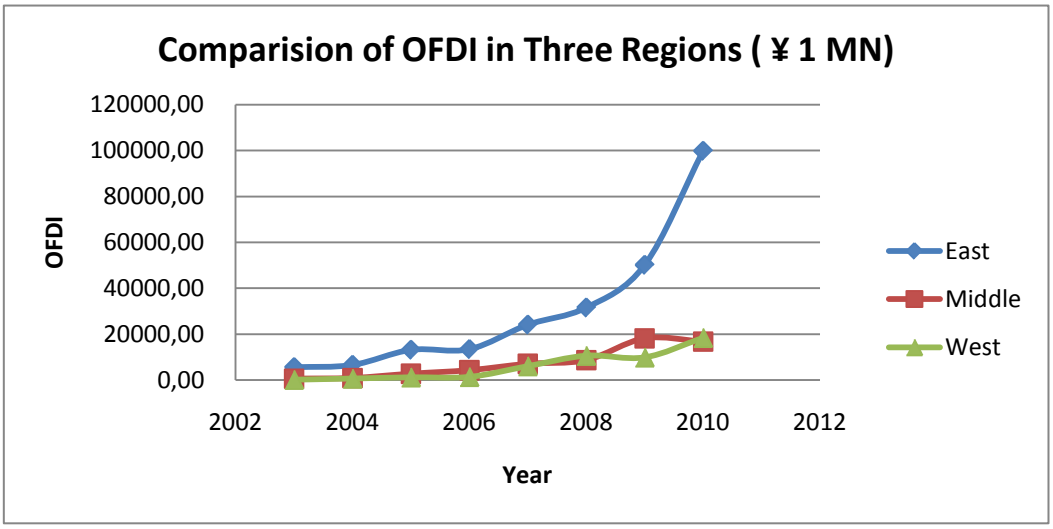
4.2.3. The results discussion for three different regions

The east area in China faces the sea and has the flat land which can provide good conditions for the agriculture. What's more, there are plenty of aquatic products, oil, iron, salt and some other resources. The east has a long history of economic development, a strategic location, a high quality of the workers and advanced technologies which support the east to be a leader in China's economic growth.

The middle part is in the inland central region and contains many plains which make it a grain production base. It has some energy sources, a variety of metal minerals, rich resources of non-metallic minerals and a good foundation of heavy industry.

Most of the vast west region has a cold weather and lacks of water, which is bad for the crops. Because of the late development, the underdeveloped economy and the low technical management level in west lead to a big gap between the middle and east. However, this land is rich in mineral resources which indicate a great development potential.

Graph 4-1: FDI outflows of three different regions in China, 2003-2010



The main differences between the three areas are explained enough about the coefficients in the regression results. In the graph above, the OFDI in the east is much higher than the middle and west due to the fact that the east region has more money and requires more technologies. While in the west, the objective of the OFDI enterprises are mainly on the national strategy level, not on the economic benefits level. The complementary effect between OFDI and domestic investment is showed significantly in east and west area, while in the middle part, the OFDI makes no sense on the domestic investment.

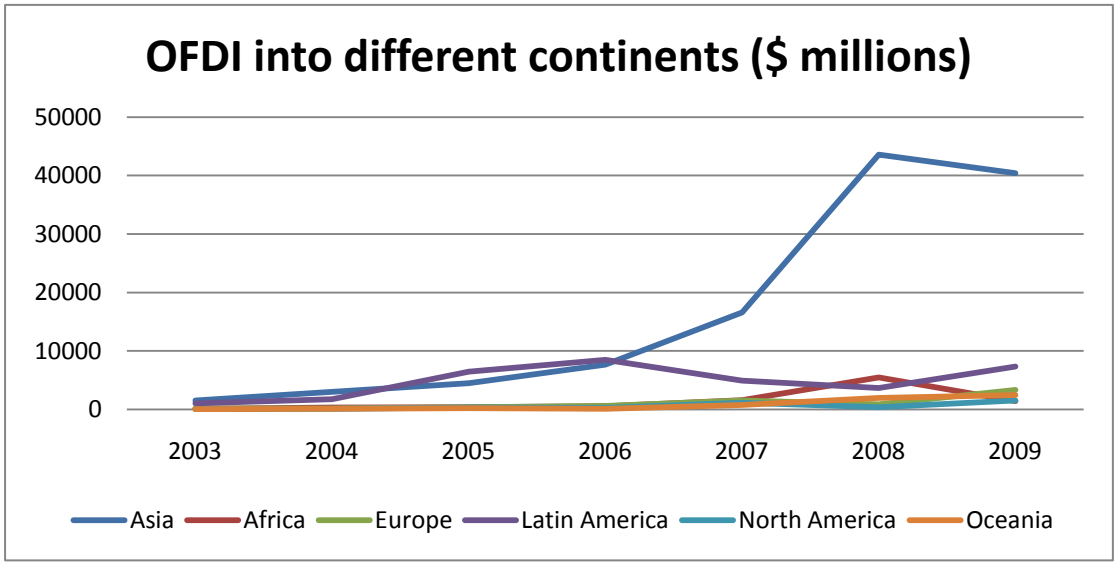
One possible reason is that although OFDI is insignificant in the middle area, sometimes it just means the substitution effect is larger than the complementary effect or in turn in some circumstances. So the coefficients probably don't mean that there is no significant effect, but tells that those two opposite effects might cancel each other out in some situations.

Another reason is that different regions have their own development situations as well as different economic policies, which is a very important aspect of the relationship between OFDI and domestic investment. Thus in this circumstances, we cannot just point out which regression result is right or better than the other, we need to analyze it according to the different situations and draw the conclusion practically.

4.2.4. The results discussion for OFDI into different continents

This part is going to examine the effect of China's abroad investment into different regions of the world on the domestic investment in China, to identify if there are any differences in different continents. The effect of OFDI's receiving continent on GDI has been a subject of debate, as OFDI has recently increased dramatically.

Graph 4-2: OFDI into different continents ($ millions), 2003-2009



In our empirical analysis, the OFDI into different continents make no sense on the gross domestic investment in China, which can find the evidence that the quite small positive coefficient in the equation and the nonsignificant coefficients even though the R^2 is quite high. Therefore, we can make a conclusion that investment into different continents does not have significant promotion on the domestic investment, since the impact strength is negligible to some extent compared to the other variables which show impacts on the domestic investment.

The main reason for that is the outward direct investment is still very much a developed-country phenomenon. Putting all the various economic regions together, it becomes clear that China's OFDI is primarily targeted at developing and emerging economies, where Asia and Hongkong must be the first destination of choice, after that is Latin America is the second most attractive region for China's OFDI and followed by Africa. So Europe, North America and Oceania receive relatively small amounts of China's OFDI. For the fiscal reason, most of Chinese OFDI is officially reported as flowing to Hong Kong and tax havens. Europe and the rest of the world have only a modest share, so even if there is causality between investments into other continents and domestic investments, the intensity of it might be very small. From this point of view, Chinese investment into each continent is growing compared with previous years but remains relatively insignificant to affect the domestic investment.

4.3. Recommendation

The theoretical and empirical researches in the thesis show that outward foreign direct investment promotes the long-term stable growth of China's economy in general and with the development of economic growth, outward foreign direct investment has shown a steady development trend. Chinese government should continue favoring the OFDI strategy in the future. China's OFDI also has some drawbacks, which are the characteristics of Chinese environment. We give some corresponding recommendations in this part.

First, China still has to implement free trade policy because foreign trade is an important force of the economic development. If we don't implement open trade policy or not exploit international trade market, China's surplus labor-intensive products cannot be bought out, the labor will not get paid and the residents' income will drop. This situation will reduce the domestic demand and result in forming a vicious circle, then China's economy cannot develop and the society cannot remain stable either.

Second, China should insist on "Going Global" strategy to coordinate the development of outward foreign direct investment and domestic investment. Looking at the analysis of the current situation of China's OFDI and economic effects, we can conclude that China has experienced a significant growth in OFDI but the growth rate still has some gaps compared with the word level. Because of late start, the scale of OFDI is relatively small and the industry and regional distributions of OFDI is not reasonable. Therefore, oversea investment companies should build its core technology to compete in the international market and strengthen the training of business personnel to become more competitive, so that the OFDI will go on wheels.

Third, there are still some problems in current China's foreign direct investment management regime, such as a long approval time and strict controls. These disadvantages have greatly hindered foreign direct investment by affecting the efficiency and enthusiasm of enterprises. Therefore, China should quickly set up a special foreign direct investment promotion agency which is responsible for drafting the practices and specific policies in the OFDI management. Meanwhile, it should

coordinate with the National Development and Reform Commission (NDRC), the State Administration of Foreign Exchange, the People's Bank of China and Ministry of Finance to provide services for the foreign exchanges, capital investments, asset management and other matters outside the country.

Finally, the foreign invested firms in China should find its competitive advantages and make the best of them. They generally have a small scale and the lack of scales lead to a lack of overall scale economies of foreign investment in industrial sectors. Meanwhile foreign companies with strong capital and large scales quickly capture the market and block the market to the foreign investment enterprises in China. Therefore, Chinese enterprises must strengthen their own economies of scale through mergers and acquisitions to complement each other and obtain economy of scale to compete in the international market.

5. Conclusions

Napoleon called China a "sleeping dragon"; however, looking at the recent economic developments in China, we can clearly see that the dragon is awakening. Since entering into the 21th century, China has experienced a process of progressive liberalization of OFDI, much in line with its economic improvement in general. Now China has become the second largest FDI inflows in the world and also an increasingly important FDI outflows country.

From the previous studies review, the researchers find that FDI outflows both contain positive and negative effects on the economy. Our major aim is to analyze the relationship between OFDI and GDI using econometrics methodology.

Since the reform and "Opening Up" policy in 1979, China's foreign direct investment has gone through four stages and finally taken shape. Hence we divided our data into two periods and compare the regression results from each. What's more, we use the regional data of three parts in China as sub-sample panel data to do analysis. The last section of the empirical analysis is to uncover the relationship between the destination of outward foreign investment and the domestic investment in China.

In the overall regression, after the test of stationarity and cointegration, we revise our model using Johansen test to explore the long-term equilibrium. The overseas investments would bring more domestic investment opportunities in China in both short and long terms during the whole period we choose. While when we analyze the data which is separately by different regions and time periods, different regions show a positive relationship which is much in line with the entire country but divided time periods part argues that there is no clearly relationship between OFDI and GDI. The promoting effect of OFDI only behaves significantly in overall country during the whole period and also in the different regions, but not in separated periods. Considering the limitation of the available data, we cannot revise our model nor undertake some further analysis with the separate periods and the regional panel data. By analyzing results from different regions, we find that the situation is in line with the country level. And the destinations of OFDI make no difference to the effect of OFDI on GDI.

In the last section, we give some recommendations from the micro, medium and macro aspects about China's OFDI. The government should set free the limitations and encourage more overseas investment. The other agencies and foreign investment firms also should make some improvements according to the changes in the international market.

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Appendix

Table 1: The raw data for the regression model, 1986-2010

Year	OFDI ($ 0.1BN)	FDI ($ 0.1BN)	GDI (¥ 0.1BN)	GDS (¥ 0.1BN)	GDP (¥ 0.1BN)
1986	6.29	18.74	3120.60	2237.60	10275.20
1987	6.45	23.14	3791.70	3073.30	12058.60
1988	8.5	31.94	4753.80	3801.50	15042.80
1989	7.8	33.92	4410.40	5146.90	16992.30
1990	8.3	34.87	4517.00	7119.60	18667.80
1991	9.13	43.66	5594.50	9244.90	21781.50
1992	40	110.07	8080.10	11757.30	26923.50
1993	43	275.15	13072.30	15203.50	35333.90
1994	20	337.67	17042.10	21518.80	48197.90
1995	20	375.21	20019.30	29662.30	60793.70
1996	21	417.25	22913.50	38520.80	71176.60
1997	26	452.57	24941.10	46279.80	78973.00
1998	27	454.63	28406.20	53407.50	84402.30
1999	19	403.1871	29854.71	59621.80	89677.10
2000	10	407.1481	32917.73	64332.40	99214.60
2001	69	468.7759	37213.49	73762.40	109655.20
2002	27	527.4286	43499.91	86910.70	120332.70
2003	28.5465	535.0467	55566.61	103617.70	135822.80
2004	54.9799	606.2998	70477.40	119555.40	159878.30
2005	122.6117	603.2459	88773.60	141051.00	184937.40
2006	176.3397	630.2053	109998.20	161587.30	216314.40
2007	265.0609	747.6789	137323.90	172534.20	265810.30
2008	559.0717	923.9544	172828.40	217885.40	314045.40
2009	565.2899	900.3267	224598.80	260771.70	340506.90
2010	590	1057	278140.00	303302.00	397983.00

Table 2: Processed data for the regression model, 1986-2010

Time Period	Year	OFDI	FDI	GDI	GDS	GDP	Exchange
First Period (1986-1998): Rapid development & Adjustment and development	1986	21.7181	64.7055	3120.60	2237.60	10275.20	345.28
	1987	24.0075	86.1294	3791.70	3073.30	12058.60	372.21
	1988	31.6379	118.8839	4753.80	3801.50	15042.80	372.21
	1989	29.3678	127.7122	4410.40	5146.90	16992.30	376.51
	1990	39.7006	166.7902	4517.00	7119.60	18667.80	478.32
	1991	48.6017	232.4153	5594.50	9244.90	21781.50	532.33
	1992	220.5840	606.9920	8080.10	11757.30	26923.50	551.46
	1993	247.7660	1585.4143	13072.30	15203.50	35333.90	576.20
	1994	172.3740	2910.2764	17042.10	21518.80	48197.90	861.87
	1995	167.0200	3133.3787	20019.30	29662.30	60793.70	835.10
	1996	174.5982	3469.1000	22913.50	38520.80	71176.60	831.42
	1997	215.5348	3751.7148	24941.10	46279.80	78973.00	828.98
	1998	223.5357	3763.9272	28406.20	53407.50	84402.30	827.91
Second Period (1999-2010): “Going Global” strategy	1999	157.2877	3337.7038	29854.71	59621.80	89677.10	827.83
	2000	82.7840	3370.5348	32917.73	64332.40	99214.60	827.84
	2001	571.1130	3880.0581	37213.49	73762.40	109655.20	827.70
	2002	223.4790	4365.5265	43499.91	86910.70	120332.70	827.70
	2003	236.2794	4428.5815	55566.61	103617.70	135822.80	827.70
	2004	455.0576	5018.2222	70477.40	119555.40	159878.30	827.68
	2005	1004.3983	4941.6094	88773.60	141051.00	184937.40	819.17
	2006	1405.7448	5023.8706	109998.20	161587.30	216314.40	797.18
	2007	2015.5231	5685.3504	137323.90	172534.20	265810.30	760.40
	2008	3882.8089	6416.9557	172828.40	217885.40	314045.40	694.51
	2009	3861.4953	6150.1317	224598.80	260771.70	340506.90	683.10
	2010	3998.4300	7163.2890	278140.00	303302.00	397983.00	677.70

Table 3: The raw data of OFDI for each province in China, 2003-2009

OFDI ($ 0.01Million)							
Year / Province	2003	2004	2005	2006	2007	2008	2009
Beijing	30054	15739	11306	6981	9440	20582	30581
Shanghai	5224	20564	66680	31629	33864	32543	98752
Guangdong	9555	13893	20708	57039	88991	121394	77388
Hunan	255	296	3067	6888	29000	46502	101628
Zhejiang	3665	7225	15817	19165	45898	50558	78207
Liaoning	847	4141	3019	10484	7703	32558	88076
Jiangsu	2490	5733	10828	12595	23996	27025	69778
Shandong	8883	7523	15904	10225	29076	48627	90934
Jilin	163	2887	1083	2948	17624	7416	33841
Shanxi	4562	411	562	1179	3194	2754	32576
Fujian	6162	1591	4253	10387	30932	27939	31080
Yunnan	251	491	2072	4364	13621	23915	27001
Sichuan	147	506	2666	2739	1389	12799	26093
Tianjin	544	1754	1887	3331	17578	15277	18798
Neimeng	220	667	2181	2110	1000	460	18525
Henan	604	469	8538	4812	3516	23636	17832
Hebei	110	1286	8538	214	3615	4709	15152
Heilongjiang	744	5645	16643	31957	24477	14285	12936
Xinjiang	121	3500	1757	1455	29553	16363	19237
Anhui	200	614	1902	2989	1616	5315	5720
Hainan	0	0	6	343	119	113	7454
Jiangxi	320	93	654	375	1436	1446	4038
Chongqing	0	985	590	658	5101	11215	5194
Gansu	83	317	3770	2087	17826	38651	1637
Ningxia	0	137	109	1818	30	1571	1254
Hubei	176	131	485	359	4253	3450	10947
Guizhou	0	0	0	0	51	15	522
Qinghai	102	0	100	80	110	202	208
Shan’Xi	21	234	302	118	1583	14499	13230
Guangxi	208	450	321	759	2665	8537	6463
Xizang	0	0	0	0	0	0	0

Table 4: The raw data of GDP for each province in China, 2003-2009

GDP (¥ 0.1billion)							
Year / Province	2003	2004	2005	2006	2007	2008	2009
Beijing	3611.9	4283.3	6814.5	3538	8879	10488.03	11469.28
Shanghai	6250.81	7450.27	9125	4781.9	11658	13698.15	14344.73
Guangdong	13449.93	16040	21701.28	11416.8	29863	35696.46	37775.49
Hunan	4633.73	5612.26	6237	3206.2	8366	11156.64	12299.85
Zhejiang	9200	11243	13365	7123	17633	21486.92	22716.98
Liaoning	6002.5	6872.65	7920	3672.1	10418	13461.57	14696.23
Jiangsu	12451.8	15000	18272.12	9871.2	24738	30312.61	33478.76
Shandong	12430	15490.7	18468.3	10206.4	25326	31072.06	33621.32
Jilin	2521.8	2958.21	3614.92	1550.6	4693	6424.06	7072.25
Shanxi	2445.6	3042.4	4000	2112.3	5465	6938.73	7050.38
Fujian	5241.73	6053	6487	3157.2	8440	10823.11	11855.08
Yunnan	2458.8	2959.48	3400	1670.1	4260	5700.1	6178.25
Sichuan	5456.3	6556	7385.1	3726.1	9657	12506.25	14050.78
Tianjin	2386.94	2931.88	3663.86	1986	5014	6354.38	7068.56
Neimeng	2092.86	2700	3822.7	1776.1	6140	7761.8	8967.52
Henan	7025.93	8815.09	10535.2	5506.9	14234	18407.78	19724.73
Hebei	7095.4	8836.9	10116.6	5146.9	13387	16188.61	17067.99
Heilongjiang	4433	5305	5510	2575	7081	8310	8257.24
Xinjiang	1875	2203	2680	1052	3305	4203.41	4005.41
Anhui	3973.2	4812.7	5375.8	2886.1	6906	8874.17	10191.48
Hainan	698.3	790.12	903.6	491.6	1121	1459.23	1585.19
Jiangxi	2830	3500	4070	1839.8	5323	6480.33	6954.12
Chongqing	2250.11	2650	3069.1	1468.1	3938	5096.66	5693.58
Gansu	1301.06	1540	1894	897.9	2494	3176.11	3373.78
Ningxia	385	460.3	525	285	769	1098.51	1198.15
Hubei	5395.91	6320	6000	3288.3	8451	11330.38	12566.05
Guizhou	1344.31	1591.5	1910	930	2543	3333.4	3662.43
Qinghai	390.16	465.73	903.6	275.1	706	961.53	1012.69
Shan’Xi	2398.58	2883.5	3674.75	1858.1	4806	6851.32	7752.2
Guangxi	2733.21	450	321	2012.5	5386	7171.58	7903.47
Xizang	184.59	0	0	113.4	326	395.91	434.34

Table 5: The raw data of GDS for each province in China, 2003-2009

GDS (¥ 0.1billion)							
Year / Province	2003	2004	2005	2006	2007	2008	2009
Beijing	5293.5	6122.4	7477.7	8703.8	9155.3	11952.8	14672.1
Shanghai	1825.5	2116.7	2461.5	2807.4	3083.1	3978.0	4885.9
Guangdong	5457.0	6207.5	7084.0	8014.2	8922.4	11434.7	13551.1
Hunan	2781.5	3342.3	4119.7	4796.2	5422.4	7048.6	8099.4
Zhejiang	1355.5	1603.9	1973.6	2271.4	2541.9	3211.7	3914.0
Liaoning	5434.9	6048.5	6950.2	7701.2	8071.5	10154.7	12030.9
Jiangsu	2161.4	2405.6	2798.1	3107.5	3186.8	3923.1	4614.4
Shandong	3342.4	3585.5	4078.6	4373.6	4478.2	5545.1	6430.1
Jilin	5103.2	6116.1	7665.6	8727.0	8745.2	11464.2	13707.3
Shanxi	7638.2	8863.1	10581.3	12183.4	13014.9	16718.7	20080.6
Fujian	6452.2	7364.1	8746.0	10473.5	11162.8	14504.7	17833.4
Yunnan	2475.8	2972.4	3508.7	4077.8	4546.5	5647.5	6619.5
Sichuan	2924.7	3322.3	3903.1	4478.1	4709.7	5853.5	7078.8
Tianjin	2015.5	2347.7	2752.9	3151.7	3360.8	4166.2	5092.7
Neimeng	6768.4	7721.5	9035.1	10358.0	11438.1	14382.2	17082.8
Henan	4919.1	5607.3	6488.6	7367.4	7812.2	9515.8	11207.4
Hebei	3296.5	3860.7	4465.8	5103.4	5430.8	6745.4	8163.5
Heilongjiang	3036.5	3483.2	4092.1	4762.3	5321.7	6549.5	7809.8
Xinjiang	14061.8	16193.4	19051.4	21583.3	22243.4	27500.7	31411.4
Anhui	1971.7	2240.1	2561.3	2946.2	3185.3	3852.0	4686.2
Hainan	546.9	615.9	697.6	790.6	863.1	1058.5	1282.9
Jiangxi	1896.6	2189.7	2545.9	2949.1	3228.2	3989.0	4908.7
Chongqing	4333.8	5019.4	5902.7	6787.7	7450.9	9646.7	11575.2
Gansu	912.8	1094.6	1350.9	1596.9	1790.1	2237.1	2676.1
Ningxia	1766.5	2052.1	2430.3	2854.9	3046.4	3783.8	4668.6
Hubei	91.9	107.5	123.1	139.8	159.6	184.9	226.4
Guizhou	2519.9	2948.4	3534.0	4067.6	4278.4	5494.5	6743.8
Qinghai	1217.4	1384.9	1586.7	1823.4	1915.0	2461.9	3026.9
Shan’Xi	260.5	299.3	348.9	406.3	442.3	580.5	711.3
Guangxi	377.7	425.5	509.5	581.1	614.0	794.1	967.7
Xizang	1371.8	1534.7	1816.4	2035.6	2054.9	2553.0	3050.8

Table 6: The raw data of FDI for each province in China, 2003-2009

FDI (¥ 0.1billion)							
Year / Province	2003	2004	2005	2006	2007	2008	2009
Beijing	463.3	531.6	606.7	697.0	876.2	982.9	1066.1
Shanghai	415.5	470.4	567.7	686.0	828.9	938.1	977.2
Guangdong	175.2	200.6	219.3	247.0	291.1	338.4	370.4
Hunan	61.2	69.1	77.1	111.0	177.9	180.0	205.0
Zhejiang	38.4	108.1	126.4	148.0	171.5	221.6	239.9
Liaoning	735.0	679.2	815.0	945.0	1087.7	1247.6	1317.8
Jiangsu	182.6	193.5	207.1	308.0	313.3	174.9	192.7
Shandong	81.2	94.7	109.8	137.0	144.9	161.7	180.5
Jilin	1508.2	1721.9	2006.7	2255.0	2570.3	2939.9	3084.3
Shanxi	1500.1	2169.8	2657.2	3243.0	3820.3	4159.3	4443.9
Fujian	612.3	834.3	1019.1	1257.0	1456.6	1582.6	1640.0
Yunnan	116.4	129.4	154.8	183.0	237.5	254.6	279.1
Sichuan	661.2	688.8	753.3	878.0	1027.1	1121.3	1174.5
Tianjin	136.7	163.3	184.9	232.0	289.7	334.8	369.1
Neimeng	596.6	694.1	786.2	885.0	963.1	1011.6	1119.9
Henan	126.3	148.6	206.4	233.0	256.6	293.0	346.6
Hebei	176.8	226.9	257.8	280.0	313.4	340.3	377.2
Heilongjiang	102.1	119.1	158.2	213.0	243.2	266.2	279.6
Xinjiang	2412.6	2609.6	2889.2	3143.0	3507.0	3726.5	3939.3
Anhui	104.5	126.8	147.1	180.0	219.1	258.3	272.0
Hainan	89.0	86.3	92.0	118.0	941.0	966.6	903.4
Jiangxi	65.5	72.5	80.3	93.0	197.7	238.5	278.0
Chongqing	136.3	139.8	166.0	199.0	268.7	421.1	461.2
Gansu	21.0	22.3	23.4	26.0	28.0	32.2	35.7
Ningxia	73.1	78.9	84.2	107.0	118.3	141.1	158.9
Hubei	3.6	3.3	3.5	4.0	5.1	5.5	6.4
Guizhou	116.0	124.6	137.0	149.0	164.7	136.9	162.0
Qinghai	21.6	30.6	31.6	28.0	30.6	38.3	49.2
Shan’Xi	7.9	9.6	7.0	20.0	24.3	33.1	28.4
Guangxi	38.8	40.7	44.6	44.0	21.8	24.5	25.3
Xizang	12.5	14.5	18.5	26.0	30.9	45.6	47.8

Table 7: The raw data of GDI for each province in China, 2003-2009

GDI (¥ 0.1billion)							
Year / Province	2003	2004	2005	2006	2007	2008	2009
Beijing	1796.1	2169.3	2528.2	2827.2	3296.4	3907.2	3814.7
Shanghai	807.5	1039.4	1245.7	1495.1	1820.5	2353.1	3389.8
Guangdong	2020.4	2478.0	3218.8	4139.7	5470.2	6884.7	8866.6
Hunan	813.4	1100.9	1443.9	1826.6	2255.7	2861.5	3531.2
Zhejiang	707.9	1174.7	1788.0	2643.6	3363.2	4372.9	5475.4
Liaoning	1605.6	2076.4	2979.6	4200.4	5689.6	7435.2	10019.1
Jiangsu	834.2	969.0	1169.1	1741.1	2594.3	3651.4	5038.9
Shandong	1046.2	1166.2	1430.8	1737.3	2236.0	2833.5	3656.0
Jilin	2213.7	2499.1	3050.3	3509.7	3900.0	4420.4	4823.1
Shanxi	3450.1	5233.0	6557.1	8165.4	10069.2	12268.1	15300.6
Fujian	3477.5	4740.3	5781.4	6520.1	7590.2	8420.4	9323.0
Yunnan	1074.5	1418.7	1935.3	2525.1	3533.6	5087.5	6747.0
Sichuan	1253.1	1496.4	1892.9	2316.7	2981.8	4287.8	5207.7
Tianjin	889.0	1303.2	1713.2	2176.6	2683.6	3301.9	4745.4
Mongolia	3483.3	5315.1	6970.6	9307.3	11111.4	12537.7	15435.9
Henan	1725.9	2263.0	3099.4	4311.6	5904.7	8010.1	10490.6
Hebei	1605.1	1809.5	2264.8	2676.6	3343.5	4330.4	5647.0
Heilongjiang	1348.0	1590.3	2072.6	2629.1	3175.5	4154.8	5534.0
Xinjiang	3850.8	4813.2	5870.0	6977.9	7973.4	9294.3	10868.7
Anhui	750.3	921.3	1236.5	1661.2	2198.7	2939.7	3756.4
Hainan	225.4	280.0	317.1	367.2	423.9	502.4	705.4
Jiangxi	899.3	1161.5	1537.1	1933.2	2407.4	3127.7	3979.6
Chongqing	1902.7	2336.3	2818.4	3585.2	4412.9	5639.8	7127.8
Gansu	633.0	748.1	865.2	998.3	1197.4	1488.8	1864.5
Ningxia	814.6	1000.1	1291.5	1777.6	2208.6	2759.0	3435.9
Hubei	106.6	134.0	162.4	181.4	231.1	270.3	309.9
Guizhou	915.3	1200.7	1508.9	1882.2	2480.7	3415.0	4614.4
Qinghai	526.2	619.8	733.9	870.4	1022.6	1304.2	1712.8
Shan’Xi	232.3	255.6	289.2	329.8	408.5	482.8	583.2
Guangxi	227.0	318.0	376.2	443.3	498.7	599.8	828.9
Tibet	800.1	973.4	1147.2	1339.1	1567.1	1850.8	2260.0

Table 8: Panel data for the east region, 1986-2010

East	Province	2003	2004	2005	2006	2007	2008	2009
GDI (¥ 0.1billion)	Beijing	1796.1	2169.3	2528.2	2827.2	3296.4	3907.2	3814.7
	Shanghai	807.5	1039.4	1245.7	1495.1	1820.5	2353.1	3389.8
	Guangdong	2020.4	2478	3218.8	4139.7	5470.2	6884.7	8866.6
	Zhejiang	707.9	1174.7	1788	2643.6	3363.2	4372.9	5475.4
	Liaoning	1605.6	2076.4	2979.6	4200.4	5689.6	7435.2	10019.1
	Jiangsu	834.2	969	1169.1	1741.1	2594.3	3651.4	5038.9
	Shandong	1046.2	1166.2	1430.8	1737.3	2236	2833.5	3656
	Fujian	3477.5	4740.3	5781.4	6520.1	7590.2	8420.4	9323
	Tianjin	889	1303.2	1713.2	2176.6	2683.6	3301.9	4745.4
	Hebei	1605.1	1809.5	2264.8	2676.6	3343.5	4330.4	5647
	Hainan	225.4	280	317.1	367.2	423.9	502.4	705.4
OFDI (¥ 0.1billion)	Beijing	24.8757	13.02686	9.261536	5.565114	7.178176	14.2944	20.88988
	Shanghai	4.323905	17.02041	54.62226	25.21401	25.75019	22.60144	67.45749
	Guangdong	7.908674	11.49896	16.96337	45.47035	67.66876	84.30935	52.86374
	Zhejiang	3.033521	5.979988	12.95681	15.27795	34.90084	35.11304	53.4232
	Liaoning	0.701062	3.427423	2.473074	8.357635	5.857361	22.61186	60.16472
	Jiangsu	2.060973	4.745089	8.869973	10.04048	18.24656	18.76913	47.66535
	Shandong	7.352459	6.226637	13.02808	8.151166	22.10939	33.77194	62.11702
	Fujian	5.100287	1.316839	3.48393	8.280309	23.52069	19.40391	21.23075
	Tianjin	0.450269	1.451751	1.545774	2.655407	13.36631	10.61003	12.84091
	Hebei	0.091047	1.064396	6.994073	0.170597	2.748846	3.270448	10.35033
	Hainan	0	0	0.004915	0.273433	0.090488	0.07848	5.091827
FDI (¥ 0.1billion)	Beijing	463.3	531.6	606.7	697	876.2	982.9	1066.1
	Shanghai	415.5	470.4	567.7	686	828.9	938.1	977.2
	Guangdong	175.2	200.6	219.3	247	291.1	338.4	370.4
	Zhejiang	38.4	108.1	126.4	148	171.5	221.6	239.9
	Liaoning	735	679.2	815	945	1087.7	1247.6	1317.8
	Jiangsu	182.6	193.5	207.1	308	313.3	174.9	192.7
	Shandong	81.2	94.7	109.8	137	144.9	161.7	180.5
	Fujian	612.3	834.3	1019.1	1257	1456.6	1582.6	1640
	Tianjin	136.7	163.3	184.9	232	289.7	334.8	369.1
	Hebei	176.8	226.9	257.8	280	313.4	340.3	377.2
	Hainan	89	86.3	92	118	941	966.6	903.4
GDS (¥ 0.1billion)	Beijing	463.3	531.6	606.7	697	876.2	982.9	1066.1
	Shanghai	415.5	470.4	567.7	686	828.9	938.1	977.2
	Guangdong	175.2	200.6	219.3	247	291.1	338.4	370.4
	Zhejiang	38.4	108.1	126.4	148	171.5	221.6	239.9
	Liaoning	735	679.2	815	945	1087.7	1247.6	1317.8
	Jiangsu	182.6	193.5	207.1	308	313.3	174.9	192.7
	Shandong	81.2	94.7	109.8	137	144.9	161.7	180.5
	Fujian	612.3	834.3	1019.1	1257	1456.6	1582.6	1640
	Tianjin	136.7	163.3	184.9	232	289.7	334.8	369.1
	Hebei	176.8	226.9	257.8	280	313.4	340.3	377.2
	Hainan	89	86.3	92	118	941	966.6	903.4
GDP (¥ 0.1billion)	Beijing	3611.9	4283.3	6814.5	3538	8879	10488.03	11469.28
	Shanghai	6250.81	7450.27	9125	4781.9	11658	13698.15	14344.73
	Guangdong	13449.93	16040	21701.28	11416.8	29863	35696.46	37775.49
	Zhejiang	9200	11243	13365	7123	17633	21486.92	22716.98
	Liaoning	6002.5	6872.65	7920	3672.1	10418	13461.57	14696.23
	Jiangsu	12451.8	15000	18272.12	9871.2	24738	30312.61	33478.76
	Shandong	12430	15490.7	18468.3	10206.4	25326	31072.06	33621.32
	Fujian	5241.73	6053	6487	3157.2	8440	10823.11	11855.08
	Tianjin	2386.94	2931.88	3663.86	1986	5014	6354.38	7068.56
	Hebei	7095.4	8836.9	10116.6	5146.9	13387	16188.61	17067.99
	Hainan	698.3	790.12	903.6	491.6	1121	1459.23	1585.19

Table 9: Panel data for the middle region, 1986-2010

Middle	Year	2003	2004	2005	2006	2007	2008	2009
GDI (¥ 0.1billion)	Hunan	0.175539	0.19616	0.231506	0.569709	0.269627	0.256484	0.287093
	Jilin	0.877825	0.844801	0.843808	2.263446	0.831025	0.688101	0.681975
	Shanxi	1.410738	1.720024	1.639275	3.865644	1.842489	1.768061	2.170181
	Henan	0.245647	0.256719	0.294195	0.782945	0.414831	0.435148	0.53185
	Heilongjiang	0.304083	0.299774	0.376152	1.02101	0.448454	0.499976	0.6702
	Anhui	0.18884	0.191431	0.230012	0.575586	0.318375	0.331265	0.368582
	Jiangxi	0.317774	0.331857	0.377666	1.050766	0.452264	0.482645	0.572265
	Hubei	0.019756	0.021203	0.027067	0.055165	0.027346	0.023856	0.024662
OFDI (¥ 0.1billion)	Hunan	4.55E-05	4.37E-05	0.000403	0.001713	0.002636	0.002895	0.005644
	Jilin	5.35E-05	0.000808	0.000245	0.001516	0.002856	0.000802	0.003269
	Shanxi	0.001544	0.000112	0.000115	0.000445	0.000444	0.000276	0.003156
	Henan	7.12E-05	4.4E-05	0.000664	0.000697	0.000188	0.000892	0.000618
	Heilongjiang	0.000139	0.000881	0.002474	0.009893	0.002628	0.001194	0.00107
	Anhui	4.17E-05	0.000106	0.00029	0.000826	0.000178	0.000416	0.000383
	Jiangxi	9.36E-05	2.2E-05	0.000132	0.000162	0.000205	0.000155	0.000397
	Hubei	2.7E-05	1.72E-05	6.62E-05	8.7E-05	0.000383	0.000211	0.000595
FDI (¥ 0.1billion)	Hunan	0.013208	0.012312	0.012362	0.03462	0.021265	0.016134	0.016667
	Jilin	0.598065	0.582075	0.555116	1.454276	0.547688	0.457639	0.436113
	Shanxi	0.613387	0.713187	0.6643	1.535293	0.699048	0.599432	0.630306
	Henan	0.017976	0.016857	0.019591	0.042311	0.018027	0.015917	0.017572
	Heilongjiang	0.023032	0.022451	0.028711	0.082718	0.034345	0.032034	0.033861
	Anhui	0.026301	0.026347	0.027363	0.062368	0.031726	0.029107	0.026689
	Jiangxi	0.023145	0.020714	0.01973	0.050549	0.037141	0.036804	0.039976
	Hubei	0.000667	0.000522	0.000583	0.001216	0.000603	0.000485	0.000509
GDS (¥ 0.1billion)	Hunan	0.600272	0.595535	0.660526	1.495914	0.648147	0.631785	0.658496
	Jilin	2.023634	2.0675	2.120545	5.628144	1.863456	1.784572	1.938181
	Shanxi	3.123242	2.913194	2.645325	5.767836	2.3815	2.409476	2.848159
	Henan	0.700135	0.636102	0.615897	1.337849	0.548841	0.516944	0.56819
	Heilongjiang	0.684976	0.656588	0.742668	1.849437	0.751546	0.788147	0.945812
	Anhui	0.49625	0.465456	0.47645	1.020824	0.461237	0.434069	0.459815
	Jiangxi	0.670177	0.625629	0.625528	1.602946	0.606463	0.615555	0.705869
	Hubei	0.017031	0.017009	0.020517	0.042514	0.018885	0.016319	0.018017
GDP (¥ 0.1billion)	Hunan	4633.73	5612.26	6237	3206.2	8366	11156.64	12299.85
	Jilin	2521.8	2958.21	3614.92	1550.6	4693	6424.06	7072.25
	Shanxi	2445.6	3042.4	4000	2112.3	5465	6938.73	7050.38
	Henan	7025.93	8815.09	10535.2	5506.9	14234	18407.78	19724.73
	Heilongjiang	4433	5305	5510	2575	7081	8310	8257.24
	Anhui	3973.2	4812.7	5375.8	2886.1	6906	8874.17	10191.48
	Jiangxi	2830	3500	4070	1839.8	5323	6480.33	6954.12
	Hubei	5395.91	6320	6000	3288.3	8451	11330.38	12566.05

Table 10: Panel data for the west region, 1986-2010

West	Year	2003	2004	2005	2006	2007	2008	2009
GDI (¥ 0.1billion)	Yunnan	1074.5	1418.7	1935.3	2525.1	3533.6	5087.5	6747
	Sichuan	1253.1	1496.4	1892.9	2316.7	2981.8	4287.8	5207.7
	Mongolia	3483.3	5315.1	6970.6	9307.3	11111.4	12537.7	15435.9
	Xinjiang	3850.8	4813.2	5870	6977.9	7973.4	9294.3	10868.7
	Chongqing	1902.7	2336.3	2818.4	3585.2	4412.9	5639.8	7127.8
	Gansu	633	748.1	865.2	998.3	1197.4	1488.8	1864.5
	Ningxia	814.6	1000.1	1291.5	1777.6	2208.6	2759	3435.9
	Guizhou	915.3	1200.7	1508.9	1882.2	2480.7	3415	4614.4
	Qinghai	526.2	619.8	733.9	870.4	1022.6	1304.2	1712.8
	Shan'Xi	232.3	255.6	289.2	329.8	408.5	482.8	583.2
	Guangxi	227	318	376.2	443.3	498.7	599.8	828.9
OFDI (¥ 0.1billion)	Yunnan	0.207753	0.406391	1.69732	3.478894	10.35741	16.60921	18.44438
	Sichuan	0.121672	0.418806	2.183907	2.183476	1.056196	8.889033	17.82413
	Neimeng	0.182094	0.552063	1.78661	1.68205	0.7604	0.319475	12.65443
	Xinjiang	0.100152	2.89688	1.439282	1.159897	22.4721	11.36427	13.14079
	Chongqing	0	0.815265	0.48331	0.524544	3.8788	7.78893	3.548021
	Gansu	0.068699	0.262375	3.088271	1.663715	13.55489	26.84351	1.118235
	Ningxia	0	0.113392	0.08929	1.449273	0.022812	1.091075	0.856607
	Guizhou	0	0	0	0	0.03878	0.010418	0.356578
	Qinghai	0.084425	0	0.081917	0.063774	0.083644	0.140291	0.142085
	Shan'Xi	0.017382	0.193677	0.247389	0.094067	1.203713	10.0697	9.037413
	Guangxi	0.172162	0.372456	0.262954	0.60506	2.026466	5.929032	4.414875
FDI (¥ 0.1billion)	Yunnan	116.4	129.4	154.8	183	237.5	254.6	279.1
	Sichuan	661.2	688.8	753.3	878	1027.1	1121.3	1174.5
	Neimeng	596.6	694.1	786.2	885	963.1	1011.6	1119.9
	Xinjiang	2412.6	2609.6	2889.2	3143	3507	3726.5	3939.3
	Chongqing	136.3	139.8	166	199	268.7	421.1	461.2
	Gansu	21	22.3	23.4	26	28	32.2	35.7
	Ningxia	73.1	78.9	84.2	107	118.3	141.1	158.9
	Guizhou	116	124.6	137	149	164.7	136.9	162
	Qinghai	21.6	30.6	31.6	28	30.6	38.3	49.2
	Shan'Xi	7.9	9.6	7	20	24.3	33.1	28.4
	Guangxi	38.8	40.7	44.6	44	21.8	24.5	25.3
GDS (¥ 0.1billion)	Yunnan	2475.8	2972.4	3508.7	4077.8	4546.5	5647.5	6619.5
	Sichuan	2924.7	3322.3	3903.1	4478.1	4709.7	5853.5	7078.8
	Neimeng	6768.4	7721.5	9035.1	10358	11438.1	14382.2	17082.8
	Xinjiang	14061.8	16193.4	19051.4	21583.3	22243.4	27500.7	31411.4
	Chongqing	4333.8	5019.4	5902.7	6787.7	7450.9	9646.7	11575.2
	Gansu	912.8	1094.6	1350.9	1596.9	1790.1	2237.1	2676.1
	Ningxia	1766.5	2052.1	2430.3	2854.9	3046.4	3783.8	4668.6
	Guizhou	2519.9	2948.4	3534	4067.6	4278.4	5494.5	6743.8
	Qinghai	1217.4	1384.9	1586.7	1823.4	1915	2461.9	3026.9
	Shan'Xi	260.5	299.3	348.9	406.3	442.3	580.5	711.3
	Guangxi	377.7	425.5	509.5	581.1	614	794.1	967.7
GDP (¥ 0.1billion)	Yunnan	2458.8	2959.48	3400	1670.1	4260	5700.1	6178.25
	Sichuan	5456.3	6556	7385.1	3726.1	9657	12506.25	14050.78
	Neimeng	2092.86	2700	3822.7	1776.1	6140	7761.8	8967.52
	Xinjiang	1875	2203	2680	1052	3305	4203.41	4005.41
	Chongqing	2250.11	2650	3069.1	1468.1	3938	5096.66	5693.58
	Gansu	1301.06	1540	1894	897.9	2494	3176.11	3373.78
	Ningxia	385	460.3	525	285	769	1098.51	1198.15
	Guizhou	1344.31	1591.5	1910	930	2543	3333.4	3662.43
	Qinghai	390.16	465.73	903.6	275.1	706	961.53	1012.69
	Shan'Xi	2398.58	2883.5	3674.75	1858.1	4806	6851.32	7752.2
	Guangxi	2733.21	450	321	2012.5	5386	7171.58	7903.47

Table 11: Raw data of OFDI into different continents ($ 1million), 2003-2009

OFDI-world	Asia	Africa	Europe	Latin America	North America	Oceania
2003	1505,03	74,81	145,03	1038,15	57,75	33,88
2004	3013,99	317,43	157,21	1762,72	126,49	120,15
2005	4484,17	391,68	395,49	6466,16	320,84	202,83
2006	7663,25	519,86	597,71	8468,74	258,05	126,36
2007	16593,15	1574,31	1540,43	4902,41	1125,71	770,06
2008	43547,5	5490,55	875,79	3677,25	364,21	1951,87
2009	40407,59	1438,87	3352,72	7327,9	1521,93	2479,98

Table 12: Processed data of OFDI into different continents (¥ 0.1billion), 2003-2009

OFDI-world	Asia	Africa	Europe	Latin America	North America	Oceania
2003	124.57	6.19	12.00	85.93	4.78	2.80
2004	249.46	26.27	13.01	145.90	10.47	9.94
2005	367.33	32.09	32.40	529.69	26.28	16.62
2006	610.90	41.44	47.65	675.11	20.57	10.07
2007	1261.74	119.71	117.13	372.78	85.60	58.56
2008	3024.42	381.32	60.82	255.39	25.29	135.56
2009	2760.24	98.29	229.02	500.57	103.96	169.41

Table 13: Regression Result from the Model of Overall of China

Dependent Variable: L_GDI
Method: Least Squares
Date: 05/24/11 Time: 10:15
Sample: 1986 2010
Included observations: 25

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.004774	0.350975	0.013601	0.9893
L_OFDI	0.197793	0.048861	4.048055	0.0006
L_FDI	-0.115111	0.061831	-1.861717	0.0767
L_GDS	0.475800	0.117651	4.044150	0.0006

R-squared	0.727022	Mean dependent var	-0.992301
Adjusted R-squared	0.688025	S.D. dependent var	0.280689
S.E. of regression	0.156778	Akaike info criterion	-0.722321

Sum squared resid	0.516169	Schwarz criterion	-0.527300
Log likelihood	13.02901	Hannan-Quinn criter.	-0.668230
F-statistic	18.64305	Durbin-Watson stat	0.945190
Prob(F-statistic)	0.000004		

Table 14: Regression Result of the first period, 1986-1998

Dependent Variable: L_GDI
Method: Least Squares
Date: 05/24/11 Time: 12:47
Sample: 1986 1998
Included observations: 13

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.628627	0.230920	-2.722271	0.0235
L_OFDI	0.013815	0.045592	0.303007	0.7688
L_FDI	0.220602	0.042360	5.207802	0.0006
L_GDS	-0.421374	0.106145	-3.969787	0.0033

R-squared	0.810023	Mean dependent var	-1.180848
Adjusted R-squared	0.746697	S.D. dependent var	0.125796
S.E. of regression	0.063312	Akaike info criterion	-2.433822
Sum squared resid	0.036076	Schwarz criterion	-2.259991
Log likelihood	19.81984	Hannan-Quinn criter.	-2.469552
F-statistic	12.79140	Durbin-Watson stat	1.274359
Prob(F-statistic)	0.001350		

Table 15: Regression Result of the second period, 1999-2010

Dependent Variable: L_GDI
Method: Least Squares
Date: 05/24/11 Time: 12:51
Sample: 1999 2010
Included observations: 12

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.370422	0.401886	-8.386508	0.0000
L_OFDI	0.005126	0.023765	0.215711	0.8346
L_FDI	-0.808286	0.076137	-10.61618	0.0000
L_GDS	0.926445	0.169112	5.478296	0.0006

R-squared	0.986286	Mean dependent var	-0.788041
Adjusted R-squared	0.981143	S.D. dependent var	0.259048
S.E. of regression	0.035573	Akaike info criterion	-3.573271
Sum squared resid	0.010123	Schwarz criterion	-3.411635
Log likelihood	25.43963	Hannan-Quinn criter.	-3.633114
F-statistic	191.7779	Durbin-Watson stat	2.380023
Prob(F-statistic)	0.000000		

Table 16: Regression result of different regions_east (pooled data)

Dependent Variable: GDI?
Method: Pooled Least Squares
Date: 05/25/11 Time: 18:35
Sample: 2003 2009
Included observations: 7
Cross-sections included: 11
Total pool (balanced) observations: 77

Variable	Coefficient	Std. Error	t-Statistic	Prob.
OFDI?	29.96859	14.01761	2.137925	0.0358
FDI?	0.314297	0.173249	1.814138	0.0737
GDS?	0.446259	0.039080	11.41920	0.0000

R-squared	0.636221	Mean dependent var	0.370549
Adjusted R-squared	0.626389	S.D. dependent var	0.319857
S.E. of regression	0.195508	Akaike info criterion	-0.388246
Sum squared resid	2.828539	Schwarz criterion	-0.296929
Log likelihood	17.94746	Hannan-Quinn criter.	-0.351720
Durbin-Watson stat	0.401718		

Table 17: Regression result of different regions_middle (pooled data)

Dependent Variable: GDI?
Method: Pooled Least Squares
Date: 05/25/11 Time: 18:54
Sample: 2003 2009
Included observations: 7
Cross-sections included: 8
Total pool (balanced) observations: 56

Variable	Coefficient	Std. Error	t-Statistic	Prob.

OFDI?	-15.59468	21.99070	-0.709149	0.4813
FDI?	-0.063276	0.277416	-0.228090	0.8205
GDS?	0.571719	0.071147	8.035689	0.0000

R-squared	0.885950	Mean dependent var	0.642909
Adjusted R-squared	0.881646	S.D. dependent var	0.701291
S.E. of regression	0.241262	Akaike info criterion	0.046219
Sum squared resid	3.084997	Schwarz criterion	0.154720
Log likelihood	1.705872	Hannan-Quinn criter.	0.088284
Durbin-Watson stat	0.514014		

Table 18: Regression result of different regions_west (pooled data)

Dependent Variable: GDI?
Method: Pooled Least Squares
Date: 05/25/11 Time: 19:16
Sample: 2003 2009
Included observations: 7
Cross-sections included: 11
Total pool (balanced) observations: 77

Variable	Coefficient	Std. Error	t-Statistic	Prob.
OFDI?	57.87021	31.10152	1.860688	0.0668
FDI?	-2.094997	0.230121	-9.103872	0.0000
GDS?	0.640321	0.028615	22.37737	0.0000

R-squared	0.885984	Mean dependent var	1.299407
Adjusted R-squared	0.882903	S.D. dependent var	1.272790
S.E. of regression	0.435542	Akaike info criterion	1.213730
Sum squared resid	14.03755	Schwarz criterion	1.305047
Log likelihood	-43.72859	Hannan-Quinn criter.	1.250256
Durbin-Watson stat	0.685247		

Table 19: Regression result from random effect model_east

Dependent Variable: GDI?
Method: Pooled EGLS (Cross-section random effects)
Date: 05/25/11 Time: 18:35
Sample: 2003 2009
Included observations: 7

Cross-sections included: 11

Total pool (balanced) observations: 77

Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.48E-05	0.064036	0.000388	0.9997
OFDI?	29.87163	10.26754	2.909328	0.0048
FDI?	0.196736	0.126751	1.552151	0.1250
GDS?	0.503060	0.038848	12.94928	0.0000
Random Effects (Cross)				
BEIJING--C	-0.329309			
SHANGHAI--C	-0.093039			
GUANGDONG--C	-0.049481			
ZHEJIANG--C	0.054245			
LIAONING--C	0.384543			
JIANGSU--C	-0.002186			
SHANDONG--C	-0.048906			
FUJIAN--C	0.085508			
TIANJIN--C	0.100190			
HEBEI--C	0.013668			
HAINAN--C	-0.115233			

Effects Specification		
	S.D.	Rho
Cross-section random	0.191154	0.7820
Idiosyncratic random	0.100912	0.2180

Weighted Statistics			
R-squared	0.756321	Mean dependent var	0.072507
Adjusted R-squared	0.746307	S.D. dependent var	0.198645
S.E. of regression	0.100053	Sum squared resid	0.730780
F-statistic	75.52470	Durbin-Watson stat	1.557319
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	0.621832	Mean dependent var	0.370549
Sum squared resid	2.940417	Durbin-Watson stat	0.387040

Table 20: Regression result from random effect model_middle

Dependent Variable: GDI?

Method: Pooled EGLS (Cross-section random effects)

Date: 05/25/11 Time: 18:55

Sample: 2003 2009

Included observations: 7

Cross-sections included: 8

Total pool (balanced) observations: 56

Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.089038	0.085310	1.043696	0.3015
OFDI?	21.74526	16.09047	1.351437	0.1824
FDI?	0.781231	0.339403	2.301778	0.0254
GDS?	0.322711	0.088711	3.637760	0.0006
Random Effects (Cross)				
HUNAN--C	-0.096797			
JILIN--C	-0.400901			
SHANXI--C	0.299332			
HENAN--C	0.074376			
HEILONGJIANG--C	0.043031			
ANHUI--C	0.016037			
JIANGXI--C	0.131681			
HUBEI--C	-0.066759			

Effects Specification

	S.D.	Rho
Cross-section random	0.200439	0.6304
Idiosyncratic random	0.153473	0.3696

Weighted Statistics

R-squared	0.857297	Mean dependent var	0.178725
Adjusted R-squared	0.849064	S.D. dependent var	0.398909
S.E. of regression	0.154978	Sum squared resid	1.248949
F-statistic	104.1309	Durbin-Watson stat	1.130543
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.872739	Mean dependent var	0.642909
Sum squared resid	3.442352	Durbin-Watson stat	0.410182

Table 21: Regression result from random effect model_west

Dependent Variable: GDI?

Method: Pooled EGLS (Cross-section random effects)

Date: 05/25/11 Time: 19:17

Sample: 2003 2009

Included observations: 7

Cross-sections included: 11

Total pool (balanced) observations: 77

Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.064115	0.131119	0.488987	0.6263
OFDI?	59.67352	27.29374	2.186344	0.0320
FDI?	-1.856709	0.340108	-5.459178	0.0000
GDS?	0.612481	0.043236	14.16591	0.0000
Random Effects (Cross)				
YUNNAN--C	0.019463			
SICHUAN--C	0.091117			
NEIMENG--C	0.790976			
XINJIANG--C	-0.306952			
CHONGQING--C	-0.134999			
GANSU--C	-0.134092			
NINGXIA--C	0.176635			
GUIZHOU--C	-0.155323			
QINGHAI--C	-0.332596			
SHANXI--C	-0.050166			
GUANGXI--C	0.035937			

Effects Specification

	S.D.	Rho
Cross-section random	0.372328	0.5917
Idiosyncratic random	0.309269	0.4083

Weighted Statistics

R-squared	0.877217	Mean dependent var	0.389220
Adjusted R-squared	0.872171	S.D. dependent var	0.850143
S.E. of regression	0.303953	Sum squared resid	6.744268
F-statistic	173.8485	Durbin-Watson stat	1.417175
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.886854	Mean dependent var	1.299407
Sum squared resid	13.93055	Durbin-Watson stat	0.686104

Table 22: Pooled Regression Result of OFDI into different continents

Dependent Variable: LOG(GDI?)
Method: Pooled Least Squares
Date: 05/24/11 Time: 19:07
Sample: 2003 2009
Included observations: 7
Cross-sections included: 6
Total pool (balanced) observations: 42

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(OFDI?)	0.063837	0.013050	4.891756	0.0000
LOG(FDI?)	0.002242	0.047405	0.047288	0.9625
LOG(GDS?)	0.533921	0.421263	1.267430	0.2125

R-squared	0.034942	Mean dependent var	-0.685269
Adjusted R-squared	-0.014548	S.D. dependent var	0.145490
S.E. of regression	0.146545	Akaike info criterion	-0.934220
Sum squared resid	0.837541	Schwarz criterion	-0.810101
Log likelihood	22.61863	Hannan-Quinn criter.	-0.888726
Durbin-Watson stat	0.287354		

Table 23: Random Regression Result of OFDI into different continents

Dependent Variable: LOG(GDI?)
Method: Pooled EGLS (Cross-section random effects)
Date: 05/24/11 Time: 19:09
Sample: 2003 2009
Included observations: 7
Cross-sections included: 6
Total pool (balanced) observations: 42
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.194781	0.092899	-34.38980	0.0000
LOG(OFDI?)	0.001493	0.002957	0.504978	0.6165
LOG(FDI?)	-0.730297	0.022929	-31.85027	0.0000
LOG(GDS?)	0.618001	0.075448	8.191136	0.0000
Random Effects (Cross)				
ASIA--C	0.000000			
AFRICA--C	0.000000			
EUROPE--C	0.000000			

LATIN_AMERICA--C	0.000000
NORTH_AMERICA--C	0.000000
OCEANIA--C	0.000000