

# Regional Determinants of Foreign Direct Investment in Manufacturing Industry

Kelly Liu<sup>1</sup>, Kevin Daly<sup>2</sup> and Maria Estela Varua<sup>3</sup>

School of Business, University of Western Sydney<sup>1</sup>

**Abstract.** Over the past three decades, the manufacturing sector has dominated China's FDI inflow, however, when manufacturing activity is bifurcated into low and high technology classes, it becomes evident that China is in a transition stage moving from FDI in traditional low-tech activity to a high-tech manufacturing environment. This paper attempts to analyse the key determinants of FDI inflow across low and high technology manufacturing industry across four geographical regions of China. In the paper we empirically investigate the determinants of FDI high-low tech inflow by market size, labor cost, labor quality, and government spending on human capita.

**Keywords:** China, FDI, Manufacturing Industry. Low High Technology

## 1. Introduction

Since China reformed and adopted the 'open up' policies in 1979, foreign direct investment (FDI) increased dramatically from almost no foreign investment to USD105.74 billion in 2010. FDI is widely recognised as one of the major driving force in promoting economic growth in China as it increases productivity, efficiency, technology level and improves management know-how through spill-over effects. (Whally & Xin, 2010; Wei and Liu, 2006; Liu, 2008; Yao, 2006). However, the uneven distribution of FDI among the regions has also contributed to the regional economic disparity between coastal region and other non-coastal regions of the northeast region, central region and western region (Chen, Ge & Lai, 2011). Thus to reduce the disparity in economic growth among the regions, it is important to identify the factors that contributed to the inflow of FDI in each region.

This paper focuses on the regional determinants of FDI inflow on the high technology and low technology categories of manufacturing industry. The distinction between the two types is made due to the following reasons. Firstly the data shows that foreign investors invest proportionately more in secondary sector (60 per cent of total FDI), especially in manufacturing industry, rather than in primary or tertiary sectors. Secondly, in the past decades, China's manufacturing industry has made an outstanding progress and has become the world's largest producer of more than 100 products. However after Global Financial Crisis of 2008, the demand for low-tech products decreased while the international demand for high-tech products has increased as the latter is found to have positive effects on productivity and competitiveness when used throughout economy (OECD, 2009). Thirdly, FDI provides host countries like China an access to new technology, capital, research & development facilities and management know-how for a host location which in turn increases economic development. However, Sun and Chai (1998) and Lin et al (2011) argue that the spillover effects of FDI depend heavily on host region's absorptive ability. The inequality between coastal and non-coastal regions may imply that the degree of technological capability varies substantially across regions but each region promotes its own comparative Significant explanatory variables of size of the economy, labour cost, labour quality, physical and telecommunication infrastructure and check whether the determinants are the same in the two categories among four regions. The structure of this chapter is as follow: section 2 describes the transformation and regional distribution of FDI in manufacturing industry among four regions. Section 3 reviews the previous studies on location determinants of FDI and section 4 presents determinant variables of FDI inflows in both high-tech and low-tech categories. Data and analytical

---

+ Email: k.liu@uws.edu.au  
Email: k.daly@uws.edu.au  
Email: m.varua@uws.edu.au

framework and empirical results will be present in section 5 and 6, respectively. The conclusion and policy implications are presented in section 7.

## **2. Transformation and Regional Distribution of FDI Inflows in both High and Low-Technology Manufacturing Industries**

This paper classifies manufacturing industries in China into only two categories, namely: low (low and medium-low technology) and high (medium-high and high technology) categories. The high-technology manufacturing category includes the following: pharmaceutical, medicinal chemicals and botanical products, telecommunication, office machinery, chemical and chemical products, machinery and equipments, electrical machinery and transport equipment. The low-technology manufacturing industries include food and beverages production, tobacco production, textiles, wearing apparel, paper and paper products, coke and petroleum production, non-metallic mineral production, basic metal production and fabricated metal production. FDI in both categories increased dramatically, especially for the high-tech category. The total FDI in low-tech category grew from USD 30.3 billion in 2001 to USD 106.1 billion in 2008, an increase of 250 per cent while the high-tech category grew from USD40.2 billion to USD 208.3 billion, which is equivalent to an increase around 418 per cent.

FDI inflows in both high-tech and low-tech manufacturing industries exhibit a strong location preference, as it has been highly concentrated in the coastal region, with very little flowing into the northeast, central and western regions. For high-tech category, coastal region had a share of 88 percent of total FDI, while the northeast, central and western regions only received 5, 4 and 3 percent, respectively.

## **3. Studies of Location Determinants of FDI in China**

Previous researchers have identified a few determinants of foreign investment, and most assume that foreign investors will choose to invest in a particular location based on per capita income, agglomeration, labour quality, labour cost, transportation network and expenditures to attract foreign investment. Wang and Swain (1997) find that the FDI in manufacturing sectors is positively related to China's GDP, GDP growth rate, wages and trade barriers, but negatively related to interest rate and exchange rate for the period of 1978-1992. Cheng and Kwan (2000) report that good infrastructure positively influences the location decision of foreign investors in China. Similarly, Sun et al (2002), similarly report that good infrastructure has a positive effect on FDI inflow to China for the period 1986-1998. However, Mudambi & Mudambi (2005) show that good infrastructure supports do not always attract significant FDI, especially into the high-technology sector. Zhang and Yuk (1998) examine the determinants of FDI in manufacturing industry coming from Hong Kong's investors into Guangdong province of China and also compare the difference between capital-intensive and labour-intensive FDI. They find that labour-intensive industries attract more export-oriented FDI, while capital-intensive industries attract FDI that are more domestic market-oriented. They also found the most important determinants are cheap labour and land, stable political environment, government incentive policies, good infrastructure, absence of language barrier and the geographical proximity of Guangdong province to Hong Kong. When NG and Tuan (2006) identify the determinants of FDI in manufacturing in Guangdong province by using firm-level data, they find that institutional force and agglomeration are both positively related to the level of FDI inflows. Based on comparative advantage, Qiu (2003) constructs a FDI model and finds that host country's comparative advantage sectors will be more attractive to FDI than its comparative disadvantage sectors. He then explains as to why prominent FDI invest in China's labour-intensive sector, arguing that this is the case as China has comparative advantage due to its large supply of labour and relative low cost of input materials.

## **4. Determinant Factors on FDI in Manufacturing Industry in both low and high-tech manufacturing industries**

The theoretical foundation used in this paper is Dunning's OLI paradigm or eclectic paradigm (Dunning, 1988). Based on OLI paradigm and empirical studies previously discussed, eight potentially important determinants of FDI inflows across four regions in China were identified. As summarised in Table 1, they

are market size, absorptive capacity, supply of unskilled labour, labour cost, physical infrastructure, telecommunication, government incentives and agglomeration.

*Market size* (GDPPC, USD dollar) should have a positive impact on regional attraction of foreign capital on both high and low-tech manufacturing industries, because it directly affects the expected revenue from domestic market, thus, market size of host location are very important for FDI. The effectiveness of technology transformation from home country to host location depends on the hosting region's *absorptive ability* (Lin et al, 2011). The host country must have a moderate technological gap with MNEs in order to attract MNEs to establish foreign subsidiaries and transfer advanced technology. Thus, we argue that government with higher expenditure on R&D increases its regional capacity to absorb more advanced foreign technology, which in turn, attract more high-tech manufacturing FDI. (RESEARCH, USD million). *Supply of unskilled labour* is a crucial factor to attract FDI, especially in low-tech manufacturing industry. The average wage level in coastal region is higher than other three non-coastal region, thus, the large amount of unskilled labour in non-coastal regions should be an essential factor for low-tech manufacturing FDI, thus, it should has a positive relationship with FDI. (UNSKILL, %). *Labour cost*, as measured by average wage paid for employee in manufacturing industry, it is expected to have both positive and negative effect on FDI. On one hand, higher the wage means lower revenue, it will reduce the attractiveness of a location for FDI. On the other hand, in recent years, MNCs are paying premium to their workers, this maybe because multinational firms want to hire quality workers, the labour cost also reflects the labour quality, and thus the sign of wage variable can be both positive and negative. (WAGE, USD dollar). *Physical infrastructure and telecommunication* development is another major determinant of FDI. Adequate and effective transportation can influence a firm's cost and revenue and hence their location decision. The level of infrastructure development of a particular region should positively correlate to FDI. Direct measure of physical infrastructure is the total length of highway per kilometres, railway per kilometres (HRWLENGTH) and the telecommunication infrastructure development is measured by total length of cable. (TELECOM, kilometres). The government incentive to attract FDI is proxied by the number of special zones in each region. In those special zones, foreign investors can enjoy tax exemption or reduction, cheaper land fees and import duties. In turn, the regions with more zones become more attractive for foreign investment. Thus, we believe the number of zones in each region (SZONES, unit) should have a positive relationship with FDI inflow for both high and low-tech manufacturing industries. *Agglomeration* refers to the concentration of economic activities that can increase the economics of scales and positive externalities (Sun et al, 2002). The level of agglomeration of a particular region should be positively related to their attraction of new FDI. Another argument is that adding to existing stock in a particular location is less risky and less costly for subsequent investors (Billington, 1999). However, on the other hand, high concentration of one category may cause competition which reduce the attractiveness of a location, thus the agglomeration effect on FDI can be both positive and negative. The foreign capital received in previous year in low and high-tech manufacturing industries is used to the agglomeration effects on both high and low-tech FDI, respectively. (AGGLOL and AGGLOH, USD million)

## 5. Data and Analytical Framework

This paper employs a panel data set of manufacturing industries reported by the China Industrial Economic Statistical Yearbook. It is the only official source provides detailed and consistent data under the separate categories of different industries in different provinces. There is a mismatch between the sectoral classifications for China's industrial statistical report (GB/T 4754) and the ISIV.3. The 'China Industrial Statistical Yearbook-2005 (report 2004's data)' is not availability, thus, the foreign investment in different industries was calculated by the average of 2003 data and 2005 data.

The empirical strategy was to establish two models to testing the determinants of FDI in both high-tech and low-tech manufacturing industries separately and apply the same model to different regions. We argue that If testing the determinants factor of both high and low-tech manufacturing by using the same model, it may provide misleading indications as different category of FDI may attracted by different determinants and different locations. For instance, FDI in high technology manufacturing industry may attracted by higher

observing capacity in coastal region while the low-tech manufacturing industry may attracted by large amount of labour supply in inland regions, thus, the classification is essential.

All determinants, except the number of special zones are lagged by one (1) period. This was due to two reasons. Firstly, decision to undertake FDI in a current year will not be realised in the sense that actual FDI flows does not eventuate until a year later, in other words, multinationals FDI activities in a given year are based on information from the previous year. Secondly, the amount of FDI inflows and the independent variable may affect each other. In order to avoid the endogeneity problem, the GDPPC, WAGE, HRWLENGTH, TELECOM, RESEARCH and UNSKILL are transformed into natural logarithm.

Thus, the low-tech manufacturing industry locational model can be written as:

$$FDIL_{it} = \alpha + \beta_1 GDPPC_{i,t-1} + \beta_2 WAGE_{i,t-1} + \beta_3 UNSKILL_{i,t-1} + \beta_4 HRWLENGTH_{i,t-1} + \beta_5 TELECOM_{i,t-1} + \beta_6 SZONES_{i,t} + \beta_7 AGGLOL_{i,t-1} + \varepsilon_{it} \quad (1)$$

Similarly, the high-tech manufacturing industry locational model is specified as follows:

$$FDIH_{it} = \alpha + \beta_1 GDPPC_{i,t-1} + \beta_2 WAGE_{i,t-1} + \beta_3 RESEARCH_{i,t-1} + \beta_4 HRWLENGTH_{i,t-1} + \beta_5 TELECOM_{i,t-1} + \beta_6 SZONES_{i,t} + \beta_7 AGGLOH_{i,t-1} + \varepsilon_{it} \quad (2)$$

Where subscript  $i$  refers to individual provinces,  $t$  refers to years from 2002 to 2010. The variables are defined in Table 1.

## 6. Empirical Results

The regression results of location determinants of low-tech manufacturing FDI shows a mixed picture among four regions in China as shown in Table 2A. For coastal region, market size (GDPPC) has significant positive effect on low-tech FDI (Table 5a, Column a) i.e., rapid growing domestic market attracts low-tech FDI in this region. It indicates that the nature of low-tech FDI in coastal region is not only export-oriented bur also domestic market-oriented. This was due to the highest population density and highest household income in coastal region. The labour cost (WAGE) and supply of unskilled labour (UNSKILL) both have a negative effect on FDI inflows, however, only WAGE variable has scientific significant effect. Generally speaking, low-tech FDI are motivated by cheap and unskilled labour in host location, however, the overall labour quality is the highest compare to other regions, especially in the Beijing, and Shanghai, thus, even for low-tech FDI, foreign investors need to pay more for the same task. In terms of employee educational attainment, by the end of 2009, 14 per cent of total employees in coastal region have college degree or above, in Beijing and Shanghai municipalities, the proportion were 35.9 per cent and 31.3 per cent, respectively. While the proportion of total employee with college degree or high in western, northeast and central regions were 12.2 per cent, 9.3 per cent and 6.3 per cent, respectively. Physical infrastructure (HRWLENGTH) and telecommunication (TELECOM) both have the positive but insignificant effects on low-tech FDI in coastal region. Although domestic market in coastal region became more attractive for foreign investors, most of products produced by FFEs are exported to FFEs' home countries or other destinations. In 2010, the total export from FFEs in coastal region was USD 808.3 billion, which equal 93.8 per cent of total export from FFEs. This shows inland highways, railways and waterways and telecommunication development were not as important as seaports located in the coastal region. The government incentive to attract FDI was measured by number of special zones (SZONES), until 2010, there are 302 different zones established in China, which 165 were located in coastal region. Special zones offer preferential policies to foreign investors in terms of tax deduction, cheap land and cheap energy fees, however, a high concentration of special zones located in the same region may reduced the attractiveness of zones and also increase the competition between firms who located in special zones, they may face competition in labours, land uses and infrastructure. Thus, even though setting special zones has a positive effect on attractiveness of coastal region, the effect is not significant. The regression results show a highly significant positive agglomeration effect (AGGLO) on low-tech FDI in coastal region, agglomeration not only measures the positive economic externality, and it also indicates the risk involved for new investors. Large amount of FDI inflows located in coastal region previously indicates the region is more market-oriented and adopted foreign business environments. In turn, it increases confidence level for new investors, especially one do not familiar with China's culture.

Table 1A: Determinants of foreign capital in low-tech manufacturing industry among four regions

	<b>Coastal (a)</b>	<b>Northeast (b)</b>	<b>Central (c)</b>	<b>Western (d)</b>
<b>CONS</b>	-0.1060 (0.910)	<b>-6.5670</b> <b>(0.027)**</b>	-1.3539 (0.584)	<b>-5.8572</b> <b>(0.034)**</b>
<b>GDPPC</b>	<b>0.7600</b> <b>(0.006)***</b>	-0.0031 (0.995)	0.1546 (0.755)	1.5108 <b>(0.052)*</b>
<b>WAGE</b>	<b>-0.4791</b> <b>(0.075)*</b>	0.3616 (0.632)	0.2599 (0.602)	-0.9733 (0.330)
<b>UNSKILL</b>	-0.0113 (0.152)	-0.0037 (0.813)	-0.0052 (0.603)	0.0001 (0.982)
<b>HRWLENGTH</b>	0.1689 (0.124)	0.3276 (0.165)	0.0838 (0.614)	<b>0.4393</b> <b>(0.091)*</b>
<b>TELECOM</b>	0.0579 (0.213)	0.3783 (0.290)	-0.0160 (0.954)	0.2841 (0.246)
<b>SZONES</b>	0.0014 (0.880)	<b>-0.1320</b> <b>(0.007)**</b>	-0.0424 (0.119)	-0.0130 (0.858)
<b>AGGLOL</b>	<b>0.4777</b> <b>(0.000)***</b>	<b>0.6668</b> <b>(0.001)***</b>	<b>0.6844</b> <b>(0.000)***</b>	0.0006 (0.996)
<b>R-sq(overall)</b>	0.9133	0.2742	0.8825	0.4439
<b>Prob &gt; chi2</b>	0.0000	0.0000	0.0000	0.0000

Note: () represents p-value, \*\*\*, \*\*, \* denote statistical significance at 1%, 5% and 10% level, respectively

The empirical results show the regional determinants of low-tech manufacturing FDI in northeast region and central region are similar (Table 1A, column b and c). For both regions, the wage variable (WAGE) has a positive sign, while the supply of unskilled labour (UNSKILL) has negative sign. Combining these two variables, it indicates that even for low-tech manufacturing activities, there was a mismatch between the basic skills of labour force and FFEs requirement, in turn, FFEs are willing to pay higher wage to get relative skilled labour. Meanwhile, the inland physical infrastructure development has a positive effect on both regions. In these two regions, the total exports from FFEs contribute 37.7 per cent in northeast region and 17.4 per cent of total regional exports in central region. These figures show low-tech FDI inflows in these two regions are more domestic market-oriented than export-oriented, as a result, inland infrastructure development is an important location factor for low-tech FDI. The government incentive to attract low-tech FDI by setting up special zones (SZONES) also failed in these two regions. For northeast region, there were ten (10) different types of special zones were set up in the period of 2000-2010, within the ten (10) special zones, 4 are export-processing zones, one (1) was high-tech development zone and five (5) were national economic and technological development zones. Based on the nature of special zones, the regional governments are trying to attract more high-tech FDI instead of low-tech FDI. However, this was not match with the regional characteristics, such as labour quality. Thus, establishing special zones reduce the attractiveness of low-tech FDI in northeast region. In central region, 32 special zones were established in the same period, 23 were economic and high-tech development zones. The agglomeration effect (AGGLOL) has a highly significant effect on low-tech FDI in both two regions, they are both significant at 1 per cent level. Comparing with coastal region, northeast and central regions opened to foreign investors with a short period, thus, experience of doing business in these regions from previous FDI are extremely important for new investors.

In western region, market size (GDPPC) and physical infrastructure (HRWLENGTH) are the only two variables that have scientific significant effect on low-tech FDI. Western region is compose by mountains, plateaus and basins, the geographical environment made it too costly to export products to U.S. and European union, who are the major importers of China's products. As a result, domestic market and intraregional infrastructure development are two important variables on low-tech FDI. Although western region is reach in labour supply, 60.6 per cent of total regional population are living in rural area, they do not have the based skills for manufacturing production, and thus, the supply of unskilled labour (UNSKILL) has a positive but not significant effect on low-tech FDI. The effect of establishing special zones to attract low-tech FDI was also not significant. Since China adopting 'western development' strategy since 1999, there

were 35 different types of special zones were established, 24 were economic and technology development zones, three (3) high-tech zones, eight (8) were export-processing zones. However, due to the economic development, labour quality and physical infrastructure development, setting up zones was not sufficient enough to attract foreign investors. In addition, three (3) high-technology zones and eight (8) export-processing zones were not suitable for western region. Firstly, the research and research development facilities and human resources were not superior, secondly, the major importers of China's products are U.S. and European Union, for them, the transportation cost is high due to the distance and infrastructure development. Thus setting up export-processing zones does not increase attractiveness of the western region.

The regional determinants of high-tech FDI inflows among regions also show mixed pictures (Table 1B). Due to the large amount of high-tech located in coastal region, the model fix coastal region the most, the overall R-square is 0.9758. In the period of 2001-2008, coastal region attracts 88 per cent of total high-tech FDI in China. The empirical result shows FFEs establish high-tech manufacturing production in coastal region was attracted by better telecommunication development (TELECOM) and economic externality (AGGLOH) and these two variables both are scientific significant at 1 per cent level. Compare to other developed countries, the average wage in coastal region is low, thus, the WAGE variable shows a negative but insignificant effect on high-tech FDI. The variable RESEARCH measures the government spending on research and development shows an insignificant effect on high-tech FDI. This indicates that the training provided by coastal region was not valued by foreign investors, and they are willing increase labour skills by on-job training. In contrast, in northeast region, the government spending on research and development (RESEARCH) has a positive significant effect on high-tech FDI. A 1 per cent increased in government spending on R&D would increase high-tech FDI by 0.82 per cent. This can be explained by the labour quality was not as good as in coastal region, thus, continual investing in human capital shows a positive sign for foreign investors. Moreover, the physical infrastructure (HRWLENGTH) and telecommunication (TELECOM) development are both show expected signs (Table 5b, column b), the better the physical and telecommunication development, the more FDI will attracted into northeast region. However, establishing special zones was not an effect way to attract high-tech FDI in the period of 2001-2008. Recall the same argument for low-tech FDI, the effect of setting up special zones on low-tech FDI depends on the nature of zones and the number of zones in an area. If there are too many zones in an area, they are limiting the advantage compare to setting up business outside zones due to competitions.

Table 1B: Determinants of foreign capital in high-tech manufacturing industry among four regions

	Coastal (a)	Northeast (b)	Central (c)	Western (d)
CONS	-2.2356 (0.034)	<b>-10.1900</b> <b>(0.004)**</b>	-3.4573 (0.271)	0.4994 (0.794)
GDPPC	0.4004 (0.167)	0.6206 (0.384)	-0.2520 (0.705)	0.5805 (0.318)
WAGE	-0.1805 (0.453)	-1.3179 (0.264)	-0.3818 (0.561)	-0.7477 (0.291)
RESEARCH	0.0035 (0.975)	<b>0.8207</b> <b>(0.015)**</b>	0.3976 (0.282)	0.1847 (0.344)
HRWLENGTH	0.1194 (0.181)	<b>0.7014</b> <b>(0.010)***</b>	0.0041 (0.983)	-0.0219 (0.910)
TELECOM	<b>0.1832</b> <b>(0.000)***</b>	<b>0.9367</b> <b>(0.019)**</b>	<b>0.6561</b> <b>(0.060)*</b>	0.1860 (0.314)
SZONES	-0.0066 (0.430)	<b>-0.1298</b> <b>(0.023)**</b>	-0.0588 (0.180)	-0.0142 (0.793)
AGGLOH	<b>0.7269</b> <b>(0.000)***</b>	0.1212 (0.594)	<b>0.9071</b> <b>(0.000)***</b>	<b>0.7045</b> <b>(0.000)***</b>
R-sq(overall)	0.9758	0.0016	0.8877	0.9501
Prob > chi2	0.0000	0.0000	0.0000	0.0000

Note: () represents p-value, \*\*\*, \*\*, \* denote statistical significance at 1%, 5% and 10% level, respectively

In central region, market size (GDPPC) has no significant effects on high-tech FDI (Table 1B, column c). This can be explained by the major investors in northeast region are from Japan and South Korea, and most of the final products are exported back to their home countries instead of serving domestic market. Thus, the size of domestic market has no effect on high-tech FDI. The labour cost (WAGE) has the expected sign; however, scientific insignificant, recall that the overall labour cost in China is low, the wage level has limited implication for foreign investors. Both telecommunication (TELECOM) and physical infrastructure (HRWLENGTH) have positive sign, but insignificant effect. Recalls the most of products are exporting back to Japan and South Korea, although inland physical infrastructure and telecommunication are essential for high-tech manufacturing productions, the seaports are more important in this region. Comparing high-tech FDI to low-tech FDI, it involves more risks such as large amount of initial investment on machinery, R&D and labour training, thus, experiences from previous investments play an important role for decision makers. The agglomeration (AGGLOH) shows a positive effect on high-tech FDI, which is scientific significant at 1 per cent level. A 1 percent in increase of high-tech FDI will increase 0.91 per cent for the next year. Government incentive to attract high-tech FDI by setting up special zones (SZONES) has also failed in northeast region, it not only has an insignificant effect, but also has a negative sign. This implies the preferential policies implied in zones are not matched with foreign investors' expectations.

For western region, none of the location determinant variables is statistically significant, except the agglomeration effect. Data shows that the western region has never been an attractive destination for foreign investment since China opened its door to trade. This result is further supported by the fact that the western region only receives 3 per cent of high-tech FDI in China. Market size (GDPPC), labour quality (RESEARCH), physical infrastructure (HRWLENGTH) and telecommunication (TELECOM) all have insignificant effect on high-tech FDI in western region. This implies although government tried to establishing special zones and implementing preferential policies to attract foreign investors, it cannot compensate investors due to underdeveloped economic environment, unskilled labour force and disadvantaged geographical location, this is further confirmed by the negative insignificant sign of SZONES variable.

## 7. Conclusion

The purpose of this paper is to investigate the local determinants of FDI. In order to provide accurate information for policy maker to attract right FDI into the right location, we break down manufacturing industries into low and high tech categories according to research intensity and find out the foreign capital investment in China has created a movement from low and to high tech manufacturing industry. However, if breaking down 30 provinces into 4 regions, namely, coastal region, northeast region, central region and western region, each region has different characteristics, one region may attract for high-tech while other region is attract for low-tech manufacturing. Thus, we analysed and summarised the determinants of FDI for both low and high tech industrial production across four regions in China.

The empirical testing suggests that for coastal region, the important determinants of low-tech FDI in coastal region are the domestic market, labour cost, and agglomeration effect, while the important determinants for high-tech are the development of telecommunication. To attract greater FDI into this area, the policy makers should continue to invest telecommunication development and open more domestic market to foreign investors. For other three inland regions, physical infrastructure is essential to increase the attractiveness for both high-tech and low-tech FDI, while the telecommunication development is especially important for northeast and central regions.

Based on the empirical results, the policy implications are: for coastal region, government should continual invest on research and development in order to attract more high-tech FDI. In order to reduce regional disparities, the Chinese government should improve the regional investment environment, and implementing more preferential policies, however, the preferential policies should be more location and industrial based. For inland regions, especially the western region, have rich natural resources endowment and cheaper production inputs, the government should encourage resource-seeking, low-tech FDI, such as mining and raw material industries. In addition, like coastal region successfully attracting export-oriented FDI to promote regional development, the government policy should also promote export-oriented FDI, and exporting to the neighbor countries, e.g. Russia and India. The infrastructure development is an essential to encourage FDI into the western region. Western region should invest more on physical infrastructure, it will increase the attractiveness of low-tech FDI, the FDI will promote economic development, in turn, better economic development will attractive more FDI inflows,

## 8. Reference

- [1] Billington, M. The location of foreign direct investment: an empirical analysis. *Applied Economics*. 1999, **31**: 65-76.
- [2] CHEN, C. *Foreign direct investment in China: location determinants, investor differences and economic impacts*, Northampton, MA: Edward Elgar. 2011
- [3] CHEN, Z., GE, Y., & LAI, H. (2011). Foreign Direct Investment and Wage Inequality: Evidence from China. *World Development*. 2011, **39** (8): 1322-1332
- [4] CHENG, L., & KWAN, Y. K. The location of foreign direct investment in Chinese regions: Further analysis of labour quality. In: KRUEGER, A. O. (ed.). *The Role of Foreign Direct Investment in East Asian Economic Development*. University of Chicago Press, 2000.
- [5] DUNNING, J. H. *Explaining International Production*, Boston, MA: Unwin Hyman, 1988.
- [6] GRAF, M. & MUDAMBI, S., M. The outsourcing of IT-enabled business process: A conceptual model of the location decision. *Journal of International management*. 2005 **11**: 253-268.
- [7] KINOSHITA, Y. R&D and technology spillovers through FDI: Innovation and absorptive capacity. *C.E.P.R. discussion paper no. 2775*. London: Centre for Economic Policy Research, 2001.
- [8] LIN, C.-H., LEE, C.-M., & YANG, C.-H. Does foreign direct investment really enhance China's regional productivity? *The journal of international trade & Economic Development: An international and comparative review*. 2011, **20**: 741-768.
- [9] LIU, Z. Foreign direct investment and technology spillover: Theory and evidence. *Journal of Development Economics*. 2008, **85**: 176-193.
- [10] MUDAMBI, R., & MUDAMBI, S., M. Multinational enterprises knowledge flows: the effect of government inward investment policy. *Management International review*. 2005, **45**: 155-178.
- [11] NG, L. F., & TUAN, C. Spatial agglomeration, FDI and regional growth in China: Locality of local and foreign manufacturing investment. *Journal of Asian Economics*. 2006, **17**: 691-713.
- [12] OECD Science, Technology and Industry Scoreboard, OECD, 2009.
- [13] QIU, L. D. Comparing sectoral FDI incentives: Comparative advantages and market opportunities. *Annals of economics and finance*. 2003, **4**: 383-408.
- [14] SHAUKAT, A. & GUO, W. Determinants of FDI in China. *Journal of global business and technology*. 2005, **1**: 21-33.
- [15] SUN, H., & CHAI, J. Direct foreign investment and inter-regional economic disparity in China. *International Journal of Social Economics*. 1998, **25**: 424-447.
- [16] SUN, Q., TONG, W., & YU, Q. Determinants of foreign direct investment across China. *Journal of International Money and Finance*. 2002, **21**: 79-113.
- [17] WANG, Z. Q. & SWAIN, N. Determinants of Inflow of Foreign Direct Investment in Hungary and China: Time-Series Approach. *Journal of International Development*. 1997, **9**: 695-726..
- [18] WEI, Y., & LIU, X. Productivity spillovers from R&D, exports and FDI in China's manufacturing sector. *Journal of International Business Studies*. 2006, **37**: 544-557.
- [19] WEI, K., YAO, S., & LIU, A. (2009). Foreign direct investment and regional inequality in China. *Review of development economics*, **13**, 778-791.
- [20] WHALLEY, J., & XIN, X. China's FDI and non-FDI economies and the sustainability of future high Chinese growth. *China Economic Review*. 2010, **21**: 123-135.
- [21] YANG, D. Foreign direct investment and development of high-growth industrial sectors in China, 1998-2006. *The Chinese Economy*, 2010, **43**: 93-114
- [22] YAO, S. On economic growth, FDI and exports in China. *Applied Economics*, 2006, **38**: 339-351.
- [23] YU, K., XIN, X., GUO, P. & LIU, X. Foreign direct investment and China's regional income inequality. *Economic Modeling*, 2011, **28**: 1348-1353.
- [24] ZHANG, X., & YUK, H. P. Determinants of Hong Kong manufacturing investment in China: a survey. *Marketing intelligence and planning*. 1998, **16**: 260-267.